Detection for automation solutions OsiSense

Catalogue

Simply easy!™

Telemecanique Sensors

General content

Detection for automation solutions
OsiSense

Limit switches 1
OsiSense XC

Electronic pressure sensors 2
OsiSense XM

Inductive proximity sensors 3
OsiSense XS

Capacitive proximity sensors 4
OsiSense XT

Photo-electric sensors 5
OsiSense XU

Ultrasonic sensors 6
OsiSense XX

Radio frequency identification 7
OsiSense XG

Opto-electronic rotary encoders 8
OsiSense XCC

Index 9

Contents

Limit switches
OsiSense XC Standard

Selection guide . . . . . *page 1/2*

■ Variable composition: Simplicity through innovation. . . . . *page 1/8*

OsiSense XC Standard

■ Miniature design, metal, type XCMD - Presentation. . . . . *page 1/10*
- □ Pre-cabled . . . . . *page 1/12*
- □ Integral or remote connector . . . . . *page 1/16*
- □ Variable composition . . . . . *page 1/20*
- □ Separate components . . . . . *page 1/24*

■ Compact design, types XCKD, XCKP and XCKT - Presentation . . . . . *page 1/30*
- □ Variable composition . . . . . *page 1/46*

■ Compact design, plastic, type XCKP - Presentation. . . . . *page 1/32*
- □ Complete units with 1 cable entry . . . . . *page 1/34*
- □ Integral M12 connector . . . . . *page 1/38*

■ Compact design, metal, type XCKD - Presentation . . . . . *page 1/38*
- □ Complete units with 1 cable entry . . . . . *page 1/40*
- □ Integral M12 connector . . . . . *page 1/42*
- □ Adaptable sub-assemblies: bodies, contacts . . . . . *page 1/48*

■ Compact design, plastic, type XCKT - Presentation
- □ Complete units with 2 cable entries . . . . . *page 1/44*

OsiSense XC Standard, with reset

■ Compact design, plastic, type XCPR - Presentation . . . . . *page 1/52*
- □ Complete switches with 1 cable entry. . . . . *page 1/54*

■ Compact design, metal, type XCDR - Presentation . . . . . *page 1/52*
- □ Complete switches with 1 cable entry. . . . . *page 1/56*

■ Compact design, plastic, type XCTR - Presentation. . . . . *page 1/52*
- □ Complete switches with 2 cable entries . . . . . *page 1/58*

OsiSense XC Basic

■ Miniature design, plastic, type XCMN - Presentation . . . . . *page 1/26*
- □ Complete units, pre-cabled . . . . . *page 1/28*

■ Compact design, plastic, types XCKN and XCNT - Presentation . . . . . *page 1/60*
- □ Complete units with 1 cable entry. . . . . *page 1/62*
- □ Complete units with 2 cable entries . . . . . *page 1/64*

■ Compact design, with reset, types XCNR and XCNTR - Presentation . . . . . *page 1/68*
- □ Complete units with 1 cable entry. . . . . *page 1/70*
- □ Complete units with 2 cable entries . . . . . *page 1/71*

OsiSense XC Standard, “Classic” format

■ Metal, type types XCKM, XCKL et XCKML - Presentation . . . . . *page 1/74*
- □ Complete switches with 3 cable entries . . . . . *page 1/76*

■ Metal, type XCKL - Presentation . . . . . *page 1/74*
- □ Complete switches incorporating cable gland . . . . . *page 1/78*

■ Metal, 2 x 2-pole contacts, type XCKML - Presentation . . . . . *page 1/74*
- □ Complete switches with 3 cable entries . . . . . *page 1/80*

■ Metal, types XCKM and XCKL
- □ Variable composition . . . . . *page 1/82*
- □ Adaptable sub-assemblies. . . . . *page 1/84*

OsiSense XC Standard, EN 50041 format

■ Plastic, double insulated, type XCKS - Presentation . . . . . *page 1/90*
- □ Complete switches with 1 cable entry. . . . . *page 1/92*
- □ Variable composition . . . . . *page 1/96*

OsiSense XC Standard, industrial EN 50041 format

■ Metal, type XCKJ - Presentation . . . . . page 1/102
- Complete switches
  - Fixed body with 1 cable entry . . . . . page 1/104
  - Fixed body with 1 integral M12 connector . . . . . page 1/108
  - Fixed body with 1 integral 7/8”16 UN connector . . . . . page 1/110
- Variable composition: standard bodies, fixed or plug-in . . . . . page 1/112
- Adaptable sub-assemblie
  - Bodies, contact blocks . . . . . page 1/116
  - For low temperature applications (- 40 °C) . . . . . page 1/124
  - For high temperature applications (+ 120 °C) . . . . . page 1/128

Limit switches OsiSense XC

■ General . . . . . page 1/130

Selection guide . . . . . ***page 1/138***

■ Wireless and batteryless, type XCKW - Presentation . . . . . page 1/142
- Network access points . . . . . page 1/146

OsiSense XC Special

Selection guide . . . . . ***page 1/148***

■ For very severe applications, type XC2J - Presentation . . . . . page 1/150
- 1 cable entry incorporating cable gland . . . . . page 1/152
- Variable composition . . . . . page 1/154
- Adaptable sub-assemblies . . . . . page 1/155
  - temperature applications (- 40 °C) . . . . . page 1/164
  - temperature applications (+ 120 °C) . . . . . page 1/166

■ For material handling applications, type XC1AC - Presentation . . . . . page 1/168
- Complete switches . . . . . page 1/170
- Replacement parts . . . . . page 1/172

■ For hoisting and material handling applications XCR, XCKMR et XCKVR
- Presentation . . . . . page 1/174
- Complete switches with 1 cable entry . . . . . page 1/178
- For conveyor belt shift monitoring applications . . . . . page 1/182
- Complete switches with 3 cable entries . . . . . page 1/184

■ Miniature design
- Miniature design, DIN 41635 A format . . . . . page 1/190
- Sealed design, Pre-cabled . . . . . page 1/192
- General . . . . . page 1/194

Screw limit switches OsiSense XRBAet XR2

Selection guide . . . . . ***page 1/204***

■ Standard duty, OsiSense XRBA - Presentation . . . . . page 1/206

■ Heavy duty, OsiSense XR2 - Presentation . . . . . page 1/212

■ For power circuits, OsiSense XF9 - Presentation . . . . . page 1/222

Limit switches
OsiSense XC Standard

Design		Miniature format	Compact format, CENELEC EN50047	
		Metal, pre-cabled	Plastic, 1 cable entry	Plastic, 2 cable entries
Enclosure		Metal	Plastic, double insulated	
Modularity		Head, body and connection modularity	Head, body and cable entry modularity	Head and body modularity
Conformity/Certifications		UL, CSA, CCC, GOST	CENELEC EN 50047 UL, CSA, CCC, GOST	
Body dimensions (w x h x d) in mm		30 x 50 x 16	31 x 65 x 30	58 x 51 x 30
Head		Linear movement (plunger) Rotary movement (lever) Rotary movement, multidirectional Same heads for ranges XCMD, XCKD, XCKP and XCKT		
Contact blocks				
2 electrically separate contacts	snap action with positive opening operation	p	p	p
	slow break with positive opening operation	p	p	p
2 same polarity contacts	snap action	–	–	–
	slow break	–	–	–
3 electrically separate contacts	snap action with positive opening operation	p	p	p
	slow break with positive opening operation	p	p	p
4 electrically separate contacts	snap action with positive opening operation	p	–	–
	slow break with positive opening operation	–	–	–
4 contacts (2 x 2 same polarity contacts)	snap action	–	–	–
Degree of protection IP/IK		IP 66, IP 67, IP 68, IK 06	IP 66, IP 67, IK 04	
Operating temperature		- 25°C... + 70°C		
Connection	Screw terminals	–	1 entry for ISO M16 or M20, Pg 11, Pg 13.5 cable gland or 1/2" NPT, PF 1/2	2 entries for ISO M16 or Pg 11 cable gland or 1/2" NPT (using adaptor)
	Pre-cabled	Ø 7.5 PvR, CEI, halogen free, depending on model	–	
	Connector	Integral or remote M12 or remote 7/8"-16UN	M12	–
Type reference		XCMD	XCKP	XCKT
Pages		1/10	1/30 and 1/34	1/44

Compact format, CENELEC EN50047	Compact format, with reset		
Metal, 1 cable entry	**Plastic, 1 cable entry**	**Plastic, 2 cable entries**	**Metal, 1 cable entry**
Metal	Plastic, double insulated		Metal
Head, body and connection modularity	–		
CENELEC EN 50047 UL, CSA, CCC, GOST	UL, CSA, GOST		
31 x 65 x 30	31 x 65 x 30	58 x 51 x 30	31 x 65 x 30
Linear movement (plunger) Rotary movement (lever) Rotary movement, multidirectional Same heads for ranges XCMD, XCKD, XCKP and XCKT	Linear movement (plunger) Rotary movement (lever)		
p	p	p	p
p	p	p	p
–	–	–	–
–	–	–	–
p	–	–	–
p	–	–	–
–	–	–	–
–	–	–	–
–	–	–	–
IP 66, IP 67, IK 06	IP 66, IP 67, IK 04 and IK06 (for XCDR)		
- 25°C... + 70°C			
1 entry for ISO M16 or M20, Pg 11, Pg 13.5 cable gland or 1/2" NPT, PF 1/2	1 entry for ISO M20 or Pg 13.5 cable gland or 1/2" NPT	2 entries for ISO M16 or Pg 11 cable gland or 1/2" NPT (using adaptor)	1 entry for ISO M20 or Pg 13.5 cable gland or 1/2" NPT
–			
M12	–		
XCKD	XCPR	XCTR	XCDR
1/38 and 1/42	1/52	1/58	1/56

Limit switches
OsiSense XC Standard

Design		"Classic" format		EN 50041 format	Industrial EN50041 format
		Metal, 3 cable entries	Metal, 1 cable entry	Plastic, 1 cable entry	Metal, 1 cable entry or connector
Enclosure		Metal		Plastic, double insulated	Metal
Modularity		Head, body and operator modularity			
Conformity/Certifications		UL, CSA, CCC (XCKM), GOST		CENELEC EN 50041 UL, CSA, CCC, GOST	
Body dimensions (w x h x d) in mm		63 x 64 x 30	52 x 72 x 30	40 x 72.5 x 36	40 x 77 x 44 42.5 x 84 x 36
Head		Linear movement (plunger) Rotary movement (lever) Rotary movement, multidirectional			
Contact blocks					
2 electrically separate contacts	snap action with positive opening operation	●	●	●	●
	slow break with positive opening operation	●	●	●	●
2 same polarity contacts	snap action	–	–	–	●
	slow break	–	–	–	–
3 electrically separate contacts	snap action with positive opening operation	●	●	●	●
	slow break with positive opening operation	●	●	●	●
4 electrically separate contacts	snap action with positive opening operation	–	–	–	–
	slow break with positive opening operation	–	–	–	–
4 contacts (2 x 2 same polarity contacts)	snap action	–	–	●	●
Degree of protection IP/IK		IP 66, IK 06		IP 65, IK 03	IP 66, IK 07
Operating temperature		- 25°C... + 70°C			- 25°C... + 70°C - 40°C or + 120°C depending on model
Connection	**Screw terminals (entry for cable gland)**	3 entries for ISO M20 or Pg 11 cable gland or 1/2" NPT	1 entry incorporating cable gland or tapped 1/2" NPT	1 entry for ISO M20 or Pg 13.5 cable gland	1 entry for ISO M20 or Pg 13.5 cable gland or 1/2" NPT
	Connector	–			Integral M12 or 7/8"-16UN
Type reference		**XCKM**	**XCKL**	**XCKS**	**XCKJ**
Pages		1/74	1/74	1/90	1/102

Limit switches
OsiSense XC Basic

Miniature format	Compact format EN 50047		Compact format, with reset knob	
Plastic, pre-cabled	**Plastic, 1 cable entry**	**Plastic, 2 cable entries**	**Plastic, 1 cable entry**	**Plastic, 2 cable entries**
Plastic, double insulated	Plastic, double insulated			
–				
UL, CSA, CCC, GOST	CENELEC EN 50047 UL, CSA, CCC, GOST		UL, CSA, CCC, GOST	
30 x 50 x 16	31 x 65 x 30	59 x 51 x 30	31 x 65 x 30	59 x 51 x 30
Linear movement (plunger) Rotary movement (lever) Rotary movement, multidirectional				
●	●	●	●	●
–	●	●	●	●
–	–	–	–	–
– –	– ●	● –	– ●	● –
–	●	–	●	–
–	–	–		–
–	–	–		–
–	–	–		–
IP 65, IK 04				
- 25°C... + 70°C				
–	1 entry for ISO M20 or Pg 11 cable gland Other cable entries *(3)*: ISO M16 x 1.5 and PF 1/2 (G1/2)	2 entries for ISO M16 or Pg 11 cable gland or 1/2" NPT (using adaptor)	1 entry for ISO M20 or Pg 11 cable gland Other cable entries *(3)*: ISO M16 x 1.5 and PF 1/2 (G1/2)	2 entries for ISO M16 or Pg 11 cable gland or 1/2" NPT (using adaptor)
Ø 7.5 PvR, CEI, halogen free, depending on model	–			
XCMN	**XCKN**	**XCNT**	**XCNR**	**XCNTR**
1/28	1/62	1/64	1/70	1/71

Limit switches
OsiSense XC Special

Design/Applications	Very severe applications	Very severe material handling applications	For hoisting and material handling applications (XCR); for conveyor belt shift monitoring (XCRT)	For hoisting and material handling applications	Subminiature format and microswitch. Applications requiring high precision and a low operating force
	Metal, 1 cable entry	Metal, 3 cable entries	Metal or polyester, 1 cable entry	Metal or plastic, 3 cable entries	Plastic, pre-cabled
Enclosure	Metal	Metal	Metal or polyester	Metal or plastic	Polyester
Features	Head and body modularity	–	–	–	–
Conformity/Certifications	UL, CSA, GOST	CSA, GOST	CSA (XCR) CCC (XCR), GOST	CE, UL, CSA, CCC, GOST	CE, UL
Body dimensions (w x h x d) in mm	40 x 81 x 41	77 x 83 x 44	85 x 95 x 75	118 x 77 x 59 (metal) 118 x 77 x 67 (plastic)	Depending on type
Head	Linear movement (plunger) or rotary movement (lever)	Linear movement (plunger)	Rotary movement (lever)	Rotary movement (lever)	–
Contact blocks					
2 electrically separate contacts					
snap action with positive opening operation	–	–	–	–	–
slow break with positive opening operation	–	●	–	–	–
2 same polarity contacts					
snap action	●	–	–	–	●
slow break	–	●	–	–	–
3 electrically separate contacts					
snap action with positive opening operation	–	–	–	–	–
slow break with positive opening operation	–	–	–	–	–
4 electrically separate contacts					
snap action with positive opening operation	–	–	●		–
slow break with positive opening operation	–	–	●	●	–
4 contacts (2 x 2 same polarity contacts), snap action	●	–	●	–	–
Degree of protection IP/IK	IP 65/IK 08	IP 65	IP 54/IK 07 or IP 65 depending on model	IP 66/IK 07 (metal) IP 65/IK 04 (plastic)	IP 67 or IP 40 depending on model IP 00 (tags)
Operating temperature	- 25°C... + 70°C; - 40° C or + 120° C (XC2J depending on model)				
Connection					
Screw terminals (entry for cable gland)	1 entry with integral cable gland	3 tapped entries for Pg 13.5 cable gland	1 tapped entry for Pg 13.5 cable gland	3 tapped entries for Pg 13.5 cable gland or tapped M20 x 1.5	Tag connections or pre-wired depending on model
Pre-cabled	–				
Connector	–				
Type reference	**XC2J**	**XC1AC**	**XCR XCRT**	**XCKMR XCKVR**	**XEP**
Pages	1/164 et 1/176	1/182	1/188	1/189	1/202,1/204 et 1/206

Limit switches

Preventa XCS
Safety switches

Safety limit switches and guard switches Preventa XCS								
Standard		**With lever or hinge**	**Actuator operated**					**Coded magnetic for detection without contact**
Miniature format	**Compact format**	**Compact format**	**Miniature format**	**Compact format**	**Industrial format with or without locking**		**Rectangular format with solenoid interlocking**	**Rectangular or cylindrical format**
Metal, pre-cabled	**Metal or plastic, 1 cable entry**	**Plastic, 1 or 2 cable entries**	**Plastic, pre-cabled**	**Plastic, 1 or 2 cable entries**	**Metal, 1 cable entry**		**Metal, 2 cable entries or plastic, 1 cable entry**	**Coded magnetic switch or coded magnetic system, pre-cabled or connector**
					Without locking	With locking, manual unlocking		

Metal	Metal or plastic	Plastic, double insulated	Plastic, double insulated		Metal		Metal / Plastic, double insulated	Plastic
–		–	–		–		–	
UL, CSA		UL, CSA	UL, CSA	UL, CSA, GOST	UL, CSA, GOST		UL, CSA, GOST	CE, UL, CSA, TÜV, GOST depending on model
30 x 50 x 16	34 x 65 x 34.5	Depending on type	30 x 78 x 15	30 x 93 x 30 52 x 114 x 30	40 x 60 x 44		98 x 146 x 44 110 x 93.5 x 33	Depending on type
Linear movement (plunger) or rotary movement (lever)		Rotary movement (lever)	Turret head		Turret head		Turret head	–
–		–	–	●	–		–	Depending on model
–		●	●		–		– / ●	
–		–	–	●	–		–	
–		●	●		–		– / ●	
●		●	–	●	–		–	
●		●	●		●		● / –	
–		–	–		–		–	
–		–	–		–		–	
●	–	–	–		–		–	
IP 66, IP 67 IP 68 (XCSM) IK 06 (XCSM & XCSD) IK 04 (XCSP)		IP 67	IP 67		IP 67		IP 67	IP 66, IP 67 IP 69K depending on model
- 25°C... + 70°C		- 25°C... + 70°C	- 25°C... + 70°C		- 25°C... + 70°C		- 25°C... + 70°C	- 25°C... + 70°C
XCSP and XCSD: 1 entry for Pg 13.5 or M20 cable gland or 1/2" NPT		Depending on model: 1 or 2 entries for Pg 13.5 or ISO M20 cable gland or 1/2" NPT	Depending on model: 1 or 2 entries for ISO M16 or Pg 11 cable gland or 1/2" NPT		1 entry for ISO M20 or Pg 13.5 cable gland or 1/2" NPT		Depending on model: 1 or 2 entries for Pg 13.5 or ISO M20 cable gland or 1/2" NPT	–
XCSM: Ø 7.5 cable, PvR		–	XCSMP: Ø 7.5 cable, PvR		–		–	PVC cable
–		–	–		–		–	Remote M8, remote M12 or integral M12 depending on model
XCSM	**XCSP XCSD**	**XCSPL, XCSPR XCSTL, XCSTR**	**XCSMP**	**XCSPA XCSTA**	**XCSA**	**XCSB XCSC**	**XCSE**	**XCSTE**	**XCSDM/C/P/R XCSDM3/4**

Limit switches

OsiSense XC

Variable composition: **s**implicity through **i**nnovation

1

Principle

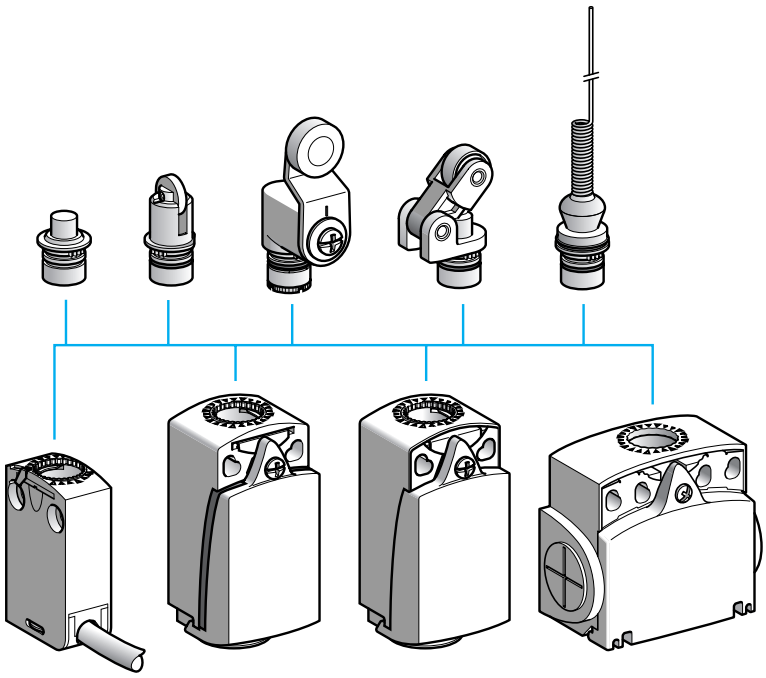
Variable composition principle

■ The Miniature design XCMD and Compact design XCKD, XCKP and XCKT ranges benefit from the variable composition concept.

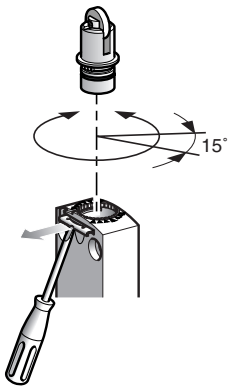
■ A worldwide detection first for improving productivity.
A complete offer for resolving the most commonly encountered detection problems:
□ product selection simplified,
□ product availability simplified,
□ installation and setting-up simplified,
□ maintenance simplified.

Heads

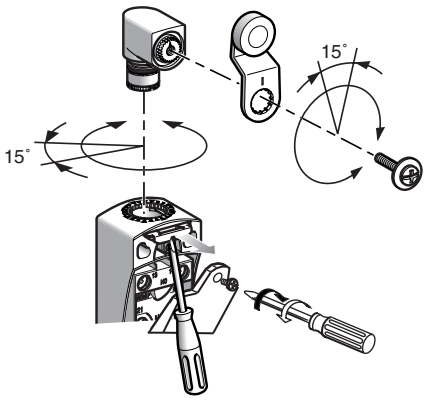
■ A single metal operating head type for the Miniature design XCMD and Compact design XCKD, XCKP and XCKT ranges.



■ Interchanging of heads achieved by simple operation of forked metal latch.
■ Adjustable in 3 planes:



All the heads can be adjusted in 15° steps throughout 360°, in relation to the body.



All the levers can be adjusted in 15° steps throughout 360°, in relation to the horizontal axis of the head.

Limit switches

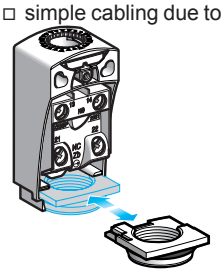
OsiSense XC

Variable composition: **s**implicity through **i**nnovation

Principle (continued)

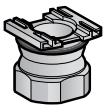
Cable entries

■ The cable entries for Compact design XCKD and XCKP switches enable:
□ simple cabling due to unrestricted access to contacts,



□ simple adaptation to the various worldwide markets:
- 6 models are available:

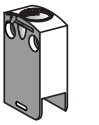
□ ISO M16 x 1.5
□ Pg 11

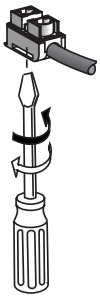


□ ISO M20 x 1.5
□ Pg 13.5
□ 1/2" NPT
□ PF 1/2 (G 1/2)

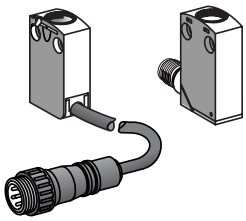
Each model is available in metal or plastic, respectively suited to Compact design XCKD and XCKP.

Connection components



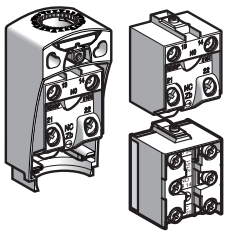


■ The miniature XCMD range allows interchanging of these pre-cabled connection components:
□ a 1/4 of a turn is all that is required for removing the connection component on XCMD bodies with 2 and 3 contacts,
□ 6 alternative cable lengths are available as standard.

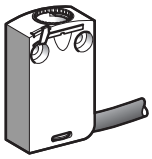


■ The miniature XCMD range also includes an integral or remote connector solution.

Contact block or bodies with contact



■ 2 and 3 snap action and slow break contact blocks, with positive opening operation, are interchangeable between the Compact design XCKD and XCKP and Classic XCKJ, XCKS, XCKM and XCKL ranges.



■ For the miniature design XCMD range, the contacts are an integral part of the body:
□ 2 and 3 snap action and slow break contacts, with positive opening operation, and interchangeable connection component,
□ 4 snap action contacts, with positive opening operation, with monolithic body and connection components.

Limit switches

OsiSense XC Standard

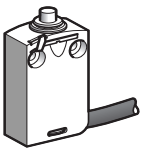
Miniature design, metal, type XCMD

1

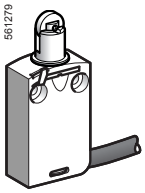
■ XCMD
pre-cabled

□ With head for linear movement (plunger). Fixing by the body

520341



561279



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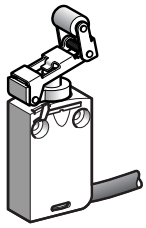
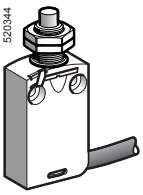


Page 1/12

□ With head for linear movement (plunger). Fixing by the head

520344



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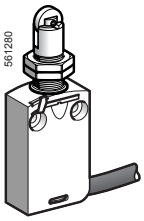
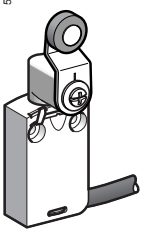


Page 1/12

□ With head for rotary movement (lever) or multi-directional. Fixing by the body

520346



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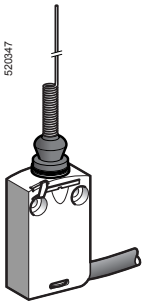


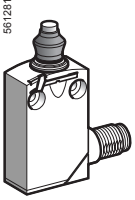
Page 1/13

■ XCMD
with connector

□ With head for linear movement (plunger)

Fixing by the body | **Fixing by the head**

561281



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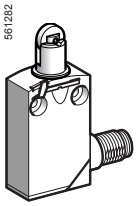

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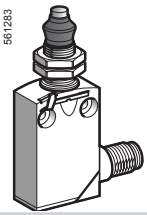
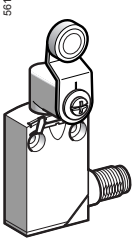


Page 1/16

□ With head for rotary movement (lever) or multi-directional. Fixing by the body

561284



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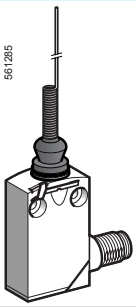


Page 1/17

Limit switches

OsiSense XC Standard

Miniature design, metal, type XCMD

Environment characteristics

Conformity to standards	Products	IEC 60947-5-1, EN 60947-5-1, UL 508, CSA C22-2 n° 14
	Machine assemblies	IEC 60204-1, EN 60204-1
Product certifications		UL, CSA (except products with special cables), CCC
Protective treatment		Standard version: "TC"
Ambient air temperature		For operation: - 25…+ 70°C. For storage: - 40…+ 70°C
Vibration resistance		XCMD snap action: 5 gn. XCMD slow break: 25 gn (10…500 Hz) conforming to IEC 60068-2-6
Shock resistance		25 gn (18 ms) conforming to IEC 60068-2-27 except head ZCE08: 15 gn (18 ms)
Electric shock protection		Class I conforming to IEC 61140 and NF C 20-030
Degree of protection		**IP 66, IP 67 and IP 68** *(1)* **conforming to IEC 60529; IK 06 conforming to EN 50102**
Materials		Bodies: Zamak, heads: Zamak
Repeat accuracy		0.05 mm on the tripping points, with 1 million operations for head with end plunger

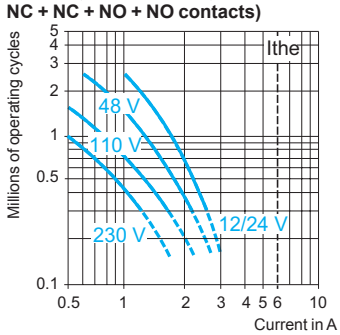
(1) Protection against prolonged immersion: the test conditions are subject to agreement between the manufacturer and the user.

Contact block characteristics

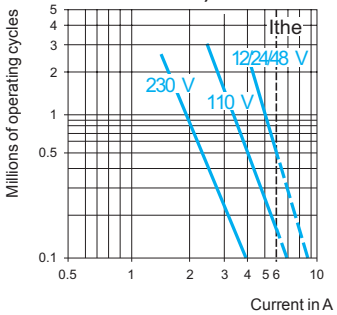
Rated operational characteristics	Switches with 2 contacts	**∿ AC-15; B300 (Ue = 240 V, Ie = 1.5 A)** **⎓ DC-13; R300 (Ue = 250 V, Ie = 0.1 A), conforming to IEC 60947-5-1 Appendix A, EN 60947-5-1**
	Switches with 3 and 4 contacts	**∿ AC-15; C300 (Ue = 240 V, Ie = 0.75 A)** **⎓ DC-13; R300 (Ue = 250 V, Ie = 0.1 A), conforming to IEC 60947-5-1 Appendix A, EN 60947-5-1**
	Pre-cabled switches	**Ithe = 6 A for 2 contacts, 4 A for 3 contacts, 3 A for 4 contacts**
	Switches with M12, 4-pin connector	Ui = 250 V, Ie = 3 A maximum, Ithe = 3 A
	Switches with M12, 5-pin connector	Ui = 60 V, Ie = 4 A maximum, Ithe = 4 A
	Switches with 7/8"-16UN, 5-pin connector	Ui = 250 V, Ie = 6 A maximum, Ithe = 6 A
Rated insulation voltage		Ui = 400 V degree of pollution 3 conforming to IEC 60947-5-1 Ui = 300 V conforming to UL 508, CSA C22-2 n° 14
Rated impulse withstand voltage		U imp = 4 kV conforming to IEC 60947-1, IEC 60664
Positive operation (depending on model)		NC contacts with positive opening operation conforming to IEC 60947-5-1 Appendix K, EN 60947-5-1
Resistance across terminals		≤ 25 mΩ conforming to IEC 60255-7 category 3
Short-circuit protection		6 A cartridge fuse type gG (gl)
Minimum actuation speed (for head with end plunger)		Snap action contact: 0.01 m/minute, slow break contact: 6 m/minute
Electrical durability		■ Conforming to IEC 60947-5-1 Appendix C ■ Utilisation categories AC-15 and DC-13 ■ Maximum operating rate: 3600 operating cycles/hour ■ Load factor: 0.5

AC supply 50/60 Hz ∿
⁓ inductive circuit

XCMD snap action (NC + NO, NC + NC, NC + NC + NO, NC + NC + NO + NO contacts)



XCMD slow break (NC + NO, NC + NC + NO contacts)



DC supply ⎓

Power broken in W for 5 million operating cycles

Voltage	V	24	48	120
⁓	W	3	2	1

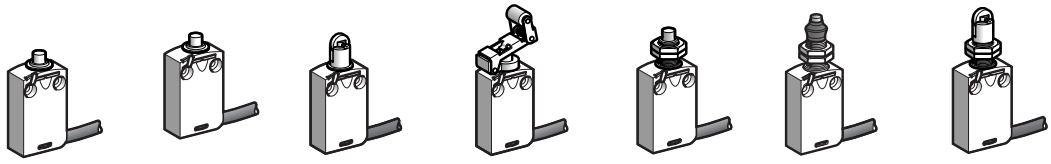
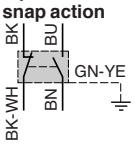
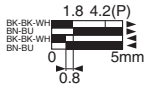
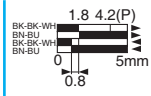
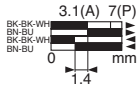
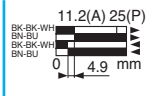
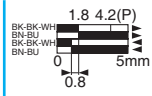
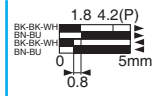
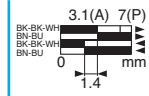
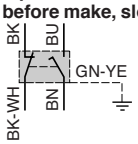
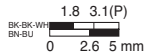
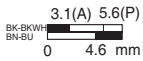
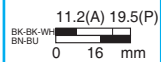
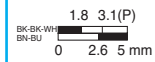
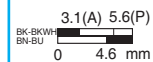
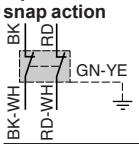
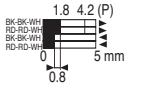
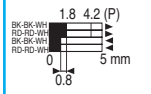
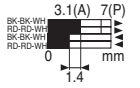
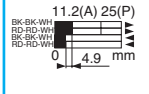
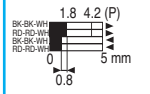
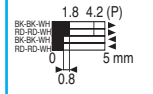
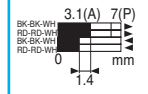
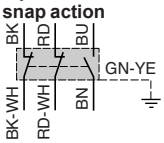
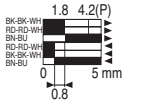
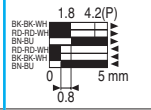
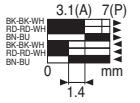
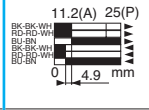
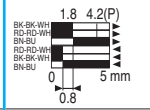
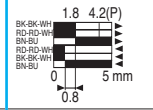
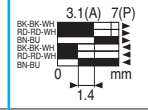
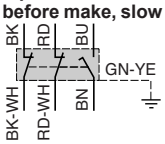
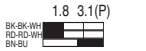
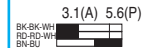
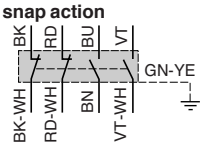
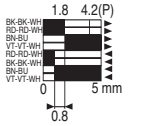
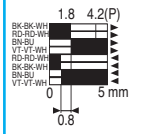
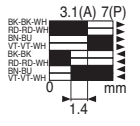
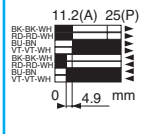
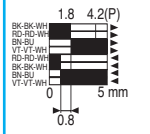
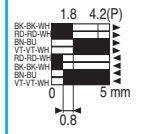
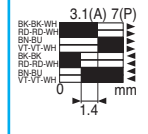
Power broken in W for 5 million operating cycles

Voltage	V	24	48	120
⁓	W	4	3	3

Limit switches

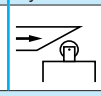
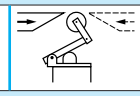
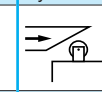
OsiSense XC Standard

Miniature design, metal, type XCMD
Pre-cabled

Type of head	Plunger (fixing by the body)				Plunger (fixing by the head)		
							
Type of operator	Metal end plunger	Metal end plunger with elastomer boot *(1)*	Steel roller plunger	Retractable steel roller lever plunger	M12 with metal end plunger	M16 with metal end plunger with elastomer boot *(1)*	M12 with steel roller plunger
References							
2-pole NC + NO snap action 	**XCMD2110L1** 	**XCMD2111L1** 	**XCMD2102L1** 	**XCMD2124L1** 	**XCMD21F0L1** 	**XCMD21G1L1** 	**XCMD21F2L1** 
2-pole NC + NO break before make, slow break 	**XCMD2510L1** 	**XCMD2511L1**	**XCMD2502L1** 	**XCMD2524L1** 	**XCMD25F0L1**	**XCMD25G1L1** 	**XCMD25F2L1** 
2-pole NC + NC snap action 	**ZCMD29L1 + ZCE10** 	**ZCMD29L1 + ZCE11** 	**ZCMD29L1 + ZCE02** 	**ZCMD29L1 + ZCE24** 	**ZCMD29L1 + ZCEF0** 	**ZCMD29L1 + ZCEG1** 	**ZCMD29L1 + ZCEF2** 
3-pole NC + NC + NO snap action 	**ZCMD39L1 + ZCE10** 	**ZCMD39L1 + ZCE11** 	**ZCMD39L1 + ZCE02** 	**ZCMD39L1 + ZCE24** 	**ZCMD39L1 + ZCEF0** 	**ZCMD39L1 + ZCEG1** 	**ZCMD39L1 + ZCEF2** 
3-pole NC + NC + NO break before make, slow break 	**ZCMD37L1 + ZCE10** 	**ZCMD37L1 + ZCE11**	**ZCMD37L1 + ZCE02**	**ZCMD37L1 + ZCE24**	**ZCMD37L1 + ZCEF0**	**ZCMD37L1 + ZCEG1**	**ZCMD37L1 + ZCEF2** 
Weight (kg)	0.180	0.180	0.185	0.200	0.195	0.220	0.205
4-pole NC + NC + NO + NO snap action 	**ZCMD41L1 + ZCE10** 	**ZCMD41L1 + ZCE11** 	**ZCMD41L1 + ZCE02** 	**ZCMD41L1 + ZCE24** 	**ZCMD41L1 + ZCEF0** 	**ZCMD41L1 + ZCEG1** 	**ZCMD41L1 + ZCEF2** 
Weight (kg)	0.160	0.160	0.165	0.180	0.175	0.200	0.185

Contact operation: ■ *closed* □ *open* — *(A) = cam displacement* *(P) = positive opening point* — ⊖ *NC contact with positive opening operation*

Characteristics

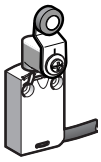
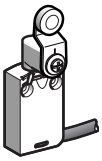
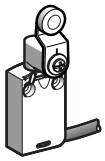
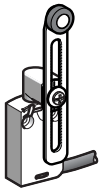
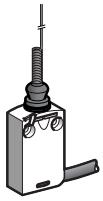
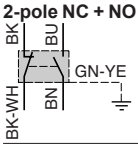
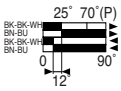
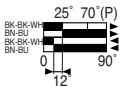
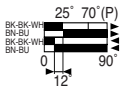
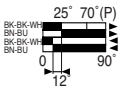
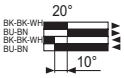
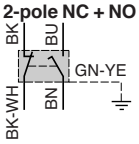
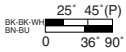
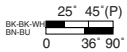
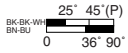
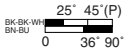
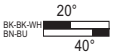
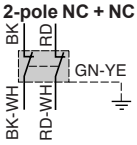
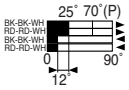
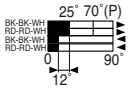
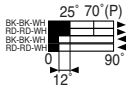
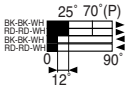
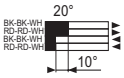
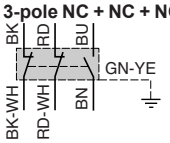
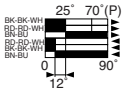
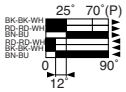
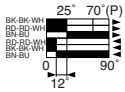
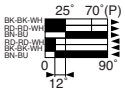
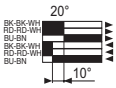
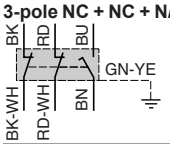
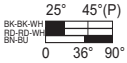
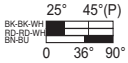
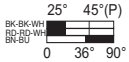
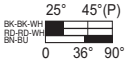
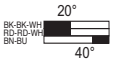
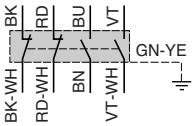
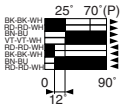
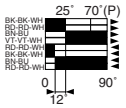
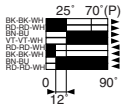
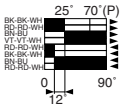
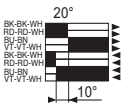
Switch actuation		On end	By 30° cam		On end		By 30° cam
Type of actuation							
Maximum actuation speed		0.5 m/s					0.1m/s
Mechanical durability		10 million operating cycles					
Minimum force or torque	For tripping	8.5 N	7 N	2.5 N	8.5 N		7 N
	For positive opening	42.5 N	35 N	12.5 N	42.5 N		35 N
Cabling		PvR cable, 5 x 0.75 mm², length 1 metre for 2-pole contact versions, 7 x 0.5 mm², length 1 metre for 3-pole contact versions, 9 x 0.34 mm², length 1 metre for 4-pole contact versions. For other lengths see page 1/22.					

(1) Nitrile for indoor use.

Limit switches

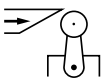
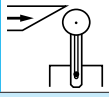
OsiSense XC Standard

Miniature design, metal, type XCMD
Pre-cabled

Type of head	Rotary (fixing by the body)				Multi-directional
					
Type of operator	Thermoplastic roller lever	Steel roller lever	Roller lever with ball bearing mounted roller	Variable length thermoplastic roller lever	"Cat's whisker" *(1)*
References					
2-pole NC + NO snap action 	**XCMD2115L1** 	**XCMD2116L1** 	**XCMD2117L1** 	**XCMD2145L1** 	**XCMD2106L1** 
2-pole NC + NO break before make, slow break 	**XCMD2515L1** 	**XCMD2516L1** 	**XCMD2517L1** 	**XCMD2545L1** 	**XCMD2506L1** 
2-pole NC + NC snap action 	**ZCMD29L1 + ZCE01 + ZCY15** 	**ZCMD29L1 + ZCE01 + ZCY16** 	**ZCMD29L1 + ZCE01 + ZCY17** 	**ZCMD29L1 + ZCE01 + ZCY45** 	**ZCMD29L1 + ZCE06** 
3-pole NC + NC + NO snap action 	**ZCMD39L1 + ZCE01 + ZCY15** 	**ZCMD39L1 + ZCE01 + ZCY16** 	**ZCMD39L1 + ZCE01 + ZCY17** 	**ZCMD39L1 + ZCE01 + ZCY45** 	**ZCMD39L1 + ZCE06** 
3-pole NC + NC + N/O break before make, slow break 	**ZCMD37L1 + ZCE01 + ZCY15** 	**ZCMD37L1 + ZCE01 + ZCY16** 	**ZCMD37L1 + ZCE01 + ZCY17** 	**ZCMD37L1 + ZCE01 + ZCY45** 	**ZCMD37L1 + ZCE06** 
Weight (kg)	0.220	0.225	0.220	0.230	0.180
4-pole NC + NC + NO + NO snap action 	**ZCMD41L1 + ZCE01 + ZCY15** 	**ZCMD41L1 + ZCE01 + ZCY16** 	**ZCMD41L1 + ZCE01 + ZCY17** 	**ZCMD41L1 + ZCE01 + ZCY45** 	**ZCMD41L1 + ZCE06** 
Weight (kg)	0.200	0.205	0.200	0.210	0.160
Contact operation	*closed* / *open*	*(A) = cam displacement* / *(P) = positive opening point*		*NC contact with positive opening operation*	

(1) Value taken with actuation by moving part at 100 mm from the fixing.

Characteristics

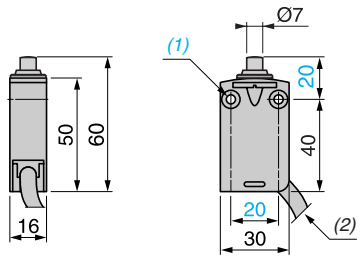
Switch actuation		By 30° cam			By any moving part
Type of actuation					
Maximum actuation speed		1.5 m/s			1 m/s
Mechanical durability		10 million operating cycles			5
Minimum force or torque	For tripping	0.1 N.m			
	For positive opening	0.5 N.m			–
Cabling		PvR cable, 5 x 0.75 mm², length 1 metre for 2-pole contact versions, 7 x 0.5 mm², length 1 metre for 3-pole contact versions, 9 x 0.34 mm², length 1 metre for 4-pole contact versions. For other lengths see page 1/22.			

Limit switches

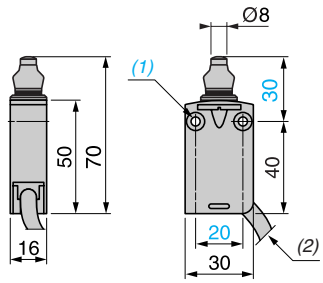
OsiSense XC Standard

Miniature design, metal, type XCMD
Pre-cabled

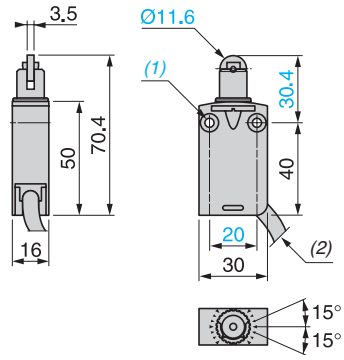
XCMD2●10L1



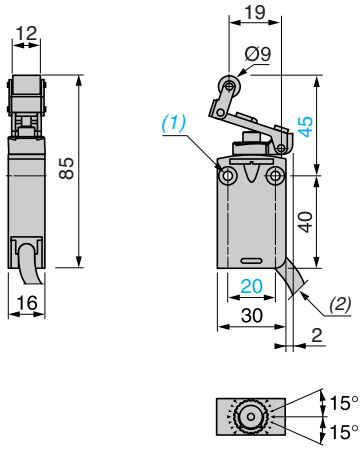
XCMD2●11L1



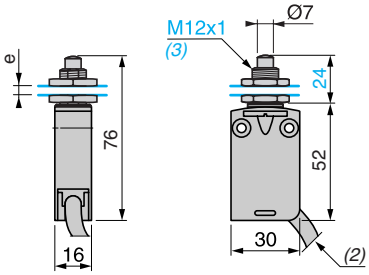
XCMD2●02L1



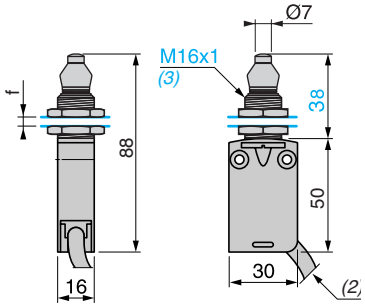
XCMD2●24L1



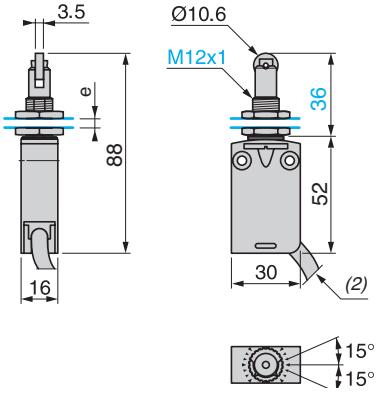
XCMD2●F0L1



XCMD2●G1L1



XCMD2●F2L1



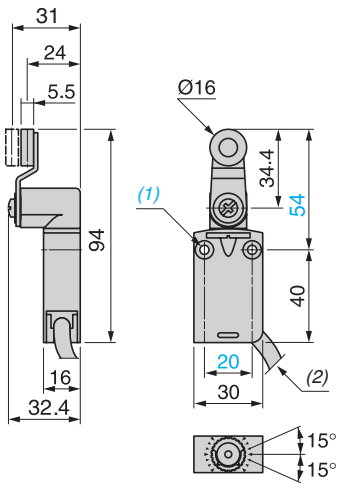
(1) 2 fixing holes Ø 4.2 mm, counterbored Ø 8 mm by 4 mm deep.
(2) External diameter of cable 7.5 mm.
(3) Fixing nut thickness 3.5 mm.
e: 8 mm max, panel cut-out Ø 12.5 mm.
f: 8 mm max, panel cut-out Ø 16.5 mm.

Limit switches

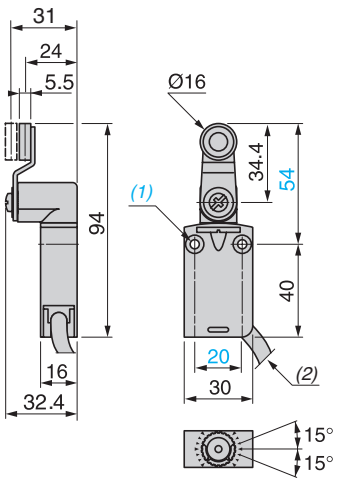
OsiSense XC Standard

Miniature design, metal, type XCMD
Pre-cabled

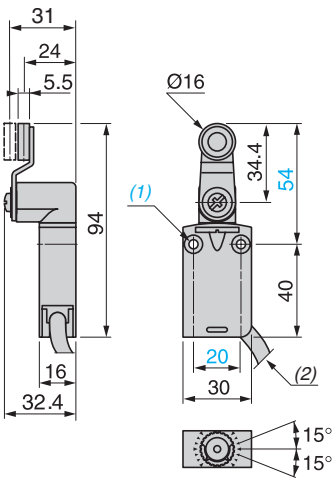
XCMD2●15L1



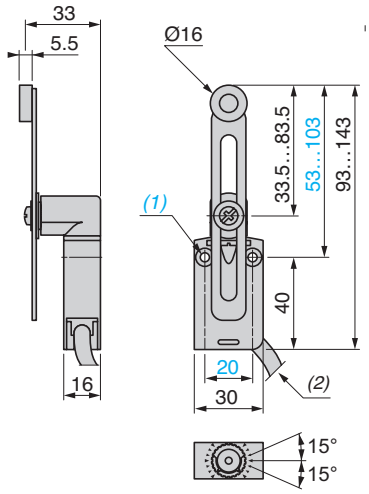
XCMD2●16L1



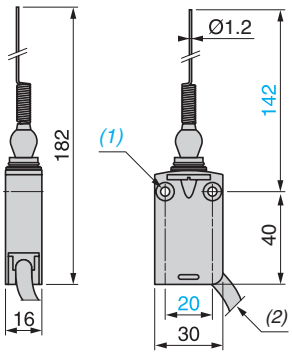
XCMD2●17L1



XCMD2●45L1



XCMD2●06L1

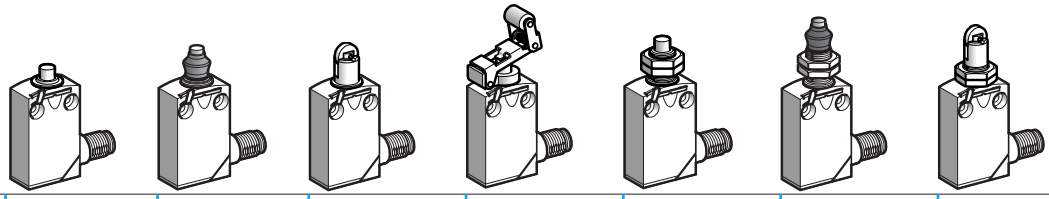


(1) 2 fixing holes Ø 4.2 mm, counterbored Ø 8 mm by 4 mm deep.
(2) External diameter of cable 7.5 mm.
e: 8 mm max, panel cut-out Ø 12.5 mm.
f: 8 mm max, panel cut-out Ø 16.5 mm.

Limit switches

OsiSense XC Standard

Miniature design, metal, type XCMD
Connector

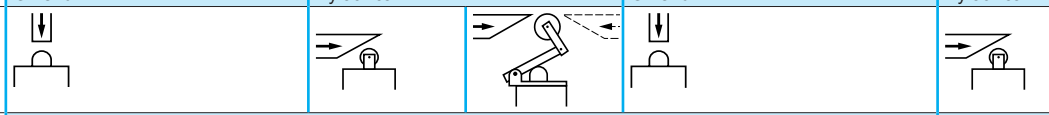
Type of head	Plunger (fixing by the body)				Plunger (fixing by the head)		
							
Type of operator	Metal end plunger	Metal end plunger with elastomer boot *(1)*	Steel roller plunger	Retractable steel roller lever plunger	M12 with metal end plunger	M16 with metal end plunger with elastomer boot *(1)*	M12 with steel roller plunger
References							
Single-pole CO snap action + integral M12 4-pin connector	**XCMD2110M12**	**XCMD2111M12**	**XCMD2102M12**	**XCMD2124M12**	**XCMD21F0M12**	**XCMD21G1M12**	**XCMD21F2M12**
2-pole NC + NO snap action + integral M12 5-pin connector	**XCMD2110C12** ⊖	**XCMD2111C12** ⊖	**XCMD2102C12** ⊖	**XCMD2124C12** ⊖	**XCMD21F0C12** ⊖	**XCMD21G1C12** ⊖	**XCMD21F2C12** ⊖
2-pole NC + NC snap action + integral M12 5-pin connector	**ZCMD29C12 + ZCE10** ⊖	**ZCMD29C12 + ZCE11** ⊖	**ZCMD29C12 + ZCE02** ⊖	**ZCMD29C12 + ZCE24** ⊖	**ZCMD29C12 + ZCEF0** ⊖	**ZCMD29C12 + ZCEG1** ⊖	**ZCMD29C12 + ZCEF2** ⊖
Weight (kg)	0.085	0.085	0.090	0.105	0.100	0.125	0.110
2-pole NC + NO snap action + M12 5-pin connector on 0.8 m flying lead	**ZCMD21L08R12 + ZCE10** ⊖	**ZCMD21L08R12 + ZCE11** ⊖	**ZCMD21L08R12 + ZCE02** ⊖	**ZCMD21L08R12 + ZCE24** ⊖	**ZCMD21L08R12 + ZCEF0** ⊖	**ZCMD21L08R12 + ZCEG1** ⊖	**ZCMD21L08R12 + ZCEF2** ⊖
2-pole NC + NO snap action + 7/8"-16UN 5-pin connector on 0 8 m flying lead	**ZCMD21L08U78 + ZCE10** ⊖	**ZCMD21L08U78 + ZCE11** ⊖	**ZCMD21L08U78 + ZCE02** ⊖	**ZCMD21L08U78 + ZCE24** ⊖	**ZCMD21L08U78 + ZCEF0** ⊖	**ZCMD21L08U78 + ZCEG1** ⊖	**ZCMD21L08U78 + ZCEF2** ⊖
Weight (kg)	0.150	0.150	0.155	0.170	0.165	0.190	0.175

Contact operation
- *closed*
- *open*

(A) = cam displacement
(P) = positive opening point

⊖ *NC contact with positive opening operation*

Characteristics

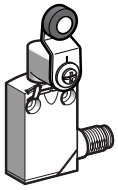
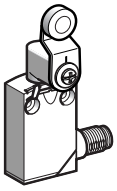
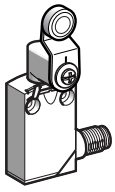
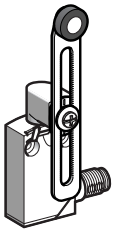
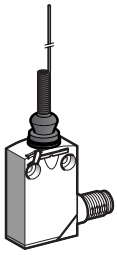
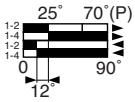
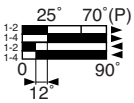
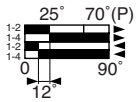
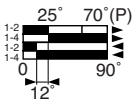
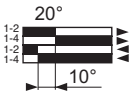
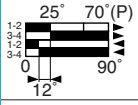
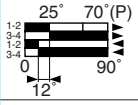
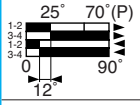
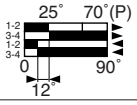
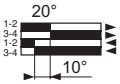
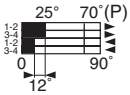
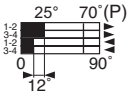
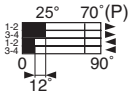
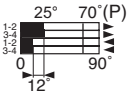
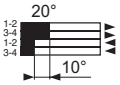
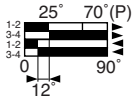
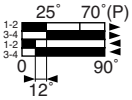
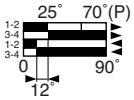
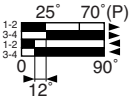
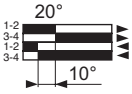
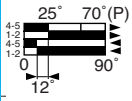
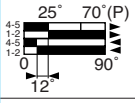
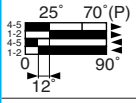
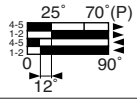
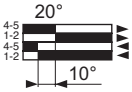
Switch actuation		On end		By 30° cam		On end	By 30° cam
Type of actuation							
Maximum actuation speed		0.5 m/s					0.1 m/s
Mechanical durability		10 million operating cycles					
Minimum force or torque	For tripping	8.5 N		7 N	2.5 N	8.5 N	7 N
	For positive opening	42.5 N		35 N	12.5 N	42.5 N	35 N
Positive operation		Although their design is identical to the pre-cabled switches, the switches incorporating an M12 4-pin connector cannot be marked with the ⊖ symbol because they are single-pole CO.					

(1) Nitrile for indoor use.

Limit switches

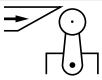
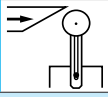
OsiSense XC Standard

Miniature design, metal, type XCMD Connector

Type of head	Rotary (fixing by the body)				Multi-directional
					
Type of operator	Thermoplastic roller lever	Steel roller lever	Roller lever with ball bearing mounted roller	Variable length thermoplastic roller lever	"Cat's whisker" *(1)*
References					
Single-pole CO snap action With integral M12, 4-pin connector	**XCMD2115M12** 	**XCMD2116M12** 	**XCMD2117M12** 	**XCMD2145M12** 	**XCMD2106M12** 
2-pole NC + NO snap action With integral M12, 5-pin connector	**XCMD2115C12** ⊖ 	**XCMD2116C12** ⊖ 	**XCMD2117C12** ⊖ 	**XCMD2145C12** ⊖ 	**XCMD2106C12** 
2-pole NC + NC snap action With integral M12, 5-pin connector	**ZCMD29C12 + ZCE01 + ZCY15** ⊖ 	**ZCMD29C12 + ZCE01 + ZCY16** ⊖ 	**ZCMD29C12 + ZCE01 + ZCY17** ⊖ 	**ZCMD29C12 + ZCE01 + ZCY45** ⊖ 	**ZCMD29C12 + ZCE06** 
Weight (kg)	0.125	0.130	0.125	0.135	0.085
2-pole NC + NO snap action With M12, 5-pin connector on 0.8 m flying lead	**ZCMD21L08R12 + ZCE01 + ZCY15** ⊖ 	**ZCMD21L08R12 + ZCE01 + ZCY16** ⊖ 	**ZCMD21L08R12 + ZCE01 + ZCY17** ⊖ 	**ZCMD21L08R12 + ZCE01 + ZCY45** ⊖ 	**ZCMD21L08R12 + ZCE06** 
2-pole NC + NO snap action With 7/8"-16UN, 5-pin connector on 0.8 m flying lead	**ZCMD21L08U78 + ZCE01 + ZCY15** ⊖ 	**ZCMD21L08U78 + ZCE01 + ZCY16** ⊖ 	**ZCMD21L08U78 + ZCE01 + ZCY17** ⊖ 	**ZCMD21L08U78 + ZCE01 + ZCY45** ⊖ 	**ZCMD21L08U78 + ZCE06** 
Weight (kg)	0.200	0.205	0.200	0.210	0.160
Contact operation	■ *closed* □ *open*	*(A) = cam displacement* *(P) = positive opening point*		⊖ *NC contact with positive opening operation*	

(1) Value taken with actuation by moving part at 100 mm from the fixing.

Characteristics

Switch actuation		By 30° cam			By any moving part
Type of actuation					
Maximum actuation speed		1.5 m/s			1 m/s
Mechanical durability		10 million operating cycles			5
Minimum force or torque	For tripping	0.1 N.m			
	For positive opening	0.5 N.m			–
Positive operation		Although their design is identical to the pre-cabled switches, the switches incorporating an M12 4-pin connector cannot be marked with the ⊖ symbol because they are single-pole CO.			

Limit switches

OsiSense XC Standard

Miniature design, metal, type XCMD
Connector cabling accessories

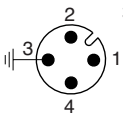
References of suitable pre-wired female connectors

Type of connector		M12 straight, 4-pin 4 A, 250 V	M12 straight, 5-pin 4 A, 24 V	M12 elbowed, 5-pin 4 A, 24 V	7/8"-16 UN straight, 5-pin, 6 A, 250 V
With cable	L = 2 m	XZCP1169L2	XZCP1164L2	XZCP1264L2	XZCP1771L2
	L = 5 m	XZCP1169L5	XZCP1164L5	XZCP1264L5	XZCP1771L5
	L = 10 m	XZCP1169L10	XZCP1164L10	XZCP1264L10	XZCP1771L10
Weight (kg)		0.105	0.115	0.115	0.190

Connections

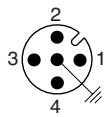
XCMD with connector

4-pin, M12



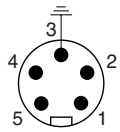
3 A - 250 V
1 = common
2 = NC
3 = ⏚
4 = NO

5-pin, M12



4 A - 60 V
XCMD21●● or **ZCMD21●●**
1 - 2 = NC
3 - 4 = NO
5 = ⏚
XCMD29●● or **ZCMD29●●**
1 - 2 = NC
3 - 4 = NC
5 = ⏚

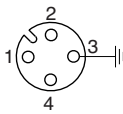
5-pin, 7/8"-16UN



6 A - 250 V
1 - 2 = NC
4 - 5 = NO
3 = ⏚

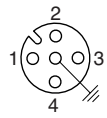
Pre-wired female connectors XZCP

4-pin, M12



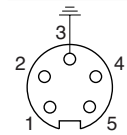
1 = brown
2 = blue
3 = yellow/green ⏚
4 = black

5-pin, M12



1 = brown
2 = white
3 = blue
4 = black
⏚ = yellow/ green

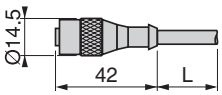
5-pin, 7/8"-16UN



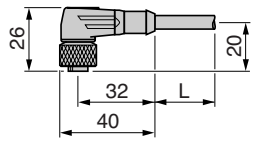
1 = black
2 = blue
3 = yellow/green ⏚
4 = brown
5 = white

Dimensions

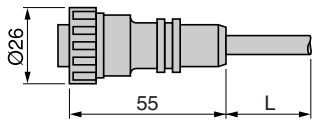
XZCP116●L●



XZCP1264L●



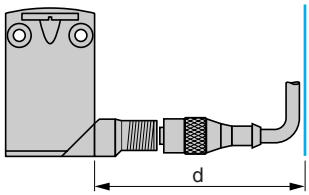
XZCP1771L●



L: *cable length 2, 5 or 10 m.*

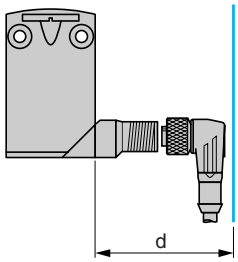
Distances required for plug-in connectors

M12 straight connector



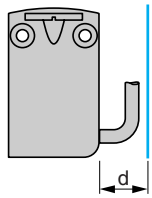
d: *min. 65 mm, recommended 69 mm*

M12 elbowed connector



d: *min. 42 mm, recommended 45 mm*

Connector on flying lead



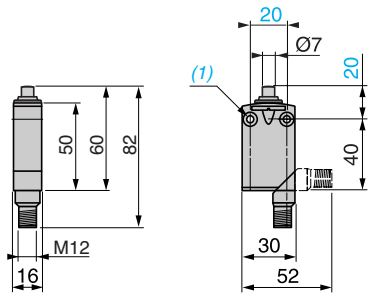
d: *min. 20 mm*

Limit switches

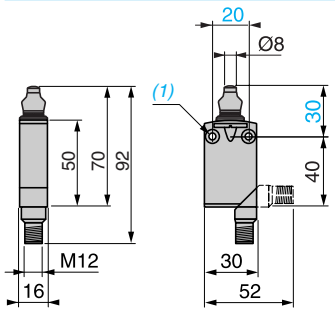
OsiSense XC Standard

Miniature design, metal, type XCMD
Connector

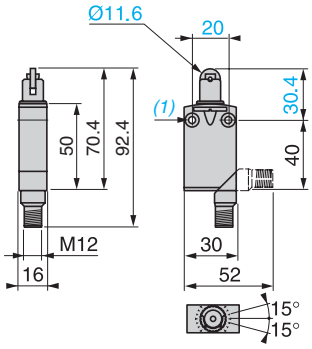
XCMD2●10M12



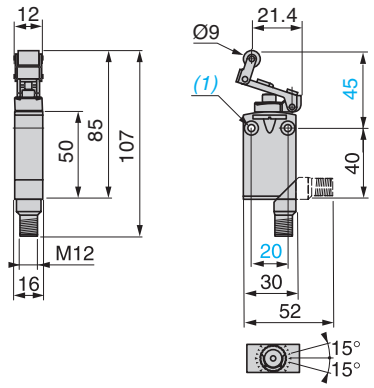
XCMD2●11M12



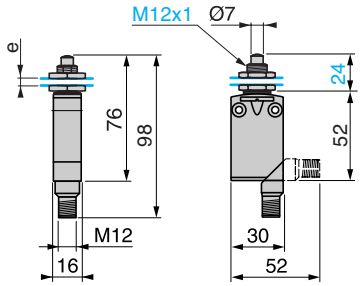
XCMD2●02M12



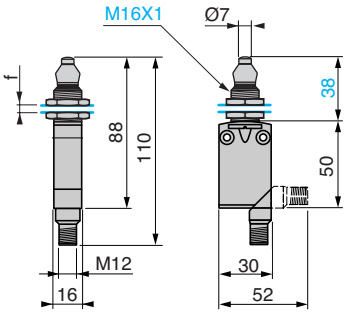
XCMD2●24M12



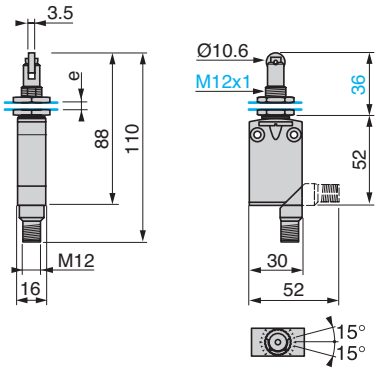
XCMD2●F0M12



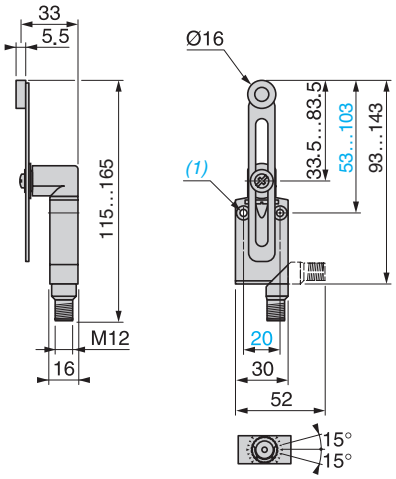
XCMD2●G1M12



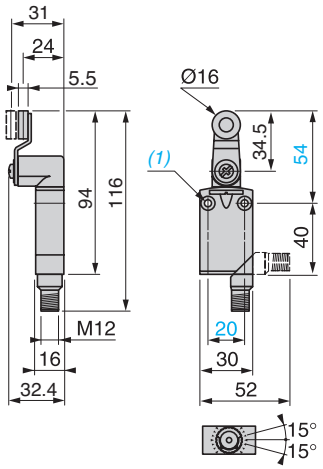
XCMD2●F2M12



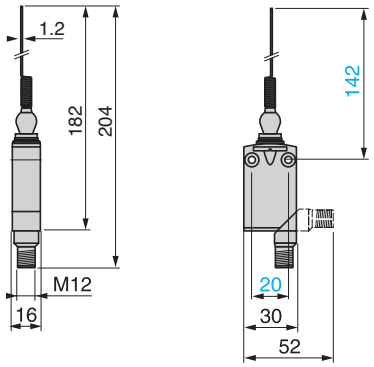
XCMD2●45M12



XCMD2●15M12/●16M12/●17M12



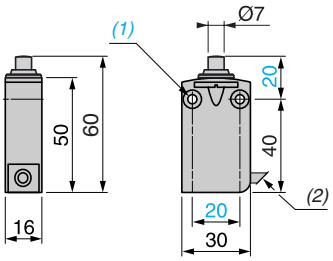
XCMD2●06M12



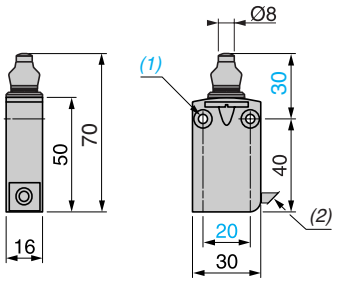
(1) 2 fixing holes Ø 4.2 mm, counterbored Ø 8 mm by 4 mm deep.
e: 8 mm max, panel cut-out Ø 12.5 mm, fixing nut thickness 3.5 mm.
f: 8 mm max., panel cut-out Ø 16.5 mm, fixing nut thickness 3.5 mm.

1

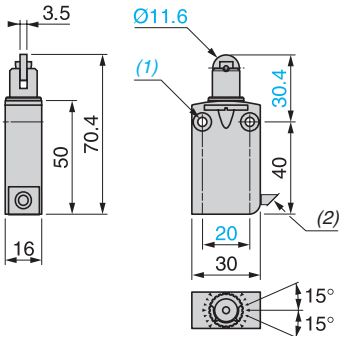
ZCMD21L08●●● + ZCE10



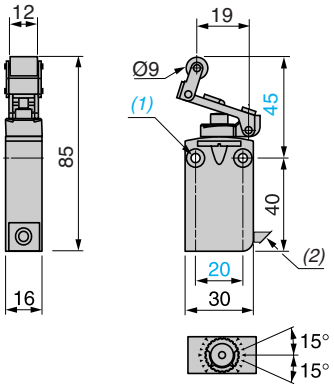
ZCMD21L08●●● + ZCE11



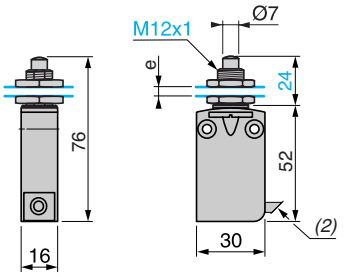
ZCMD21L08●●● + ZCE02



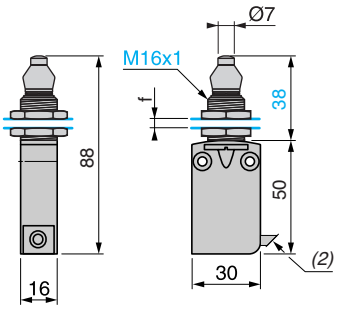
ZCMD21L08●●● + ZCE24



ZCMD21L08●●● + ZCEF0

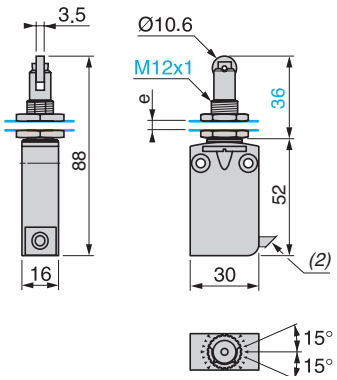


ZCMD21L08●●● + ZCEG1

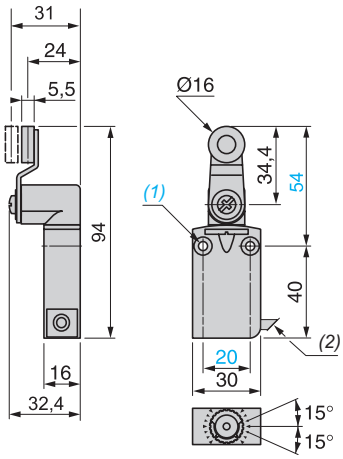


(1) 2 fixing holes Ø 4.2 mm, counterbored Ø 8 mm by 4 mm deep.
(2) External diameter 7.5 mm.
e: 8 mm max, panel cut-out Ø 12.5 mm, fixing nut thickness 3.5 mm.
f: 8 mm max., panel cut-out Ø 16.5 mm, fixing nut thickness 3.5 mm.

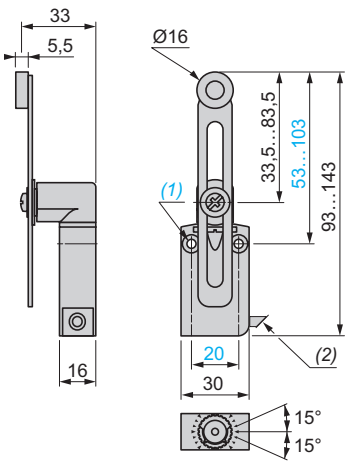
ZCMD21L08●●● + ZCEF2



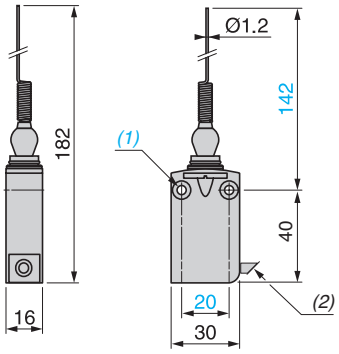
ZCMD21L08●●● + ZCE01 + ZCY15/16/17



ZCMD21L08●●● + ZCE01 + ZCY45



ZCMD21L08●●● + ZCE06

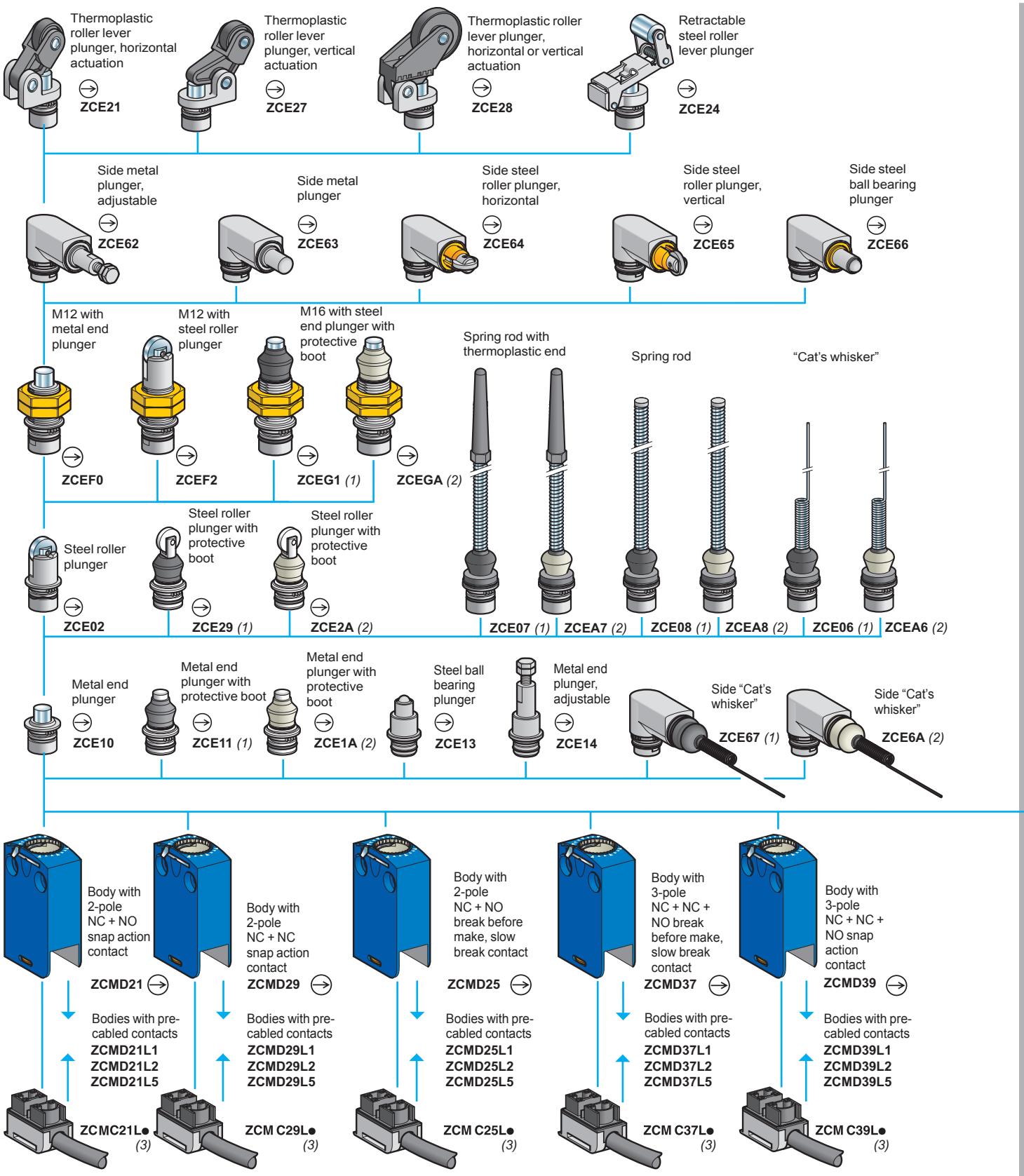


(1) 2 fixing holes Ø 4.2 mm, counterbored Ø 8 mm by 4 mm deep.
(2) External diameter 7.5 mm.
e: 8 mm max, panel cut-out Ø 12.5 mm, fixing nut thickness 3.5 mm.
f: 8 mm max, panel cut-out Ø 16.5 mm, fixing nut thickness 3.5 mm.

Limit switches

OsiSense XC Standard

Miniature design, metal, type XCMD
Variable composition

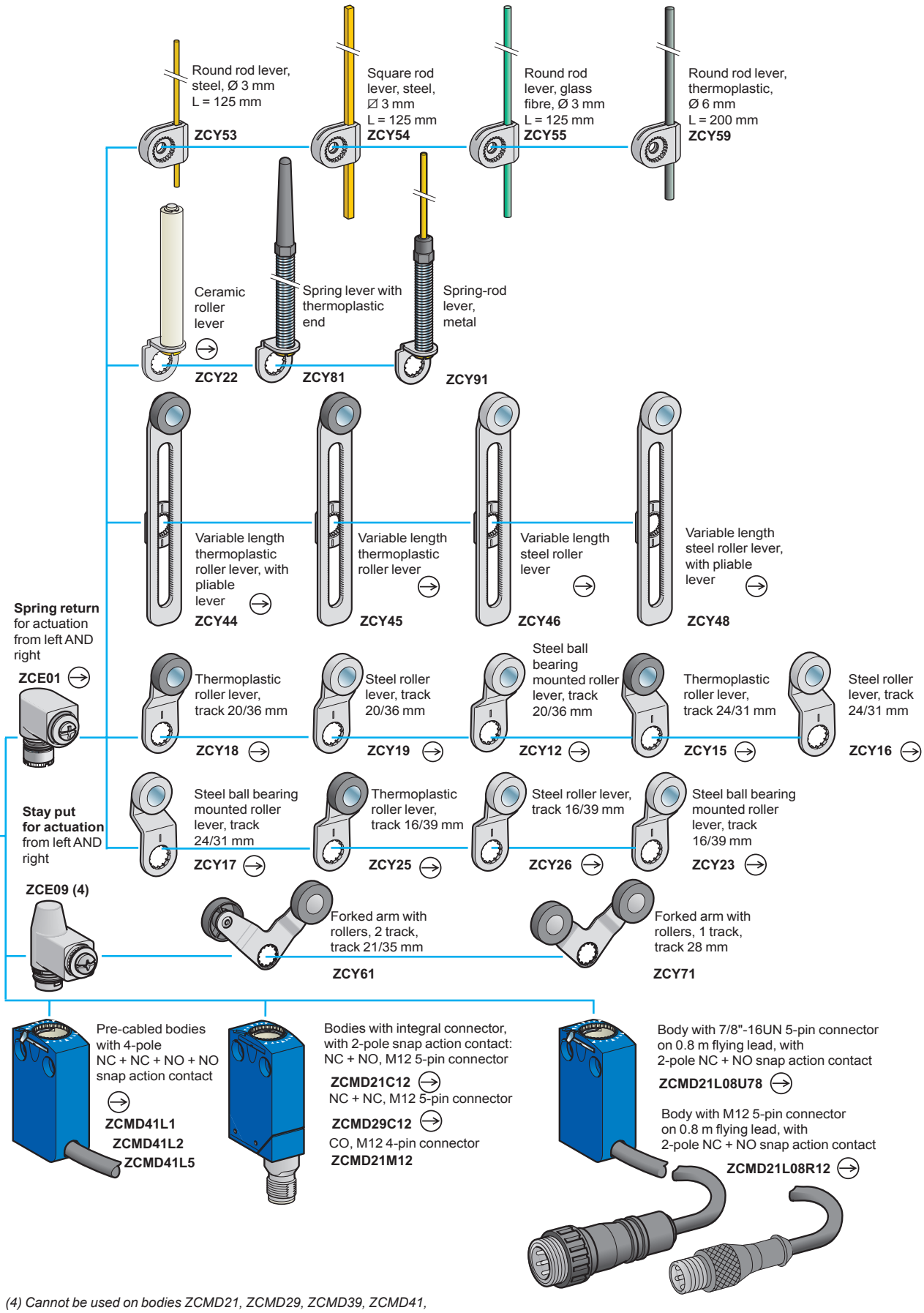


(1) Nitrile boot for indoor use.
(2) Silicone boot for outdoor use.
(3) Pre-cabled connection components: replace the "●" in the reference by the required cable length in metres, either: 1, 2, 3, 5, 7 or 10.
Example: ZCMC21L● becomes ZCMC21L7 for a 7 metre long cable.
Note: Only cable lengths of 1, 2 and 5 metres are available for pre-cabled connection components ZCMC37L● and ZCM39L●

Limit switches

OsiSense XC Standard

Miniature design, metal, type XCMD
Variable composition

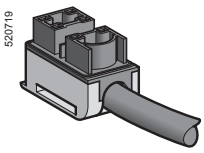


(4) Cannot be used on bodies ZCMD21, ZCMD29, ZCMD39, ZCMD41, ZCMD21C12, ZCMD21M12, ZCMD29C12, ZCMD21L08●●●.

Limit switches

OsiSense XC Standard

Miniature design, metal, type XCMD
Separate components

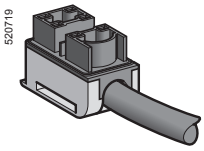


ZCMC21E●

Pre-cabled connection components with CEI cable

(Connitato Elettrotecnico Italiano) *(1)*

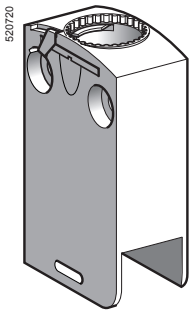
Type of contact	Scheme	Length of CEI cable in metres	Reference	Weight kg
2-pole				
NC + NO snap action		1	**ZCMC21E1**	0.100
		2	**ZCMC21E2**	0.190
		3	**ZCMC21E3**	0.280
		5	**ZCMC21E5**	0.440
		7	**ZCMC21E7**	0.700
		10	**ZCMC21E10**	0.970



ZCMC25T06
ZCMC21T●

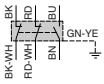
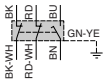
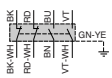
Pre-cabled connection components with halogen free cable

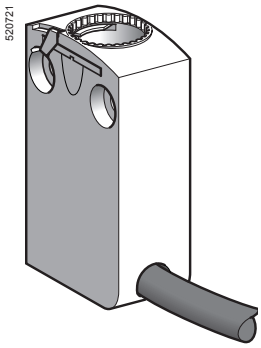
Type of contact	Positive operation *(3)*	Scheme	Length of cable in metres	Reference	Weight kg
2-pole					
NC + NO break before make, slow break	⊖		0.6	**ZCMC25T06**	0.080
NC + NO snap action	⊖		1	**ZCMC21T1**	0.130
			2	**ZCMC21T2**	0.250
			5	**ZCMC21T5**	0.520



ZCMD6●
ZCMD7●

Bodies with gold contacts

Type of contact	Positive operation *(3)*	Scheme	Length of cable in metres	Reference	Weight kg
2-pole					
NC + NO snap action	⊖		–	**ZCMD61**	0.055
NC + NC snap action	⊖		–	**ZCMD69**	0.055
NC + NO break before make, slow break	⊖		–	**ZCMD65**	0.055
3-pole					
NC + NC + NO snap action	⊖		–	**ZCMD79**	0.055
NC + NC + NO break before make, slow break	⊖		–	**ZCMD77**	0.055
4-pole					
NC + NC + NO + NO snap action	⊖		1	**ZCMD81L1**	0.160
			2	**ZCMD81L2**	0.255
			5	**ZCMD81L5**	0.525



ZCMD81L●

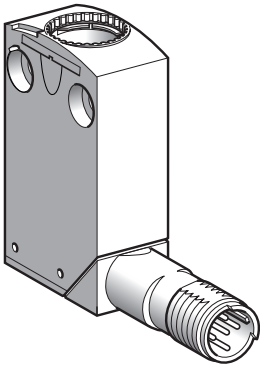
(1) Cable not UL, CSA certified.
(2) Other types of contacts and cable possible. Please consult our Customer Care Centre.
(3) ⊖ bodies with contacts assuring positive opening operation.

Limit switches

OsiSense XC Standard

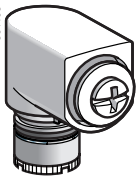
Miniature design, metal, type XCMD
Separate components

562245



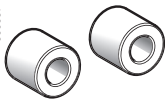
ZCMD61●●●

561408



ZCE05

566637

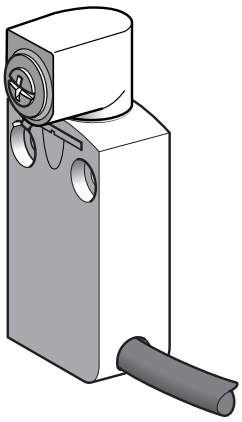


XCMZ06

566638

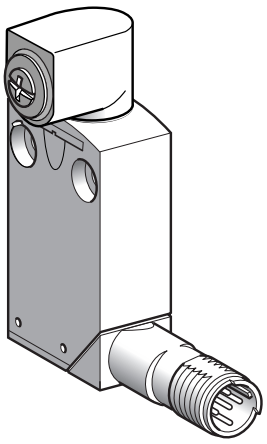
XCMZ07

562246



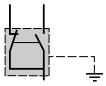
XCMD2●01L1

562247



XCMD2101●12

Bodies with gold contacts, connector

Type of contact	Positive operation (1)	Scheme	Connector	Reference	Weight kg
2-pole					
NC + NO snap action	–		M12, 5-pin	**ZCMD61C12**	0.065
NC + NC snap action	–		M12, 5-pin	**ZCMD69C12**	0.065
Single-pole					
CO snap action	–		M12, 4-pin	**ZCMD61M12**	0.065

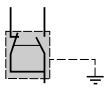
Accessories

Description	Positive operation (1)	Suitable levers for use with head	Reference	Weight kg
Rotary head, without lever, spring return, for actuation from left AND right or from left OR right *(2)*	⊖	ZCY12, ZCY15, ZCY16, ZCY17, ZCY18, ZCY19, ZCY22, ZCY23, ZCY25, ZCY26, ZCY39, ZCY53, ZCY54, ZCY55, ZCY81	**ZCE05**	0.045
Spacer for mounting multi-track XCMD	–	–	**XCMZ06**	0.005
Spacer for angular positioning of heads with adjustable levers, for values other than - 90°, 0° and 90°	–	–	**XCMZ07**	0.005

Bodies with contacts, with rotary head (without operating lever), pre-cabled

Type of contact	Positive operation (1)	Scheme	Length of cable in metres	Reference	Weight kg
2-pole					
NC + NO snap action	⊖		1	**XCMD2101L1**	0.180
NC + NO break before make, slow break	⊖		1	**XCMD2501L1**	0.180

Bodies with contacts, with rotary head (without operating lever), connector

Type of contact	Positive operation (1)	Scheme	Connector	Reference	Weight kg
2-pole					
NC + NO snap action	⊖		M12, 5-pin	**XCMD2101C12**	0.110
Single-pole					
CO snap action	–		M12, 4-pin	**XCMD2101M12**	0.110

(1) ⊖ bodies with contacts or head assuring positive opening operation.
(2) For programming see page 1/130.

Limit switches

OsiSense XC Basic

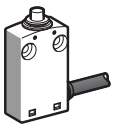
Miniature design, plastic, type XCMN

1

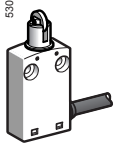
■ XCMN
pre-cabled

□ With head for linear movement (plunger). Fixing by the body

520366



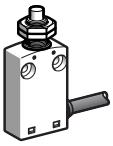
530750



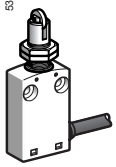
Page 1/28

□ With head for linear movement (plunger). Fixing by the head

530751



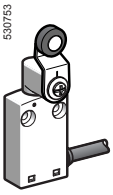
530752



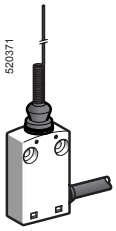
Page 1/28

□ With head for rotary movement (lever) or multi-directional

530753



520371



Page 1/29

Limit switches

OsiSense XC Basic

Miniature design, plastic, type XCMN

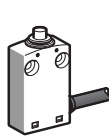
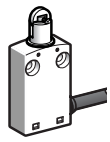
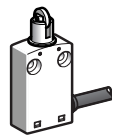
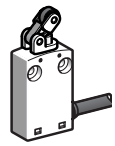
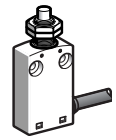
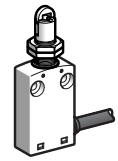
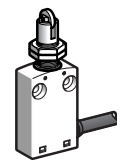
Environment characteristics		
Conformity to standards	Products	IEC 60947-5-1, EN 60947-5-1, UL 508, CSA C22-2 n° 14
	Machine assemblies	IEC 60204-1, EN 60204-1
Product certifications		UL, CSA, CCC
Protective treatment	Standard version	"TC"
Ambient air temperature	For operation	- 25…+ 70°C
	For storage	- 40…+ 70°C
Vibration resistance	Conforming to IEC 60068-2-6	5 gn (10…500 Hz)
Shock resistance	Conforming to IEC 60068-2-27	25 gn (18 ms)
Electric shock protection		Class II conforming to IEC 61140 and NF C 20030
Degree of protection		**IP 65 conforming to IEC 60529; IK 04 conforming to EN 50102**
Materials	Bodies	Plastic
	Heads	Zamak

Contact block characteristics	
Rated operational characteristics	∿ AC-15; B300 (Ue = 240 V, Ie = 1.5 A); Ithe = 6 A
	⎓ DC-13; R300 (Ue = 250 V, Ie = 0.1 A), conforming to IEC 60947-5-1 Appendix A, EN 60947-5-1
Rated insulation voltage	Ui = 400 V degree of pollution 3 conforming to IEC 60947-1 Ui = 300 V conforming to UL 508, CSA C22-2 n° 14
Rated impulse withstand voltage	U imp = 4 kV conforming to IEC 60947-1, IEC 60664
Short-circuit protection	6 A cartridge fuse type gG (gl)

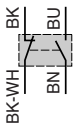
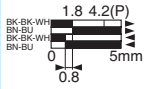
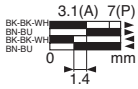
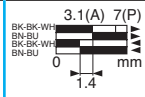
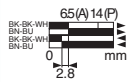
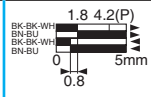
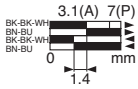
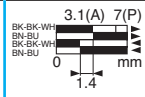
Limit switches

OsiSense XC Basic

Miniature design, plastic, type XCMN
Pre-cabled

Type of head	Plunger (fixing by the body)				Plunger (fixing by the head)		
							
Type of operator	Metal end plunger	Steel roller plunger for lateral cam approach	Steel roller plunger for traverse cam approach	Thermoplastic roller lever plunger, horizontal actuation in 1 direction	M12 with metal end plunger	M12 with steel roller plunger for lateral cam approach	M12 with steel roller plunger for traverse cam approach

References

 **2-pole NC + NO snap action**	**XCMN2110L1**	**XCMN2102L1**	**XCMN2103L1**	**XCMN2121L1**	**XCMN21F0L1**	**XCMN21F2L1**	**XCMN21F3L1**
							
Weight (kg)	0.080	0.080	0.080	0.090	0.065	0.095	0.095

Contact operation
- closed
- open

(A) = cam displacement
(P) = positive opening point

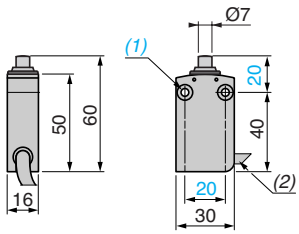
NC contact with positive opening operation

Characteristics

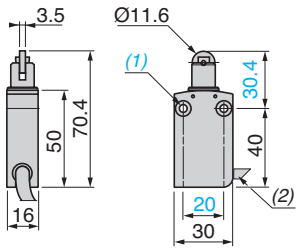
Switch actuation		On end	By 30° cam		On end	By 30° cam
Type of actuation						
Maximum actuation speed		0.5 m/s	0.1 m/s	0.5 m/s		0.1 m/s
Mechanical durability		5 million operating cycles				
Minimum force or torque	For tripping	8.5 N	7 N	2.5 N	8.5 N	7 N
	For positive opening	42.5 N	35 N	12.5 N	42.5 N	35 N
Cabling		PvR cable, 4 x 0.75 mm², length 1 metre				

Dimensions

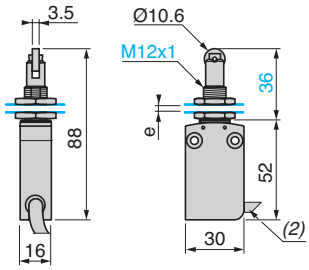
XCMN2110L1



XCMN2102L1, XCMN2103L1

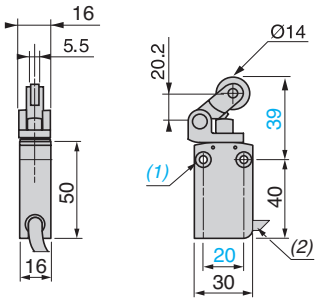


XCMN21F2L1, XCMN21F3L1

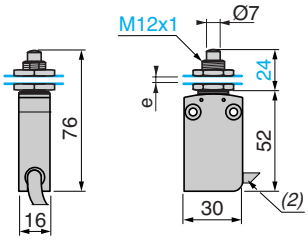


(1) 2 fixing holes Ø 4.2 mm, counterbored Ø 8 mm by 4 mm deep.
(2) External diameter 7.5 mm.
e: 8 mm max, panel cut-out Ø 12.5 mm.
Fixing nut thickness 3.5 mm.

XCMN2121L1



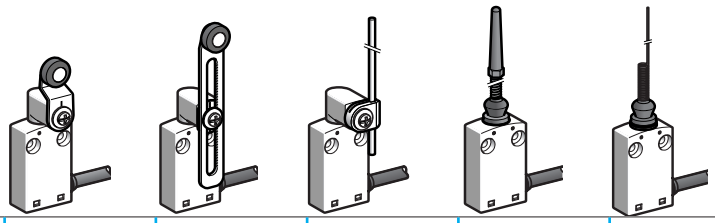
XCMN21F0L1



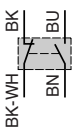
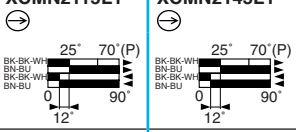
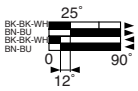
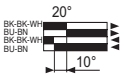
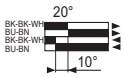
Limit switches

OsiSense XC Basic

Miniature design, plastic, type XCMN
Pre-cabled

Type of head	Rotary (fixing by the body)			Multi-directional	
					
Type of operator	Thermoplastic roller lever	Variable length thermoplastic roller lever	Round thermoplastic rod lever, Ø 6 mm *(1)*	Spring lever with thermoplastic end *(1)*	"Cat's whisker" *(1)*

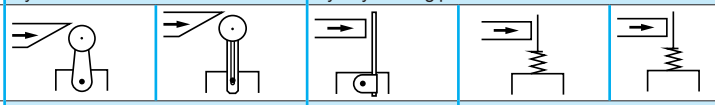
References

2-pole NC + NO snap action	XCMN2115L1	XCMN2145L1	XCMN2159L1	XCMN2107L1	XCMN2106L1
					
Weight (kg)	0.100	0.105	0.080	0.085	0.080

Contact operation: *closed* / *open*; *(A) = cam displacement*, *(P) = positive opening point*; *NC contact with positive opening operation*

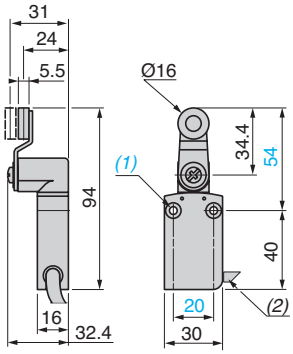
(1) Value taken with actuation by moving part at 100 mm from the fixing.

Characteristics

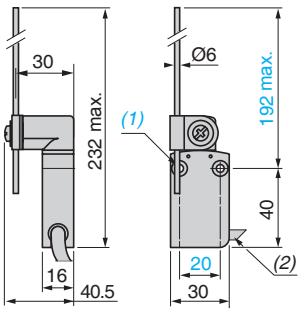
Switch actuation	By 30° cam		By any moving part		
Type of actuation					
Maximum actuation speed	1.5 m/s		1 m/s	1 m/s (any direction)	
Mechanical durability	5 million operating cycles				
Minimum force or torque – For tripping	0.1 N.m				
Minimum force or torque – For positive opening	0.5 N.m		–	–	–
Cabling	PvR cable, 4 x 0.75 mm², length 1 metre				

Dimensions

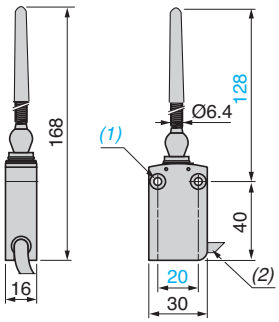
XCMN2115L1



XCMN2159L1

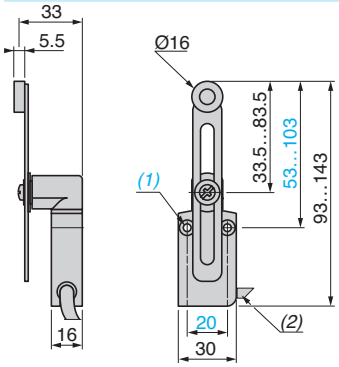


XCMN2107L1

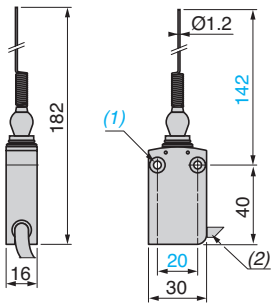


(1) 2 fixing holes Ø 4.2 mm, counterbored Ø 8 mm by 4 mm deep.
(2) External diameter 7.5 mm.

XCMN2145L1



XCMN2106L1



Limit switches

OsiSense XC Standard

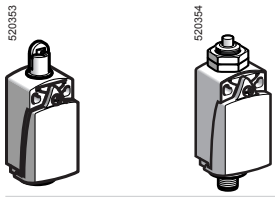
Compact design, plastic, types XCKP and XCKT
Compact design, metal, type XCKD

■ XCKP, XCKD

with 1 cable entry
Conforming to CENELEC EN 50047

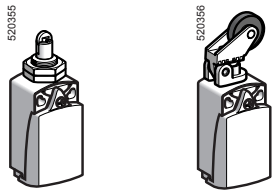
□ With head for linear movement (plunger). Fixing by the head or by the body

XCKD



Pages 1/38 and 1/42

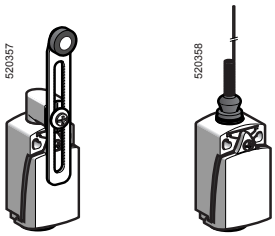
XCKP



Pages 1/32 and 1/34

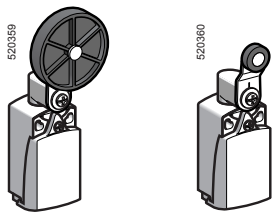
□ With head for rotary movement (lever) or multi-directional. Fixing by the body

XCKD



Pages 1/39 et 1/47

XCKP



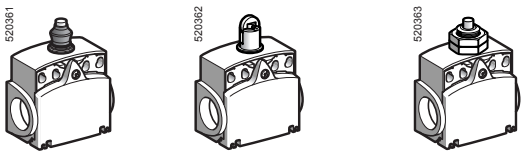
Pages 1/33 et 1/35

■ XCKT

with 2 cable entries
Tripping/resetting points and fixing centres conform to CENELEC EN 50047

□ With head for linear movement (plunger). Fixing by the head or by the body

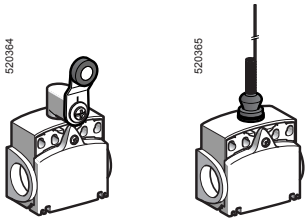
XCKT



Page 1/44

□ With head for rotary movement (lever) or multi-directional. Fixing by the body

XCKT



Page 1/44

Environment characteristics

Conformity to standards	Products	IEC 60947-5-1, EN 60947-5-1, UL 508, CSA C22-2 n° 14
	Machine assemblies	IEC 60204-1, EN 60204-1
Product certifications		UL, CSA, CCC
Protective treatment	Standard version	"TC"
Ambient air temperature	For operation	- 25…+ 70°C
	For storage	- 40…+ 70°C
Vibration resistance	Conforming to IEC 60068-2-6	25 gn (10…500 Hz) except product with head ZCE24: 20 gn
Shock resistance	Conforming to IEC 60068-2-27	50 gn (11 ms) except head ZCE08: 15 gn (11 ms) and ZCE24: 30 gn (18 ms)
Electric shock protection		Class II conforming to IEC 61140 and NF C 20-030 for **XCKP** and **XCKT**
		Class I conforming to IEC 61140 and NF C 20-030 for **XCKD**
Degree of protection		**IP 66 and IP 67 conforming to IEC 60529; IK 04 conforming to EN 50102 for XCKP and XCKT, IK 06 conforming to EN 50102 for XCKD**
Repeat accuracy		0.1 mm on the tripping points, with 1 million operating cycles for head with end plunger
Cable entry or connector	Depending on model	Either tapped entry for n° 11 or n° 13 cable gland, tapped ISO M16 x 1.5 or ISO M20 x 1.5, tapped 1/2" NPT or PF 1/2 (G1/2) or M12 connector
Materials		**XCKD** Zamak bodies and heads, **XCKP and XCKT** plastic bodies, Zamak heads

Limit switches

OsiSense XC Standard

Compact design, plastic, types XCKP and XCKT
Compact design, metal, type XCKD

Contact block characteristics

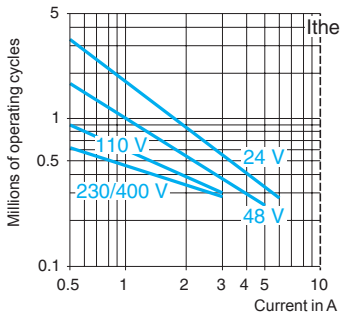
Rated operational characteristics	XE2●P	∼ AC-15; A300 (Ue = 240 V, Ie = 3 A); Ithe = 10 A ⎓ DC-13; Q300 (Ue = 250 V, Ie = 0.27 A), conforming to IEC 60947-5-1 Appendix A, EN 60947-5-1
	XE3●P	∼ AC-15; B300 (Ue = 240 V, Ie = 1.5 A); Ithe = 6 A ⎓ DC-13; R300 (Ue = 250 V, Ie = 0.1 A), conforming to IEC 60947-5-1 Appendix A, EN 60947-5-1
Rated insulation voltage	XE2●P	Ui = 500 V degree of pollution 3 conforming to IEC 60947-1 Ui = 300 V conforming to UL 508, CSA C22-2 n° 14
	XE3●P	Ui = 400 V degree of pollution 3 conforming to IEC 60947-1 Ui = 300 V conforming to UL 508, CSA C22-2 n° 14
Rated impulse withstand voltage	XE2●P	U imp = 6 kV conforming to IEC 60947-1, IEC 60664
	XE3●P	U imp = 4 kV conforming to IEC 60947-1, IEC 60664
Positive operation (depending on model)		NC contacts with positive opening operation conforming to IEC 60947-5-1 Appendix K, EN 60947-5-1
Resistance across terminals		≤ 25 mΩ conforming to IEC 60255-7 category 3
Short-circuit protection	XE2●P	10 A cartridge fuse type gG (gI)
	XE3●P	6 A cartridge fuse type gG (gI)
Connection (screw clamp terminals)	XE2SP●151 and XE2SP2141	Clamping capacity, min: 1 x 0.34 mm², max: 2 x 1.5 mm²
	XE2NP21●1 and XE2NP31●1	Clamping capacity, min: 1 x 0.5 mm², max: 2 x 2.5 mm²
	XE3NP and XE3SP	Clamping capacity, min: 1 x 0.34 mm², max: 1 x 1 mm² or 2 x 0.75 mm²
Minimum actuation speed (for head with end plunger)		**XE2SP●151**, **XE2SP2141** and **XE3SP**: 0.01 m/minute
		XE2NP21●1, **XE2NP31●1** and **XE3NP**: 6 m/minute

Electrical durability

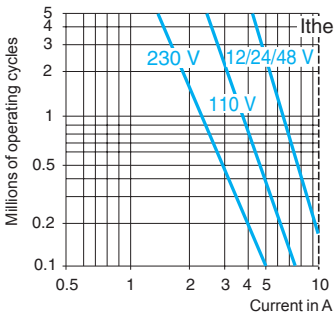
- Conforming to IEC 60947-5-1 Appendix C
- Utilisation categories AC-15 and DC-13
- Maximum operating rate: 3600 operating cycles/hour
- Load factor: 0.5

AC supply
50/60 Hz ∼
inductive circuit

XE2SP●151, XE2SP2141



XE2NP21●1, XE2NP31●1



DC supply ⎓

Power broken in W for 5 million operating cycles.

Voltage	V	24	48	120
	W	10	7	4

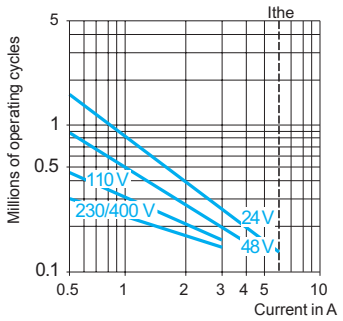
Power broken in W for 5 million operating cycles.

Voltage	V	24	48	120
	W	13	9	7

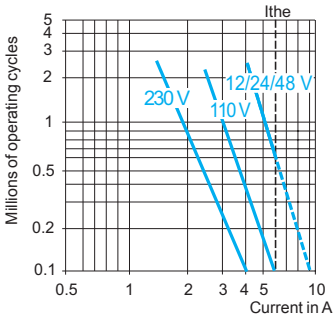
For XE2SP●151 on ∼ or ⎓, NC and NO contacts simultaneously loaded to the values shown with reverse polarity.

AC supply
50/60 Hz ∼
inductive circuit

XE3SP●●●●



XE3NP●●●●



DC supply ⎓

Power broken in W for 5 million operating cycles.

Voltage	V	24	48	120
	W	3	2	1

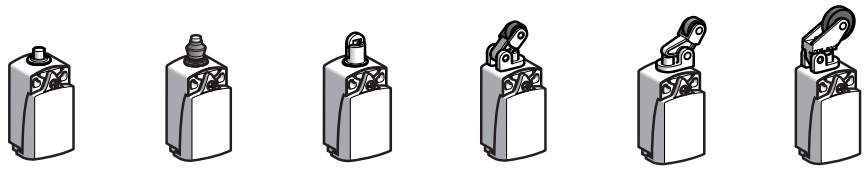
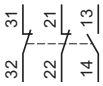
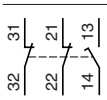
Power broken in W for 5 million operating cycles.

Voltage	V	24	48	120
	W	4	3	2

Limit switches

OsiSense XC Standard

Compact design, plastic, type XCKP
Complete switches with 1 cable entry

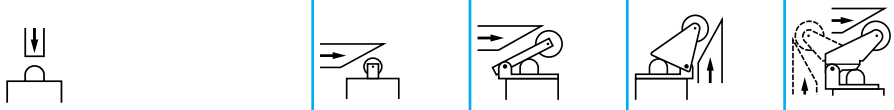
Type of head	Plunger (fixing by the body)					
	Form B *(1)*		Form C *(1)*	Form E *(1)*		
						
Type of operator	Metal end plunger	Metal end plunger with elastomer boot	Steel roller plunger	Thermoplastic roller lever plunger, horizontal actuation in 1 direction	Thermoplastic roller lever plunger, vertical actuation in 1 direction	Thermoplastic roller lever plunger, horiz. or vert. actuation in 1 direction
References of complete switches with 1 ISO M16 x 1.5 cable entry *(2)*						
2-pole NC + NO snap action (XE2SP2151)	**XCKP2110P16** 1.8 4.6(P) 0 5mm 0.9	**XCKP2111P16** 1.8 4.6(P) 0 5mm 0.9	**XCKP2102P16** 3.1(A) 7.8(P) 0 mm 1.5	**XCKP2121P16** 6.5(A) 15.7(P) 0 mm 3	**XCKP2127P16** 6.5(B) 15.7(P) 0 mm 3	**XCKP2128P16** 9.8(A) 22.5(P) 0 mm 4.9
2-pole NC + NO break before make, slow break (XE2NP2151)	**XCKP2510P16** 1.8 3.2(P) 0 3 5mm	**XCKP2511P16** 1.8 3.2(P) 0 3 5mm	**XCKP2502P16** 3.1(A) 5.6(P) 0 5.2 mm	**XCKP2521P16** 6.5(A) 11.3(P) 0 10.5 mm	**XCKP2527P16** 6.6(A) 11.6(P) 0 mm	**XCKP2528P16** 9.8(A) 17.2(P) 0 16.1 mm
2-pole NC + NC snap action (XE2SP2141)	**ZCP29 + ZCPEP16 + ZCE10** 1.8 4.6(P) 0 5mm 0.9	**ZCP29 + ZCPEP16 + ZCE11** 1.8 4.6(P) 0 5mm 0.9	**ZCP29 + ZCPEP16 + ZCE02** 3.1(A) 7.8(P) 0 mm 1.5	**ZCP29 + ZCPEP16 + ZCE21** 6.5(A) 15.7(P) 0 mm 3	**ZCP29 + ZCPEP16 + ZCE27** 6.5(B) 15.7(P) 0 mm 3	**ZCP29 + ZCPEP16 + ZCE28** 9.8(A) 22.5(P) 0 mm 4.9
2-pole NC + NC simultaneous, slow break (XE2NP2141)	**ZCP27 + ZCPEP16 + ZCE10** 1.8 3.2(P) 0 5mm	**ZCP27 + ZCPEP16 + ZCE11** 1.8 3.2(P) 0 5mm	**ZCP27 + ZCPEP16 + ZCE02** 3.1 5.6(P) 0 mm	**ZCP27 + ZCPEP16 + ZCE21** 6.6(A) 11.6(P) 0 mm	**ZCP27 + ZCPEP16 + ZCE27** 6.6(B) 11.6(P) 0 mm	**ZCP27 + ZCPEP16 + ZCE28** 5.3(A) 0 mm
 **3-pole NC + NC + NO snap action (XE3SP2141)**	**ZCP39 + ZCPEP16 + ZCE10** 1.8 4.6(P) 0 5mm 0.9	**ZCP39 + ZCPEP16 + ZCE11** 1.8 4.6(P) 0 5mm 0.9	**ZCP39 + ZCPEP16 + ZCE02** 3.1(A) 7.8(P) 0 mm 1.5	**ZCP39 + ZCPEP16 + ZCE21** 6.5(A) 15.7(P) 0 mm 3	**ZCP39 + ZCPEP16 + ZCE27** 6.5(B) 15.7(P) 0 mm 3	**ZCP39 + ZCPEP16 + ZCE28** 9.8(A) 22.5(P) 0 mm 4.9
 **3-pole NC + NC + NO break before make, slow break (XE3NP2141)**	**ZCP37 + ZCPEP16 + ZCE10** 1.8 3.2(P) 0 3 5mm	**ZCP37 + ZCPEP16 + ZCE11** 1.8 3.2(P) 0 3 5mm	**ZCP37 + ZCPEP16 + ZCE02** 3.1(A) 5.6(P) 0 5.2 mm	**ZCP37 + ZCPEP16 + ZCE21** 6.5(A) 11.3(P) 0 10.5 mm	**ZCP37 + ZCPEP16 + ZCE27** 6.5(B) 11.3(P) 0 10.5 mm	**ZCP37 + ZCPEP16 + ZCE28** 9.8(A) 17.2(P) 0 16.1 mm
Weight (kg)	0.090	0.090	0.095	0.105	0.100	0.105

References of complete switches with 1 entry for n° 11 cable gland

For an entry tapped for a n° 11 cable gland, replace P16 in the reference by G11. Example: XCKP2110P16 becomes XCKP2110G11 or ZCPEP16 becomes ZCPEG11.

Contact operation ■ *closed* □ *open* — *(A) (B) = cam displacement* *(P) = positive opening point* — ⊖ *NC contact with positive opening operation*

Characteristics

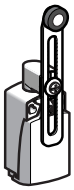
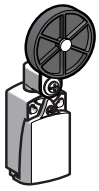
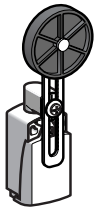
Switch actuation	On end		By 30° cam			
Type of actuation						
Maximum actuation speed	0.5 m/s			1 m/s		
Mechanical durability (in millions of operating cycles)	15		10	15		
Minimum force or torque For tripping	15 N		12 N	6 N		
Minimum force or torque For positive opening	45 N		36 N	18 N		
Cable entry *(3)*	1 entry tapped M16 x 1.5 mm for ISO cable gland, clamping capacity 4 to 8 mm					

(1) Form conforming to EN 50047, see page 1/136.
(2) Switches with gold contacts or eyelet type connections: please consult our Customer Care Centre.

Limit switches

OsiSense XC Standard

Compact design, plastic, type XCKP
Complete switches with 1 cable entry

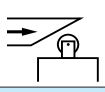
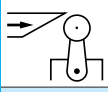
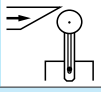
Type of head	Plunger (fixing by the head)		Rotary (fixing by the body)				Multi-directional
			Form A *(1)*				
							
Type of operator	M18 with metal end plunger	M18 with steel roller plunger	Thermoplastic roller lever	Variable length thermoplastic roller lever	Thermoplastic roller lever, Ø 50 mm	Variable length thermoplastic roller lever, Ø 50 mm	"Cat's whisker" *(2)*
References of complete switches with 1 ISO M16 x 1.5 cable entry *(3)*							
13 21 / 14 22 **2-pole NC + NO snap action (XE2SP2151)**	**XCKP21H0P16**	**XCKP21H2P16**	**XCKP2118P16**	**XCKP2145P16**	**XCKP2139P16**	**XCKP2149P16**	**XCKP2106P16**
13 21 / 14 22 **2-pole NC + NO break before make, slow break (XE2NP2151)**	**XCKP25H0P16**	**XCKP25H2P16**	**XCKP2518P16**	**XCKP2545P16**	**XCKP2539P16**	**XCKP2549P16**	**XCKP2506P16**
11 21 / 12 22 **2-pole NC + NC snap action (XE2SP2141)**	**ZCP29 + ZCPEP16 + ZCEH0**	**ZCP29 + ZCPEP16 + ZCEH2**	**ZCP29 + ZCPEP16 + ZCE01 + ZCY18**	**ZCP29 + ZCPEP16 + ZCE01 + ZCY45**	**ZCP29 + ZCPEP16 + ZCE01 + ZCY39**	**ZCP29 + ZCPEP16 + ZCE01 + ZCY49**	**ZCP29 + ZCPEP16 + ZCE06**
11 21 / 12 22 **2-pole NC + NC simultaneous, slow break (XE2NP2141)**	**ZCP27 + ZCPEP16 + ZCEH0**	**ZCP27 + ZCPEP16 + ZCEH2**	**ZCP27 + ZCPEP16 + ZCE01 + ZCY18**	**ZCP27 + ZCPEP16 + ZCE01 + ZCY45**	**ZCP27 + ZCPEP16 + ZCE01 + ZCY39**	**ZCP27 + ZCPEP16 + ZCE01 + ZCY49**	**ZCP27 + ZCPEP16 + ZCE06**
31 21 13 / 32 22 14 **3-pole NC + NC + NO snap action (XE3SP2141)**	**ZCP39 + ZCPEP16 + ZCEH0**	**ZCP39 + ZCPEP16 + ZCEH2**	**ZCP39 + ZCPEP16 + ZCE01 + ZCY18**	**ZCP39 + ZCPEP16 + ZCE01 + ZCY45**	**ZCP39 + ZCPEP16 + ZCE01 + ZCY39**	**ZCP39 + ZCPEP16 + ZCE01 + ZCY49**	**ZCP39 + ZCPEP16 + ZCE06**
31 21 13 / 32 22 14 **3-pole NC + NC + NO break before make, slow break (XE3NP2141)**	**ZCP37+ ZCPEP16 + ZCEH0**	**ZCP37 + ZCPEP16 + ZCEH2**	**ZCP37 + ZCPEP16 + ZCE01 + ZCY18**	**ZCP37 + ZCPEP16 + ZCE01 + ZCY45**	**ZCP37 + ZCPEP16 + ZCE01 + ZCY39**	**ZCP37 + ZCPEP16 + ZCE01 + ZCY49**	**ZCP37 + ZCPEP16 + ZCE06**
Weight (kg)	0.130	0.130	0.135	0.145	0.145	0.155	0.085

References of complete switches with 1 entry for n° 11 cable gland

*For an entry tapped for a n° 11 cable gland, replace P16 in the reference by **G11**. Example: XCKP21H0P16 becomes **XCKP21H0G11** or ZCPEP16 becomes **ZCPEG11**.*

Contact operation — *closed* / *open* — *(A) = cam displacement* — *(P) = positive opening point* — *NC contact with positive opening operation*

Characteristics

Switch actuation		On end	By 30° cam				By any moving part
Type of actuation							
Maximum actuation speed		0.5 m/s		1.5 m/s			1 m/s (any direct.)
Mechanical durability		10 million operating cycles					5 million
Minimum force or torque	For tripping	15 N	10 N	0.1 N.m			0.13 N.m
	For positive opening	45 N	36 N	0.25 N.m			–
Cable entry		1 entry tapped M16 x 1.5 mm for ISO cable gland, clamping capacity 4 to 8 mm					

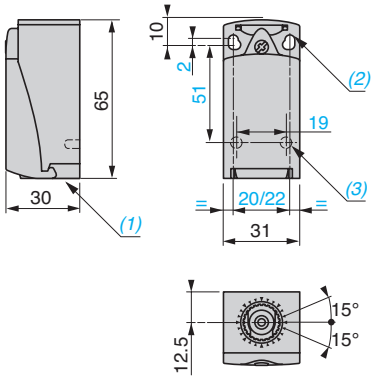
(1) Form conforming to EN 50047, see page 1/136.
(2) Value taken with actuation by moving part at 100 mm from the fixing.
(3) Switches with gold contacts or eyelet type connections: please consult our Customer Care Centre.

Limit switches

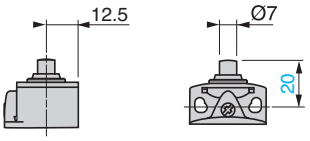
OsiSense XC Standard

Compact design, plastic, type XCKP
Complete switches with 1 cable entry

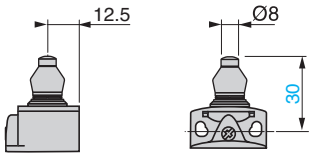
ZCP2● + ZCPEP16/ZCP3● + ZCPEP16



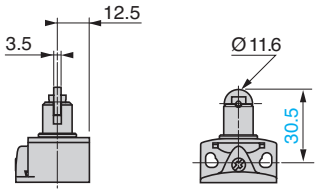
ZCE10



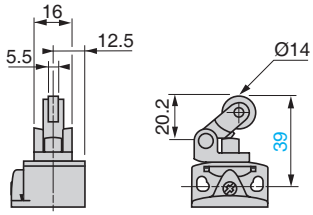
ZCE11



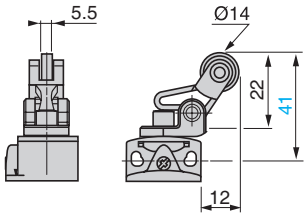
ZCE02



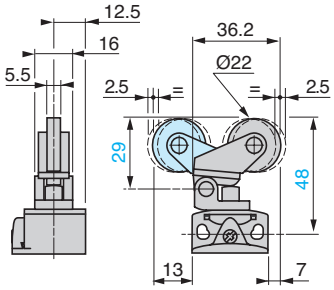
ZCE21



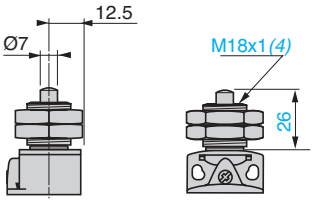
ZCE27



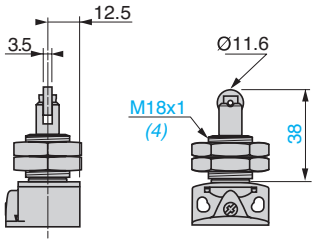
ZCE28



ZCEH0



ZCEH2



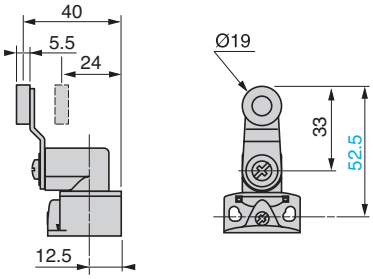
(1) Tapped entry for ISO M16 x 1.5 or Pg 11 cable gland.
(2) 2 elongated holes Ø 4.3 x 6.3 mm on 22 mm centres, 2 holes Ø 4.3 on 20 mm centres.
(3) 2 x Ø 3 holes for support studs, depth 4 mm.
(4) Fixing nut thickness 3.5 mm.

Limit switches

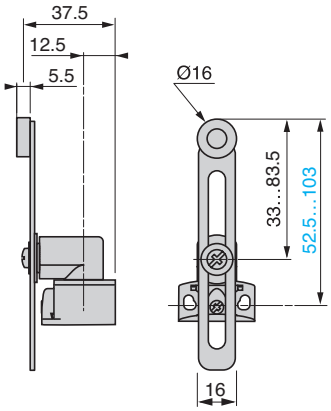
OsiSense XC Standard

Compact design, plastic, type XCKP
Complete switches with 1 cable entry

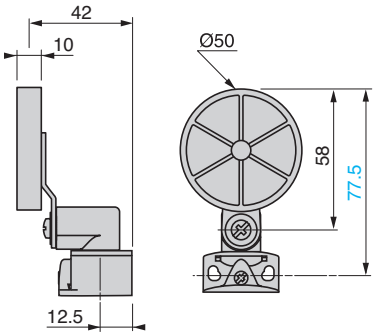
ZCE01 + ZCY18



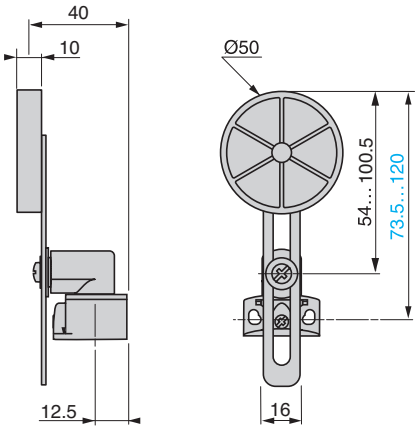
ZCE01 + ZCY45



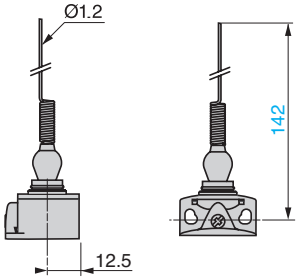
ZCE01 + ZCY39



ZCE01 + ZCY49



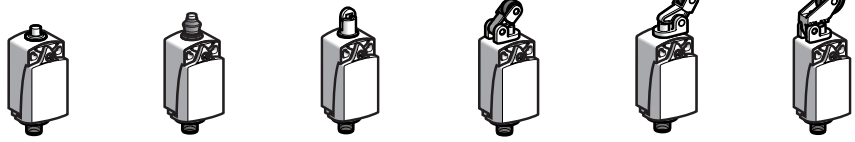
ZCE06



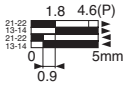
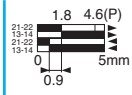
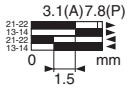
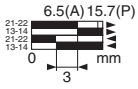
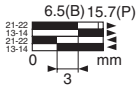
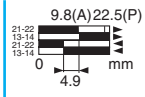
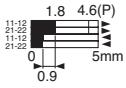
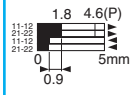
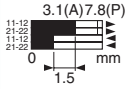
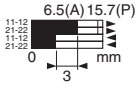
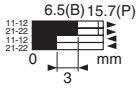
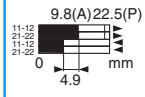
Limit switches

OsiSense XC Standard

Compact design, plastic, type XCKP
M12 connector

Type of head	Plunger (fixing by the body)					
	Form B *(1)*		Form C *(1)*	Form E *(1)*		
						
Type of operator	Metal end plunger	Metal end plunger with elastomer boot *(2)*	Steel roller plunger	Thermoplastic roller lever plunger, horizontal actuation in 1 direction	Thermoplastic roller lever plunger, vertical actuation in 1 direction	Thermoplastic roller lever plunger, horiz. or vert. actuation in 1 direction

References

2-pole NC + NO snap action (XE2SP2151)	**XCKP2110M12** ⊖ 	**XCKP2111M12** ⊖ 	**XCKP2102M12** ⊖ 	**XCKP2121M12** ⊖ 	**XCKP2127M12** ⊖ 	**XCKP2128M12** ⊖ 
2-pole NC + NC snap action (XE2SP2141)	**ZCP29M12 + ZCE10** ⊖ 	**ZCP29M12 + ZCE11** ⊖ 	**ZCP29M12 + ZCE02** ⊖ 	**ZCP29M12 + ZCE21** ⊖ 	**ZCP29M12 + ZCE27** ⊖ 	**ZCP29M12 + ZCE28** ⊖ 
Weight (kg)	0.100	0.100	0.100	0.110	0.110	0.110
Contact operation	*closed* / *open*		*(A) (B) = cam displacement* / *(P) = positive opening point*		⊖ *NC contact with positive opening operation*	

(1) Form conforming to EN 50047, see page 1/136.
(2) Nitrile for indoor use.

Characteristics

Switch actuation		On end	By 30° cam			
Type of actuation						
Maximum actuation speed		0.5 m/s		1 m/s		
Mechanical durability (in millions of operating cycles)		15	10	15		
Minimum force or torque	For tripping	15 N	12 N	6 N		
	For positive opening	45 N	36 N	18 N		
Connection		M12 connector, Ui = 250 V, Ie = 3 A maximum, Ith = 3 A				

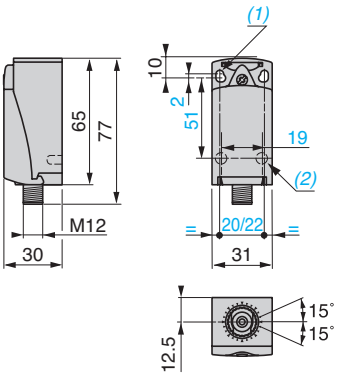
Connections

M12 connector

XE2SP2151	XE2SP2141
1-2: NC	1-2: NC
3-4: NO	3-4: NC

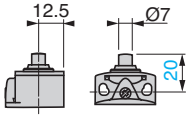
Dimensions

ZCP2●M12

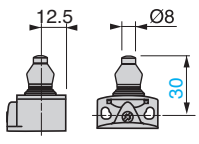


(1) 2 elongated holes Ø 4.3 x 6.3 mm on 22 mm centres, 2 holes Ø 4.3 on 20 mm centres.
(2) 2 x Ø 3 holes for support studs, depth 4 mm.
(3) Fixing nut thickness 3.5 mm.

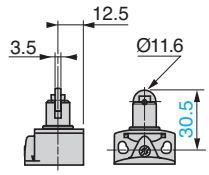
ZCE10



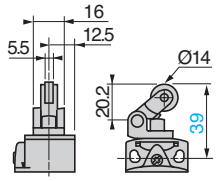
ZCE11



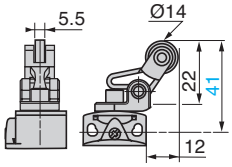
ZCE02



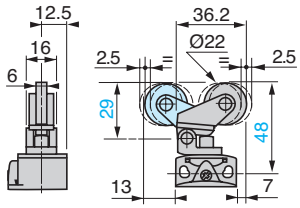
ZCE21



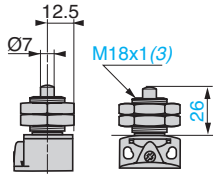
ZCE27



ZCE28



ZCEH0

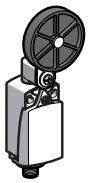


Telemecanique Sensors

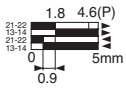
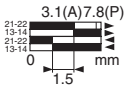
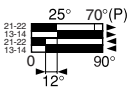
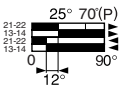
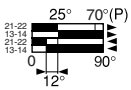
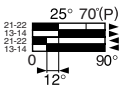
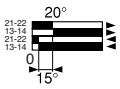
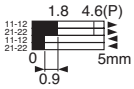
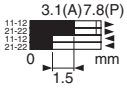
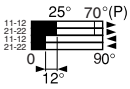
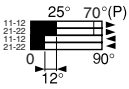
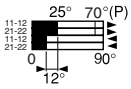
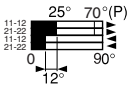
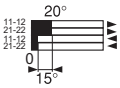
Compact design

OsiSense XC Standard

Compact design, plastic, type XCKP
M12 connector

Type of head	Plunger (fixing by the head)		Rotary (fixing by the body)				Multi-directional
			Form A *(1)*				
							
Type of operator	M18 with metal end plunger	M18 with steel roller plunger	Thermoplastic roller lever	Variable length thermoplastic roller lever	Thermoplastic roller lever, Ø 50 mm	Variable length thermoplastic roller lever, Ø 50 mm	"Cat's whisker" *(2)*

References

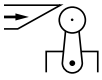
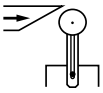
2-pole NC + NO snap action (XE2SP2151)	**XCKP21H0M12** ⊖ 	**XCKP21H2M12** ⊖ 	**XCKP2118M12** ⊖ 	**XCKP2145M12** ⊖ 	**XCKP2139M12** ⊖ 	**XCKP2149M12** ⊖ 	**XCKP2106M12** 
2-pole NC + NC snap action (XE2S P2141)	**ZCP29M12 + ZCEH0** ⊖ 	**ZCP29M12 + ZCEH2** ⊖ 	**ZCP29M12 + ZCE01 + ZCY18** ⊖ 	**ZCP29M12 + ZCE01 + ZCY45** ⊖ 	**ZCP29M12 + ZCE01 + ZCY39** ⊖ 	**ZCP29M12 + ZCE01 + ZCY49** ⊖ 	**ZCP29M12 + ZCE06** 
Weight (kg)	0.140	0.140	0.140	0.150	0.155	0.160	0.090

Contact operation
- ■ *closed*
- □ *open*

(A) = cam displacement
(P) = positive opening point
⊖ *NC contact with positive opening operation*

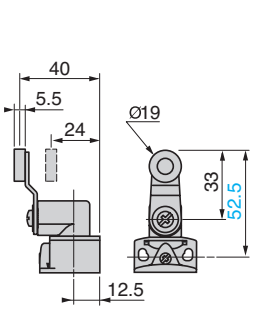
(1) Form conforming to EN 50047, see page 1/136.
(2) Value taken with actuation by moving part at 100 mm from the fixing.

Characteristics

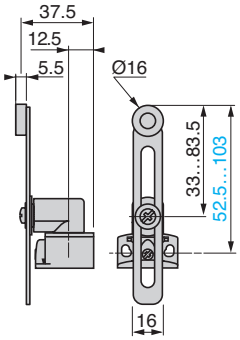
Switch actuation	On end	By 30° cam			By any moving part
Type of actuation					
Maximum actuation speed	0.5 m/s		1.5 m/s		1 m/s (any direct.)
Mechanical durability (in millions of operating cycles)	10				5
Minimum force or torque – For tripping	15 N	10 N	0.1 N.m		0.13 N.m
Minimum force or torque – For positive opening	45 N	36 N	0.25 N.m		–
Connection	M12 connector, Ui = 250 V, Ie = 3 A maximum, Ith = 3 A				

Dimensions

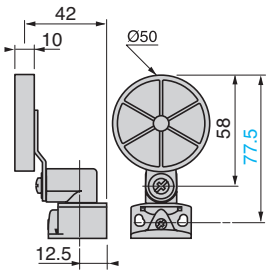
ZCE01 + ZCY18



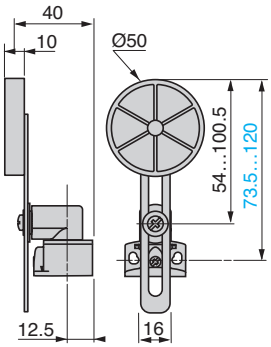
ZCE01 + ZCY45



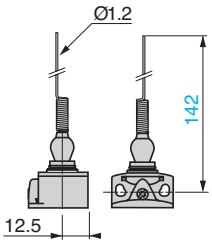
ZCE01 + ZCY39



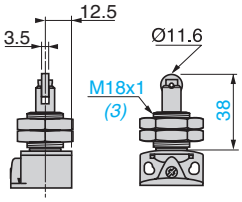
ZCE01 + ZCY49



ZCE06



ZCEH2

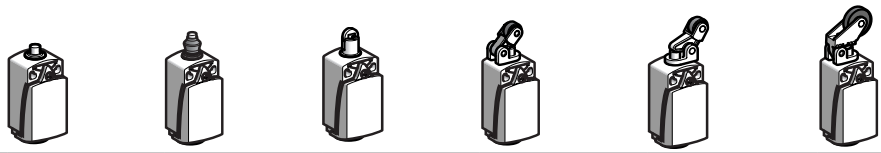
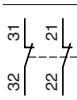


(3) Fixing nut thickness 3.5 mm.

Limit switches

OsiSense XC Standard

Compact design, metal, type XCKD
Complete switches with 1 cable entry

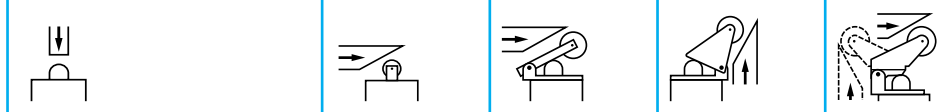
Type of head	Plunger (fixing by the body)					
	Form B *(1)*		Form C *(1)*	Form E *(1)*		
						
Type of operator	Metal end plunger	Metal end plunger with elastomer boot *(2)*	Steel roller plunger	Thermoplastic roller lever plunger, horizontal actuation in 1 direction	Thermoplastic roller lever plunger, vertical actuation in 1 direction	Thermoplastic roller lever plunger, horiz. or vert. actuation in 1 direction
References of complete switches with 1 ISO M16 x 1.5 cable entry *(3)*						
2-pole NC + NO snap action (XE2S P2151)	**XCKD2110P16** ⊖ 1.8 4.6(P) 0 5mm 0.9	**XCKD2111P16** ⊖ 1.8 4.6(P) 0 5mm 0.9	**XCKD2102P16** ⊖ 3.1(A) 7.8(P) 0 mm 1.5	**XCKD2121P16** ⊖ 6.5(A) 15.7(P) 0 mm 3	**XCKD2127P16** ⊖ 6.5(B) 15.7(P) 0 mm 3	**XCKD2128P16** ⊖ 9.8(A) 22.5(P) 0 mm 4.9
2-pole NC + NO break before make, slow break (XE2N P2151)	**XCKD2510P16** ⊖ 1.8 3.2(P) 0 3 5mm	**XCKD2511P16** ⊖ 1.8 3.2(P) 0 3 5mm	**XCKD2502P16** ⊖ 3.1(A) 5.6(P) 0 5.2 mm	**XCKD2521P16** ⊖ 6.5(A) 11.3(P) 0 10.5 mm	**XCKD2527P16** ⊖ 6.6(A) 11.6(P) 0 mm	**XCKD2528P16** ⊖ 9.8(A) 17.2(P) 0 16.1 mm
2-pole NC + NC snap action (XE2S P2141)	**ZCD29 + ZCDEP16 + ZCE10** ⊖ 1.8 4.6(P) 0 5mm 0.9	**ZCD29 + ZCDEP16 + ZCE11** ⊖ 1.8 4.6(P) 0 5mm 0.9	**ZCD29 + ZCDEP16 + ZCE02** ⊖ 3.1(A) 7.8(P) 0 mm 1.5	**ZCD29 + ZCDEP16 + ZCE21** ⊖ 6.5(A) 15.7(P) 0 mm 3	**ZCD29 + ZCDEP16 + ZCE27** ⊖ 6.5(B) 15.7(P) 0 mm 3	**ZCD29 + ZCDEP16 + ZCE28** ⊖ 9.8(A) 22.5(P) 0 mm 4.9
2-pole NC + NC simultaneous, slow break (XE2N P2141)	**ZCD27 + ZCDEP16 + ZCE10** ⊖ 1.8 3.2(P) 0 5mm	**ZCD27 + ZCDEP16 + ZCE11** ⊖ 1.8 3.2(P) 0 5mm	**ZCD27 + ZCDEP16 + ZCE02** ⊖ 3.1 5.6(P) 0 5mm	**ZCD27 + ZCDEP16 + ZCE21** ⊖ 6.6(A) 11.6(P) 0 5mm	**ZCD27 + ZCDEP16 + ZCE27** ⊖ 6.6(B) 11.6(P) 0 5mm	**ZCD27 + ZCDEP16 + ZCE28** ⊖ 5.3(A) 0 5mm
3-pole NC + NC + NO snap action (XE3S P2141)	**ZCD39 + ZCDEP16 + ZCE10** ⊖ 1.8 4.6(P) 0 5mm 0.9	**ZCD39 + ZCDEP16 + ZCE11** ⊖ 1.8 4.6(P) 0 5mm 0.9	**ZCD39 + ZCDEP16 + ZCE02** ⊖ 3.1(A) 7.8(P) 0 mm 1.5	**ZCD39 + ZCDEP16 + ZCE21** ⊖ 6.5(A) 15.7(P) 0 mm 3	**ZCD39 + ZCDEP16 + ZCE27** ⊖ 6.5(B) 15.7(P) 0 mm 3	**ZCD39 + ZCDEP16 + ZCE28** ⊖ 9.8(A) 22.5(P) 0 mm 4.9
 **3-pole NC + NC + NO break before make, slow break (XE3N P2141)**	**ZCD37 + ZCDEP16 + ZCE10** ⊖ 1.8 3.2(P) 0 3 5mm	**ZCD37 + ZCDEP16 + ZCE11** ⊖ 1.8 3.2(P) 0 3 5mm	**ZCD37 + ZCDEP16 + ZCE02** ⊖ 3.1(A) 5.6(P) 0 5.2 mm	**ZCD37 + ZCDEP16 + ZCE21** ⊖ 6.5(A) 11.3(P) 0 10.5 mm	**ZCD37 + ZCDEP16 + ZCE27** ⊖ 6.5(B) 11.3(P) 0 10.5 mm	**ZCD37 + ZCDEP16 + ZCE28** ⊖ 9.8(A) 17.2(P) 0 16.1 mm
Weight (kg)	0.180	0.180	0.185	0.195	0.190	0.195

References of complete switches with 1 entry for n° 11 cable gland

For an entry tapped for a n° 11 cable gland, replace P16 in the reference by **G11**. Example: XCKD2110P16 becomes ***XCKD2110G11*** or ZCDEP16 becomes ***ZCDEG11***.

Contact operation ■ *closed* □ *open* — *(A) (B) = cam displacement* *(P) = positive opening point* — ⊖ *NC contact with positive opening operation*

Characteristics

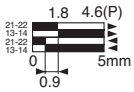
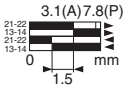
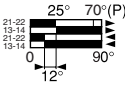
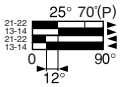
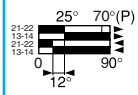
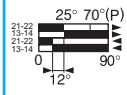
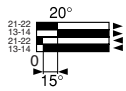
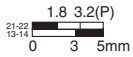
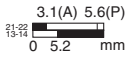
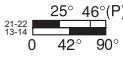
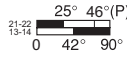
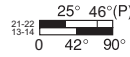
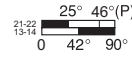
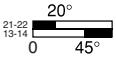
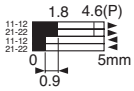
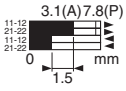
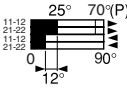
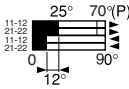
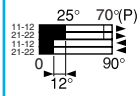
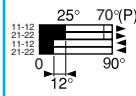
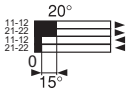
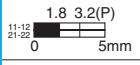
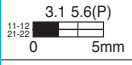
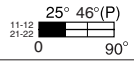
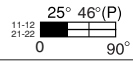
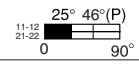
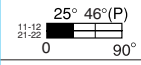
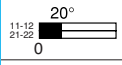
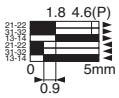
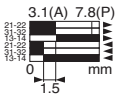
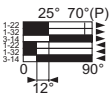
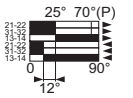
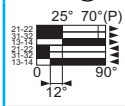
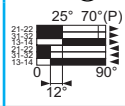
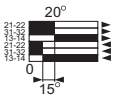
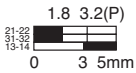
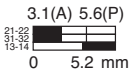
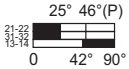
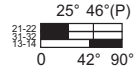
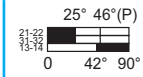
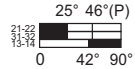
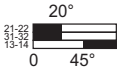
Switch actuation		On end	By 30° cam			
Type of actuation						
Maximum actuation speed		0.5 m/s		1 m/s		
Mechanical durability (in millions of operating cycles)		15	10	15		
Minimum force or torque	For tripping	15 N	12 N	6 N		
	For positive opening	45 N	36 N	18 N		
Cable entry		1 entry tapped M16 x 1.5 mm for ISO cable gland, clamping capacity 4 to 8 mm				

(1) Form conforming to EN 50047, see page 1/136.
(2) Nitrile for indoor use.
(3) Switches with gold contacts or eyelet type connections: please consult our Customer Care Centre.

Limit switches

OsiSense XC Standard

Compact design, metal, type XCKD
Complete switches with 1 cable entry

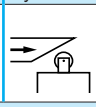
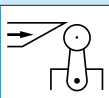
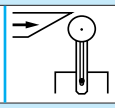
Type of head	Plunger (fixing by the head)		Rotary (fixing by the body)				Multi-directional
			Form A *(1)*				
Type of operator	M18 with metal end plunger	M18 with steel roller plunger	Thermoplastic roller lever	Variable length thermoplastic roller lever	Thermoplastic roller lever, Ø 50 mm	Variable length thermoplastic roller lever, Ø 50 mm	"Cat's whisker" *(2)*
References of complete switches with 1 ISO M16 x 1.5 cable entry *(3)*							
13 21 / 14 22 **2-pole NC + NO snap action (XE2S P2151)**	**XCKD21H0P16**	**XCKD21H2P16**	**XCKD2118P16**	**XCKD2145P16**	**XCKD2139P16**	**XCKD2149P16**	**XCKD2106P16**
							
13 21 / 14 22 **2-pole NC + NO break before make, slow break (XE2N P2151)**	**XCKD25H0P16**	**XCKD25H2P16**	**XCKD2518P16**	**XCKD2545P16**	**XCKD2539P16**	**XCKD2549P16**	**XCKD2506P16**
							
11 21 / 12 22 **2-pole NC + NC snap action (XE2S P2141)**	**ZCD29 + ZCDEP16 + ZCEH0**	**ZCD29 + ZCDEP16 + ZCEH2**	**ZCD29 + ZCDEP16 + ZCE01 + ZCY18**	**ZCD29 + ZCDEP16 + ZCE01 + ZCY45**	**ZCD29 + ZCDEP16 + ZCE01 + ZCY39**	**ZCD29 + ZCDEP16 + ZCE01 + ZCY49**	**ZCD29 + ZCDEP16 + ZCE06**
							
11 21 / 12 22 **2-pole NC + NC simultaneous, slow break (XE2N P2141)**	**ZCD27 + ZCDEP16 + ZCEH0**	**ZCD27 + ZCDEP16 + ZCEH2**	**ZCD27 + ZCDEP16 + ZCE01 + ZCY18**	**ZCD27 + ZCDEP16 + ZCE01 + ZCY45**	**ZCD27 + ZCDEP16 + ZCE01 + ZCY39**	**ZCD27 + ZCDEP16 + ZCE01 + ZCY49**	**ZCD27 + ZCDEP16 + ZCE06**
							
31 21 13 / 32 22 14 **3-pole NC + NC + NO snap action (XE3S P2141)**	**ZCD39 + ZCDEP16 + ZCEH0**	**ZCD39 + ZCDEP16 + ZCEH2**	**ZCD39 + ZCDEP16 + ZCE01 + ZCY18**	**ZCD39 + ZCDEP16 + ZCE01 + ZCY45**	**ZCD39 + ZCDEP16 + ZCE01 + ZCY39**	**ZCD39 + ZCDEP16 + ZCE01 + ZCY49**	**ZCD39 + ZCDEP16 + ZCE06**
							
31 21 13 / 32 22 14 **3-pole NC + NC + NO break before make, slow break (XE3N P2141)**	**ZCD37+ ZCDEP16 + ZCEH0**	**ZCD37 + ZCDEP16 + ZCEH2**	**ZCD37 + ZCDEP16 + ZCE01 + ZCY18**	**ZCD37 + ZCDEP16 + ZCE01 + ZCY45**	**ZCD37 + ZCDEP16 + ZCE01 + ZCY39**	**ZCD37 + ZCDEP16 + ZCE01 + ZCY49**	**ZCD37 + ZCDEP16 + ZCE06**
							
Weight (kg)	0.220	0.220	0.225	0.235	0.235	0.245	0.175

References of complete switches with 1 entry for n° 11 cable gland

*For an entry tapped for a n° 11 cable gland, replace P16 in the reference by **G11**. Example: XCKD21H0P1 6 becomes **XCKD21H0G11** or ZCDEP16 becomes **ZCDEG11**.*

Contact operation — *closed* / *open* — *(A) = cam displacement* — *(P) = positive opening point* — *NC contact with positive opening operation*

Characteristics

Switch actuation	On end	By 30° cam			By any moving part
Type of actuation					
Maximum actuation speed	0.5 m/s		1.5 m/s		1 m/s (any direct.)
Mechanical durability	10 million operating cycles				5 million
Minimum force or torque — For tripping	15 N	10 N	0.1 N.m		0.13 N.m
Minimum force or torque — For positive opening	45 N	36 N	0.25 N.m		–
Cable entry	1 entry tapped M16 x 1.5 mm for ISO cable gland, clamping capacity 4 to 8 mm				

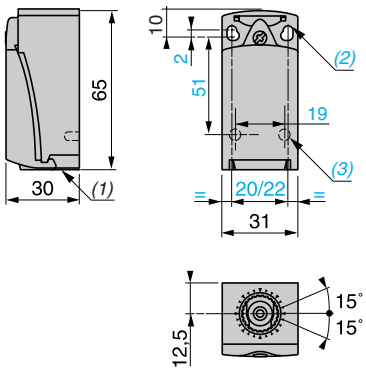
(1) Form conforming to EN 50047, see page 1/136.
(2) Value taken with actuation by moving part at 100 mm from the fixing.
(3) Switches with gold contacts or eyelet type connections: please consult our Customer Care Centre.

Limit switches

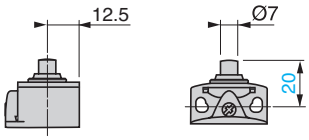
OsiSense XC Standard

Compact design, metal, type XCKD
Complete switches with 1 cable entry

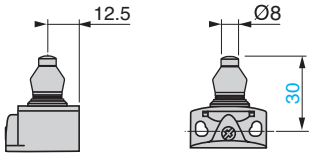
ZCD2● + ZCDEP16/ZCD3● + ZCDEP16



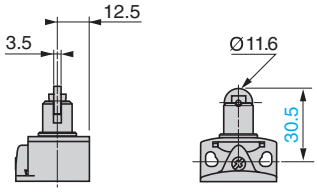
ZCE10



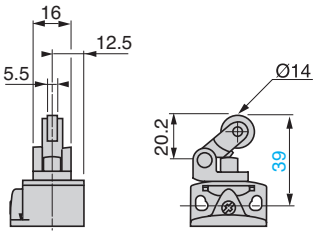
ZCE11



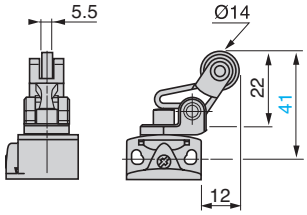
ZCE02



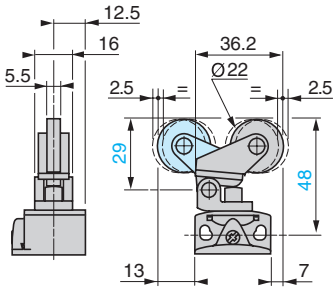
ZCE21



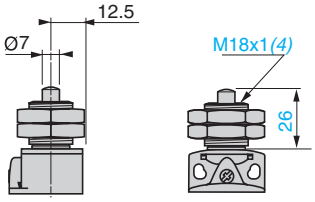
ZCE27



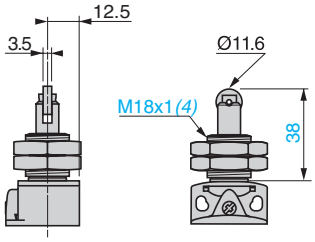
ZCE28



ZCEH0



ZCEH2



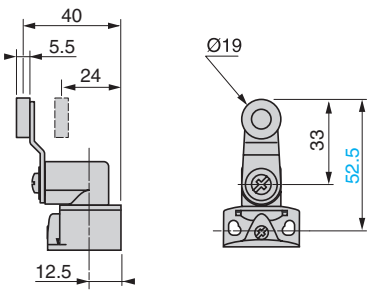
(1) Tapped entry for ISO M16 x 1.5 or Pg 11 cable gland.
(2) 2 elongated holes Ø 4.3 x 6.3 mm on 22 mm centres, 2 holes Ø 4.3 on 20 mm centres.
(3) 2 x Ø 3 holes for support studs, depth 4 mm.
(4) Fixing nut thickness 3.5 mm.

Limit switches

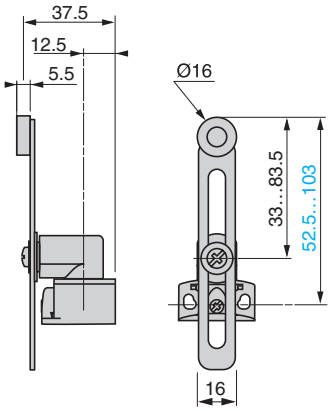
OsiSense XC Standard

Compact design, metal, type XCKD
Complete switches with 1 cable entry

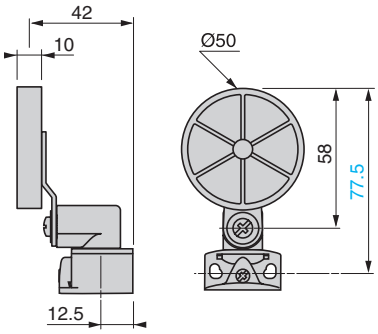
ZCE01 + ZCY18



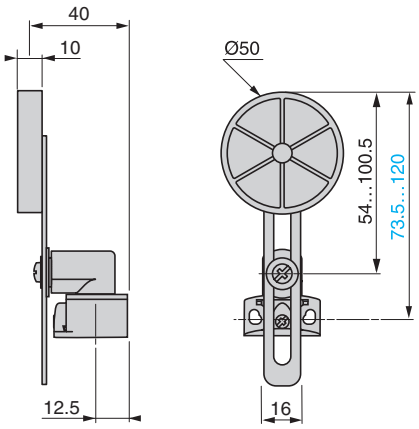
ZCE01 + ZCY45



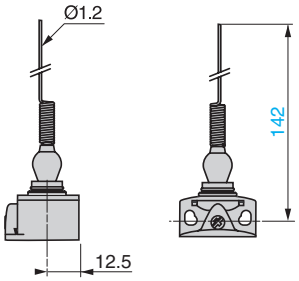
ZCE01 + ZCY39



ZCE01 + ZCY49



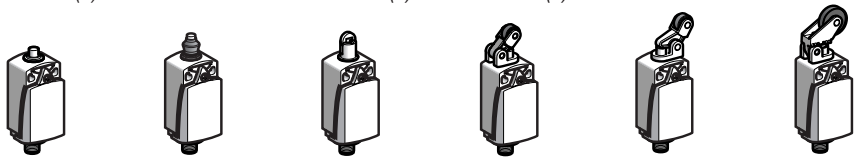
ZCE06



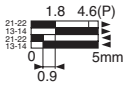
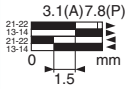
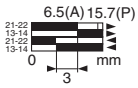
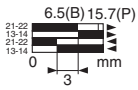
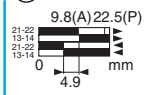
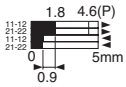
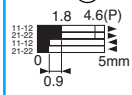
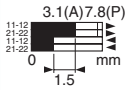
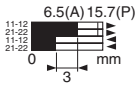
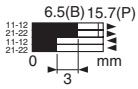
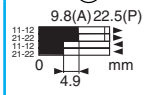
Limit switches

OsiSense XC Standard

Compact design, metal, type XCKD
M12 connector

Type of head	Plunger (fixing by the body)					
	Form B *(1)*		Form C *(1)*	Form E *(1)*		
						
Type of operator	Metal end plunger	Metal end plunger with elastomer boot *(2)*	Steel roller plunger	Thermoplastic roller lever plunger, horizontal actuation in 1 direction	Thermoplastic roller lever plunger, vertical actuation in 1 direction	Thermoplastic roller lever plunger, horiz. or vert. actuation in 1 direction

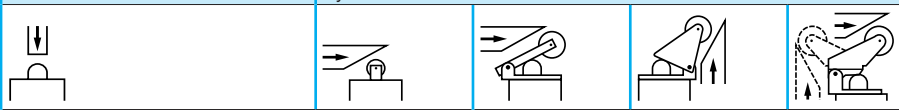
References

2-pole NC + NO snap action (XE2S P2151)	**XCKD2110M12** 	**XCKD2111M12**	**XCKD2102M12** 	**XCKD2121M12** 	**XCKD2127M12** 	**XCKD2128M12** 
2-pole NC + NC snap action (XE2S P2141)	**ZCD29M12 + ZCE10** 	**ZCD29M12 + ZCE11** 	**ZCD29M12 + ZCE02** 	**ZCD29M12 + ZCE21** 	**ZCD29M12 + ZCE27** 	**ZCD29M12 + ZCE28** 
Weight (kg)	0.190	0.190	0.195	0.205	0.200	0.205

Contact operation
- *closed*
- *open*
- *(A) (B) = cam displacement*
- *(P) = positive opening point*
- *NC contact with positive opening operation*

(1) Form conforming to EN 50047, see page 1/136.
(2) Nitrile for indoor use.

Characteristics

Switch actuation	On end		By 30° cam			
Type of actuation						
Maximum actuation speed	0.5 m/s			1 m/s		
Mechanical durability (in millions of operating cycles)	15		10	15		
Minimum force or torque — For tripping	15 N		12 N	6 N		
Minimum force or torque — For positive opening	45 N		36 N	18 N		
Connection	M12 connector, Ui = 60 V, Ie = 4 A maximum, Ith = 4 A					

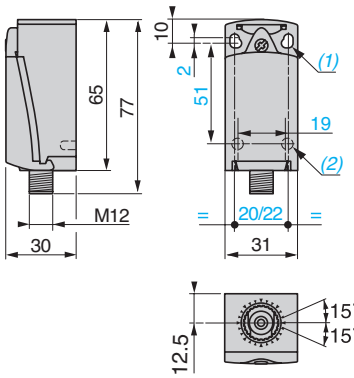
Connections

M12 connector

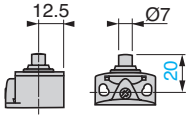
XE2S P2151	XE2S P2141
1-2: NC	1-2: NC
3-4: NO	3-4: NO
5: ⏚	5: ⏚

Dimensions

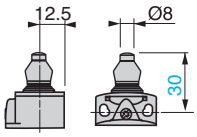
ZCD2●M12



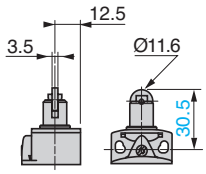
ZCE10



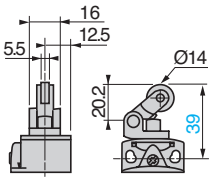
ZCE11



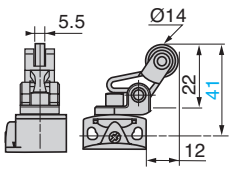
ZCE02



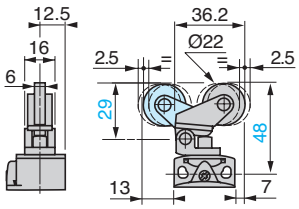
ZCE21



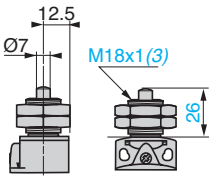
ZCE27



ZCE28



ZCEH0



(1) 2 elongated holes Ø 4.3 x 6.3 mm on 22 mm centres, 2 holes Ø 4.3 on 20 mm centres.
(2) 2 x Ø 3 holes for support studs, depth 4 mm.
(3) Fixing nut thickness 3.5 mm.

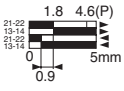
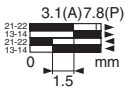
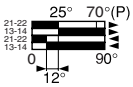
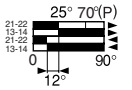
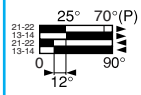
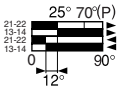
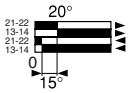
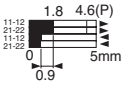
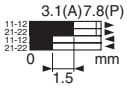
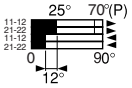
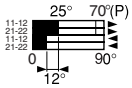
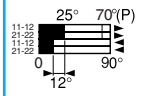
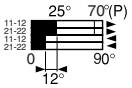
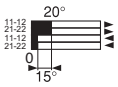
Limit switches

OsiSense XC Standard

Compact design, metal, type XCKD
M12 connector

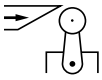
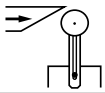
Type of head	Plunger (fixing by the head)		Rotary (fixing by the body)				Multi-directional
			Form A *(1)*				
Type of operator	M18 with metal end plunger	M18 with steel roller plunger	Thermoplastic roller lever	Variable length thermoplastic roller lever	Thermoplastic roller lever, Ø 50 mm	Variable length thermoplastic roller lever, Ø 50 mm	"Cat's whisker" *(2)*

References

2-pole NC + NO snap action (XE2S P2151)	**XCKD21H0M12** 	**XCKD21H2M12** 	**XCKD2118M12** 	**XCKD2145M12** 	**XCKD2139M12** 	**XCKD2149M12** 	**XCKD2106M12** 
2-pole NC + NC snap action (XE2S P2141)	**ZCD29M12 + ZCEH0** 	**ZCD29M12 + ZCEH2** 	**ZCD29M12 + ZCE01 + ZCY18** 	**ZCD29M12 + ZCE01 + ZCY45** 	**ZCD29M12 + ZCE01 + ZCY39** 	**ZCD29M12 + ZCE01 + ZCY49** 	**ZCD29M12 + ZCE06** 
Weight (kg)	0.235	0.235	0.220	0.220	0.220	0.220	0.185
Contact operation	*closed* / *open*		*(A) = cam displacement* / *(P) = positive opening point*		*NC contact with positive opening operation*		

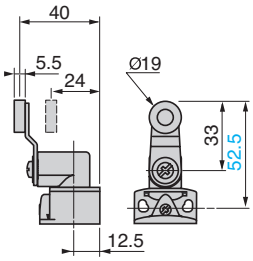
(1) Form conforming to EN 50047, see page 1/136.
(2) Value taken with actuation by moving part at 100 mm from the fixing.

Characteristics

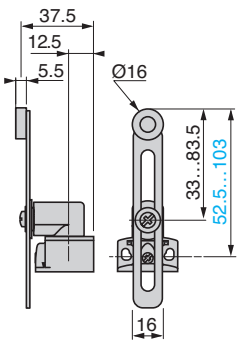
Switch actuation	On end	By 30° cam			By any moving part
Type of actuation					
Maximum actuation speed	0.5 m/s		1.5 m/s		1 m/s (any direct.)
Mechanical durability (in millions of operating cycles)	10				5
Minimum force or torque — For tripping	15 N	10 N	0.1 N.m		0.13 N.m
Minimum force or torque — For positive opening	45 N	36 N	0.25 N.m		–
Connection	M12 connector, Ui = 60 V, Ie = 4 A maximum, Ith = 4 A				

Dimensions

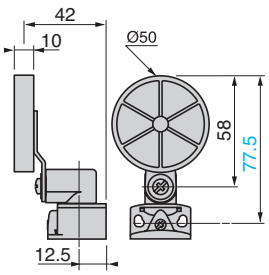
ZCE01 + ZCY18



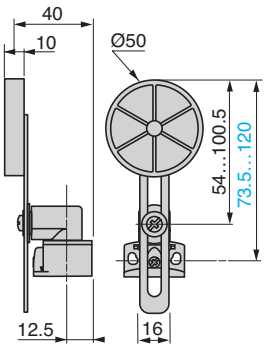
ZCE01 + ZCY45



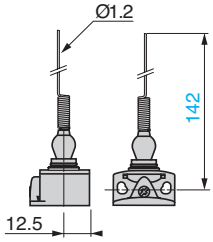
ZCE01 + ZCY39



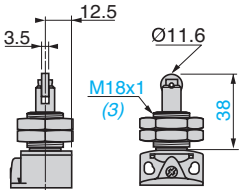
ZCE01 + ZCY49



ZCE06



ZCEH2

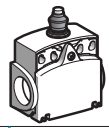
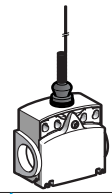


(3) Fixing nut thickness 3.5 mm.

Limit switches

OsiSense XC Standard

Compact design, plastic, type XCKT
Complete switches with 2 cable entries

Type of head	Plunger (fixing by the body)				Multi-directional
	Form B *(1)*		Form C *(1)*	Form E *(1)*	
					
Type of operator	Metal end plunger	Metal end plunger with elastomer boot *(2)*	Steel roller plunger	Thermoplastic roller lever plunger, horizontal actuation in 1 direction	"Cat's whisker" *(3)*

References of complete switches with 2 ISO M16 x 1.5 cable entries *(4)*

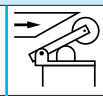
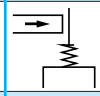
13 21 / 14 22 **2-pole NC + NO snap action (XE2SP3151)**	**XCKT2110P16** ⊖ 1.8 4.6(P) 0 5mm 0.9	**XCKT2111P16** ⊖ 1.8 4.6(P) 0 5mm 0.9	**XCKT2102P16** ⊖ 3.1(A) 7.8(P) 0 mm 1.5	**XCKT2121P16** ⊖ 6.5(A) 15.7(P) 0 mm 3	**XCKT2106P16** 20° 0 15°
13 21 / 14 22 **2-pole NC + NO break before make, slow break (XE2NP3151)**	**ZCT25P16 + ZCE10** ⊖ 1.8 3.2(P) 0 3 5mm	**ZCT25P16 + ZCE11** ⊖ 1.8 3.2(P) 0 3 5mm	**ZCT25P16 + ZCE02** ⊖ 3.1(A) 5.6(P) 0 5.2 mm	**ZCT25P16 + ZCE21** ⊖ 6.5(A) 11.3(P) 0 10.5 mm	**ZCT25P16 + ZCE06** 20° 0 45°
21 13 / 22 14 **2-pole NC + NO make before break, slow break (XE2NP3161)**	**ZCT26P16 + ZCE10** ⊖ 3 4.4(P) 0 1.8 5mm	**ZCT26P16 + ZCE11** ⊖ 3 4.4(P) 0 1.8 5mm	**ZCT26P16 + ZCE02** ⊖ 5.2 7.6(P) 0 3.1 mm	**ZCT26P16 + ZCE21** ⊖ 10.9(A) 16(P) 0 6.6 mm	**ZCT26P16 + ZCE06** 45° 0 20°
11 21 / 12 22 **2-pole NC + NC simultaneous, slow break (XE2NP2141)**	**ZCT27P16 + ZCE10** ⊖ 1.8 3.2(P) 0 5mm	**ZCT27P16 + ZCE11** ⊖ 1.8 3.2(P) 0 5mm	**ZCT27P16 + ZCE02** ⊖ 3.1 5.6(P) 0 mm	**ZCT27P16 + ZCE21** ⊖ 6.6(A) 11.6(P) 0 mm	**ZCT27P16 + ZCE06** 20° 0
13 23 / 14 24 **2-pole NO + NO simultaneous, slow break (XE2NP3131)**	**ZCT28P16 + ZCE10** 1.8 0 5mm	**ZCT28P16 + ZCE11** 1.8 0 5mm	**ZCT28P16 + ZCE02** 3.1(A) 0 mm	**ZCT28P16 + ZCE21** 6.6(A) 0 mm	**ZCT28P16 + ZCE06** 20° 0
Weight (kg)	0.100	0.100	0.105	0.115	0.095

References of complete switches with 2 entries for n° 11 cable gland

*For entries tapped for n° 11 cable gland, replace P16 in the reference by **G11**. Example: XCKT2110P16 becomes **XCKT2110G11**.*

Contact operation ■ *closed* □ *open* *(A) = cam displacement* *(P) = positive opening point* ⊖ *NC contact with positive opening operation*

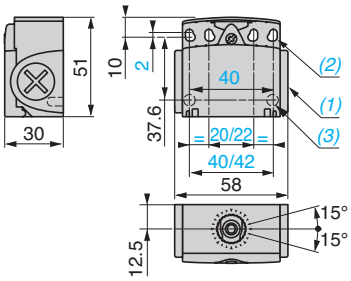
Characteristics

Switch actuation	On end	By 30° cam		By any moving part
Type of actuation				
Maximum actuation speed	0.5 m/s		1 m/s	1 m/s (any direction)
Mechanical durability (in millions of operating cycles)	15	10	15	5
Minimum force or torque — For tripping	15 N	12 N	6 N	0.3 N.m
Minimum force or torque — For positive opening	45 N	36 N	18 N	–
Cable entry *(3)*	2 entries tapped M16 x 1.5 for ISO cable gland Clamping capacity 4 to 8 mm (1 entry fitted with blanking plug)			

(1) Form conforming to EN 50047, see page 1/136. (2) Nitrile for indoor use.
(3) Value taken with actuation by moving part at 100 mm from the fixing. (4) Switches with gold contacts or eyelet type connections: please consult our Customer Care Centre.

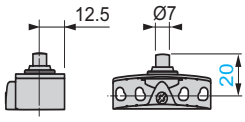
Dimensions

ZCT2•P16

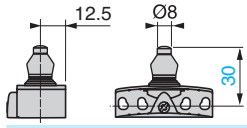


(1) Tapped entry for ISO M16 x 1.5 or Pg 11 cable gland.
(2) 4 elongated holes Ø 4.3 x 6.3 mm on 22/42mm ctrs, 4 holes Ø 4.3 on 20/40 mm ctrs.
(3) 2 x Ø 3 holes for support studs, depth 4 mm.

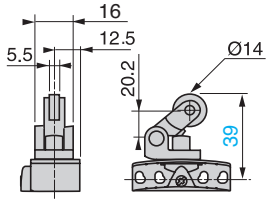
ZCE10



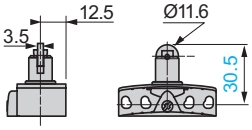
ZCE11



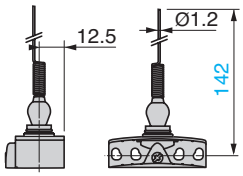
ZCE21



ZCE02



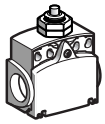
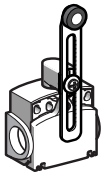
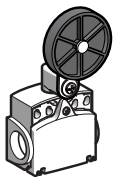
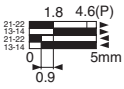
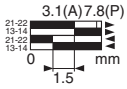
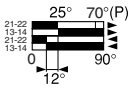
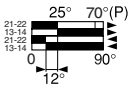
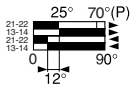
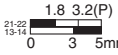
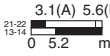
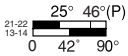
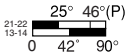
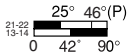
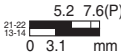
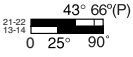
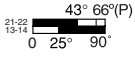
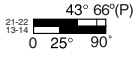
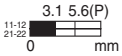
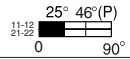
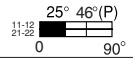
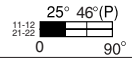
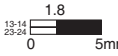
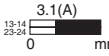
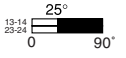
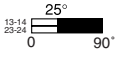
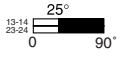
ZCE06



Limit switches

OsiSense XC Standard

Compact design, plastic, type XCKT
Complete switches with 2 cable entries

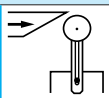
Type of head	Plunger (fixing by the head)		Rotary (fixing by the body) Form A *(1)*		
					
Type of operator	M18 with metal end plunger	M18 with steel roller plunger	Thermoplastic roller lever	Variable length thermoplastic roller lever	Thermoplastic roller lever, Ø 50 mm
References of complete switches with 2 ISO M16 x 1.5 cable entries *(2)*					
2-pole NC + NO snap action (XE2SP3151)	**XCKT21H0P16** ⊖ 	**XCKT21H2P16** ⊖ 	**XCKT2118P16** ⊖ 	**XCKT2145P16** ⊖ 	**XCKT2139P16** ⊖ 
2-pole NC + NO break before make, slow break (XE2NP3151)	**ZCT25P16 + ZCEH0** ⊖ 	**ZCT25P16 + ZCEH2** ⊖ 	**ZCT25P16 + ZCE01 + ZCY18** ⊖ 	**ZCT25P16 + ZCE01 + ZCY45** ⊖ 	**ZCT25P16 + ZCE01 + ZCY39** ⊖ 
2-pole NO + NC make before break, slow break (XE2NP3161)	**ZCT26P16 + ZCEH0** ⊖	**ZCT26P16 + ZCEH2** ⊖ 	**ZCT26P16 + ZCE01 + ZCY18** ⊖ 	**ZCT26P16 + ZCE01 + ZCY45** ⊖ 	**ZCT26P16 + ZCE01 + ZCY39** ⊖ 
2-pole NC + NC simultaneous, slow break (XE2NP2141)	**ZCT27P16 + ZCEH0** ⊖	**ZCT27P16 + ZCEH2** ⊖ 	**ZCT27P16 + ZCE01 + ZCY18** ⊖ 	**ZCT27P16 + ZCE01 + ZCY45** ⊖ 	**ZCT27P16 + ZCE01 + ZCY39** ⊖ 
2-pole NO + NO simultaneous, slow break (XE2NP3131)	**ZCT28P16 + ZCEH0** 	**ZCT28P16 + ZCEH2** 	**ZCT28P16 + ZCE01 + ZCY18** 	**ZCT28P16 + ZCE01 + ZCY45** 	**ZCT28P16 + ZCE01 + ZCY39** 
Weight (kg)	0.145	0.145	0.145	0.155	0.160

References of complete switches with 2 entries for n° 11 cable gland

For entries tapped for n° 11 cable gland, replace P16 in the reference by **G11**. Example: XCKT21H0P16 becomes **XCKT21H0G11**.

Contact operation	■ *closed* □ *open*	*(A) = cam displacement* *(P) = positive opening point*	⊖ *NC contact with positive opening operation*

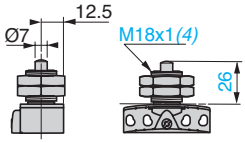
Characteristics

Switch actuation		On end	By 30° cam	
Type of actuation				
Maximum actuation speed		0.5 m/s		1.5 m/s
Mechanical durability		10 million operating cycles		
Minimum force or torque	For tripping	15 N	10 N	0.1 N.m
	For positive opening	45 N	36 N	0.25 N.m
Cable entry *(3)*		2 entries tapped M16 x 1.5 for ISO cable gland Clamping capacity 4 to 8 mm (1 entry fitted with blanking plug)		

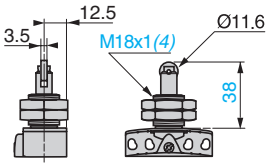
(1) Form conforming to EN 50047, see page 1/136.
(2) Switches with gold contacts or eyelet type connections: please consult our Customer Care Centre.

Dimensions

ZCEH0

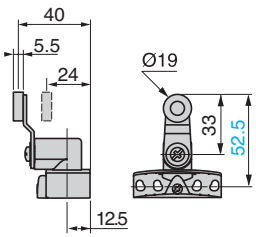


ZCEH2

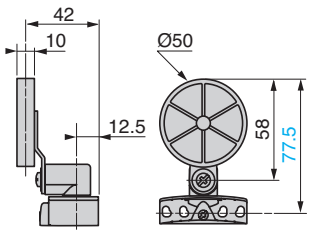


(4) Fixing nut thickness 3.5 mm.

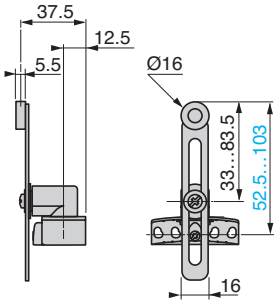
ZCE01 + ZCY18



ZCE01 + ZCY39



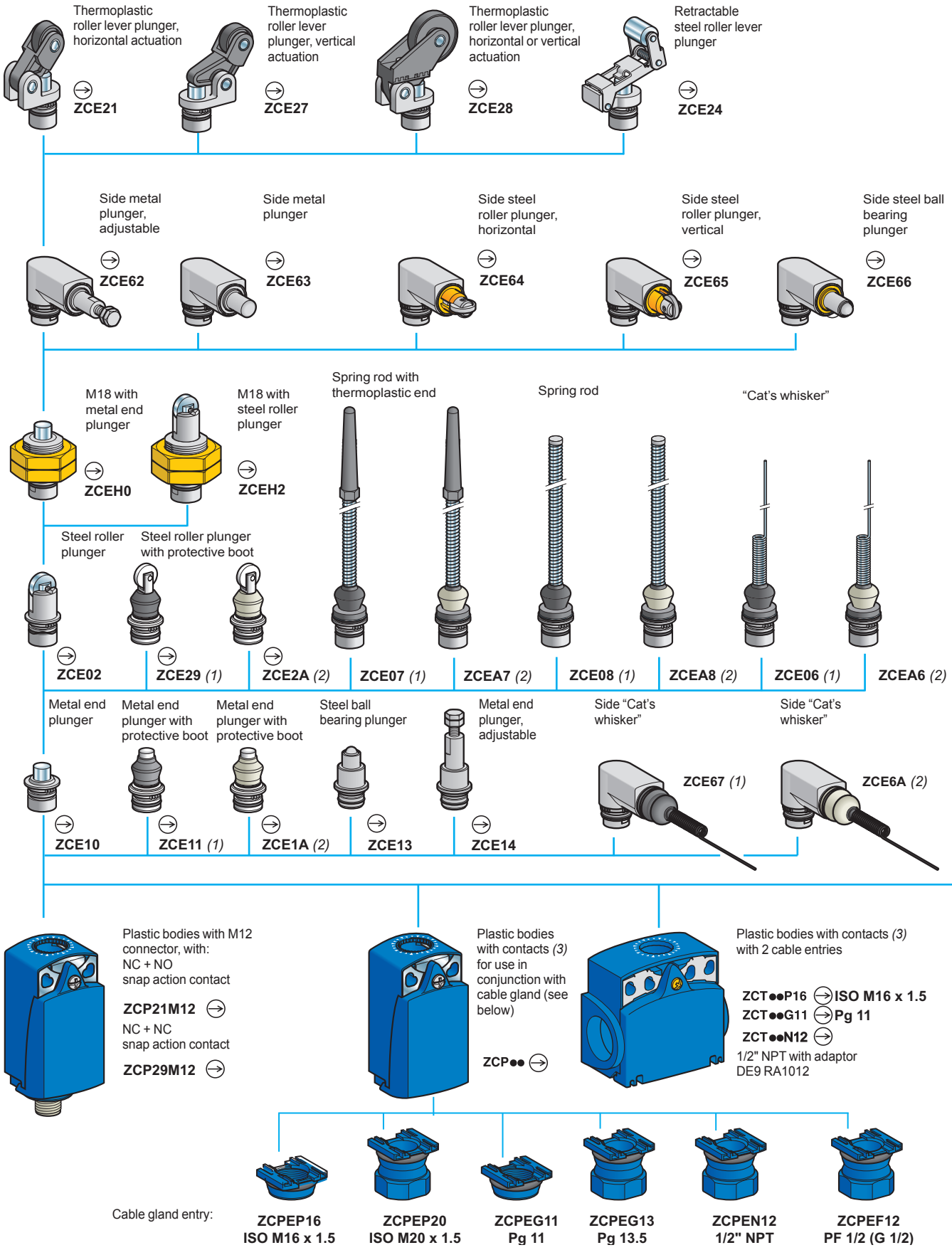
ZCE01 + ZCY45



Limit switches

OsiSense XC Standard

Compact design, types XCKD, XCKP and XCKT
Variable composition

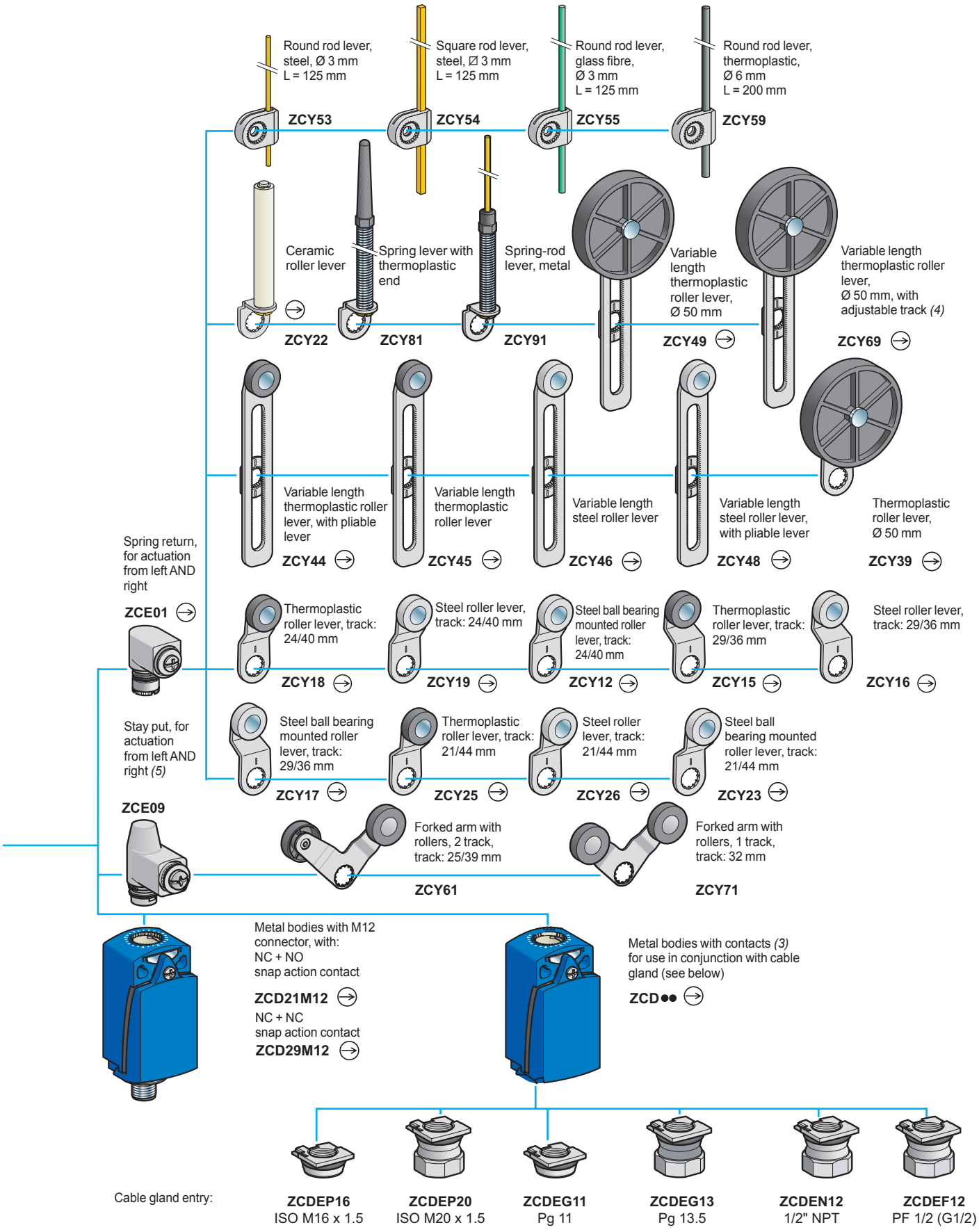


(1) Nitrile boot for indoor use.
(2) Silicone boot for outdoor use.
(3) For further information, see page 1/48.

Limit switches

OsiSense XC Standard

Compact design, types XCKD, XCKP and XCKT
Variable composition

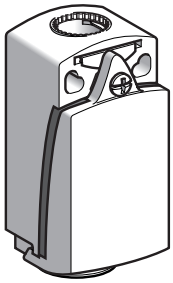


(4) Variable length and adjustable track by lever deformation.
(5) Suitable with bodies: ZCD21, ZCP21, ZCT21, ZCD29, ZCP29, ZCD31, ZCP31, ZCD39, ZCP39, ZCD2●M12, ZCP2●M12

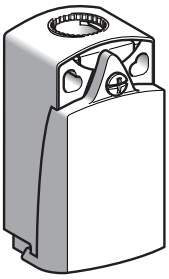
Limit switches

OsiSense XC Standard

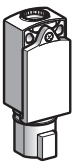
Compact design, metal, type type XCKD or plastic, type XCKP
Adaptable sub-assemblies: bodies with contacts


520710

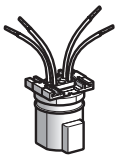
ZCD●●


520711

ZCP●●



ZCP21D44



ZCPED44

Bodies with contacts, types XCKD and XCKP *(1)*

Type of contact	Positive operation *(2)*	Scheme	Body material	Reference	Weight kg
2-pole					
NC + NO snap action (XE2SP2151)	⊖	13 21 / 14 22	Metal	**ZCD21**	0.140
			Plastic	**ZCP21**	0.070
NC + NC snap action XE2SP2141)	⊖	11 21 / 12 22	Metal	**ZCD29**	0.140
			Plastic	**ZCP29**	0.070
NC + NO break before make, slow break (XE2NP2151)	⊖	13 21 / 14 22	Metal	**ZCD25**	0.140
			Plastic	**ZCP25**	0.070
NO + NC make before break, slow break (XE2NP2161)	⊖	13 21 / 14 22	Metal	**ZCD26**	0.140
			Plastic	**ZCP26**	0.070
NC + NC simultaneous, slow break (XE2NP2141)	⊖	11 21 / 12 22	Metal	**ZCD27**	0.140
			Plastic	**ZCP27**	0.070
NO + NO simultaneous, slow break (XE2NP2131)	–	13 23 / 14 24	Metal	**ZCD28**	0.140
			Plastic	**ZCP28**	0.070
3-pole					
NC + NO + NO snap action (XE3SP2151)	⊖	21 33 13 / 22 34 14	Metal	**ZCD31**	0.140
			Plastic	**ZCP31**	0.070
NC + NC + NO snap action (XE3SP2141)	⊖	31 21 13 / 32 22 14	Metal	**ZCD39**	0.140
			Plastic	**ZCP39**	0.070
NC + NC + NO break before make, slow break (XE3NP2141)	⊖	31 21 13 / 32 22 14	Metal	**ZCD37**	0.140
			Plastic	**ZCP37**	0.070
NC + NO + NO break before make, slow break (XE3NP2151)	⊖	21 33 13 / 22 34 14	Metal	**ZCD35**	0.140
			Plastic	**ZCP35**	0.070

Components for connection using DEUTSCH connector

Bodies with contacts for DEUTSCH connector

Type of contact	Positive operation *(2)*	Scheme	Cable entry	Reference	Weight kg
2-pole					
NC + NO snap action (XE2SP2151)	⊖	13 21 / 14 22	Connector	**ZCP21D44**	0.065
DEUTSCH male connector DT04-4P				**ZCPED44**	0.015

(1) Bodies with gold contacts or eyelet type connections: please consult your Regional Sales Office.
(2) ⊖: bodies with contacts assuring positive opening operation.

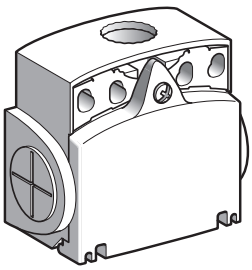
Limit switches

OsiSense XC Standard

Compact design, plastic, type XCKT

Adaptable sub-assemblies: bodies with contacts

561390

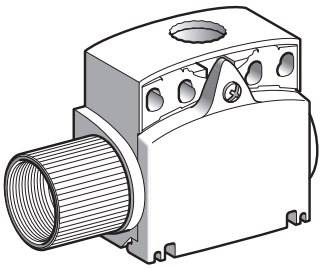


ZCT●●●

Bodies with contacts, type XCKT plastic, 2 cable entries

Type of contact	Positive operation *(1)*	Scheme	Cable entries	Reference	Weight kg
2-pole					
NC + NO snap action (XE2SP3151)	⊖	13 21 / 14 22	ISO M16 x 1.5	**ZCT21P16**	0.085
			Pg 11	**ZCT21G11**	0.085
NC + NO break before make, slow break (XE2NP3151)	⊖	13 21 / 14 22	ISO M16 x 1.5	**ZCT25P16**	0.085
			Pg 11	**ZCT25G11**	0.085
NC + NC simultaneous, slow break (XE2NP3141)	⊖	11 21 / 12 22	ISO M16 x 1.5	**ZCT27P16**	0.085
			Pg 11	**ZCT27G11**	0.085
NO + NO simultaneous, slow break (XE2NP3131)	–	13 23 / 14 24	ISO M16 x 1.5	**ZCT28P16**	0.085
			Pg 11	**ZCT28G11**	0.085
NO + NC make before break, slow break (XE2NP3161)	⊖	13 21 / 14 22	ISO M16 x 1.5	**ZCT26P16**	0.085
			Pg 11	**ZCT26G11**	0.085

561387



ZCT●●N12

Bodies with contacts, type XCKT plastic, 2 cable entries with 1/2" NPT adaptor

Type of contact	Positive operation *(1)*	Scheme	Reference	Weight kg
2-pole				
NC + NO snap action (XE2SP3151)	⊖	13 21 / 14 22	**ZCT21N12**	0.130
NC + NO break before make, slow break (XE2NP3151)	⊖	13 21 / 14 22	**ZCT25N12**	0.130
NC + NC simultaneous, slow break (XE2NP3141)	⊖	11 21 / 12 22	**ZCT27N12**	0.130
NO + NO simultaneous, slow break (XE2NP3131)	–	13 23 / 14 24	**ZCT28N12**	0.130
NO + NC make before break, slow break (XE2NP3161)	⊖	13 21 / 14 22	**ZCT26N12**	0.130

(1) ⊖: bodies with contact assuring positive opening operation.

Limit switches

OsiSense XC Standard

Compact design, metal, type XCKD or plastic, types XCKP and XCKT
Adaptable sub-assemblies: bodies with contacts

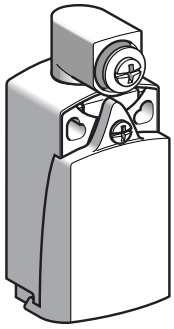
561427

ZCE05

561392

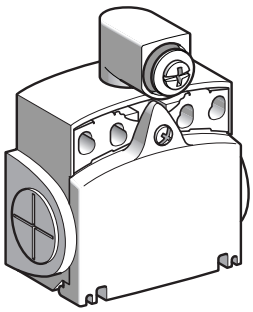
DE9RA1012

561388



XCK●2●01●●

561389



XCKT2●01●●

Accessories

Description	Suitable levers for use with head	Unit reference	Weight kg
Rotary head, without lever, spring return, for actuation from left AND right or left OR right *(1)*	ZCY12, ZCY15, ZCY16, ZCY17, ZCY18, ZCY19, ZCY22, ZCY23, ZCY25, ZCY26, ZCY39, ZCY53, ZCY54, ZCY55, ZCY81	**ZCE05**	0.045
Tap-off terminal for XCKT	Sold in lots of 10	**XALZ09**	0.010
Spacer for angular positioning of heads with adjustable levers, for values other than - 90°, 0° and 90°	–	**XCMZ07**	0.002
Adaptor for 1/2" NPT conduit (male Pg 11 / female 1/2" NPT)	Sold in lots of 10	**DE9 RA1012**	0.050

Bodies with contacts, type XCKP plastic, with rotary head (without operating lever)

Type of contact	Scheme	Positive operation *(2)*	Cable entry	Reference	Weight kg
2-pole					
NC + NO snap action (XE2SP2151)	13 21 / 14 22	⊖	ISO M16 x 1.5	**XCKP2101P16**	0.115
		⊖	Pg 11	**XCKP2101G11**	0.115
		⊖	M12 connector	**XCKP2101M12**	0.125
NC + NO break before make, slow break (XE2NP2151)	13 21 / 14 22	⊖	ISO M16 x 1.5	**XCKP2501P16**	0.115
		⊖	Pg 11	**XCKP2501G11**	0.115

Bodies with contacts, type XCKD metal, with rotary head (without operating lever)

Type of contact	Scheme	Positive operation *(2)*	Cable entry	Reference	Weight kg
2-pole					
NC + NO snap action (XE2SP2151)	13 21 / 14 22	⊖	ISO M16 x 1.5	**XCKD2101P16**	0.185
		⊖	Pg 11	**XCKD2101G11**	0.185
		⊖	M12 connector	**XCKD2101M12**	0.195
NC + NO break before make, slow break (XE2NP2151)	13 21 / 14 22	⊖	ISO M16 x 1.5	**XCKD2501P16**	0.185
		⊖	Pg 11	**XCKD2501G11**	0.185

Bodies with contacts, type XCKT plastic, with rotary head (without operating lever)

Type of contact	Scheme	Positive operation *(2)*	Cable entry	Reference	Weight kg
2-pole					
NC + NO snap action (XE2SP3151)	13 21 / 14 22	⊖	ISO M16 x 1.5	**XCKT2101P16**	0.130
		⊖	Pg 11	**XCKT2101G11**	0.130
NC + NO break before make, slow break (XE2NP3151)	13 21 / 14 22	⊖	ISO M16 x 1.5	**XCKT2501P16**	0.130
		⊖	Pg 11	**XCKT2501G11**	0.130

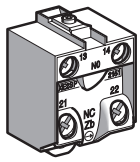
(1) For programming see page 1/130.
(2) ⊖: bodies with contact assuring positive opening operation.

Limit switches

OsiSense XC Standard

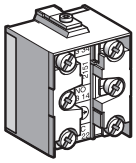
Compact design, metal, type XCKD or plastic, types XCKP and XCKT
Adaptable sub-assemblies: contact blocks

561393



XE2●●21●●

561394



XE3●●21●●

Contact blocks with screw clamp terminals for XCKD and XCKP

Type of contact	Positive operation *(1)*	Scheme	Reference for standard contacts	Weight kg
2-pole				
NC + NO **snap action**	⊖	13 21 / 14 22	**XE2SP2151**	0.020
NC + NC **simultaneous, snap action**	⊖	11 21 / 12 22	**XE2SP2141**	0.020
NC + NO **break before make, slow break**	⊖	13 21 / 14 22	**XE2NP2151**	0.020
NO + NC **make before break, slow break**	⊖	13 21 / 14 22	**XE2NP2161**	0.020
NC + NC **simultaneous, slow break**	⊖	11 21 / 12 22	**XE2NP2141**	0.020
NO + NO **simultaneous, slow break**	–	13 23 / 14 24	**XE2NP2131**	0.020
3-pole				
NC + NO + NO **snap action**	⊖	21 33 13 / 22 34 14	**XE3SP2151**	0.035
NC + NC + NO **snap action**	⊖	31 21 13 / 32 22 14	**XE3SP2141**	0.035
NC + NC + NO **break before make, slow break**	⊖	31 21 13 / 32 22 14	**XE3NP2141**	0.035
NC + NO + NO **break before make, slow break**	⊖	21 33 13 / 22 34 14	**XE3NP2151**	0.035

Contact blocks with screw clamp terminals for XCKT

Type of contact	Positive operation *(1)*	Scheme	Reference for standard contacts	Weight kg
2-pole				
NC + NO **snap action**	⊖	13 21 / 14 22	**XE2SP3151**	0.015
NC + NO **break before make, slow break**	⊖	13 21 / 14 22	**XE2NP3151**	0.015
NO + NC **make before break, slow break**	⊖	13 21 / 14 22	**XE2NP3161**	0.015
NC + NC **simultaneous, slow break**	⊖	11 21 / 12 22	**XE2NP3141**	0.015
NO + NO **simultaneous, slow break**	–	13 23 / 14 24	**XE2NP3131**	0.015

(1) ⊖: contact blocks assuring positive opening operation.

Limit switches

OsiSense XC Standard

Compact design, plastic, with reset, types XCPR and XCTR
Compact design, metal, with reset, type XCDR

1

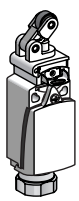
■ XCPR, XCDR
with 1 cable entry

□ With head for linear movement (plunger). Fixing by the body

XCDR

520412

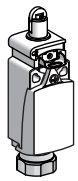
520414



Page 1/56

XCPR

520425



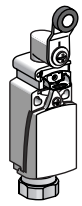
520427

Page 1/52

□ With head for rotary movement (lever) or multi-directional. Fixing by the body

XCDR

520416



Page 1/56

XCPR

520428

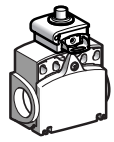
Page 1/52

■ XCTR
with 2 cable entries
Tripping/resetting points and fixing centres conform to CENELEC 50047

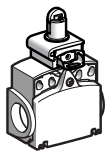
□ With head for linear movement (plunger). Fixing by the body

XCTR

520436



520437

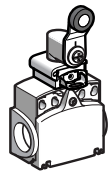


Page 1/58

□ With head for rotary movement (lever) or multi-directional. Fixing by the body

XCTR

520438



Page 1/58

Limit switches

OsiSense XC Standard

Compact design, plastic, with reset, types XCPR and XCTR
Compact design, metal, with reset, type XCDR

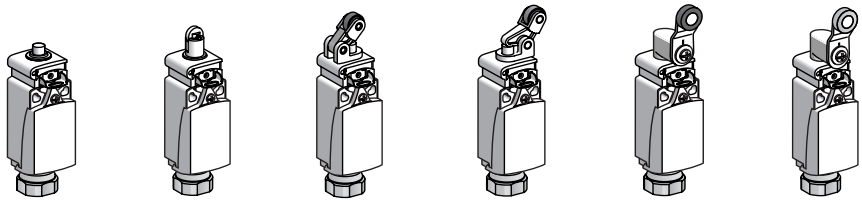
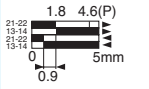
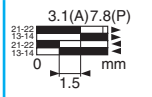
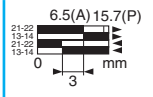
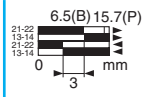
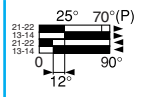
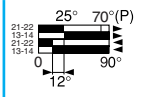
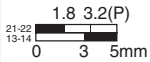
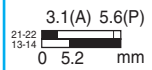
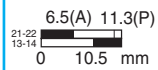
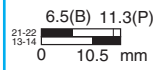
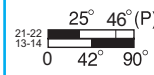
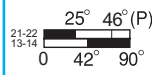
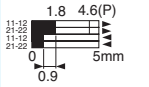
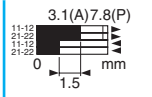
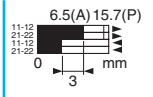
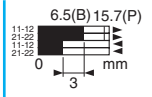
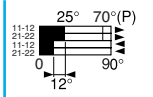
Environment characteristics		
Conformity to standards	Products	EN/IEC 60947-5-1, UL 508, CSA C22-2 n° 14
	Machine assemblies	EN/IEC 60204-1
Product certifications		UL, CSA
Protective treatment	Standard version	"TC"
Ambient air temperature	For operation	- 25…+ 70 °C
	For storage	- 40…+ 70 °C
Vibration resistance	Conforming to IEC 60068-2-6	25 gn (10…500 Hz)
Shock resistance	Conforming to IEC 60068-2-27	50 gn (11 ms)
Electric shock protection		Class II conforming to IEC 61140 and NF C 20-030 for **XCPR** and **XCTR**
		Class I conforming to IEC 61140 and NF C 20-030 for **XCDR**
Degree of protection		**IP 66 and IP 67 conforming to IEC 60529; IK 04 conforming to EN 50102**
Repeat accuracy		0.1 mm on the tripping points, with 1 million operating cycles for head with end plunger
Cable entry	Depending on model	Either: tapped entry for n° 13 cable gland, tapped ISO M20 x 1.5 or tapped 1/2" NPT
Materials		**XCDR**: Zamak bodies and heads, **XCPR** and **XCTR**: plastic bodies, Zamak heads

Contact block characteristics		
Rated operational characteristics		∼ AC-15; A300 (Ue = 240 V, Ie = 3 A); Ithe = 10 A ⎓ DC-13; Q300 (Ue = 250 V, Ie = 0.27 A), conforming to EN/IEC 60947-5-1 Appendix A
Rated insulation voltage		Ui = 500 V degree of pollution 3 conforming to IEN/IEC 60947-1 Ui = 300 V conforming to UL 508, CSA C22-2 n° 14
Rated impulse withstand voltage		U imp = 6 kV conforming to EN/IEC 60947-1, IEC 60664
Positive operation (depending on model)		NC contacts with positive opening operation conforming to EN/IEC 60947-5-1 Appendix K
Resistance across terminals		⩽ 25 mΩ conforming to IEC 60255-7 category 3
Short-circuit protection		10 A cartridge fuse type gG (gI)
Connection (screw clamp terminals)	XE2SP2151	Clamping capacity, min: 1 x 0.34 mm^2, max: 2 x 1.5 mm^2
	XE2NP2151	Clamping capacity, min: 1 x 0.5 mm^2, max: 2 x 2.5 mm^2
Minimum actuation speed (for head with end plunger)		**XE2SP2151**: 0.01 m/minute
		XE2NP2151: 6 m/minute

Limit switches

OsiSense XC Standard

Compact design, plastic, with reset,type XCPR
Complete switches with 1 cable entry

Type of head	Plunger (fixing by the body)				Rotary (fixing by the body)	
						
Type of operator	Metal end plunger	Steel roller plunger	Thermoplastic roller lever plunger, horizontal actuation in 1 direction	Thermoplastic roller lever plunger, vertical actuation in 1 direction	Thermoplastic roller lever	Steel roller lever
References of complete switches with 1 ISO M20 x 1.5 cable entry						
13 21 / 14 22 **2-pole NC + NO snap action (XE2SP2151)**	**XCPR2110P20** ⊖ 	**XCPR2102P20** ⊖ 	**XCPR2121P20** ⊖ 	**XCPR2127P20** ⊖ 	**XCPR2118P20** ⊖ 	**XCPR2119P20** ⊖ 
13 21 / 14 22 **2-pole NC + NO break before make, slow break (XE2NP2151)**	**XCPR2510P20** ⊖ 	**XCPR2502P20** ⊖ 	**XCPR2521P20** ⊖ 	**XCPR2527P20** ⊖ 	**XCPR2518P20** ⊖ 	**XCPR2519P20** ⊖ 
11 21 / 12 22 **2-pole NC + NC snap action (XE2SP2141)**	**XCPR2910P20** ⊖ 	**XCPR2902P20** ⊖ 	**XCPR2921P20** ⊖ 	**XCPR2927P20** ⊖ 	**XCPR2918P20** ⊖ 	–
Weight (kg)	0.115	0.115	0.125	0.120	0.155	–

References of complete switches with 1 Pg 13.5 cable entry

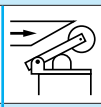
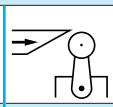
For complete switches with 1 Pg 13.5 cable entry replace P20 by **G13**.
Example: XCPR2110P20 becomes **XCPR2110G13**.

References of complete switches with 1 entry for 1/2" NPT conduit

For complete switches with 1 entry for 1/2" NPT conduit replace P20 by **N12**.
Example: XCPR2110P20 becomes **XCPR2110N12**.

Contact operation ■ *closed* □ *open* — *(A) (B) = cam displacement* *(P) = positive opening point* — ⊖ *NC contact with positive opening operation*

Characteristics

Switch actuation	On end	By 30° cam			
Type of actuation					
Maximum actuation speed	0.5 m/s		1 m/s		1.5 m/s
Minimum force or torque — For tripping	15 N	12 N	6 N		0.1 N.m
Minimum force or torque — For positive opening	45 N	36 N	18 N		0.25 N.m
Cable entry	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm 1 entry tapped Pg 13.5 for cable gland, clamping capacity 9 to 12 mm 1 entry tapped for 1/2" NPT (USAS B2-1) conduit				
Other versions	Complete switches with cable entries other than those listed above. please consult our Customer Care Centre.				

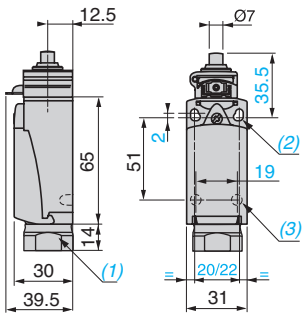
Limit switches

OsiSense XC Standard

Compact design, plastic, with reset,type XCPR
Complete switches with 1 cable entry

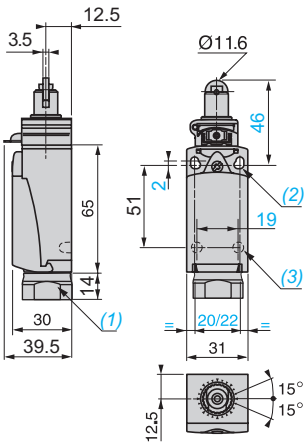
Dimensions

XCPR2●10●●●

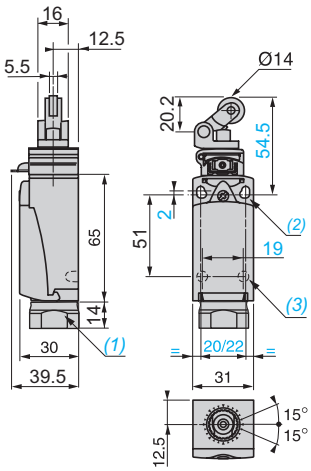


(1) Tapped entry for ISO M20 x 1.5 or Pg 13.5 cable gland or tapped 1/2" NPT.
(2) 2 elongated holes Ø 4.3 x 6.3 mm on 22 mm centres, 2 holes Ø 4.3 on 20 mm centres.
(3) 2 x Ø 3 holes for support studs, depth 4 mm.

XCPR2●02●●●

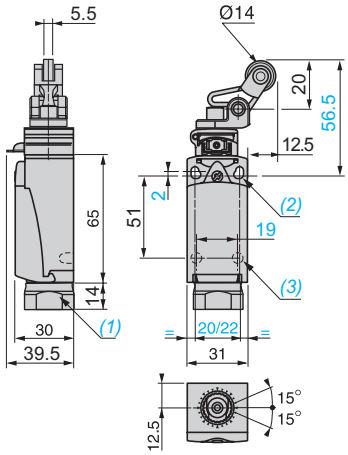


XCPR2●21●●●

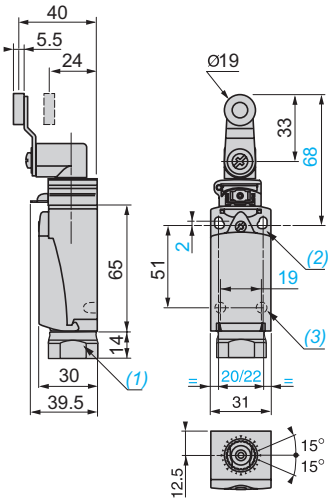


Dimensions

XCPR2●27●●●



XCPR2●18●●●, XCPR2●19●●●

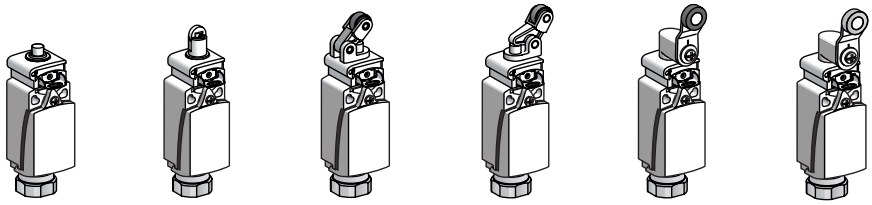


(1) Tapped entry for ISO M20 x 1.5 or Pg 13.5 cable gland or tapped 1/2" NPT.
(2) 2 elongated holes Ø 4.3 x 6.3 mm on 22 mm centres, 2 holes Ø 4.3 on 20 mm centres.
(3) 2 x Ø 3 holes for support studs, depth 4 mm.

Limit switches

OsiSense XC Standard

Compact design, metal, with reset, type XCDR
Complete switches with 1 cable entry

Type of head	Plunger (fixing by the body)				Rotary (fixing by the body)	
						
Type of operator	Metal end plunger	Steel roller plunger	Thermoplastic roller lever plunger, horizontal actuation in 1 direction	Thermoplastic roller lever plunger, vertical actuation in 1 direction	Thermoplastic roller lever	Steel roller lever
References of complete switches with 1 ISO M20 x 1.5 cable entry						
13 21 14 22 **2-pole NC + NO snap action (XE2SP2151)**	**XCDR2110P20** 1.8 4.6(P) 0 5mm 0.9	**XCDR2102P20** 3.1(A) 7.8(P) 0 mm 1.5	**XCDR2121P20** 6.5(A) 15.7(P) 0 mm 3	**XCDR2127P20** 6.5(B) 15.7(P) 0 mm 3	**XCDR2118P20** 25° 70°(P) 0 90° 12°	**XCDR2119P20** 25° 70°(P) 0 90° 12°
13 21 14 22 **2-pole NC + NO break before make, slow break (XE2NP2151)**	**XCDR2510P20** 1.8 3.2(P) 0 3 5mm	**XCDR2502P20** 3.1(A) 5.6(P) 0 5.2 mm	**XCDR2521P20** 6.5(A) 11.3(P) 0 10.5 mm	**XCDR2527P20** 6.5(B) 11.3(P) 0 10.5 mm	**XCDR2518P20** 25° 46°(P) 0 42° 90°	**XCDR2519P20** 25° 46°(P) 0 42° 90°
Weight (kg)	0.215	0.220	0.225	0.225	0.255	0.255

References of complete switches with 1 Pg 13.5 cable entry

For complete switches with 1 Pg 13.5 cable entry replace P20 by **G13**.
Example: XCDR2110P20 becomes **XCDR2110G13**.

References of complete switches with 1 entry for 1/2" NPT conduit

For complete switches with 1 entry for 1/2" NPT conduit replace P20 by **N12**.
Example: XCDR2110P20 becomes **XCDR2110N12**.

Contact operation — *closed* / *open* — *(A) (B) = cam displacement* / *(P) = positive opening point* — *NC contact with positive opening operation*

Characteristics

Switch actuation		On end	By 30° cam			
Type of actuation						
Maximum actuation speed		0.5 m/s		1 m/s		1.5 m/s
Minimum force or torque	For tripping	15 N	12 N	6 N		0.1 N.m
	For positive opening	45 N	36 N	18 N		0.25 N.m
Cable entry		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm 1 entry tapped Pg 13.5 for cable gland, clamping capacity 9 to 12 mm 1 entry tapped for 1/2" NPT (USAS B2-1) conduit				

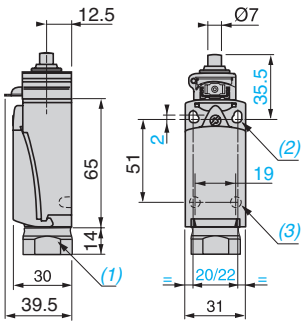
Limit switches

OsiSense XC Standard

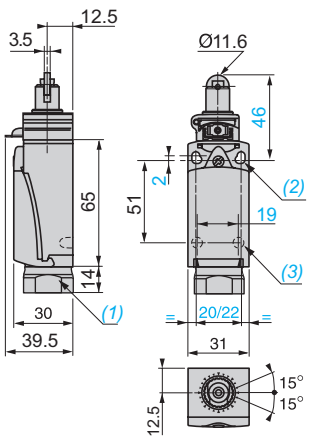
Compact design, metal, with reset, type XCDR
Complete switches with 1 cable entry

Dimensions

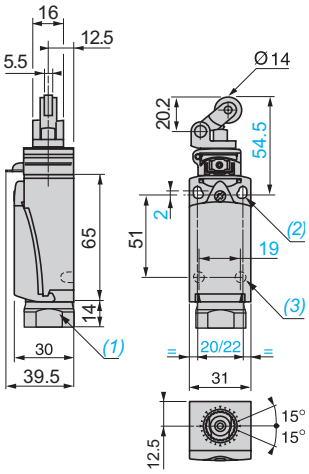
XCDR2●10●●●



XCDR2●02●●●



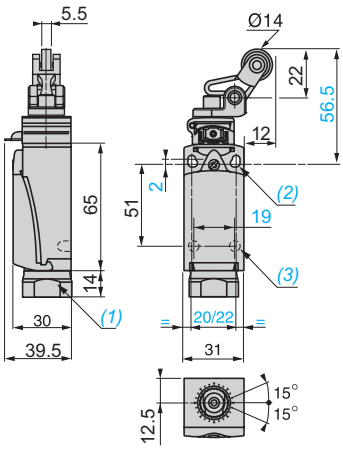
XCDR2●21●●●



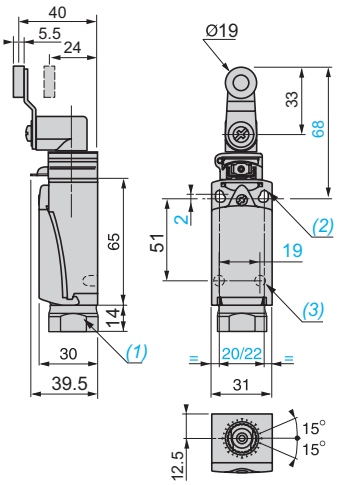
(1) Tapped entry for ISO M20 x 1.5 or Pg 13.5 cable gland or tapped 1/2" NPT.
(2) 2 elongated holes Ø 4.3 x 6.3 mm on 22 mm centres, 2 holes Ø 4.3 on 20 mm centres.
(3) 2 x Ø 3 holes for support studs, depth 4 mm.

Dimensions

XCDR2●27●●●



XCDR2●18●●●, XCDR2●19●●●

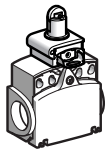
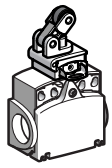
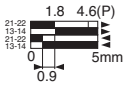
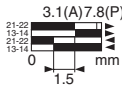
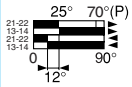
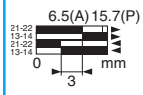
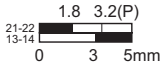
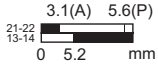
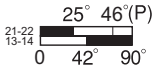
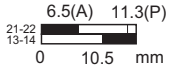


(1) Tapped entry for ISO M20 x 1.5 or Pg 13.5 cable gland or tapped 1/2" NPT.
(2) 2 elongated holes Ø 4.3 x 6.3 mm on 22 mm centres, 2 holes Ø 4.3 on 20 mm centres.
(3) 2 x Ø 3 holes for support studs, depth 4 mm.

Limit switches

OsiSense XC Standard

Compact design, plastic, with reset, type XCTR
Complete switches with 2 cable entries

Type of head	Plunger (fixing by the body)			
				
Type of operator	Metal end plunger	Steel roller plunger	Thermoplastic roller lever plunger	Thermoplastic roller lever plunger, horizontal actuation in 1 direction
References of complete switches with 2 ISO M16 x 1.5 cable entries				
2-pole NC + NO snap action (XE2SP3151)	**XCTR2110P16** ⊖ 	**XCTR2102P16** ⊖ 	**XCTR2118P16** ⊖ 	**XCTR2121P16** ⊖ 
2-pole NC + NO break before make, slow break (XE2NP3151)	**XCTR2510P16** ⊖ 	**XCTR2502P16** ⊖ 	**XCTR2518P16** ⊖ 	**XCTR2521P16** ⊖ 
Weight (kg)	0.120	0.125	0.165	0.135

References of complete switches with 2 Pg 11 cable entries

For complete switches with 2 Pg 11 cable entries replace P16 by **G11**.
Example: XCTR2110P16 becomes **XCTR2110G11**.

References of complete switches with 2 entries tapped for 1/2" NPT conduit

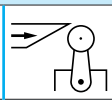
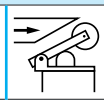
For complete switches with 2 entries for 1/2" NPT conduit replace P16 by **N12**.
Example: XCTR2110P16 becomes **XCTR2110N12**.

Contact operation

- ■ *closed*
- □ *open*

(A) = cam displacement
(P) = positive opening point
⊖ *NC contact with positive opening operation*

Characteristics

Switch actuation		On end	By 30° cam		
Type of actuation					
Maximum actuation speed		0.5 m/s		1.5 m/s	1 m/s
Minimum force or torque	For tripping	15 N	12 N	0.1 N.m	6 N
	For positive opening	45 N	36 N	0.25 N.m	18 N
Cable entry (1 entry fitted with blanking plug)		2 entries tapped M16 x 1.5 mm for ISO cable gland, clamping capacity 4 to 8 mm 2 entries tapped Pg 11 for cable gland, clamping capacity 7 to 10 mm 2 entries tapped for 1/2" NPT (USAS B2-1) conduit using Pg 11 - 1/2" NPT adaptor **DE9RA1012**			

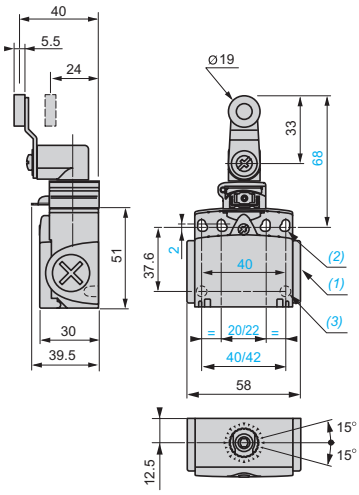
Limit switches

OsiSense XC Standard

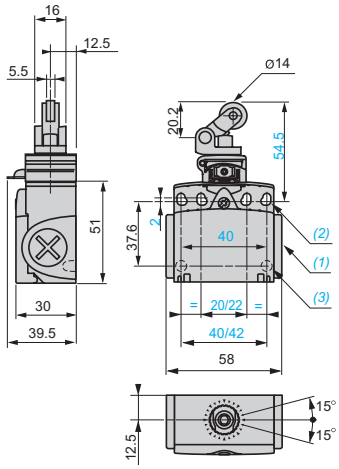
Compact design, plastic, with reset, type XCTR
Complete switches with 2 cable entries

Dimensions

XCTR2●18●●●



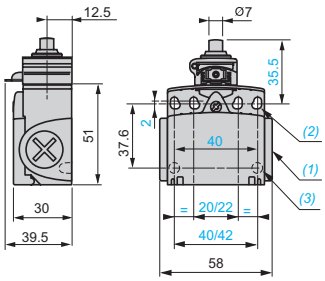
XCTR2●21●●●



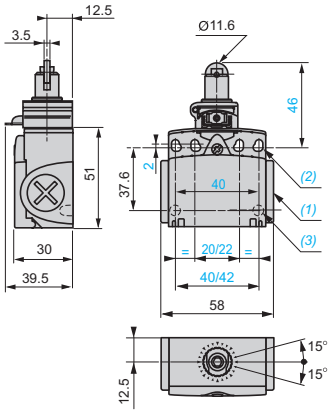
(1) Tapped entry for ISO M16 x 1.5 or Pg 11 cable gland or 1/2" NPT conduit.
(2) 4 elongated holes Ø 4.3 x 6.3 mm on 22/42 mm centres, 4 holes Ø 4.3 on 20/40 mm centres.
(3) 2 x Ø 3 holes for support studs, depth 4 mm.

Dimensions

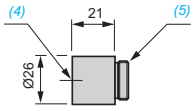
XCTR2●10●●●



XCTR2●02●●●



DE9RA1012



(1) Tapped entry for ISO M16 x 1.5 or Pg 11 cable gland or tapped 1/2" NPT.
(2) 4 elongated holes Ø 4.3 x 6.3 mm on 22/42 mm centres, 4 holes Ø 4.3 on 20/40 mm centres.
(3) 2 x Ø 3 holes for support studs, depth 4 mm.
(4) Tapped entry for 1/2" NPT conduit.
(5) Pg 11 threaded sleeve.

Limit switches

OsiSense XC Basic

Compact design, plastic, types XCKN and XCNT

1

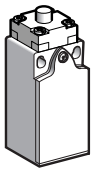
■ XCKN

with 1 cable entry

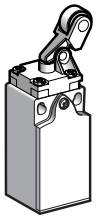
Conforming to CENELEC EN 50047

□ With head for linear movement (plunger)

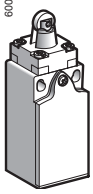
530748



530745



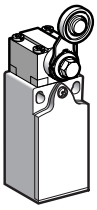
600039



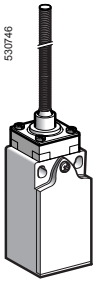
Page 1/62

□ With head for rotary movement (lever) or multi-directional

530749



530746



Page 1/171

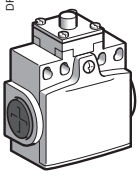
■ XCNT

with 2 cable entries

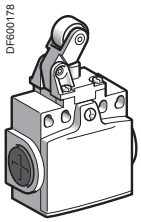
Conforming to CENELEC EN 50047

□ With head for linear movement (plunger)

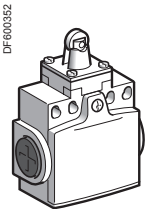
DF600177



DF600178



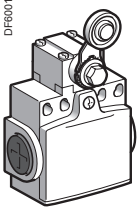
DF600352



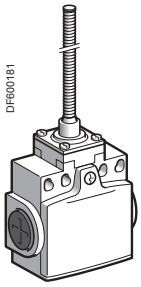
Page 1/64

□ With head for rotary movement (lever) or multi-directional

DF600180



DF600181



Page 1/165

Limit switches

OsiSense XC Basic

Compact design, plastic, types XCKN and XCNT

Environment characteristics

Conformity to standards	Products	IEC 60947-5-1, EN 60947-5-1, UL 508, CSA C22-2 n° 14
	Machine assemblies	IEC 60204-1, EN 60204-1
Product certifications		UL, CSA, CCC
Protective treatment	Version	Standard: “TC”
Ambient air temperature	For operation	- 25…+ 70°C
	For storage	- 40…+ 70°C
Vibration resistance	Conforming to IEC 60068-2-6	25 gn (10…500 Hz) except XCKN●●08: 10 gn, XCKN●●39 and XCKN●●49: 15 gn
Shock resistance	Conforming to IEC 60068-2-27	50 gn (11 ms) except XCKN2●49●● and XCKN●●39: 15 gn, XCKN2●08●●: 20 gn and XCKN2●45●●: 35 gn
Electric shock protection		Class II conforming to IEC 61140 and NF C 20030
Degree of protection		**IP 65 conforming to IEC 60529; IK 04 conforming to EN 50102**
Cable entry		Depending on model: tapped entry for ISO M20 x 1.5 or Pg 11 cable gland, ISO M 16 x 1.5 cable gland or PF 1/2 (G 1/2).
Materials	Bodies	Plastic
	Heads	Plastic

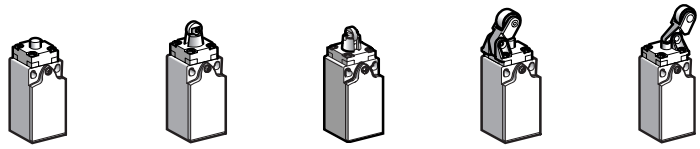
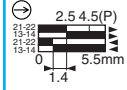
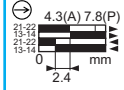
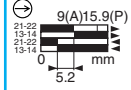
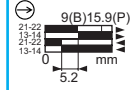
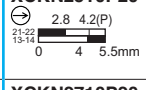
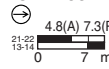
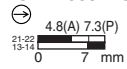
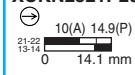
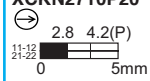
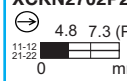
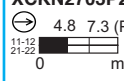
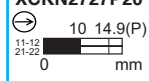
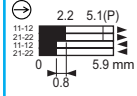
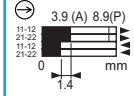
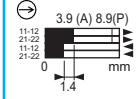
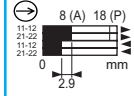
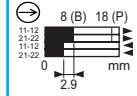
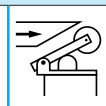
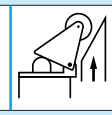
Contact block characteristics

Rated operational characteristics		∿ AC-15; A300 (Ue = 240 V, Ie = 3 A); Ithe = 10 A
		⎓ DC-13; R300 (Ue = 250 V, Ie = 0.1 A), conforming to IEC 60947-5-1 Appendix A, EN 60947-5-1
Rated insulation voltage	2-pole contact	Ui = 500 V degree of pollution 3 conforming to IEC 60947-1 Ui = 300 V conforming to UL 508, CSA C22-2 n° 14
Rated impulse withstand voltage	2-pole contact	U imp = 6 kV conforming to IEC 60947-1, IEC 60664
Positive operation		NC contacts with positive opening operation conforming to IEC 60947-5-1 Appendix K, EN 60947-5-1
Short-circuit protection		10 A cartridge fuse type gG (gI)
Connection	Screw clamp terminals	Clamping capacity, min: 1 x 0.34 mm^2, max: 2 x 1.5 mm^2

Limit switches

OsiSense XC Basic

Compact design, plastic, type XCKN
Complete switches with 1 cable entry

Type of head	Plunger (fixing by the body)				
					
Type of operator	Metal end plunger	Plastic roller plunger for lateral cam approach	Plastic roller plunger for traverse cam approach	Thermoplastic roller lever plunger, horizontal actuation in 1 direction	Thermoplastic roller lever plunger, vertical actuation in 1 direction
Sold and packed in lots of	20	20	20	20	20
References of complete switches with 1 ISO M20 x 1.5 cable entry					
2-pole NC + NO snap action	**XCKN2110P20** 	**XCKN2102P20** 	**XCKN2103P20**	**XCKN2121P20** 	**XCKN2127P20** 
2-pole N/C + N/O break before make, slow break	**XCKN2510P20** 	**XCKN2502P20** 	**XCKN2503P20** 	**XCKN2521P20** 	**XCKN2527P20**
2-pole NC + NC simultaneous, slow break	**XCKN2710P20** 	**XCKN2702P20** 	**XCKN2703P20** 	**XCKN2721P20**	**XCKN2727P20** 
2-pole NC + NC snap action	**XCKN2910P20** 	**XCKN2902P20** 	**XCKN2903P20** 	**XCKN2921P20** 	**XCKN2927P20** 
Weight (kg)	0.065	0.065	0.065	0.070	0.070
Contact operation	*closed* / *open*	*(A) (B) = cam displacement* / *(P) = positive opening point*		*NC contact with positive opening operation*	
Characteristics					
Switch actuation	On end	By 30° cam			
Type of actuation					
Maximum actuation speed	0.5 m/s	0.3 m/s		1 m/s	
Mechanical durability (in millions of operating cycles)	10				
Minimum force or torque — For tripping	15 N	12 N		6 N	
Minimum force or torque — For positive opening	30 N	20 N		10 N	
Cable entry	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm				

References of complete switches with 1 Pg 11 cable entry

For complete switches with 1 Pg 11 cable entry replace P20 by **G11**.
Example: XCKN2110P20 becomes **XCKN2110G11**.

Other cable entries

For complete switches with ISO M16 x 1.5 or PF 1/2 (G 1/2) cable entry, please consult our Customer Care Centre.

Other contacts

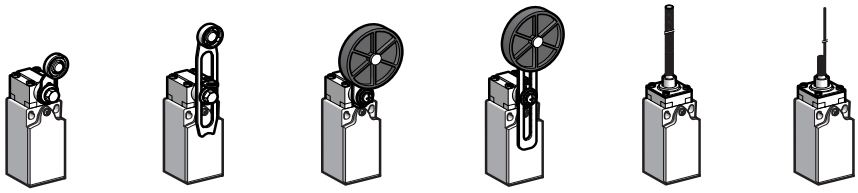
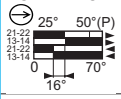
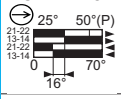
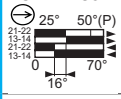
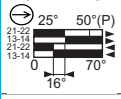
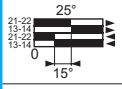
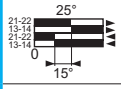
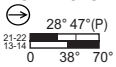
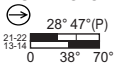
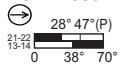
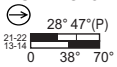
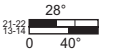
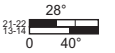
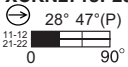
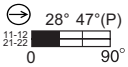
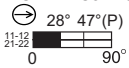
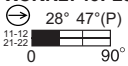
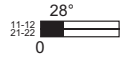
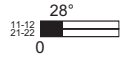
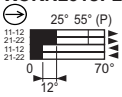
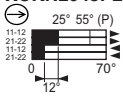
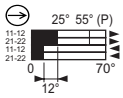
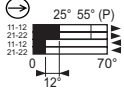
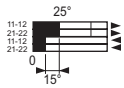
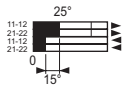
For complete switches with 2-pole contacts:
NO + NC make before break, slow break,
NO + NO simultaneous, slow break, please consult our Customer Care Centre.

For complete switches with 3-pole contacts:
NC + NO + NO snap action,
NC + NC + NO snap action,
NC + NC + NO break before make, slow break,
NC + NO + NO break before make, slow break, please consult our Customer Care Centre.

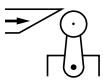
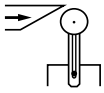
Limit switches

OsiSense XC Basic

Compact design, plastic, type XCKN
Complete switches with 1 cable entry

Type of head	Rotary (fixing by the body)				Multi-directional	
						
Type of operator	Thermoplastic roller lever	Variable length thermoplastic roller lever	Thermoplastic roller lever, Ø 50 mm	Variable length thermoplastic roller lever, Ø 50 mm	Spring rod	"Cat's whisker"
Sold and packed in lots of	20	20	20	20	20	20
References of complete switches with 1 ISO M20 x 1.5 cable entry						
2-pole NC + NO snap action	**XCKN2118P20** 	**XCKN2145P20** 	**XCKN2139P20** 	**XCKN2149P20** 	**XCKN2108P20** 	**XCKN2106P20** 
2-pole N/C + N/O break before make, slow break	**XCKN2518P20** 	**XCKN2545P20** 	**XCKN2539P20** 	**XCKN2549P20** 	**XCKN2508P20** 	**XCKN2506P20** 
2-pole NC + NC simultaneous, slow break	**XCKN2718P20** 	**XCKN2745P20** 	**XCKN2739P20** 	**XCKN2749P20** 	**XCKN2708P20** 	**XCKN2706P20** 
2-pole NC + NC snap action	**XCKN2918P20** 	**XCKN2945P20** 	**XCKN2939P20** 	**XCKN2949P20** 	**XCKN2908P20** 	**XCKN2906P20** 
Weight (kg)	0.085	0.090	0.110	0.115	0.085	0.075
Contact operation	*closed* / *open*		*(A) (B) = cam displacement* / *(P) = positive opening point*		*NC contact with positive opening operation*	

Characteristics

Switch actuation	By 30° cam		By any moving part
Type of actuation			
Maximum actuation speed	1.5 m/s		1 m/s (any direction)
Mechanical durability	10 million operating cycles		5 million operating cycles
Minimum force or torque – For tripping	0.1 N.m		0.13 N.m
Minimum force or torque – For positive opening	0.15 N.m		–
Cable entry	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm		

References of complete switches with 1 Pg 11 cable entry

For complete switches with 1 Pg 11 cable entry replace P20 by **G11**.
Example: XCKN2118P20 becomes **XCKN2118G11**.

Other cable entries

For complete switches with ISO M16 x 1.5 or PF 1/2 (G 1/2) cable entry, please consult our Customer Care Centre.

Other contacts

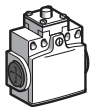
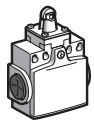
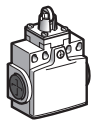
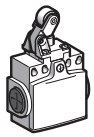
For complete switches with 2-pole contacts:
NO + NC make before break, slow break,
NO + NO simultaneous, slow break, please consult our Customer Care Centre.

For complete switches with 3-pole contacts:
NC + NO + NO snap action,
NC + NC + NO snap action,
NC + NC + NO break before make, slow break,
NC + NO + NO break before make, slow break, please consult our Customer Care Centre.

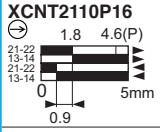
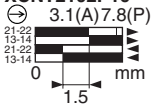
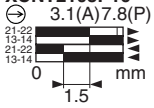
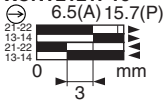
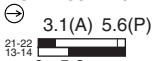
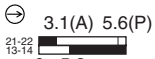
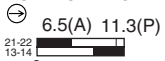
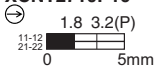
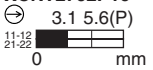
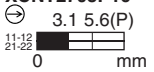
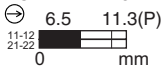
Limit switches

OsiSense XC Basic

Compact design, plastic, type XCNT
Complete switches with 2 cable entries

Type of head	Plunger (fixing by the body)			
				
Type of operator	Metal end plunger	Plastic roller plunger for lateral cam approach	Plastic roller plunger for traverse cam approach	Thermoplastic roller lever plunger, horizontal actuation in 1 direction
Sold and packed in lots of	10	10	10	10

References of complete switches with 2 ISO M16 x 1.5 cable entries

2-pole NC + NO snap action	**XCNT2110P16** 	**XCNT2102P16** 	**XCNT2103P16** 	**XCNT2121P16** 
2-pole N/C + N/O break before make, slow break	**XCNT2510P16**	**XCNT2502P16** 	**XCNT2503P16** 	**XCNT2521P16** 
2-pole NC + NC simultaneous, slow break	**XCNT2710P16** 	**XCNT2702P16** 	**XCNT2703P16** 	**XCNT2721P16** 
Weight (kg)	0.085	0.085	0.085	0.090

Contact operation: ■ *closed* □ *open* — *(A) (B) = cam displacement* *(P) = positive opening point* — ⊖ *NC contact with positive opening operation*

Characteristics

Switch actuation	On end	By 30° cam	
Type of actuation			
Maximum actuation speed	0.5 m/s	0.3 m/s	1 m/s
Mechanical durability (in millions of operating cycles)	10		
Minimum force or torque — For tripping	15 N	12 N	6 N
Minimum force or torque — For positive opening	30 N	20 N	10 N
Cable entry	2 entries tapped M16 x 1.5 mm for ISO cable gland, clamping capacity 4 to 8 mm		

References of complete switches with 2 Pg 11 cable entries

For complete switches with 2 Pg 11 cable entries replace P16 by **G11**.
Example: XCNT2110P16 becomes **XCNT2110G11**.

Complete switches with 1/2" NPT cable entry

For complete switches with 1/2" NPT cable entry use adaptor DE9 RA1012 (compatible with XCNT●●●●G11).

DE9RA1012

Description	Sold in lots of	Unit reference	Weight kg
Adaptor for 1/2" NPT conduit (male Pg 11 / female 1/2" NPT)	10	**DE9RA1012**	0.050

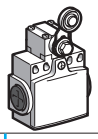
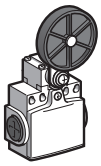
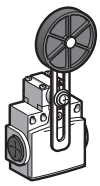
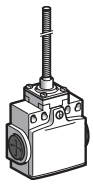
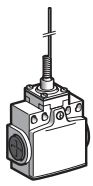
Other contacts

For complete switches with 2-pole contacts:
NO + NC make before break, slow break,
NO + NO simultaneous, slow break, please consult our Customer Care Centre.

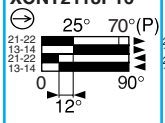
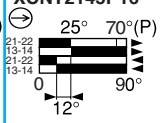
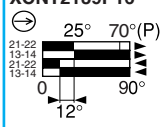
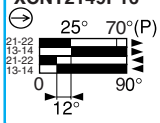
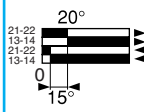
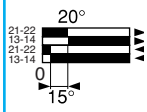
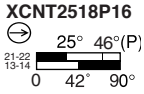
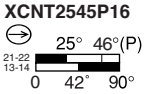
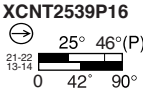
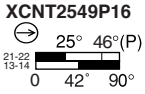
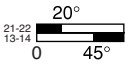
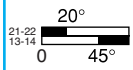
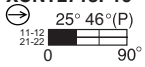
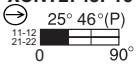
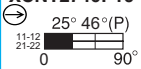
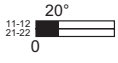
Limit switches

OsiSense XC Basic

Compact design, plastic, type XCNT
Complete switches with 2 cable entries

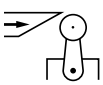
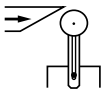
Type of head	Rotary (fixing by the body)				Multi-directional	
						
Type of operator	Thermoplastic roller lever	Variable length thermoplastic roller lever	Thermoplastic roller lever, Ø 50 mm	Variable length thermoplastic roller lever, Ø 50 mm	Spring rod	"Cat's whisker"
Sold and packed in lots of	10	10	10	10	8	8

References of complete switches with 2 ISO M16 x 1.5 cable entries

2-pole NC + NO snap action	**XCNT2118P16** 	**XCNT2145P16** 	**XCNT2139P16** 	**XCNT2149P16** 	**XCNT2108P16** 	**XCNT2106P16** 
2-pole N/C + N/O break before make, slow break	**XCNT2518P16** 	**XCNT2545P16** 	**XCNT2539P16** 	**XCNT2549P16** 	**XCNT2508P16** 	**XCNT2506P16** 
2-pole NC + NC simultaneous, slow break	**XCNT2718P16** 	**XCNT2745P16** 	**XCNT2739P16**	**XCNT2749P16** 	**XCNT2708P16** 	**XCNT2706P16**
Weight (kg)	0.105	0.120	0.120	0.120	0.100	0.090

Contact operation: ▬ *closed* ▭ *open* — *(A) (B) = cam displacement* *(P) = positive opening point* — ⊖ *NC contact with positive opening operation*

Characteristics

Switch actuation		By 30° cam				By any moving part
Type of actuation						
Maximum actuation speed		1.5 m/s				1 m/s (any direction)
Mechanical durability		10 million operating cycles				5 million operating cycles
Minimum force or torque	For tripping	0.1 N.m				0.13 N.m
	For positive opening	0.15 N.m				–
Cable entry		2 entries tapped M16 x 1.5 mm for ISO cable gland, clamping capacity 4 to 8 mm				

References of complete switches with 2 Pg 11 cable entries

For complete switches with 2 Pg 11 cable entries replace P16 by G11.
Example: XCNT2118P16 becomes **XCNT2118G11**.

Complete switches with 1/2" NPT cable entry

For complete switches with 1/2" NPT cable entry use adaptor DE9 RA1012 (compatible with XCNT●●●●G11).

DE9RA1012

Description	Sold in lots of	Unit reference	Weight kg
Adaptor for 1/2" NPT conduit (male Pg 11 / female 1/2" NPT)	10	**DE9RA1012**	0.050

Other contacts

For complete switches with 2-pole contacts:
NO + NC make before break, slow break,
NO + NO simultaneous, slow break, please consult our Customer Care Centre.

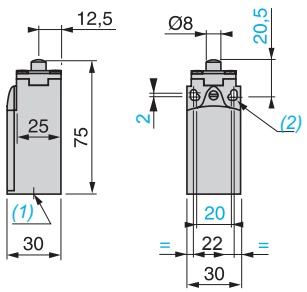
Limit switches

OsiSense XC Basic

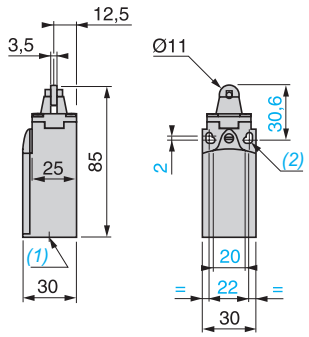
Compact design, plastic, type XCKN
Complete switches with 1 cable entry

Dimensions

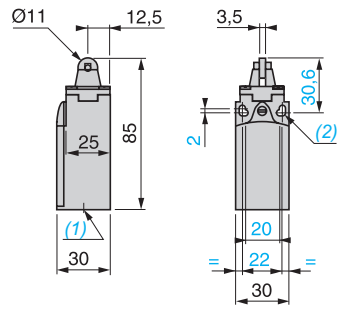
XCKN2●10P20



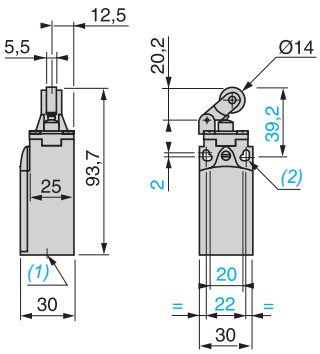
XCKN2●02P20



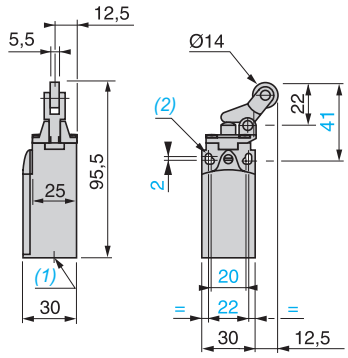
XCKN2●03P20



XCKN2●21P20

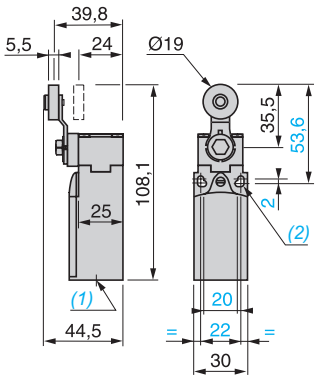


XCKN2●27P20

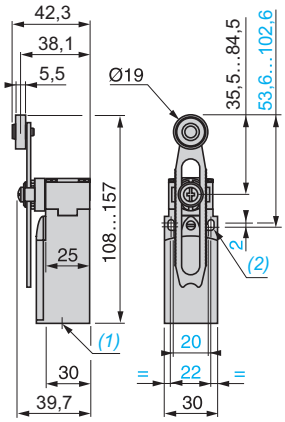


(1) 1 tapped entry for ISOM20 x 1.5 or Pg 11 cable gland.
(2) Ø: 2 elongated holes Ø 4.3 x 6.3 on 22 mm centres, 2 holes Ø 4.3 on 20 mm centres.

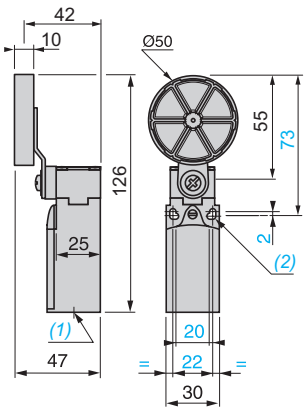
XCKN2●18P20



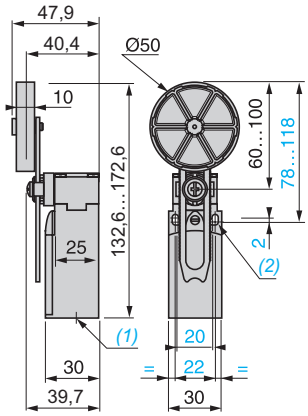
XCKN2●45P20



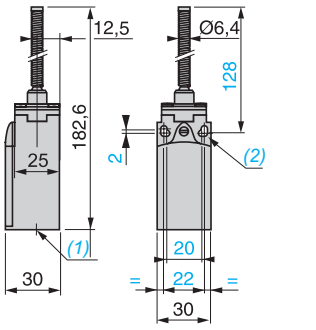
XCKN2●39P20



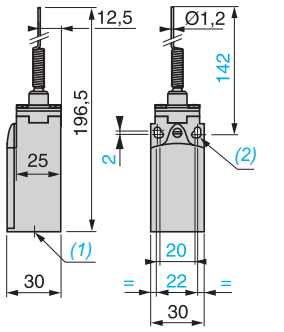
XCKN2●49P20



XCKN2●08P20



XCKN2●06P20



(1) 1 tapped entry for ISOM20 x 1.5 or Pg 11 cable gland.
(2) Ø: 2 elongated holes Ø 4.3 x 6.3 on 22 mm centres, 2 holes Ø 4.3 on 20 mm centres.

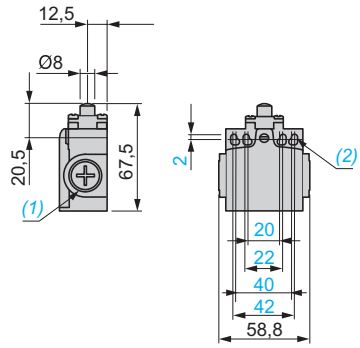
Limit switches

OsiSense XC Basic

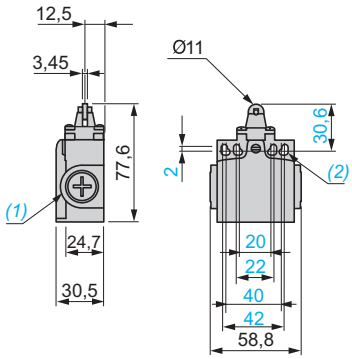
Compact design, plastic, type XCNT
Complete switches with 2 cable entries

Dimensions

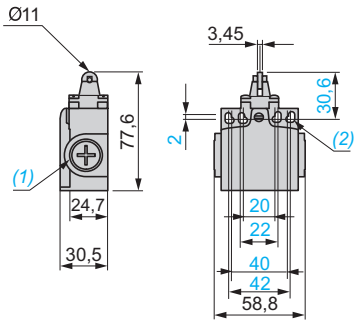
XCNT2●10P20



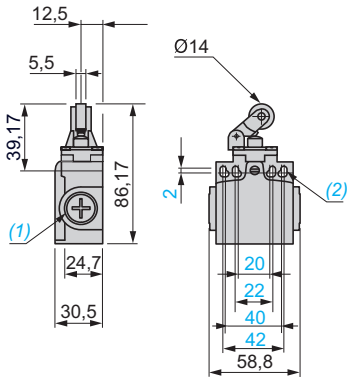
XCNT2●02P20



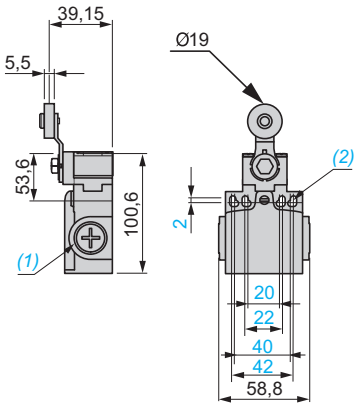
XCNT2●03P20



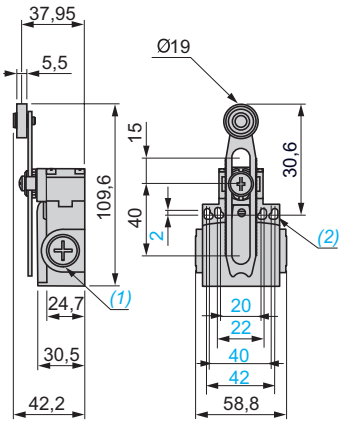
XCNT2●21P20



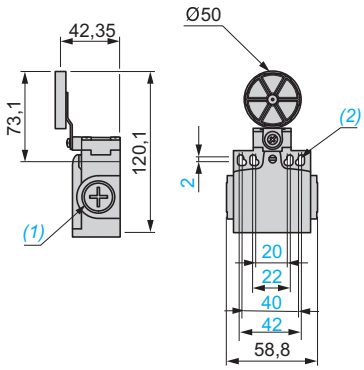
XCNT2●18P16



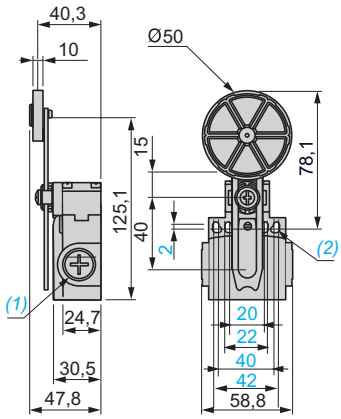
XCNT2●45P16



XCNT2●39P16

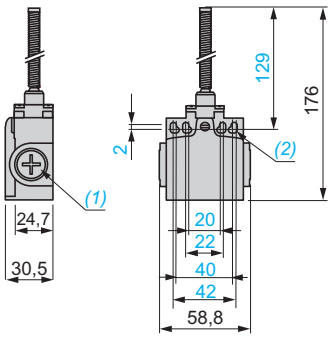


XCNT2●49P16

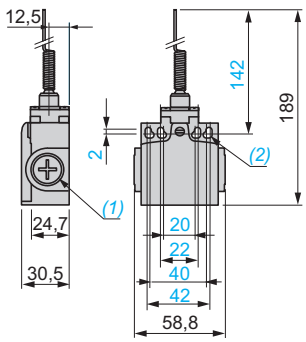


(1) 2 tapped entries for ISOM16 x 1.5 or Pg 11 cable gland.
(2) Ø: 4 elongated holes Ø 4.3 x 6.3

XCNT2●08P16



XCNT2●06P16



Limit switches

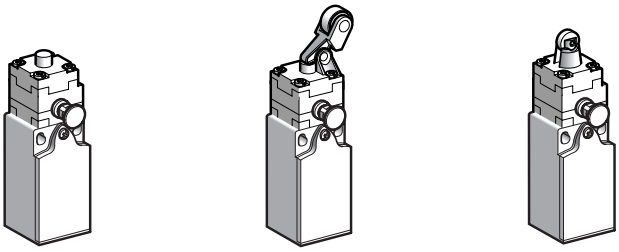
OsiSense XC Basic

Compact design, plastic, with reset knob, types XCNR and XCNTR

1

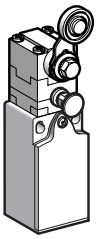
■ XCNR
with 1 cable entry

□ With head for linear movement (plunger)



Page 1/70

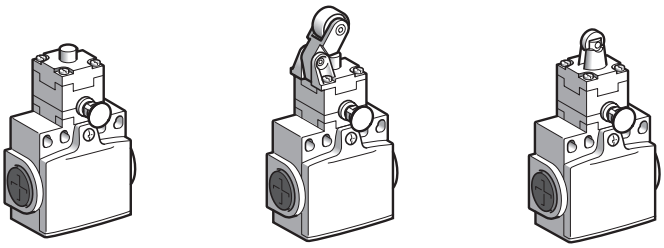
□ With head for rotary movement (lever)



Page 1/70

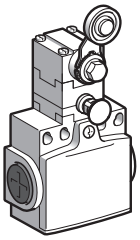
■ XCNTR
with 2 cable entries

□ With head for linear movement (plunger)



Page 1/71

□ With head for rotary movement (lever)



Page 1/71

Limit switches

OsiSense XC Basic

Compact design, plastic, with reset knob, types XCNR and XCNTR

Environment characteristics

Conformity to standards	Products	IEC 60947-5-1, EN 60947-5-1, UL 508, CSA C22-2 n° 14
	Machine assemblies	IEC 60204-1, EN 60204-1
Product certifications		UL, CSA, CCC (pending)
Protective treatment	Version	Standard: “TC”
Ambient air temperature	For operation	- 25…+ 70°C
	For storage	- 40…+ 70°C
Vibration resistance	Conforming to IEC 60068-2-6	25 gn (10…500 Hz)
Shock resistance	Conforming to IEC 60068-2-27	50 gn (11 ms)
Electric shock protection		Class II conforming to IEC 61140 and NF C 20030
Degree of protection		**IP 65 conforming to IEC 60529; IK 04 conforming to EN 50102**
Cable entry		Depending on model: tapped entry, for ISO M20 x 1.5 or Pg 11 cable gland, ISO M16 x 1.5 cable gland or PF 1/2 (G 1/2)
Materials	Bodies	Plastic
	Heads	Plastic

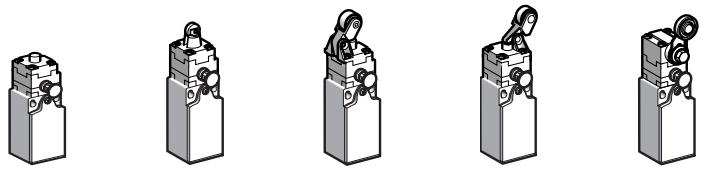
Contact block characteristics

Rated operational characteristics		∼ AC-15; A300 (Ue = 240 V, Ie = 3 A); Ithe = 10 A
		⎓ DC-13; R300 (Ue = 250 V, Ie = 0.1 A), conforming to IEC 60947-5-1 Appendix A, EN 60947-5-1
Rated insulation voltage	2-pole contact	Ui = 500 V degree of pollution 3 conforming to IEC 60947-1 Ui = 300 V conforming to UL 508, CSA C22-2 n° 14
Rated impulse withstand voltage	2-pole contact	U imp = 6 kV conforming to IEC 60947-1, IEC 60664
Positive operation		NC contacts with positive opening operation conforming to IEC 60947-5-1 Appendix K, EN 60947-5-1
Short-circuit protection		10 A cartridge fuse type gG (gI)
Connection	Screw clamp terminals	Clamping capacity, min: 1 x 0.34 mm^2, max: 2 x 1.5 mm^2

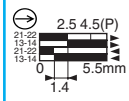
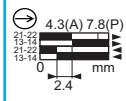
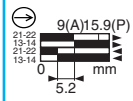
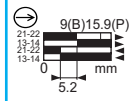
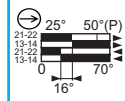
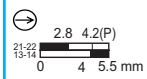
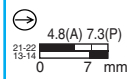
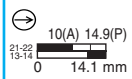
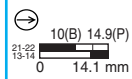
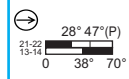
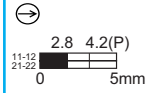
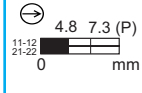
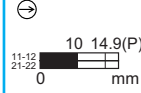
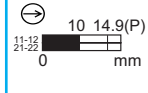
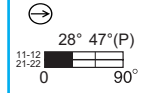
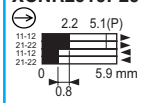
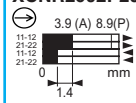
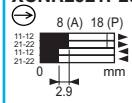
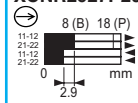
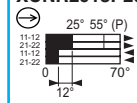
Limit switches

OsiSense XC Basic

Compact design, plastic, with reset knob, type XCNR
Complete switches with 1 cable entry

Type of head	Plunger (fixing by the body)				Rotary (fixing by the body)
					
Type of operator	Metal end plunger	Plastic roller plunger	Thermoplastic roller lever plunger, horizontal actuation in 1 direction	Thermoplastic roller lever plunger, vertical actuation in 1 direction	Thermoplastic roller lever
Sold and packed in lots of	10	10	10	10	10

References of complete switches with 1 ISO M20 x 1.5 cable entry

2-pole NC + NO snap action	**XCNR2110P20** 	**XCNR2102P20** 	**XCNR2121P20** 	**XCNR2127P20** 	**XCNR2118P20** 
2-pole N/C + N/O break before make, slow break	**XCNR2510P20** 	**XCNR2502P20** 	**XCNR2521P20** 	**XCNR2527P20** 	**XCNR2518P20** 
2-pole NC + NC simultaneous, slow break	**XCNR2710P20** 	**XCNR2702P20** 	**XCNR2721P20** 	**XCNR2727P20** 	**XCNR2718P20** 
2-pole NC + NC snap action	**XCNR2910P20** 	**XCNR2902P20** 	**XCNR2921P20** 	**XCNR2927P20** 	**XCNR2918P20** 
Weight (kg)	0.080	0.080	0.085	0.090	0.100
Contact operation	*closed* / *open*	*(A) (B) = cam displacement* / *(P) = positive opening point*		*NC contact with positive opening operation*	

Characteristics

Switch actuation	On end	By 30° cam			
Type of actuation					
Maximum actuation speed	0.5 m/s	0.3 m/s	1 m/s		1.5 m/s
Mechanical durability	100,000 operating cycles				
Minimum force or torque For tripping	15 N	12 N	6 N		0.1 N.m
Minimum force or torque For positive opening	30 N	20 N	10 N		0.15 N.m
Cable entry	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm				

References of complete switches with 1 Pg 11 cable entry

For complete switches with 1 Pg 11 cable entry replace P20 by **G11**.
Example: XCNR2110P20 becomes **XCNR2110G11**.

Other cable entries

For complete switches with ISO M16 x 1.5 or PF 1/2 (G 1/2) cable entry, please consult our Customer Care Centre.

Other contacts

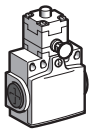
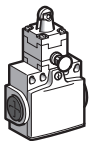
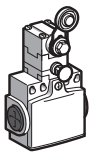
For complete switches with 2-pole contacts:
NC + NO make before break, slow break,
NO + NO simultaneous, slow break, please consult our Customer Care Centre.

For complete switches with 3-pole contacts:
NC + NO + NO snap action,
NC + NC + NO snap action,
NC + NC + NO break before make, slow break,
NC + NO + NO break before make, slow break, please consult our Customer Care Centre.

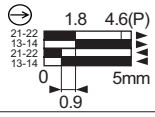
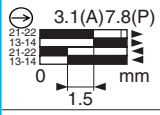
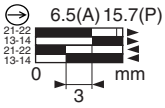
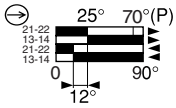
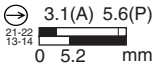
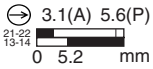
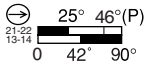
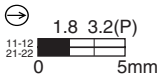
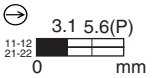
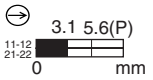
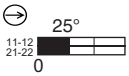
Limit switches

OsiSense XC Basic

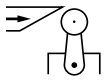
Compact design, plastic, with reset knob, type XCNTR
Complete switches with 2 cable entries

Type of head	Plunger (fixing by the body)			Rotary (fixing by the body)
				
Type of operator	Metal end plunger	Plastic roller plunger	Thermoplastic roller lever plunger, horizontal actuation in 1 direction	Thermoplastic roller lever
Sold and packed in lots of	10	10	10	10

References of complete switches with 2 ISO M16 x 1.5 cable entries

2-pole NC + NO snap action	**XCNTR2110P16** 	**XCNTR2102P16** 	**XCNTR2121P16** 	**XCNTR2118P16** 
2-pole N/C + N/O break before make, slow break	**XCNTR2510P16**	**XCNTR2502P16** 	**XCNTR2521P16** 	**XCNTR2518P16** 
2-pole NC + NC simultaneous, slow break	**XCNTR2710P16** 	**XCNTR2702P16** 	**XCNTR2721P16** 	**XCNTR2718P16** 
Weight (kg)	0.105	0.110	0.135	0.095
Contact operation	*closed* / *open*	*(A) (B) = cam displacement* / *(P) = positive opening point*		*NC contact with positive opening operation*

Characteristics

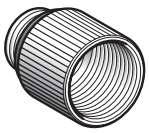
Switch actuation		On end	By 30° cam		
Type of actuation					
Maximum actuation speed		0.5 m/s	0.3 m/s	1 m/s	1.5 m/s
Mechanical durability		100 000 operating cycles			
Minimum force or torque	For tripping	15 N	12 N	6 N	0.1 N.m
	For positive opening	30 N	20 N	10 N	0.15 N.m
Cable entry		2 entries tapped M16 x 1.5 mm for ISO cable gland, clamping capacity 4 to 8 mm			

References of complete switches with 2 Pg 11 cable entries

For complete switches with 2 Pg 11 cable entries replace P16 by **G11**.
Example: XCNTR2110P16 becomes **XCNTR2110G11**.

Complete switches with 1/2" NPT cable entry

For complete switches with 1/2" NPT cable entry use adaptor DE9 RA1012 (compatible with XCNTR●●●●G11).



DE9RA1012

Description	Sold in lots of	Unit reference	Weight kg
Adaptor for 1/2" NPT conduit (male Pg 11 / female 1/2" NPT)	10	**DE9RA1012**	0.050

Other contacts

For complete switches with 2-pole contacts:
NO + NC make before break, slow break,
NO + NO simultaneous, slow break, please consult our Customer Care Centre.

Limit switches

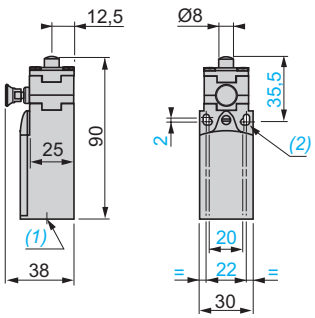
OsiSense XC Basic

Compact design, plastic, with reset knob, type XCNR
Complete switches with 1 cable entry

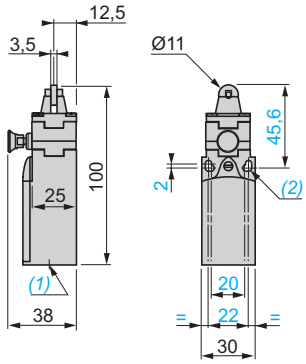
1

Dimensions

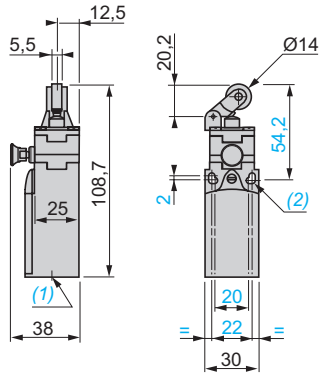
XCNR2●10P20



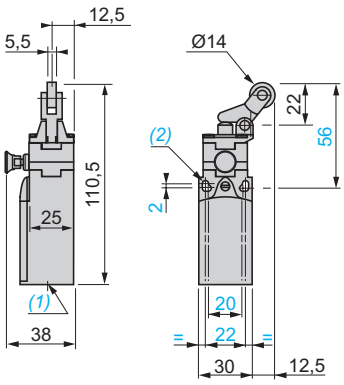
XCNR2●02P20



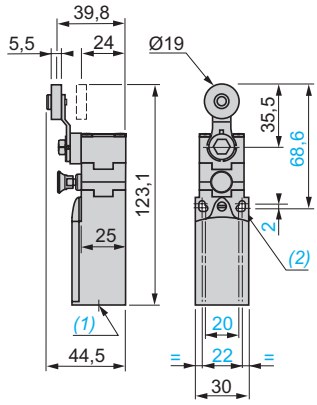
XCNR2●21P20



XCNR2●27P20



XCNR2●18P20



(1) 1 tapped entry for ISO M20 x 1.5 or Pg 11 cable gland.
(2) Ø: 2 elongated holes Ø 4.3 x 6.3 on 22 mm centres, 2 holes Ø 4.3 on 20 mm centres.

Telemecanique Sensors

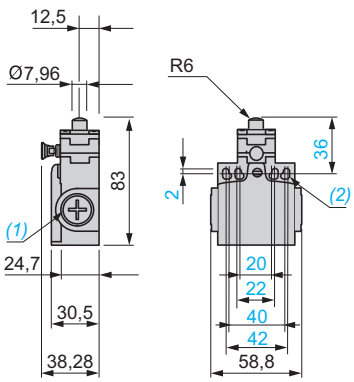
Limit switches

OsiSense XC Basic

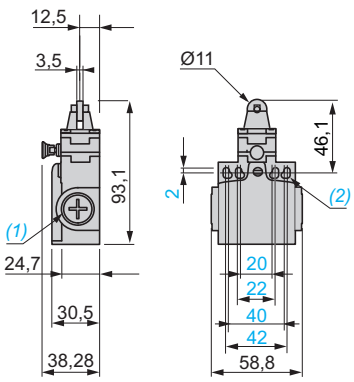
Compact design, plastic, with reset knob, type XCNTR
Complete switches with 2 cable entries

Dimensions

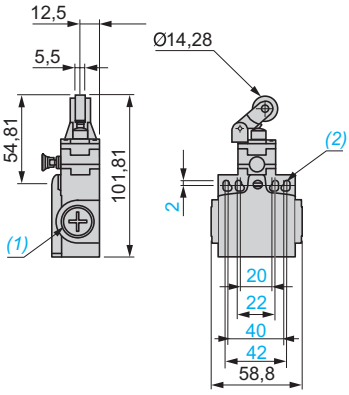
XCNTR2●10P16



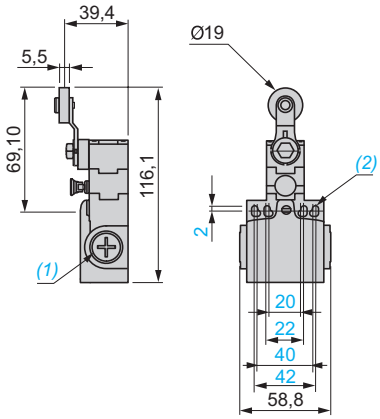
XCNTR2●02P16



XCNTR2●21P16



XCNTR2●18P16



(1) 2 tapped entries for ISO M16 x 1.5 or Pg 11 cable gland.
(2) Ø: 4 elongated holes Ø 4.3 x 6.3.

Limit switches

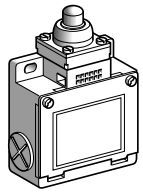
OsiSense XC Standard, Classic format

Metal, types XCKM, XCKL and XCKML

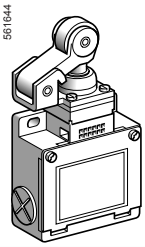
■ XCKM, with 3 cable entries

□ With head for linear movement (plunger)

561643

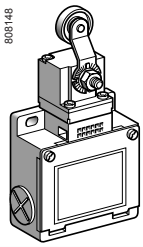


561644



□ With head for rotary movement (lever) or multi-directional

808148



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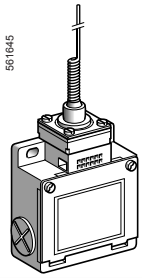
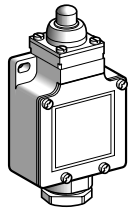


Page 1/76

■ XCKL, with 1 cable entry

□ With head for linear movement (plunger)

808140



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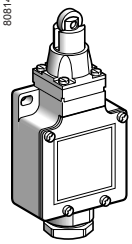
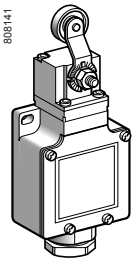


□ With head for rotary movement (lever) or multi-directional

808141



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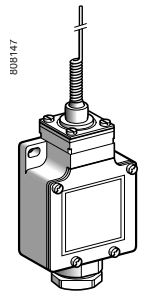
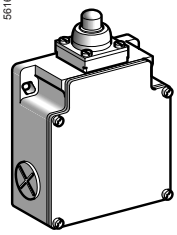


Page 1/78

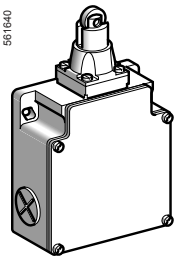
■ XCKML, with 3 cable entries and 2 x 2-pole contacts

□ With head for linear movement (plunger)

561639

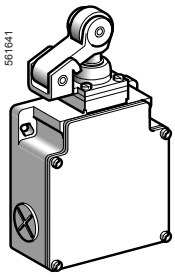


561640



□ With head for rotary movement (lever)

561641



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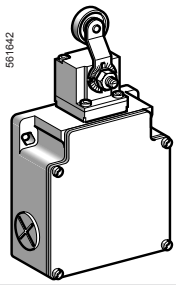


Page 1/80

Environment characteristics

Conformity to standards	Products	IEC 60947-5-1, EN 60947-5-1, UL 508, CSA C22-2 n° 14
	Machine assemblies	IEC 60204-1, EN 60204-1
Product certifications		UL, CSA CCC (only for XCKM) BV (only for XCKM and XCKL)
Protective treatment	Version	Standard: “TC”. Special: “TH”
Ambient air temperature	For operation	- 25…+ 70°C
	For storage	- 40…+ 70°C
Vibration resistance	Conforming to IEC 60068-2-6	25 gn (10…500 Hz)
Shock resistance	Conforming to IEC 60068-2-27	50 gn (11 ms)
Electric shock protection		Class I conforming to IEC 61140 and NF C 20-030
Degree of protection		IP 66 conforming to IEC 60529; IK 05 conforming to EN 50102
Repeat accuracy		**XCKML** 0.1 mm; **XCKM** and **XCKL** 0.05 mm on the tripping points, with 1 million operating cycles for head with end plunger
Cable entry or connector	Depending on model	**XCKM:** 3 tapped entries for Pg 11 cable gland or tapped ISO M20, or with 1/2" NPT adaptor **XCKL**: 1 tapped entry incorporating Pg 13.5 cable gland or 1 entry tapped 1/2" NPT **XCKML**: 3 tapped entries for Pg 13.5 cable gland or tapped ISO M20
Materials		Bodies: Zamak. Rotary heads: Zamak or plastic, depending on product reference. Other heads: plastic

Limit switches

OsiSense XC Standard, Classic format

Metal, types XCKM, XCKL and XCKML

Contact block characteristics

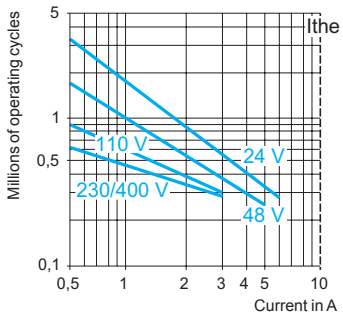
Rated operational characteristics	XE2●P	∼ AC-15; A300 (Ue = 240 V, Ie = 3 A); Ithe = 10 A ⎓ DC-13; Q300 (Ue = 250 V, Ie = 0.27 A), conforming to IEC 60947-5-1 Appendix A, EN 60947-5-1
	XE3●P	∼ AC-15; B300 (Ue = 240 V, Ie = 1.5 A); Ithe = 6 A ⎓ DC-13; R300 (Ue = 250 V, Ie = 0.1 A), conforming to IEC 60947-5-1 Appendix A, EN 60947-5-1
Rated insulation voltage	XE2●P	Ui = 500 V degree of pollution 3 conforming to IEC 60947-1 Ui = 300 V conforming to UL 508, CSA C22-2 n° 14
	XE3●P	Ui = 400 V degree of pollution 3 conforming to IEC 60947-1 Ui = 300 V conforming to UL 508, CSA C22-2 n° 14
Rated impulse withstand voltage	XE2●P	U imp = 6 kV conforming to IEC 60947-1, IEC 60664
	XE3●P	U imp = 4 kV conforming to IEC 60947-1, IEC 60664
Positive operation (depending on model)		NC contacts with positive opening operation conforming to IEC 60947-5-1 Appendix K, EN 60947-5-1
Resistance across terminals		⩽ 25 mΩ conforming to IEC 60255-7 category 3
Short-circuit protection	XE2●P	10 A cartridge fuse type gG (gI)
	XE3●P	6 A cartridge fuse type gG (gI)
Connection (screw clamp terminals)	XE2SP21●1	Clamping capacity, min: 1 x 0.34 mm², max: 2 x 1.5 mm²
	XE2NP21●1	Clamping capacity, min: 1 x 0.5 mm², max: 2 x 2.5 mm²
	XESP2151L and XENP2151L	Clamping capacity, min: 1 x 0.34 mm², max: 2 x 1.5 mm² or 1 x 2.5 mm²
	XE3NP and XE3SP	Clamping capacity, min: 1 x 0.34 mm², max: 1 x 1 mm² or 2 x 0.75 mm²
Minimum actuation speed		**XE2SP21●1, XESP2151L** and **XE3S**P: 0.01 m/minute
		XE2NP21●1, XENP2151L and **XE3N**P: 6 m/minute

Electrical durability

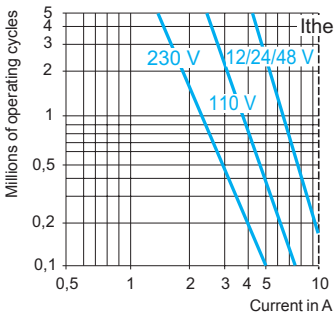
- Conforming to IEC 60947-5-1 Appendix C
- Utilisation categories AC-15 and DC-13
- Maximum operating rate: 3600 operating cycles/hour
- Load factor: 0.5

AC supply 50/60 Hz ∼
inductive circuit

XE2SP21●1, XE2SP2141, XESP2151L



XE2NP21●1, XENP2151L



DC supply ⎓

Power broken in W for 5 million operating cycles.

Voltage	V	24	48	120
inductive circuit	W	10	7	4

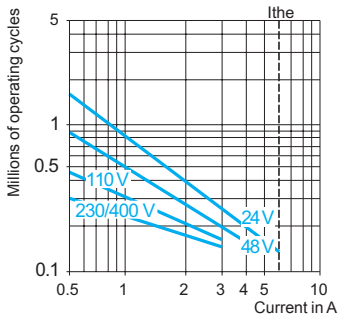
Power broken in W for 5 million operating cycles.

Voltage	V	24	48	120
inductive circuit	W	13	9	7

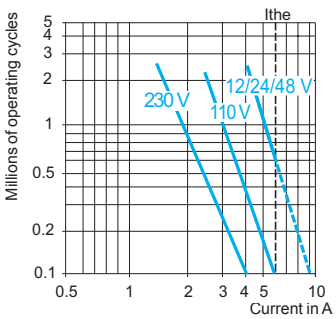
For XE2SP●151 on ∼ or ⎓, NC and NO contacts simultaneously loaded to the values shown with reverse polarity.

AC supply 50/60 Hz ∼
inductive circuit

XE3SP●●●●



XE3NP●●●●



DC supply ⎓

Power broken in W for 5 million operating cycles.

Voltage	V	24	48	120
inductive circuit	W	3	2	1

Power broken in W for 5 million operating cycles.

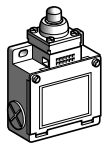
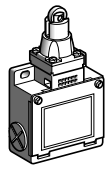
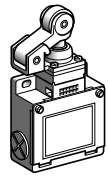
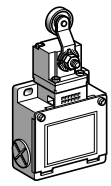
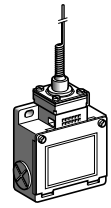
Voltage	V	24	48	120
inductive circuit	W	4	3	2

Limit switches

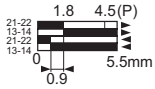
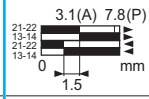
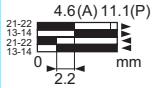
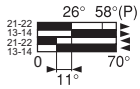
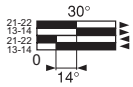
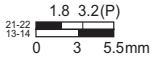
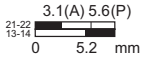
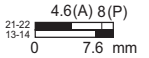
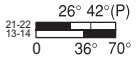
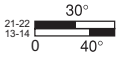
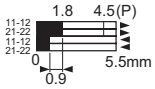
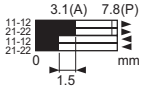
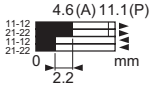
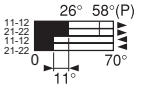
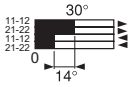
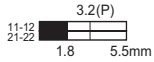
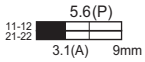
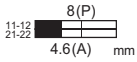
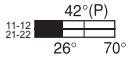
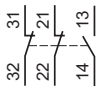
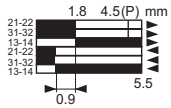
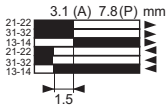
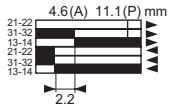
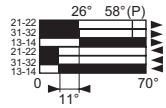
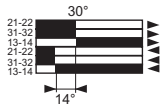
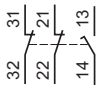
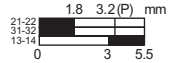
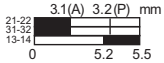
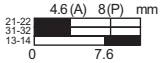
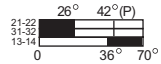
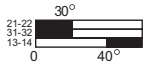
OsiSense XC Standard, Classic format

Metal, type XCKM

Complete switches with 3 cable entries

Type of head	Plunger (fixing by the body)			Rotary (fixing by the body)	Multi-directional, (fixing by the body)
					
Type of operator	Metal end plunger	Steel roller plunger	Thermoplastic roller lever plunger, horizontal actuation in 1 direction	Thermoplastic roller lever *(1)*	"Cat's whisker" *(2)*

References of complete switches with 3 ISO M20 x 1.5 cable entries *(3)*

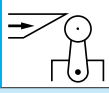
2-pole NC + NO snap action (XE2SP2151)	**XCKM110H29** ⊖ 	**XCKM102H29** ⊖ 	**XCKM121H29** ⊖ 	**XCKM115H29** ⊖ 	**XCKM106H29** 
2-pole NC + NO break before make, slow break (XE2NP2151)	**XCKM510H29** ⊖ 	**XCKM502H29** ⊖ 	**XCKM521H29** ⊖ 	**XCKM515H29** ⊖ 	**XCKM506H29** 
2-pole NC + NC snap action (XE2SP2141)	**ZCKM9H29 + ZCKD10** ⊖ 	**ZCKM9H29 + ZCKD02** ⊖ 	**ZCKM9H29 + ZCKD21** ⊖ 	**ZCKM9H29 + ZCKD15** ⊖ 	**ZCKM9H29 + ZCKD06** 
2-pole NC + NC simultaneous, slow break (XE2NP2141)	**ZCKM7H29 + ZCKD10** ⊖ 	**ZCKM7H29 + ZCKD02** ⊖ 	**ZCKM7H29 + ZCKD21** ⊖ 	**ZCKM7H29 + ZCKD15** ⊖ 	**ZCKM7H29 + ZCKD06**
3-pole NC + NC + NO snap action (XE3SP2141) 	**ZCKMD39H29 + ZCKD10** ⊖ 	**ZCKMD39H29 + ZCKD02** ⊖ 	**ZCKMD39H29 + ZCKD21** ⊖ 	**ZCKMD39H29 + ZCKD15** ⊖ 	**ZCKMD39H29 + ZCKD06** 
3-pole NC + NC + NO break before make, slow break (XE3NP2141) 	**ZCKMD37H29 + ZCKD10** ⊖ 	**ZCKMD37H29 + ZCKD02** ⊖ 	**ZCKMD37H29 + ZCKD21** ⊖ 	**ZCKMD37H29 + ZCKD15** ⊖ 	**ZCKMD37H29 + ZCKD06** 
Weight (kg)	0.250	0.255	0.300	0.280	0.250

Contact operation: ■ *closed* □ *open* — *(A) = cam displacement* *(P) = positive opening point* — ⊖ *NC contact with positive opening operation*

References of complete switches with 3 Pg 11 cable entries

For complete switches with 3 Pg 11 cable entries, delete **H29** from the end of the reference. Example: **XCKM110H29** becomes **XCKM110**.

Characteristics

Switch actuation		On end	By 30° cam			By any moving part
Type of actuation						
Maximum actuation speed		0.5 m/s		1.5 m/s		1 m/s (any direction)
Mechanical durability *(4)* **(in millions of operating cycles)**		20			15	10
Minimum force or torque	For tripping	15 N	12 N	8 N	0.1 N.m	0.13 N.m
	For positive opening	45 N	36 N	24 N	0.25 N.m	–
Cable entry		3 entries tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm				

(1) Adjustable throughout 360° in 5° steps, or in 90° steps by reversing the notched washer.
(2) Value taken with actuation by moving part at 100 mm from the fixing.
(3) Switches with gold contacts or eyelet type connections: please consult our Customer Care Centre.
(4) Limited to 15 million operating cycles for switches with contacts XE3●P.

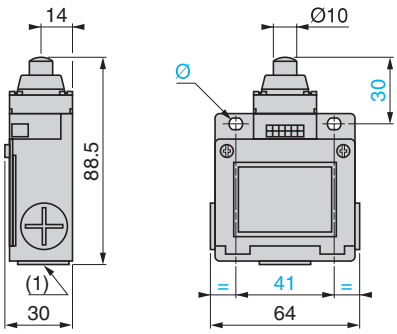
Limit switches

OsiSense XC Standard, Classic format

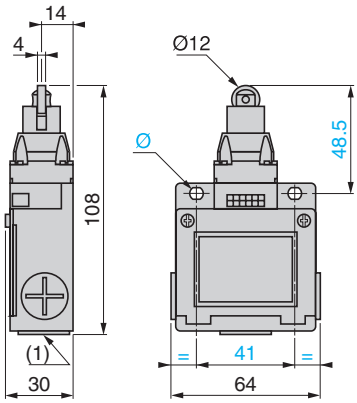
Metal, type XCKM

Complete switches with 3 cable entries

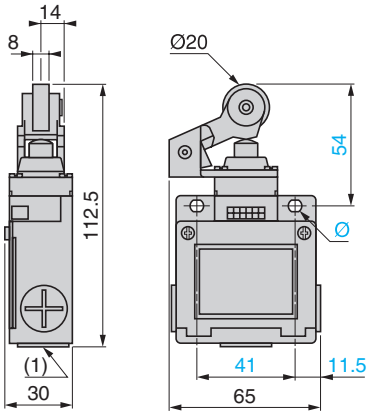
XCKM●10
ZCKMD3● + ZCKD10



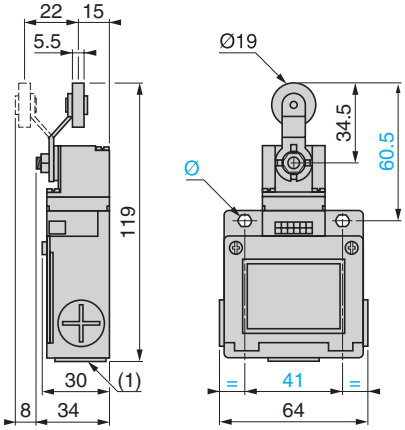
XCKM●02
ZCKMD3● + ZCKD02



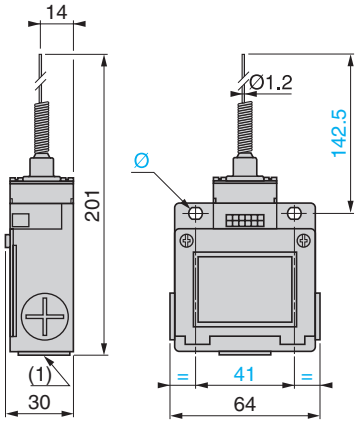
XCKM●21
ZCKMD3● + ZCKD21



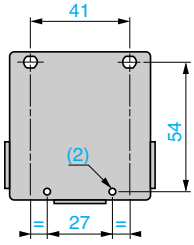
XCKM●15
ZCKMD3● + ZCKD15



XCKM●06
ZCKMD3● + ZCKD06

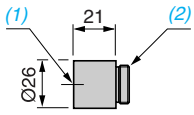


Rear view XCKM●●●, ZCKM●, ZCKMD3●



(1) 3 tapped entries for ISO M20 x 1.5 or Pg 11 cable gland or with 1/2" NPT conduit adaptor DE9RA1012.
(2) 2 x Ø 4 H 11, depth 10.
Ø: 2 elongated holes Ø 5.2 x 6.2

Adaptor for 1/2" NPT conduit
DE9RA1012



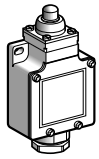
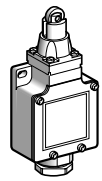
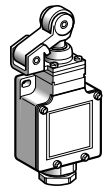
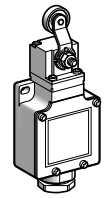
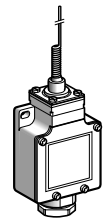
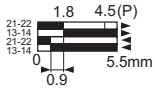
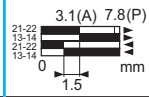
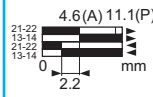
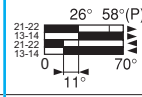
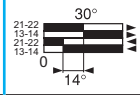
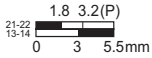
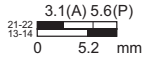
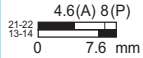
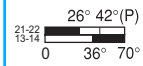
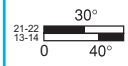
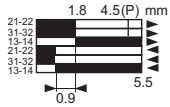
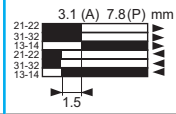
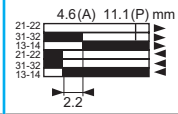
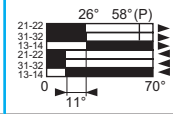
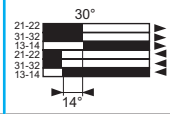
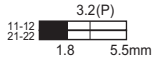
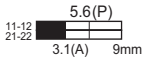
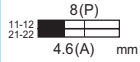
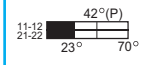
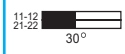
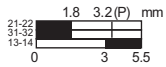
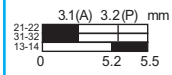
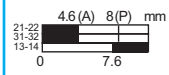
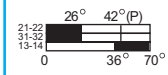
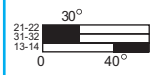
(1) Tapped entry for 1/2" NPT conduit.
(2) Pg 11 threaded sleeve.

Limit switches

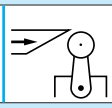
OsiSense XC Standard, Classic format

Metal, type XCKL

Complete switches incorporating Pg 13.5 cable gland

Type of head	Plunger (fixing by the body)			Rotary (fixing by the body)	Multi-directional, (fixing by the body)
					
Type of operator	Metal end plunger	Steel roller plunger	Thermoplastic roller lever plunger, horizontal actuation in 1 direction	Thermoplastic roller lever *(1)*	"Cat's whisker" *(2)*
References *(3)*					
2-pole NC + NO snap action (XE2SP2151)	**XCKL110** ⊖ 	**XCKL102** ⊖ 	**XCKL121** ⊖ 	**XCKL115** ⊖ 	**XCKL106** 
2-pole NC + NO break before make, slow break (XE2NP2151)	**XCKL510** ⊖ 	**XCKL502** ⊖ 	**XCKL521** ⊖ 	**XCKL515** ⊖ 	**XCKL506** 
3-pole NC + NC + NO snap action (XE3SP2141)	**ZCKLD39 + ZCKD10** ⊖ 	**ZCKLD39 + ZCKD02** ⊖ 	**ZCKLD39 + ZCKD21** ⊖ 	**ZCKLD39 + ZCKD15** ⊖ 	**ZCKLD39 + ZCKD06** 
2-pole NC + NC simultaneous, slow break (XE2NP2141)	**ZCKL7 + ZCKD10** ⊖ 	**ZCKL7 + ZCKD02** ⊖ 	**ZCKL7 + ZCKD21** ⊖ 	**ZCKL7+ ZCKD15** ⊖ 	**ZCKL7 + ZCKD06** 
3-pole NC + NC + NO break before make, slow break (XE3NP2141)	**ZCKLD37 + ZCKD10** ⊖ 	**ZCKLD37 + ZCKD02** ⊖ 	**ZCKLD37 + ZCKD21** ⊖ 	**ZCKLD37 + ZCKD15** ⊖ 	**ZCKLD37 + ZCKD06** 
Weight (kg)	0.255	0.260	0.305	0.285	0.255
Contact operation	■ *closed* □ *open*	*(A) = cam displacement* *(P) = positive opening point*		⊖ *NC contact with positive opening operation*	

Characteristics

Switch actuation	On end	By 30° cam			By any moving part
Type of actuation					
Maximum actuation speed	0.5 m/s		1.5 m/s		1 m/s (any direction)
Mechanical durability *(4)* **(in millions of operating cycles)**	20			15	10
Minimum force or torque — For tripping	15 N	12 N	8 N	0.1 N.m	0.13 N.m
Minimum force or torque — For positive opening	45 N	36 N	24 N	0.25 N.m	–
Cable entry	1 entry incorporating metal cable gland. Clamping capacity 6 to 13.5 mm.				

(1) Adjustable throughout 360° in 5° steps, or in 90° steps by reversing the notched washer.
(2) Value taken with actuation by moving part at 100 mm from the fixing.
(3) Switches with gold contacts or eyelet type connections: please consult our Customer Care Centre.
(4) Limited to 15 million operating cycles for switches with contacts XE3●P.

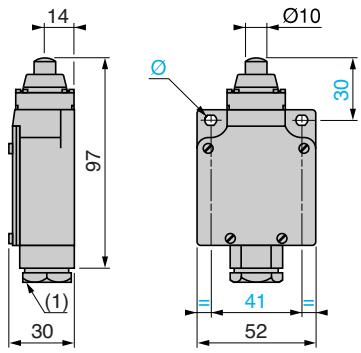
Limit switches

OsiSense XC Standard, Classic format

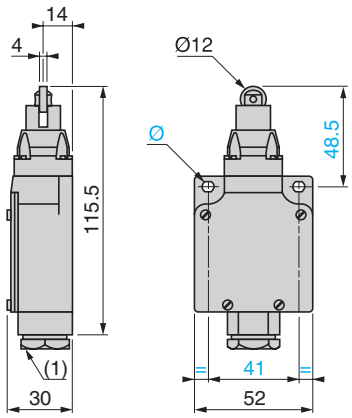
Metal, type XCKL

Complete switches incorporating Pg 13.5 cable gland

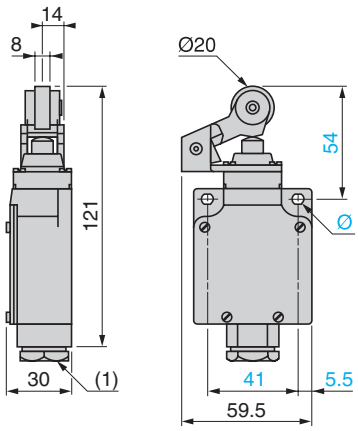
XCKL●10
ZCKL● + ZCKD10
ZCKLD3● + ZCKD10



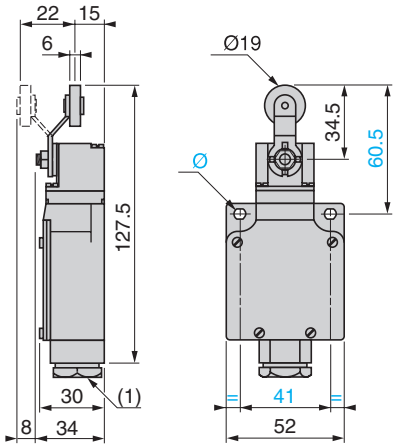
XCKL●02
ZCKL3● + ZCKD02
ZCKLD3● + ZCKD02



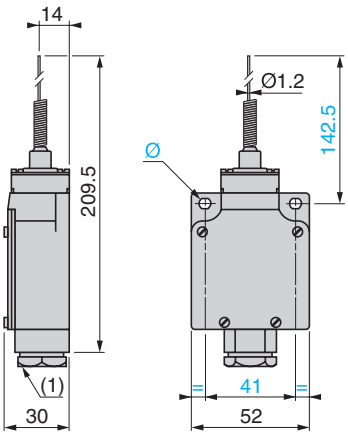
XCKL●21
ZCKL● + ZCKD21
ZCKLD3● + ZCKD21



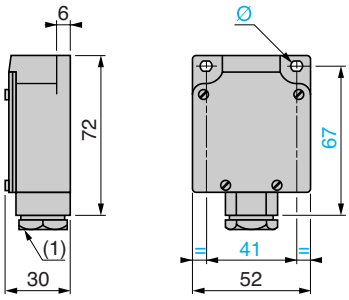
XCKL●15
ZCKL● + ZCKD15
ZCKLD3● + ZCKD15



XCKL●06
ZCKL● + ZCKD06
ZCKLD3● + ZCKD06



Body fixings

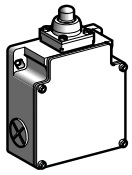
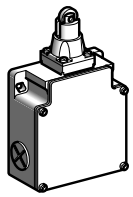
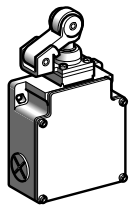
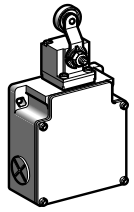
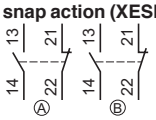
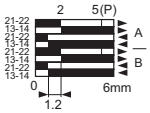
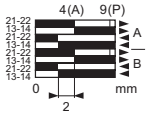
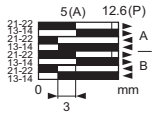
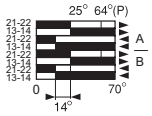
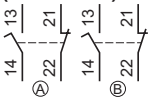
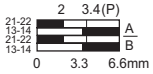
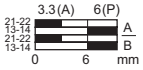
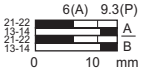
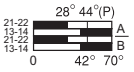
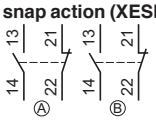
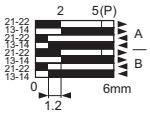
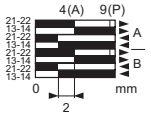
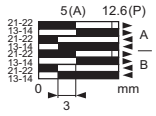
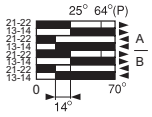
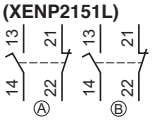
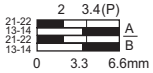
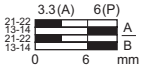
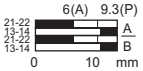
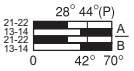


(1) Incorporated Pg 13.5 cable gland
Ø: 2 elongated holes Ø 5.2 x 6.2

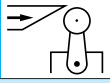
Limit switches

OsiSense XC Standard, Classic format

Metal, 2 x 2-pole contacts, type XCKML
Complete switches with 3 cable entries

Type of head	Plunger (fixing by the body)			Rotary (fixing by the body)
				
Type of operator	Metal end plunger	Steel roller plunger	Thermoplastic roller lever plunger, horizontal actuation in 1 direction	Thermoplastic roller lever *(1)*
References of complete switches with 3 ISO M20 x 1.5 cable entries *(2)*				
2 x 2-pole NC + NO snap action (XESP2151L) 	**XCKML110H29** ⊖ 	**XCKML102H29** ⊖ 	**XCKML121H29** ⊖ 	**XCKML115H29** ⊖ 
2 x 2-pole NC + NO break before make, slow break (XENP2151L) 	**XCKML510H29** ⊖ 	**XCKML502H29** ⊖ 	**XCKML521H29** ⊖ 	**XCKML515H29** ⊖ 
References of complete switches with 3 entries tapped for n° 13 cable gland *(2)*				
2 x 2-pole NC + NO snap action (XESP2151L) 	**XCKML110** ⊖ 	**XCKML102** ⊖ 	**XCKML121** ⊖ 	**XCKML115** ⊖ 
2 x 2-pole NC + NO break before make, slow break (XENP2151L) 	**XCKML510** ⊖ 	**XCKML502** ⊖ 	**XCKML521** ⊖ 	**XCKML515** ⊖ 
Weight (kg)	0.400	0.405	0.450	0.430
Contact operation	■ *closed* □ *open*	*(A) = cam displacement* *(P) = positive opening point*	⊖ *NC contact with positive opening operation*	

Characteristics

Switch actuation	On end	By 30° cam		
Type of actuation				
Maximum actuation speed	0.5 m/s		1.5 m/s	
Mechanical durability	3 million operating cycles			
Minimum force For tripping	15 N	12 N	8 N	0.2 N.m
For positive opening	60 N	50 N	50 N	0.5 N.m
Cable entry	3 entries tapped ISO M20 x 1.5, clamping capacity 7 to 13 mm, or 3 entries tapped for n° 13 cable gland conforming to NF C 68-300 (DIN Pg 13.5), clamping capacity 9 to 12 mm.			

(1) Adjustable throughout 360° in 5° steps, or in 90° steps by reversing the notched washer.
(2) Switches available with other 2-pole slow break contact blocks: NO + NC make before break, NC + NC simultaneous (with positive opening operation), NO + NO simultaneous. Please consult our Customer Care Centre.

Note: replacement parts
*The heads of limit switches type XCKML are the same as those for types XCKM and XCKL (see heads **ZCKD10**, **ZCKD02**, **ZCKD21** and **ZCKD15** on page 1/82).*

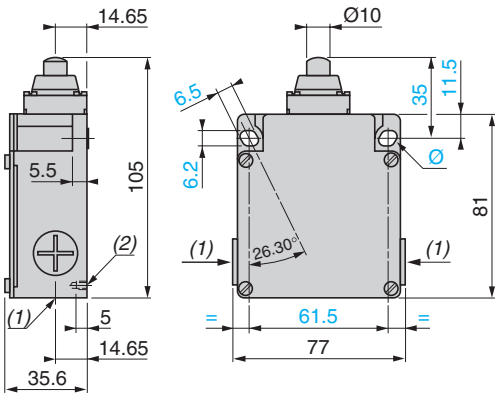
Telemecanique Sensors

Limit switches

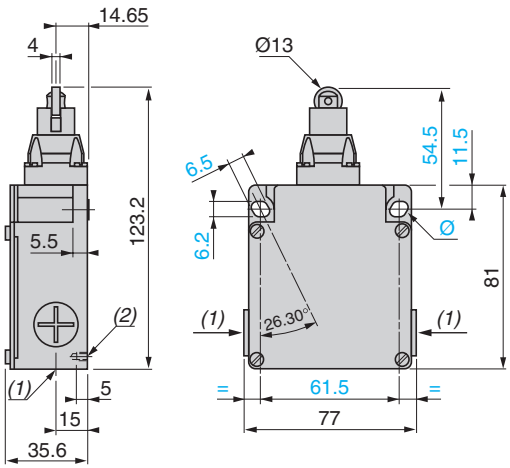
OsiSense XC Standard, Classic format

Metal, 2 x 2-pole contacts, type XCKML
Complete switches with 3 cable entries

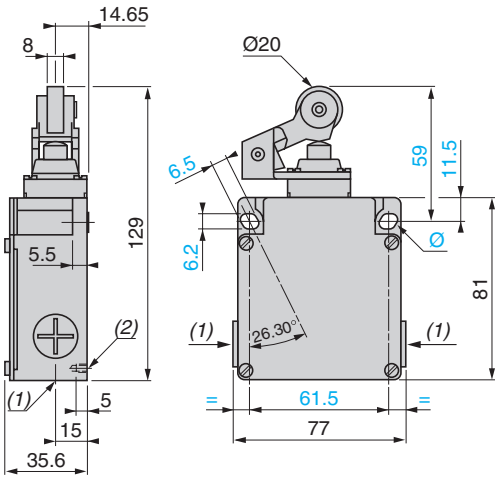
XCKML110H29, XCKML510H29, XCKML110, XCKML510



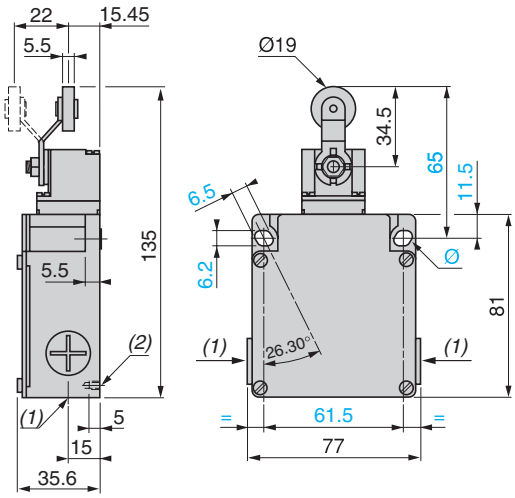
XCKML102H29, XCKML502H29, XCKML102, XCKML502



XCKML121H29, XCKML521H29, XCKML121, XCKML521



XCKML115H29, XCKML515H29, XCKML115, XCKML515

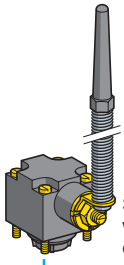


*(1) **XCKML●●●H29**: 3 entries tapped M20 x 1.5. **XCKML●●●**: 3 tapped entries for n° 13 cable gland.*
(2) 2 centring holes Ø 3.9 ± 0.2, for cover fixing holes alignment.
Ø 2 elongated holes 6.2 x 6.5, inclined at 26° 30′ to the vertical axis, for M5 screws.

Limit switches

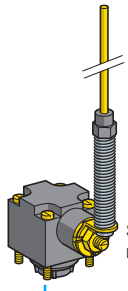
OsiSense XC Standard, Classic format

Metal, types XCKM and XCKL
Variable composition



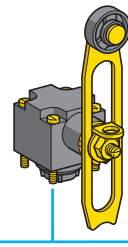
Spring-rod lever with thermoplastic end *(4)*

ZCKD81



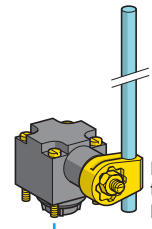
Spring-rod lever, metal *(4)*

ZCKD91



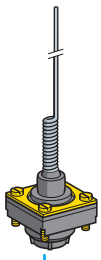
Variable length thermoplastic roller lever *(4)*

ZCKD41



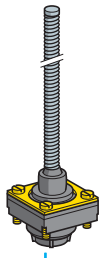
Round rod lever, thermoplastic, Ø 6 mm L = 200 mm *(5)*

ZCKD59



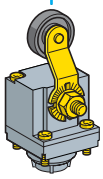
"Cat's whisker"

ZCKD06



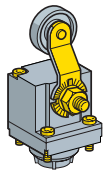
Spring rod

ZCKD08



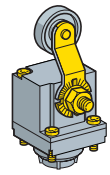
Thermoplastic roller lever *(4)*

ZCKD15



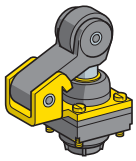
Steel roller lever *(4)*

ZCKD16



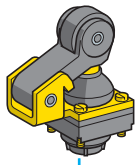
Steel ball bearing mounted roller lever *(4)*

ZCKD17



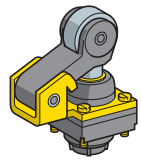
Thermoplastic roller lever 1 direction of actuation

ZCKD21



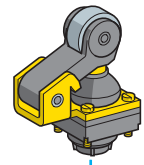
Thermoplastic roller lever plunger with protective boot, 1 direction of actuation

ZCKD219



Steel roller lever plunger 1 direction of actuation

ZCKD23

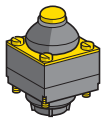


Steel roller lever plunger with protective boot 1 direction of actuation

ZCKD239

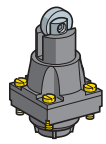
Metal end plunger

ZCKD10



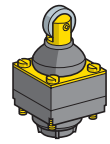
Metal end plunger with protective boot

ZCKD109



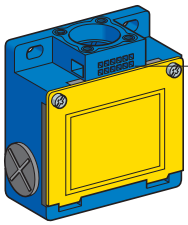
Steel roller plunger

ZCKD02



Steel roller plunger with with protective boot

ZCKD029



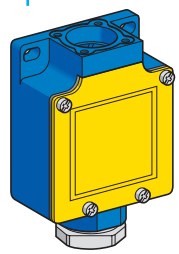
AB1 R11

Body with 2-pole contact, 3 cable entries for Pg 11 *(1) (2)*

ZCKM1, M5, M6, M7, M9
ZCKM8

Body with 3-pole contact, 3 cable entries for Pg 11 *(1) (2)*

ZCKMD3●



Body with 2-pole contact, with incorporated Pg 13.5 cable gland *(1) (3)*

ZCKL1, L5, L6, L7
ZCKL8

Body with 3-pole contact, with incorporated Pg 13.5 cable gland *(1) (3)*

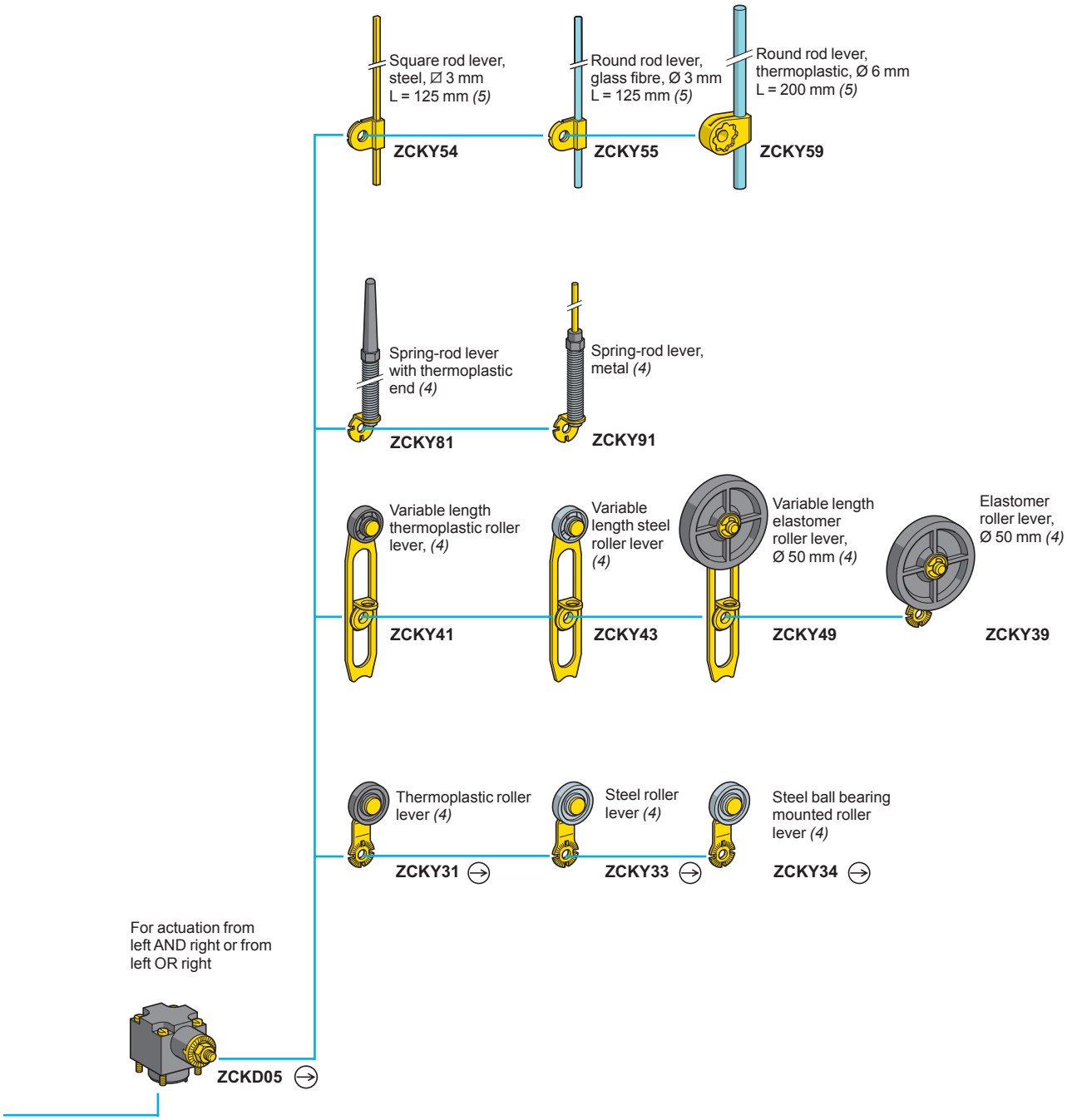
ZCKLD3●

(1) For further information, see page 1/84.
*(2) For 3 cable entries tapped ISO M20 x 1.5, add **H29** to the reference. Example: ZCKM1 becomes **ZCKM1H29**.*
*For one cable entry with 1/2" NPT adaptor, add **H7** to the reference. Example: ZCKM1 becomes **ZCKM1H7**.*
*(3) For one cable entry tapped 1/2" NPT, add **H7** to the reference. Example: ZCKL1 becomes **ZCKL1H7**.*

Limit switches

OsiSense XC Standard, Classic format

Metal, types XCKM and XCKL
Variable composition



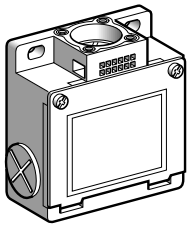
⊖: head assuring positive opening operation.
(4) Adjustable throughout 360° in 5° steps, or in 90° steps by reversing the notched washer.
(5) Adjustable throughout 360° in 5° steps, or in 45° steps by reversing the lever mounting.

Limit switches

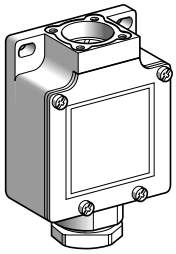
OsiSense XC Standard, Classic format

Metal, types XCKM and XCKL

Adaptable sub-assemblies



ZCKM●



ZCKL●

Bodies with 2-pole contact

With contact block	Scheme	Positive operation *(1)*	Cable entry	Reference	Weight kg
For limit switches type XCKM					
NC + NO snap action (XE2SP2151)	13 21 / 14 22	⊖	Pg 11	**ZCKM1**	0.210
			ISO M20 x 1.5	**ZCKM1H29**	0.210
			1/2" NPT *(2)*	**ZCKM1H7**	0.210
NC + NO break before make, slow break (XE2NP2151)	13 21 / 14 22	⊖	Pg 11	**ZCKM5**	0.210
			ISO M20 x 1.5	**ZCKM5H29**	0.210
			1/2" NPT *(2)*	**ZCKM5H7**	0.210
NO + NC make before break, slow break (XE2NP2161)	21 13 / 22 14	⊖	Pg 11	**ZCKM6**	0.210
			ISO M20 x 1.5	**ZCKM6H29**	0.210
			1/2" NPT *(2)*	**ZCKM6H7**	0.210
NC + NC simultaneous, slow break (XE2NP2141)	11 21 / 12 22	⊖	Pg 11	**ZCKM7**	0.210
			ISO M20 x 1.5	**ZCKM7H29**	0.210
			1/2" NPT *(2)*	**ZCKM7H7**	0.210
NO + NO simultaneous, slow break (XE2NP2131)	13 23 / 14 24	–	Pg 11	**ZCKM8**	0.210
			ISO M20 x 1.5	**ZCKM8H29**	0.210
			1/2" NPT *(2)*	**ZCKM8H7**	0.210
NC + NC snap action (XE2SP2141)	11 21 / 12 22	⊖	Pg 11	**ZCKM9**	0.210
			ISO M20 x 1.5	**ZCKM9H29**	0.210
For limit switches type XCKL					
NC + NO snap action (XE2SP2151)	13 21 / 14 22	⊖	Pg 13.5	**ZCKL1** *(3)*	0.210
			1/2" NPT	**ZCKL1H7**	0.210
NC + NO break before make, slow break (XE2NP2151)	13 21 / 14 22	⊖	Pg 13.5	**ZCKL5** *(3)*	0.210
			1/2" NPT	**ZCKL5H7**	0.210
NO + NC make before break, slow break (XE2NP2161)	21 13 / 22 14	⊖	Pg 13.5	**ZCKL6** *(3)*	0.210
			1/2" NPT	**ZCKL6H7**	0.210
NC + NC simultaneous, slow break (XE2NP2141)	11 21 / 12 22	⊖	Pg 13.5	**ZCKL7** *(3)*	0.210
			1/2" NPT	**ZCKL7H7**	0.210
NO + NO simultaneous, slow break (XE2NP2131)	13 23 / 14 24	–	Pg 13.5	**ZCKL8** *(3)*	0.210
			1/2" NPT	**ZCKL8H7**	0.210

(1) ⊖: NC contact with positive opening operation.

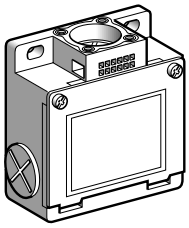
(2) 3 tapped entries, one with metal adaptor for 1/2" NPT (USASB2-1) conduit.

(3) Pg 13.5 cable gland included with switch.

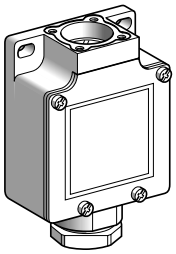
Limit switches

OsiSense XC Standard, Classic format

Metal, types XCKM and XCKL
Adaptable sub-assemblies



ZCKMD3●



ZCKLD3●

Bodies with 3-pole contact

With contact block	Scheme	Positive operation *(1)*	Cable entry	Reference	Weight kg
For limit switches type XCKM					
NC + NO + NO snap action (XE3SP2151)	21 33 13 / 22 34 14	⊖	Pg 11	**ZCKMD31**	0.210
			ISO M20 x 1.5	**ZCKMD31H29**	0.210
			1/2" NPT *(2)*	**ZCKMD31H7**	0.210
NC + NC + NO snap action (XE3SP2141)	31 21 13 / 32 22 14	⊖	Pg 11	**ZCKMD39**	0.210
			ISO M20 x 1.5	**ZCKMD39H29**	0.210
			1/2" NPT *(2)*	**ZCKMD39H7**	0.210
NC + NC + NO break before make, slow break (XE3NP2141)	31 21 13 / 32 22 14	⊖	Pg 11	**ZCKMD37**	0.210
			ISO M20 x 1.5	**ZCKMD37H29**	0.210
			1/2" NPT *(2)*	**ZCKMD37H7**	0.210
NC + NO + NO break before make, slow break (XE3NP2151)	21 33 13 / 22 34 14	⊖	Pg 11	**ZCKMD35**	0.210
			ISO M20 x 1.5	**ZCKMD35H29**	0.210
			1/2" NPT *(2)*	**ZCKMD35H7**	0.210
For limit switches type XCKL					
NC + NO + NO snap action (XE3SP2151)	21 33 13 / 22 34 14	⊖	Pg 13.5	**ZCKLD31** *(3)*	0.210
			1/2" NPT	**ZCKLD31H7**	0.210
NC + NC + NO snap action (XE3SP2141)	31 21 13 / 32 22 14	⊖	Pg 13.5	**ZCKLD39** *(3)*	0.210
			1/2" NPT	**ZCKLD39H7**	0.210
NC + NC + NO break before make, slow break (XE3NP2141)	31 21 13 / 32 22 14	⊖	Pg 13.5	**ZCKLD37** *(3)*	0.210
			1/2" NPT	**ZCKLD37H7**	0.210
NC + NO + NO break before make, slow break (XE3NP2151)	21 33 13 / 22 34 14	⊖	Pg 13.5	**ZCKLD35** *(3)*	0.210
			1/2" NPT	**ZCKLD35H7**	0.210

(1) ⊖ : NC contact with positive opening operation.

(2) 3 tapped entries, one with metal adaptor for 1/2" NPT (USASB2-1) conduit.

(3) Pg 13.5 cable gland included with switch.

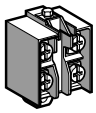
Limit switches

OsiSense XC Standard, Classic format

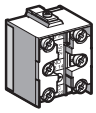
Metal, types XCKM and XCKL

Adaptable sub-assemblies

XE2SP21●1



XE2NP21●1



XE3●P21●●

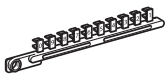
Contact blocks

Type of contact	Scheme	For bodies	Positive operation *(1)*	Reference	Weight kg
2-pole contact					
NC + NO **snap action**	13 21 / 14 22	ZCKM1 ZCKL1	⊖	**XE2SP2151**	0.020
NC + NO **break before make,** **slow break**	13 21 / 14 22	ZCKM5 ZCKL5	⊖	**XE2NP2151**	0.020
NO + NC **make before break,** **slow break**	21 13 / 22 14	ZCKM6 ZCKL6	⊖	**XE2NP2161**	0.020
NC + NC **simultaneous,** **slow break**	11 21 / 12 22	ZCKM7 ZCKL7	⊖	**XE2NP2141**	0.020
NO + NO **simultaneous,** **slow break**	13 23 / 14 24	ZCKM8 ZCKL8	–	**XE2NP2131**	0.020
NC + NC **snap action**	11 21 / 12 22	ZCKM9	⊖	**XE2SP2141**	0.020
3-pole contact					
NC + NO + NO **snap action**	21 33 13 / 22 34 14	ZCKMD31 ZCKLD31	⊖	**XE3SP2151**	0.035
NC + NC + NO **snap action**	31 21 13 / 32 22 14	ZCKMD39 ZCKLD39	⊖	**XE3SP2141**	0.035
NC + NC + NO **break before make,** **slow break**	31 21 13 / 32 22 14	ZCKMD37 ZCKLD37	⊖	**XE3NP2141**	0.035
NC + NO + NO **break before make,** **slow break**	21 33 13 / 22 34 14	ZCKMD35 ZCKLD35	⊖	**XE3NP2151**	0.035

(1) ⊖ : NC contact with positive opening operation or sub-assembly assuring positive opening operation.

Accessories for limit switches type XCKM

XCKZ09



AB1R11

Description	Sold in lots of	Unit reference	Weight kg
Tap-off terminal for cabling continuity	1	**XCKZ09**	0.010
Clip-in markers (strips of 10 numbers: 0 to 9) **Other markers,** please consult our Customer Care Centre.	25	**AB1R11**	0.002

Other versions Gold flashed contacts.
Please consult our Customer Care Centre.

Limit switches

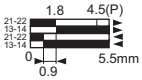
OsiSense XC Standard, Classic format

Metal, types XCKM and XCKL

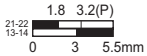
Adaptable sub-assemblies

Heads ZCKD10, D109 with body

ZCKM1, L1

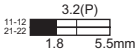


ZCKM5, L5



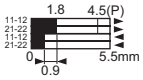
ZCKM6, L6

ZCKM7, L7

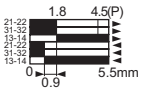


ZCKM8, L8

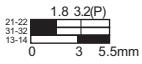
ZCKM9



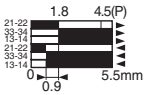
ZCKMD39, LD39



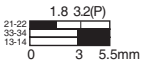
ZCKMD37, LD37



ZCKMD31, LD31

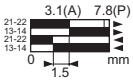


ZCKMD35, LD35

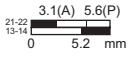


Heads ZCKD02, D029 with body

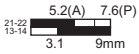
ZCKM1, L1



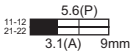
ZCKM5, L5



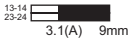
ZCKM6, L6



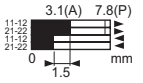
ZCKM7, L7



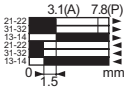
ZCKM8, L8



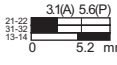
ZCKM9



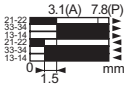
ZCKMD39, LD39



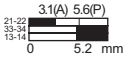
ZCKMD37, LD37



ZCKMD31, LD31

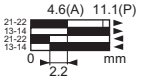


ZCKMD35, LD35

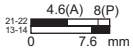


Heads ZCKD21, D23, D219, D239 with body

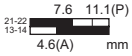
ZCKM1, L1



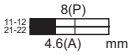
ZCKM5, L5



ZCKM6, L6

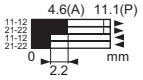


ZCKM7, L7

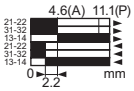


ZCKM8, L8

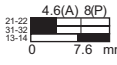
ZCKM9



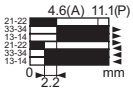
ZCKMD39, LD39



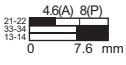
ZCKMD37, LD37



ZCKMD31, LD31

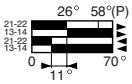


ZCKMD35, LD35

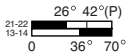


Heads ZCKD15, D16, D17 with body

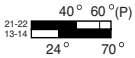
ZCKM1, L1



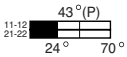
ZCKM5, L5



ZCKM6, L6

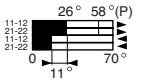


ZCKM7, L7

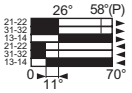


ZCKM8, L8

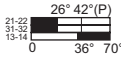
ZCKM9



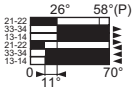
ZCKMD39, LD39



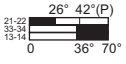
ZCKMD37, LD37



ZCKMD31, LD31

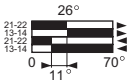


ZCKMD35, LD35

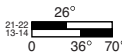


Heads ZCKD41, D59, D81, D91 with body

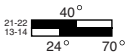
ZCKM1, L1



ZCKM5, L5



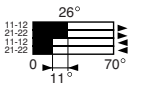
ZCKM6, L6



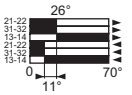
ZCKM7, L7

ZCKM8, L8

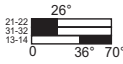
ZCKM9



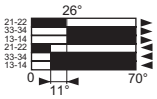
ZCKMD39, LD39



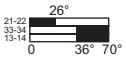
ZCKMD37, LD37



ZCKMD31, LD31

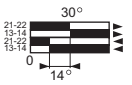


ZCKMD35, LD35

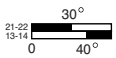


Heads ZCKD06, D08 with body

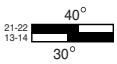
ZCKM1, L1



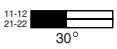
ZCKM5, L5



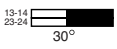
ZCKM6, L6



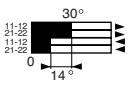
ZCKM7, L7



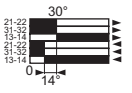
ZCKM8, L8



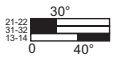
ZCKM9



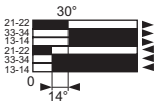
ZCKMD39, LD39



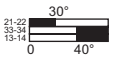
ZCKMD37, LD37



ZCKMD31, LD31



ZCKMD35, LD35



Contact operation

- ■ closed
- □ open

(A) = cam displacement
(P) = positive opening point

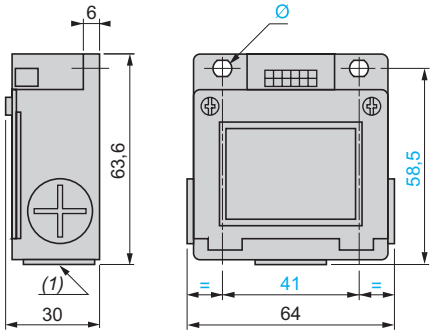
Limit switches

OsiSense XC Standard, Classic format

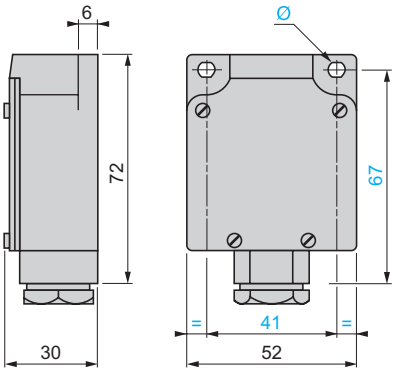
Metal, types XCKM and XCKL
Adaptable sub-assemblies

Bodies with contacts

ZCKM1, M5, M6, M7, M8, M9, MD3●, MD3H●29, MD3●H7
ZCKM1H29, M5H29, M6H29, M7H29, M8H29, M9H29
ZCKM1H7, M5H7, M6H7, M7H7, M8H7

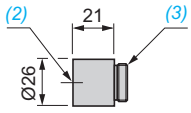


ZCKL1, L5, L6, L7, L8, LD3● (with incorporated Pg 13.5 cable gland)
ZCKL1H7, L5H7, L6H7, L7H7, L8H7, LD3●H7 (with 1/2" NPT cable entry)



Adaptor for 1/2" NPT conduit

DE9RA1012



(1) 3 tapped entries for ISO M20 x 1.5 or Pg 11 cable gland.
Ø: 2 elongated holes Ø 5.2 x 6.2
(2) Tapped entry for 1/2" NPT conduit.
(3) Pg 11 threaded sleeve.

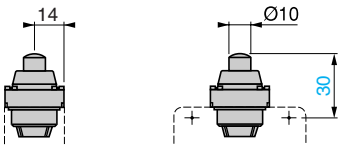
Limit switches

OsiSense XC Standard, Classic format

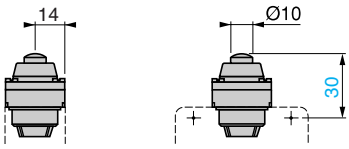
Metal, types XCKM and XCKL
Adaptable sub-assemblies

Plunger heads

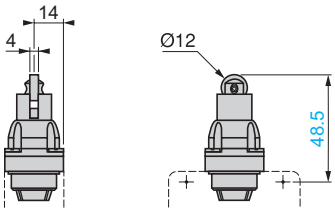
ZCKD10



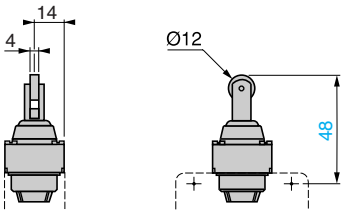
ZCKD109



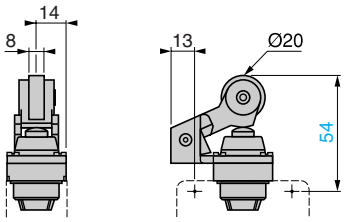
ZCKD02



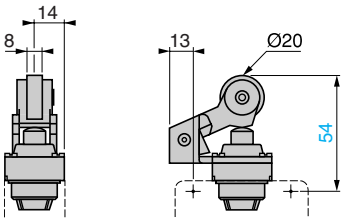
ZCKD029



ZCKD21, D23

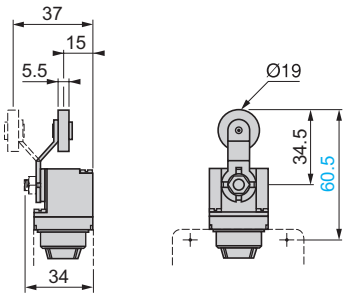


ZCKD219, D239

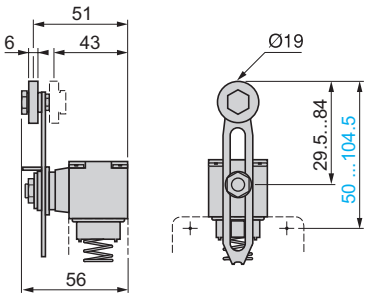


Rotary heads

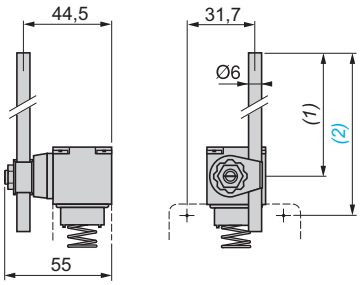
ZCKD15, D16, D17



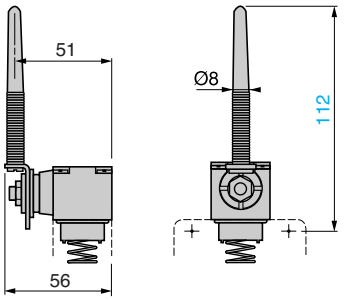
ZCKD41



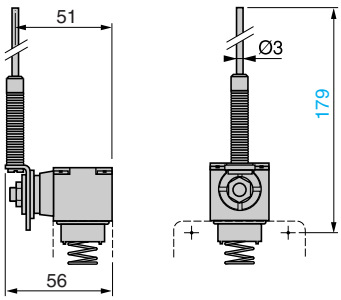
ZCKD59



ZCKD81

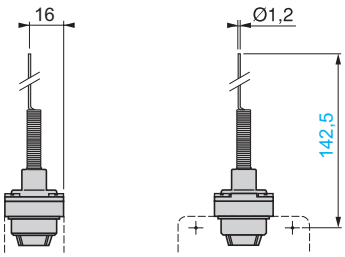


ZCKD91

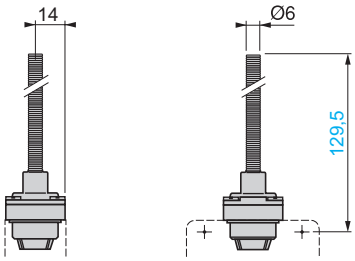


Multi-directional heads

ZCKD06



ZCKD08



(1) 190 max.
(2) 215.5 max.

Note: *operating lever spindle threaded M6.*

Limit switches

OsiSense XC Standard, format EN 50041

Plastic, double insulated, XCKS

1

Complete switch

with 2 contacts (NO + NC) and 1 cable entry

■ The OsiSense XCKS limit switches range, with 2 integrated contacts, offers “all-in-one”, ready to use products.

□ XCKS, with head for linear (plunger) and rotary (lever) movemen

Variable composition switch

with 2, 3 or 4 contacts and 1 cable entry

■ The variable composition range expands the offer up to 4 contacts and choice among 18 different actuators.

□ ZCKD: complete head with linear or rotary actuator
□ ZCKS: bodies with 2, 3 or 4 contacts

Environment characteristics

Conformity to standards	Products	EN/IEC 60947-5-1, UL 508, CSA C22-2 n°14, CCC, EAC
	Machine assemblies	EN/IEC 60204-1
Product certifications		UL, CSA, CCC, EAC
Protective treatment	Version	Standard “TC”, special “TH”
Ambient air temperature	For operation	- 25…+ 70 °C
	For storage	- 40…+ 70 °C
Vibration resistance	Conforming to EN/IEC 60068-2-6	25 gn (10…500 Hz)
Shock resistance	Conforming to EN/IEC 60068-2-27	**XCKS1●●**: 40 gn (11 ms) **XCKS5●●**: 50 gn (11 ms)
Electric shock protection	Conforming to EN/IEC 61140	Class II
Degree of protection	Conforming to EN/IEC 60529	**XCKS1●●**, **XCKS5●●**: IP 66 and IP 67 **ZCKS**: IP 65
	Conforming to EN 62262	**XCKS1●●**, **XCKS5●●**: IK 05 **ZCKS**: IK 03
Cable entry	Depending on model	Tapped entry for n° 13 cable gland or tapped ISO M20 x 1.5
Materials		Bodies and heads: plastic

Limit switches

OsiSense XC Standard, format EN 50041

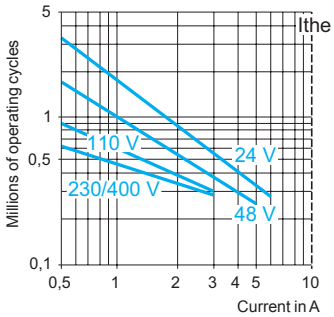
Plastic, double insulated, XCKS

Contact block characteristics

Type of contacts	Conforming to EN/IEC 60947-5-1	Type Zb, electrically separate double break contacts
Positive operation (depending on model)		NC contacts with positive opening operation conforming to EN/IEC 60947-5-1 Appendix K
Rated operational characteristics	XCKS1●●, XCKS5●● XE2●P●, XESP●	∼ AC-15 ; A300 (Ue = 240 V, Ie = 3 A) ; Ithe = 10 A ⎓ DC-13 ; Q300 (Ue = 250 V, Ie = 0.27 A), conforming to EN/IEC 60947-5-1 Appendix A
	XE3●P●	∼ AC-15 ; B300 (Ue = 240 V, Ie = 1.5 A) ; Ithe = 6 A ⎓ DC-13 ; R300 (Ue = 250 V, Ie = 0.1 A), conforming to EN/IEC 60947-5-1 Appendix A
Rated insulation voltage	XCKS1●●, XCKS5●● XE2●P●, XESP●	Ui = 500 V degree of pollution 3 conforming to EN/IEC 60947-5-1
	XE3●P●	Ui = 300 V conforming to UL 508 and CSA C22-2 n° 14
Rated impulse withstand voltage	XCKS1●●, XCKS5●● XE2●P●, XESP●	U imp = 6 kV conforming to EN/IEC 60947-1, IEC 60664
	XE3●P●	U imp = 4 kV conforming to EN/IEC 60947-1, IEC 60664
Short-circuit protection	XCKS1●●, XCKS5●● XE2●P●, XESP●	10 A cartridge fuse type gG (gI)
	XE3●P●	6 A cartridge fuse type gG (gI)
Resistance across terminals		≤ 25 mΩ conforming to EN/IEC 60255-7 category 3
Connection (screw clamp terminals)	XCKS1●●, XCKS5●● XE2SP21●1	Clamping capacity, min: 1 x 0.34 mm² / AWG 22, max: 2 x 1.5 mm² / AWG 16
	XE2NP21●1	Clamping capacity, min: 1 x 0.5 mm² / AWG 20, max: 2 x 2.5 mm² / AWG 14
	XESP●	Clamping capacity, min: 1 x 0.75 mm² / AWG 20, max: 2 x 1.5 mm² / AWG 16
	XE3●P●	Clamping capacity, min: 1 x 0.34 mm² / AWG 22, max: 1 x 1 mm² / AWG 18 or 2 x 0.75 mm² / AWG 20
Minimum actuation speed		Snap action contacts (**XCKS1●, XE●SP●** and **XESP●**): 0.01 m/minute
		Slow break contacts (**XCKS5●, XE2NP●** and **XE3NP●**): 6 m/minute
Electrical durability	XCKS1●● + LC1D38 / ∼ 230 V	15 million operating cycles
	XCKS5●● + LC1D38 / ∼ 230 V	20 million operating cycles
	ZCKS	■ Conforming to IEC 60947-5-1 Appendix C ■ Utilisation categories AC-15 and DC-13 ■ Maximum operating rate: 3600 operating cycles/hour ■ Load factor: 0.5

XE2SP21●1, XE2SP2141

AC supply 50/60 Hz ∼ ⩘ inductive circuit

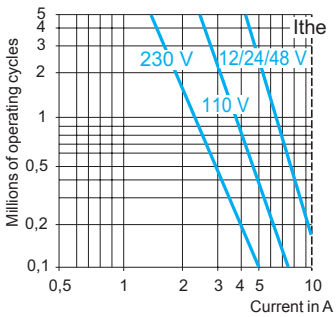


DC supply ⎓

Power broken in W for 5 million operating cycles.

Voltage	V	24	48	120
⩘	W	10	7	4

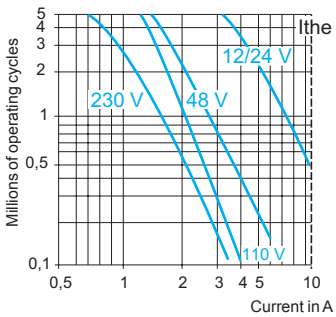
XE2NP21●1



Power broken in W for 5 million operating cycles.

Voltage	V	24	48	120
⩘	W	13	9	7

XESP3021



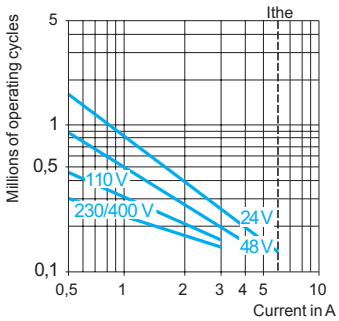
Power broken in W for 5 million operating cycles.

Voltage	V	24	48	120
⩘	W	10	7	4

For XE2S P●151 on ∼ or ⎓, NC and NO contacts simultaneously loaded to the values shown with reverse polarity.

XE3SP●●●●

AC supply 50/60 Hz ∼ ⩘ inductive circuit

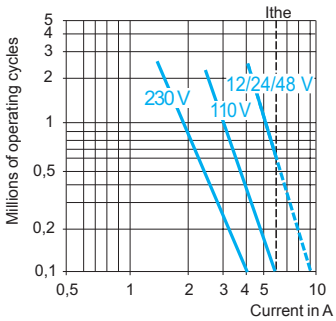


DC supply ⎓

Power broken in W for 5 million operating cycles.

Voltage	V	24	48	120
⩘	W	3	2	1

XE3NP●●●●



Power broken in W for 5 million operating cycles.

Voltage	V	24	48	120
⩘	W	4	3	2

Limit switches

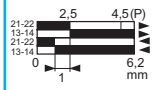
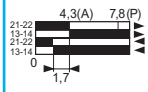
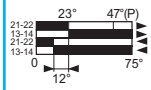
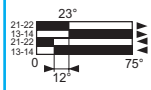
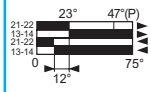
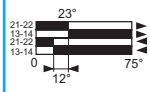
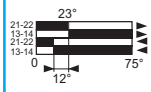
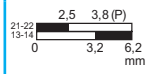
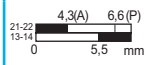
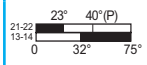
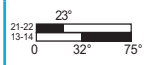
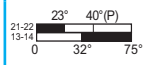
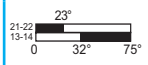
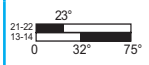
OsiSense XC Standard, format EN 50041

Plastic, double insulated, XCKS

Complete switches with 1 cable entry

Type of head	Plunger (fixing by the body)		Rotary (fixing by the body)				
Form conforming to EN 50041 *(1)*	B	C	A	A	A	A	D
Type of operator	Metal end plunger	Steel roller plunger	Thermoplastic or steel roller lever *(2)*	Elastomer roller lever, Ø 50 mm *(2)*	Variable length thermoplastic or steel roller lever *(2)*	Variable length elastomer roller lever, Ø 50 mm *(2)*	Round thermoplastic rod lever, Ø 6 mm *(3) (4)*
Positive operation	⊖	⊖	⊖	–	⊖	–	–

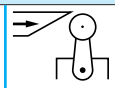
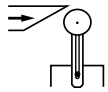
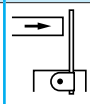
References of complete switches with 1 ISO M20 x 1.5 cable entry

2-pole NC + NO snap action	**XCKS101H29** 	**XCKS102H29** 	**XCKS131H29** (thermoplastic) **XCKS133H29** (steel) 	**XCKS139H29** 	**XCKS141H29** (thermoplastic) **XCKS143H29** (steel) 	**XCKS149H29** 	**XCKS159H29** 
2-pole NC + NO break before make, slow break	**XCKS501H29** 	**XCKS502H29** 	**XCKS531H29** (thermoplastic) **XCKS533H29** (steel) 	**XCKS539H29** 	**XCKS541H29** (thermoplastic) **XCKS543H29** (steel) 	**XCKS549H29** 	**XCKS559H29** 
Weight (kg)	0.125	0.135	0.160	0.175	0.165	0.180	0.170
Contact operation	■ *closed* □ *open*		*(A) = cam displacement* *(P) = positive opening point*		⊖ *NC contact with positive opening operation*		

References of complete switches with 1 Pg 13.5 cable entry

For an entry tapped for a Pg 13.5 cable gland, delete **H29** from the end of the reference. (Except XCKS133H29, XCKS143H29, XCKS533H29 and XCKS543H29). Example: **XCKS101H29** becomes **XCKS101**.

Characteristics

Switch actuation	On end	By 30° cam					By any moving part
Type of actuation			 or 				
Maximum actuation speed	0.5 m/s		1.5 m/s				1 m/s
Mechanical durability (in millions of operating cycles)	25	15	20				
Minimum force or torque – For tripping	15 N	12 N	0.10 N.m				
Minimum force or torque – For positive opening	30 N	20 N	0.15 N.m	–	0.15 N.m	–	–
Cable entry	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm						

(1) Form conforming to EN 50041, see page 1/137.
(2) Adjustable throughout 360° in 5° steps, or in 90° steps by reversing the notched washer.
(3) Adjustable throughout 360° in 5° steps, or in 45° steps by reversing the lever mounting.
(4) Value taken with actuation by moving part at 100 mm from the fixing.

Limit switches

OsiSense XC Standard, format EN 50041

Plastic, double insulated, XCKS

Variable composition switches with 1 cable entry

***Note**: ZCKD heads can only be used with ZCKS bodies.*

References of variable composition switches (ZCKS bodies and ZCKD heads) with 1 ISO M20 x 1.5 cable entry *(3)*

Form conforming to EN 50041 *(1)*	B	C	A	A	A	A	D
Type of operator	Metal end plunger	Steel roller plunger	Thermoplastic roller lever *(2)*	Elastomer roller lever, Ø 50 mm *(2)*	Variable length thermoplastic roller lever *(2)*	Variable length elastomer roller lever, Ø 50 mm *(2)*	Round thermoplastic rod lever, Ø 6 mm *(4) (5)*
Positive operation	⊖	⊖	⊖	–	⊖	–	–
11 21 12 22 **2-pole NC + NC snap action (XE2SP2141)**	**ZCKS9H29 + ZCKD01**	**ZCKS9H29 + ZCKD02**	**ZCKS9H29 + ZCKD31**	**ZCKS9H29 + ZCKD39**	**ZCKS9H29 + ZCKD41**	**ZCKS9H29 + ZCKD49**	**ZCKS9H29 + ZCKD59**
11 21 12 22 **2-pole NC + NC simultaneous, slow break (XE2NP2141)**	**ZCKS7H29 + ZCKD01**	**ZCKS7H29 + ZCKD02**	**ZCKS7H29 + ZCKD31**	**ZCKS7H29 + ZCKD39**	**ZCKS7H29 + ZCKD41**	**ZCKS7H29 + ZCKD49**	**ZCKS7H29 + ZCKD59**
31 21 13 32 22 14 **3-pole NC + NC + NO snap action (XE3SP2141)**	**ZCKSD39H29 + ZCKD01**	**ZCKSD39H29 + ZCKD02**	**ZCKSD39H29 + ZCKD31**	**ZCKSD39H29 + ZCKD39**	**ZCKSD39H29 + ZCKD41**	**ZCKSD39H29 + ZCKD49**	**ZCKSD39H29 + ZCKD59**
31 21 13 32 22 14 **3-pole NC + NC + NO break before make, slow break (XE3NP2141)**	**ZCKSD37H29 + ZCKD01**	**ZCKSD37H29 + ZCKD02**	**ZCKSD37H29 + ZCKD31**	**ZCKSD37H29 + ZCKD39**	**ZCKSD37H29 + ZCKD41**	**ZCKSD37H29 + ZCKD49**	**ZCKSD37H29 + ZCKD59**
Weight (kg)	0.095	0.105	0.145	0.150	0.155	0.155	0.150

Contact operation ■ *closed* □ *open* — *(A) = cam displacement* *(P) = positive opening point* — ⊖ *NC contact with positive opening operation*

References of variable composition switches (ZCKS bodies and ZCKD heads) with 1 Pg 13.5 cable entry

For ZCKS bodies with 1 Pg 13.5 cable entry, delete H29 from the end of the reference. Example: **ZCKS1H29** becomes **ZCKS1**.

Characteristics

Switch actuation	On end	By 30° cam					By any moving part
Type of actuation			or				
Maximum actuation speed	0.5 m/s		1.5 m/s				1 m/s
Mechanical durability *(6)* (in millions of operating cycles)	25	15	20				
Minimum force or torque – For tripping	15 N	12 N	0.15 N.m				
Minimum force or torque – For positive opening	45 N	36 N	0.3 N.m	–	0.3 N.m	–	–
Cable entry	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm						

(1) Form conforming to EN 50041, see page 1/137.
(2) Adjustable throughout 360° in 5° steps, or in 90° steps by reversing the notched washer.
(3) Switches with gold contacts or eyelet type connections: please consult our Customer Care Centre.
(4) Adjustable throughout 360° in 5° steps, or in 45° steps by reversing the lever mounting.
(5) Value taken with actuation by moving part at 100 mm from the fixing.
(6) Limited to 15 million operating cycles for switches with contacts XE3●P.

Limit switches

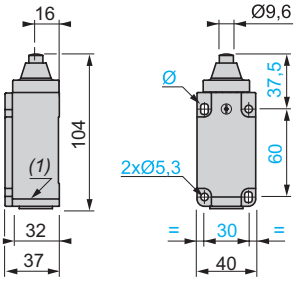
OsiSense XC Standard, format EN 50041

Plastic, double insulated, XCKS

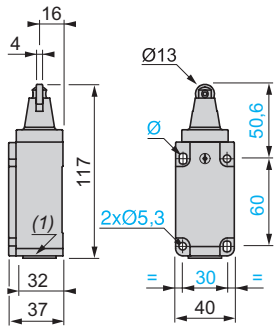
Complete switches with 1 cable entry

Dimensions

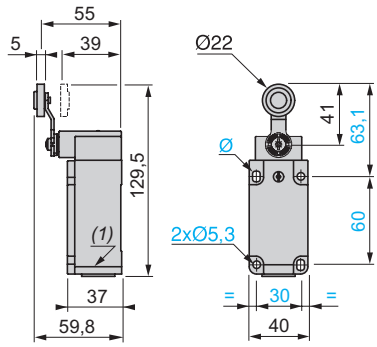
XCKS●01●●



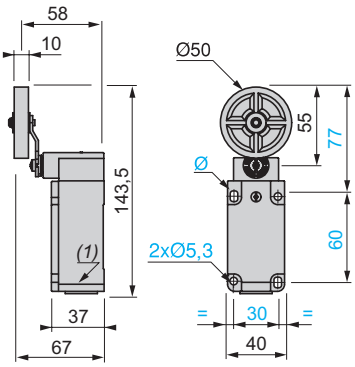
XCKS●02●●



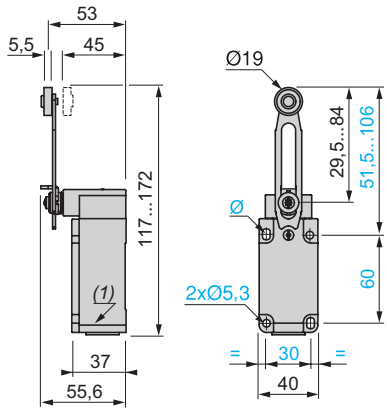
XCKS●31●● / XCKS●33●●



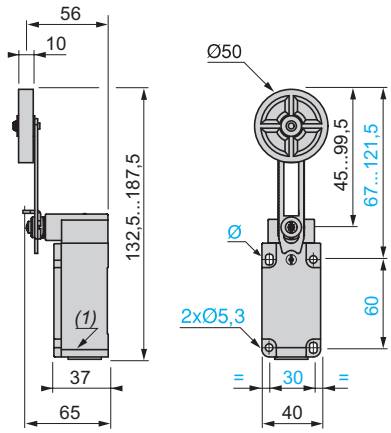
XCKS●39●●



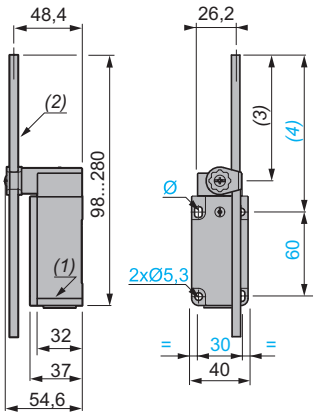
XCKS●41●● / XCKS●43●●



XCKS●49●●



XCKS●59●●



(1) 1 tapped entry for ISO M20 x 1.5 or Pg 13.5 cable gland.
(2) Ø 6 rode, lenght 200 mm.
(3) 190 max.
(4) 212 max.
Ø : 2 elongated holes 5.3 x 7.3 mm.

Limit switches

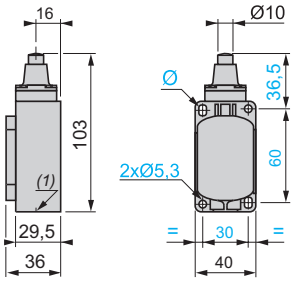
OsiSense XC Standard, format EN 50041

Plastic, double insulated, XCKS

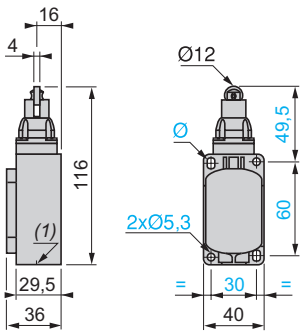
Variable composition switches with 1 cable entry

Dimensions

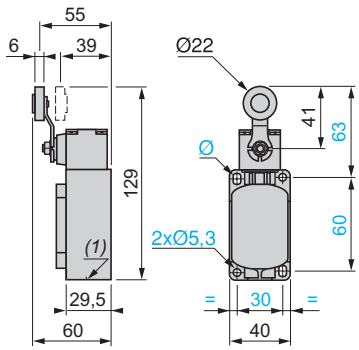
ZCKS● + ZCKD01



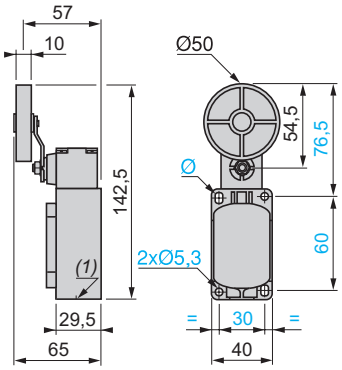
ZCKS● + ZCKD02



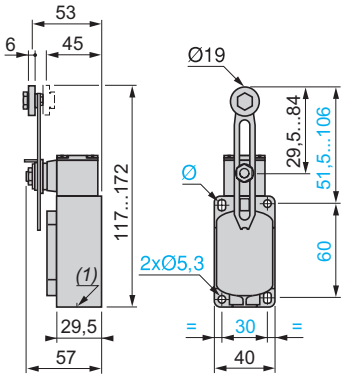
ZCKS● + ZCKD31



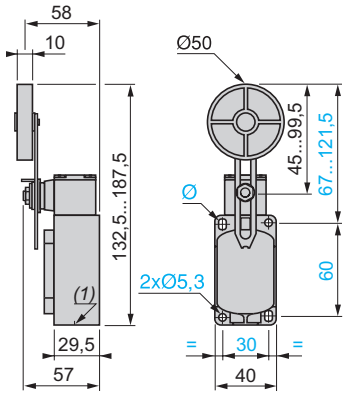
ZCKS● + ZCKD39



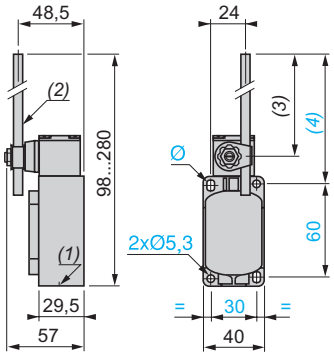
ZCKS● + ZCKD41



ZCKS● + ZCKD49



ZCKS● + ZCKD59



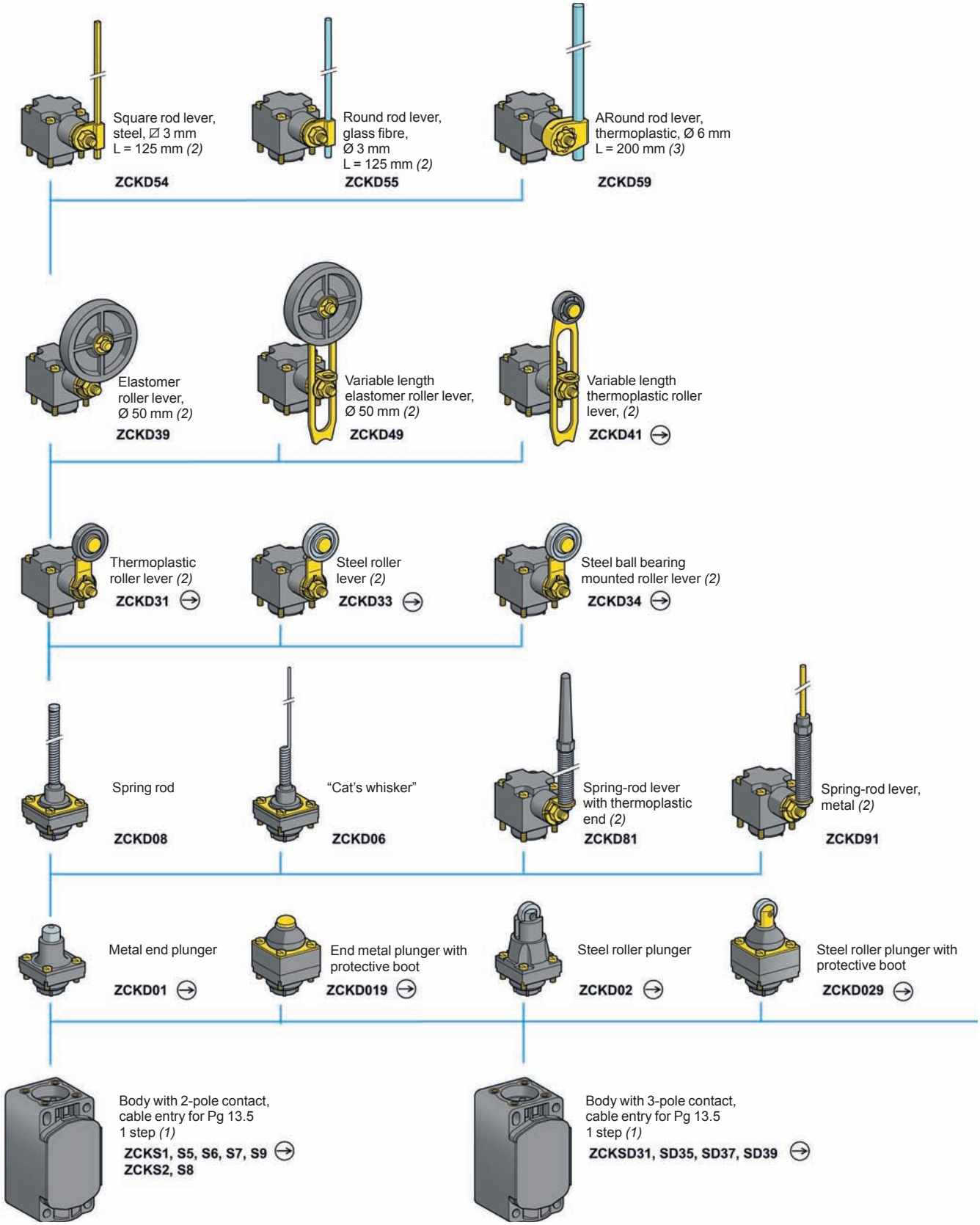
(1) 1 tapped entry for ISO M20 x 1.5 or Pg 13.5 cable gland.
(2) Ø 6 rode, lenght 200 mm.
(3) 190 max.
(4) 212 max.
Ø : 2 elongated holes 5.3 x 7.3 mm.

Limit switches

OsiSense XC Standard, format EN 50041

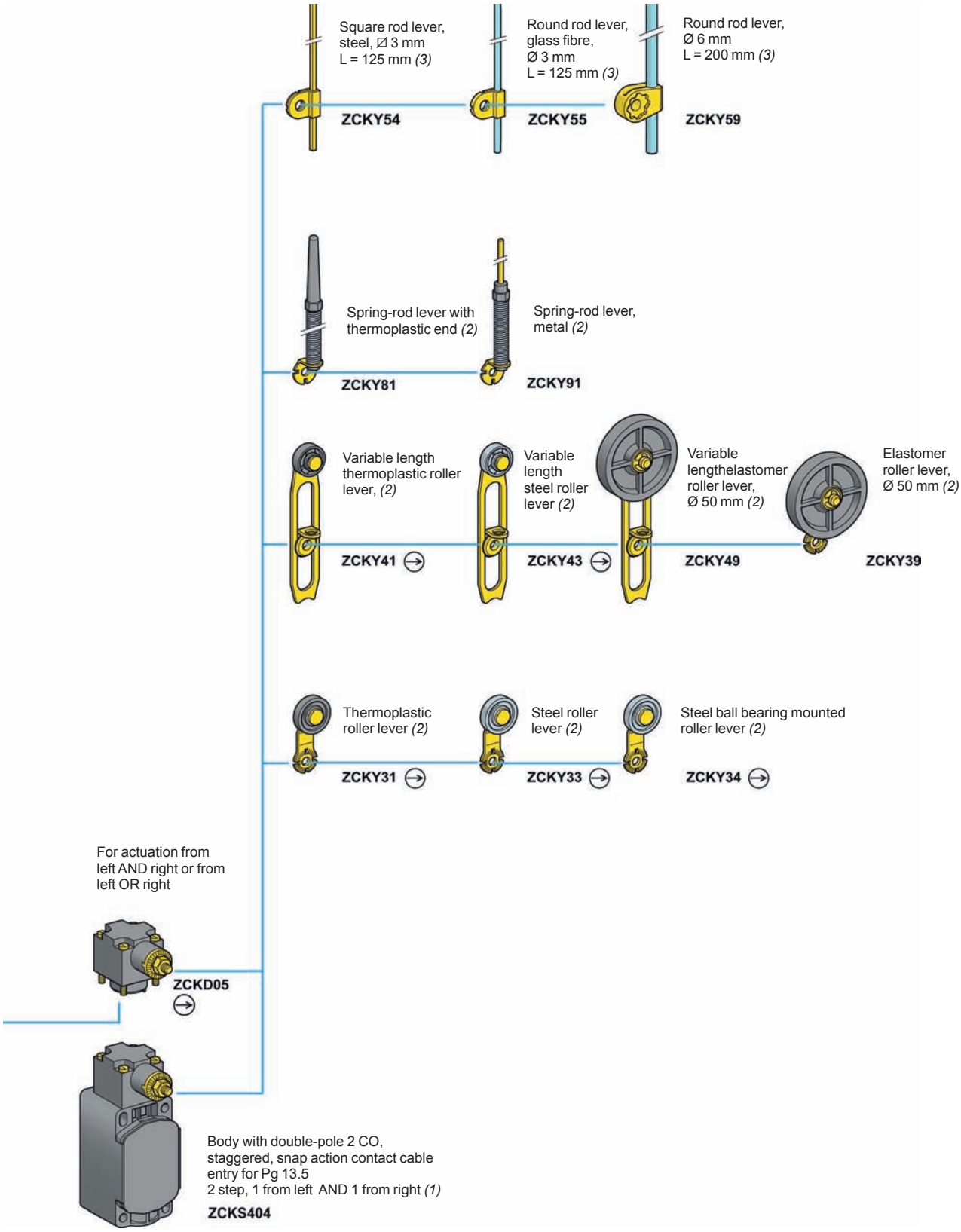
Plastic, double insulated, XCKS

Variable composition



*(1) For further details see page 1/98. For a cable entry tapped ISO M20 x 1.5, add **H29** to the reference.*
*Example: ZCKS1 becomes **ZCKS1H29**.*
(2) Adjustable throughout 360° in 5° steps, or in 90° steps by reversing the notched washer.
(3) Adjustable throughout 360° in 5° steps, or in 45° steps by reversing the lever mounting.

***Note**: ZCKD heads can only be used with ZCKS bodies.*

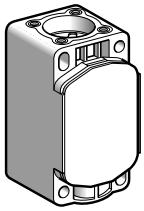

Square rod lever, steel, ∅ 3 mm L = 125 mm (3)
ZCKY54
Round rod lever, glass fibre, Ø 3 mm L = 125 mm (3)
ZCKY55
Round rod lever, Ø 6 mm L = 200 mm (3)
ZCKY59
Spring-rod lever with thermoplastic end (2)
ZCKY81
Spring-rod lever, metal (2)
ZCKY91
Variable length thermoplastic roller lever, (2)
ZCKY41
Variable length steel roller lever (2)
ZCKY43
Variable lengthelastomer roller lever, Ø 50 mm (2)
ZCKY49
Elastomer roller lever, Ø 50 mm (2)
ZCKY39
Thermoplastic roller lever (2)
ZCKY31
Steel roller lever (2)
ZCKY33
Steel ball bearing mounted roller lever (2)
ZCKY34
For actuation from left AND right or from left OR right
ZCKD05
Body with double-pole 2 CO, staggered, snap action contact cable entry for Pg 13.5
2 step, 1 from left AND 1 from right (1)
ZCKS404

Limit switches

OsiSense XC Standard, format EN 50041

Plastic, double insulated, XCKS

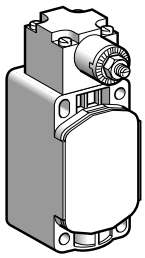
Variable composition switches



ZCKS●

Bodies with 2-pole contact

Type	With contact block	Scheme	Positive operation (1)	Cable entry	Reference	Weight kg
1 step	NC + NO snap action (XE2SP2151)	13 21 / 14 22	⊖	Pg 13.5	**ZCKS1**	0.080
				ISO M20 x 1.5	**ZCKS1H29**	0.080
	2 CO simultaneous, snap action (XESP3021)	13 11 23 21 / 14 12 24 22	–	Pg 13.5	**ZCKS2**	0.080
				ISO M20 x 1.5	**ZCKS2H29**	0.080
	NC + NO break before make, slow break (XE2NP2151)	13 21 / 14 22	⊖	Pg 13.5	**ZCKS5**	0.080
				ISO M20 x 1.5	**ZCKS5H29**	0.080
	NO + NC make before break, slow break (XE2NP2161)	21 13 / 22 14	⊖	Pg 13.5	**ZCKS6**	0.080
				ISO M20 x 1.5	**ZCKS6H29**	0.080
	NC + NC simultaneous, slow break (XE2NP2141)	11 21 / 12 22	⊖	Pg 13.5	**ZCKS7**	0.080
				ISO M20 x 1.5	**ZCKS7H29**	0.080
	NO + NO simultaneous, slow break (XE2NP2131)	13 23 / 14 24	–	Pg 13.5	**ZCKS8**	0.080
				ISO M20 x 1.5	**ZCKS8H29**	0.080
	NC + NC snap action (XE2SP2141)	11 21 / 12 22	⊖	Pg 13.5	**ZCKS9**	0.080
				ISO M20 x 1.5	**ZCKS9H29**	0.080



ZCKS404

Bodies with double-pole contact and spring return rotary head

Without operating lever

Type	With contact block	Scheme	Positive operation (1)	Cable entry	Reference	Weight kg
2 step 1 from left and 1 from right	2 CO staggered snap action	13 11 23 21 / 14 12 24 22	–	Pg 13.5	**ZCKS404**	0.150
				ISO M20 x 1.5	**ZCKS404H29**	0.150

Bodies with 3-pole contact and 1 cable entry

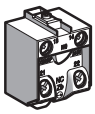
Type	With contact block	Scheme	Positive operation (1)	Cable entry	Reference	Weight kg
–	NC + NO + NO snap action (XE3SP2151)	21 33 13 / 22 34 14	⊖	Pg 13.5	**ZCKSD31**	0.080
				ISO M20 x 1.5	**ZCKSD31H29**	0.080
	NC + NC + NO snap action (XE3SP2141)	31 21 13 / 32 22 14	⊖	Pg 13.5	**ZCKSD39**	0.080
				ISO M20 x 1.5	**ZCKSD39H29**	0.080
	NC + NC + NO break before make, slow break (XE3NP2141)	31 21 13 / 32 22 14	⊖	Pg 13.5	**ZCKSD37**	0.080
				ISO M20 x 1.5	**ZCKSD37H29**	0.080
	NC + NO + NO break before make, slow break (XE3NP2151)	21 33 13 / 22 34 14	⊖	Pg 13.5	**ZCKSD35**	0.080
				ISO M20 x 1.5	**ZCKSD35H29**	0.080

(1) ⊖: NC contact with positive opening operation or head assuring positive opening operation.

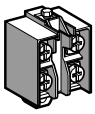
Limit switches

OsiSense XC Standard, format EN 50041

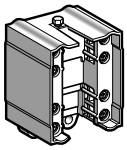
Plastic, double insulated, XCKS
Variable composition switches



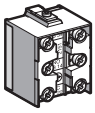
XE2SP21●1



XE2NP21●1



XESP3021



XE3●P21●●

Contact blocks for ZCKS●● bodies

Type of contact	Scheme	For body	Positive operation *(1)*	Reference	Weight kg
2-pole contact					
NC + NO snap action	13 21 / 14 22	ZCKS1	⊖	**XE2SP2151**	0.020
NC + NO break before make, slow break	13 21 / 14 22	ZCKS5	⊖	**XE2NP2151**	0.020
2 CO simultaneous snap action	13 11 23 21 / 14 12 24 22	ZCKS2	–	**XESP3021**	0.045
NO + NC make before break, slow break	21 13 / 22 14	ZCKS6	⊖	**XE2NP2161**	0.020
NC + NC simultaneous, slow break	11 21 / 12 22	ZCKS7	⊖	**XE2NP2141**	0.020
NO + NO simultaneous, slow break	13 23 / 14 24	ZCKS8	–	**XE2NP2131**	0.020
NC + NC snap action	11 21 / 12 22	ZCKS9	⊖	**XE2SP2141**	0.020
3-pole contact					
NC + NO + NO snap action	21 33 13 / 22 34 14	ZCKSD31	⊖	**XE3SP2151**	0.035
NC + NC + NO snap action	31 21 13 / 32 22 14	ZCKSD39	⊖	**XE3SP2141**	0.035
NC + NC + NO break before make, slow break	31 21 13 / 32 22 14	ZCKSD37	⊖	**XE3NP2141**	0.035
NC + NO + NO break before make, slow break	21 33 13 / 22 34 14	ZCKSD35	⊖	**XE3NP2151**	0.035

DE9RA●●12

Accessories for ZCKS●● and XCKS●●

Description	Minimum order quantity	Reference	Weight kg
Adaptator for 1/2" NPT conduit (male Pg 13.5 / female 1/2" NPT)	10	**DE9RA1212**	0.035
Adaptator for 1/2" NPT conduit (male M20 x 1.5 / female 1/2" NPT)	5	**DE9RA2012**	0.050

(1) ⊖ : NC contact with positive opening operation or sub-assembly assuring positive opening operation.

Other versions Gold flashed contacts.
Please consult our Customer Care Centre.

Limit switches

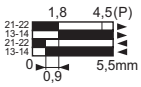
OsiSense XC Standard, format EN 50041

Plastic, double insulated, XCKS

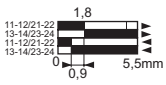
Variable composition switches

Heads ZCKD01, D109 with body

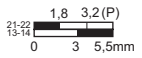
ZCKS1



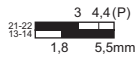
ZCKS2



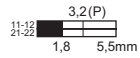
ZCKS5



ZCKS6

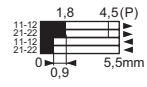


ZCKS7

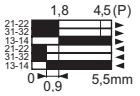


ZCKS8

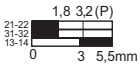
ZCKS9



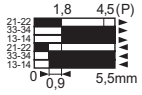
ZCKSD39



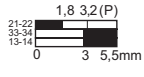
ZCKSD37



ZCKSD31

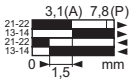


ZCKSD35

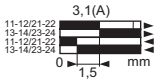


Heads ZCKD02, D029 with body

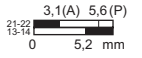
ZCKS1



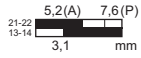
ZCKS2



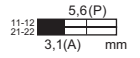
ZCKS5



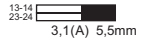
ZCKS6



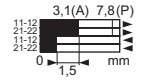
ZCKS7



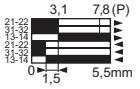
ZCKS8



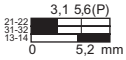
ZCKS9



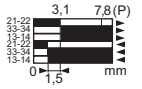
ZCKSD39



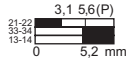
ZCKSD37



ZCKSD31

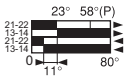


ZCKSD35

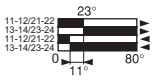


Heads ZCKD31, D33, D34 with body

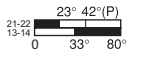
ZCKS1



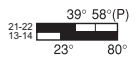
ZCKS2



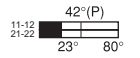
ZCKS5



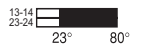
ZCKS6



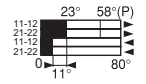
ZCKS7



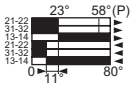
ZCKS8



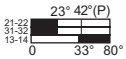
ZCKS9



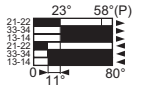
ZCKSD39



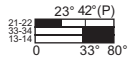
ZCKSD37



ZCKSD31

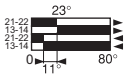


ZCKSD35

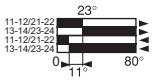


Heads ZCKD39, D41, D49, D54, D55, D59, D81, D91 with body

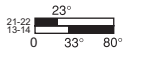
ZCKS1



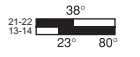
ZCKS2



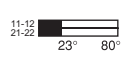
ZCKS5



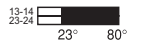
ZCKS6



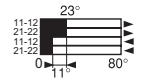
ZCKS7



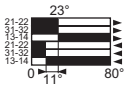
ZCKS8



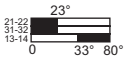
ZCKS9



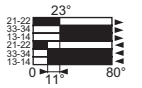
ZCKSD39



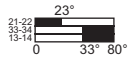
ZCKSD37



ZCKSD31

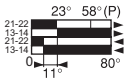


ZCKSD35

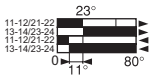


Heads ZCKD05 (positive operation only assured with a ⊖ operating lever) with body

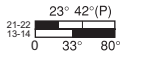
ZCKS1



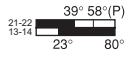
ZCKS2



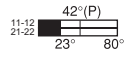
ZCKS5



ZCKS6

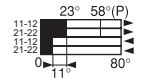


ZCKS7

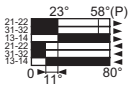


ZCKS8

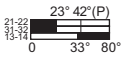
ZCKS9



ZCKSD39



ZCKSD37



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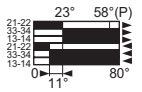

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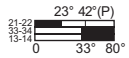
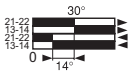
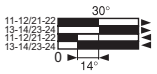


Heads ZCKD06, D08 with body

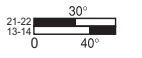
ZCKS1



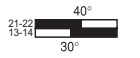
ZCKS2



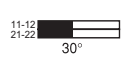
ZCKS5



ZCKS6

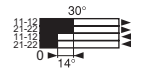


ZCKS7

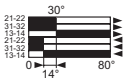


ZCKS8

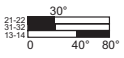
ZCKS9



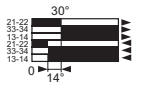
ZCKSD39



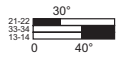
ZCKSD37



ZCKSD31

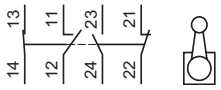


ZCKSD35

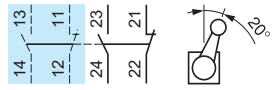


ZCKS404 (body with head)

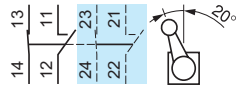
Unactuated



Actuated from left



Actuated from right



Contact operation ■ closed □ open (A) = cam displacement (P) = positive opening point

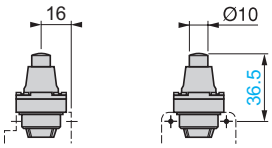
Limit switches

OsiSense XC Standard, format EN 50041

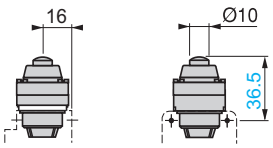
Plastic, double insulated, XCKS
Variable composition switches

Plunger heads

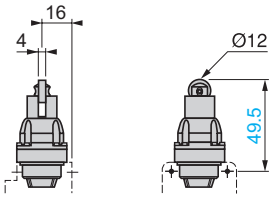
ZCKD01



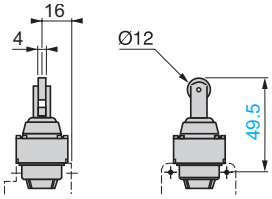
ZCKD019



ZCKD02

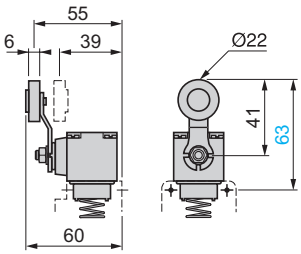


ZCKD029

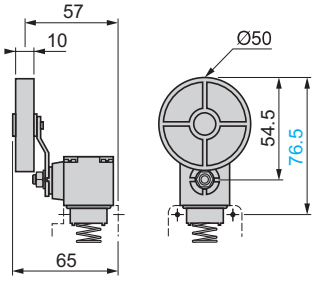


Rotary heads

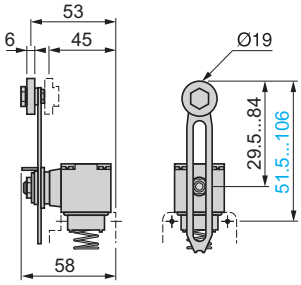
ZCKD31, ZCKD33, ZCKD34



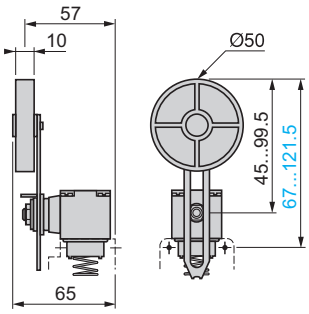
ZCKD39



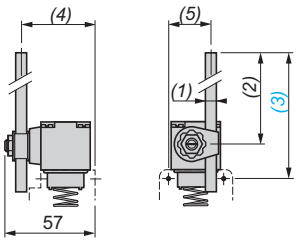
ZCKD41, ZCKD43



ZCKD49

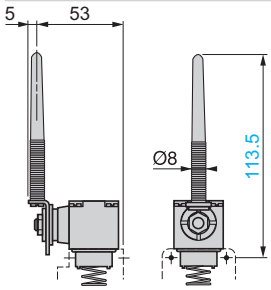


ZCKD54, ZCKD55, ZCKD59

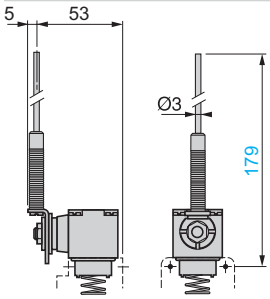


ZCK	(1) rod	(2)	(3)	(4)	(5)
D54	Ø 3, L = 125	115 max.	137 max.	49	24
D55	Ø 3, L = 125	115 max.	137 max.	49	24
D59	Ø 6, L = 200	190 max.	212 max.	46.5	26.2

ZCKD81



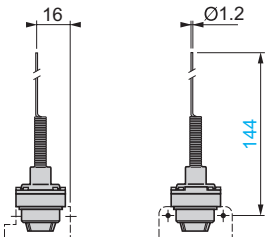
ZCKD91



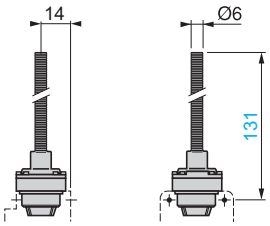
Note: *operating lever spindle threaded M6.*

Multi-directional heads

ZCKD06

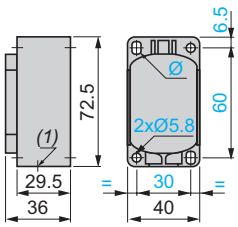


ZCKD08

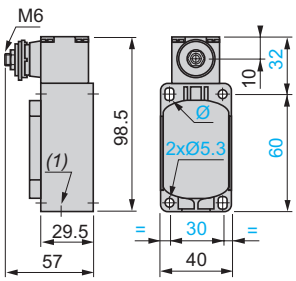


Bodies with contacts

ZCKS1, S2, S5, S6, S7, S8, S9
ZCKS1H29, S2H29, S5H29,
S6H29, S7H29, S8H29, S9H29
ZCKSD3●, SD3●H29



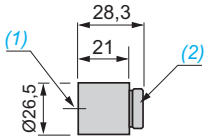
ZCKS404, S404H29



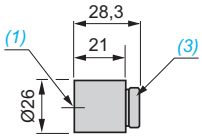
(1) 1 tapped entry for ISO M20 x 1.5 or Pg 13.5 cable gland.
Ø: 2 elongated holes 5.3 x 7.3.

Adaptators for 1/2" NPT conduit

DE9RA1212 (Pg 13.5)



DE9RA2012 (M20)



(1) Tapped entry for 1/2" NPT conduit.
(2) Pg 13.5 threaded sleeve.
(3) M20 x 1.5 threaded sleeve.

Limit switches

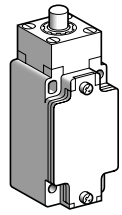
OsiSense XC Standard
Industrial format EN 50041
Metal, type XCK J
Conforming to CENELEC EN 50041

1

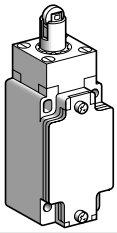
■ XCKJ
fixed body with 1 cable entry

□ With head for linear movement (plunger)

561646



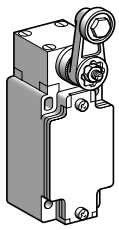
561647



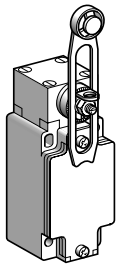
Page 1/104

□ With head for rotary movement (lever)

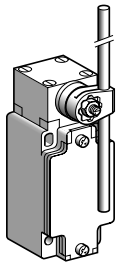
561648



561649



561650

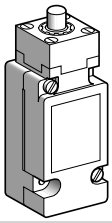


Page 1/104

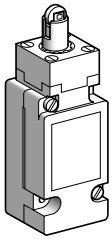
■ XCKJ
plug-in body with 1 cable entry

□ With head for linear movement (plunger)

561651



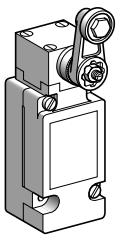
561652



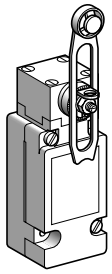
Page 1/106

□ With head for rotary movement (lever)

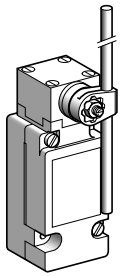
561653



561654



561655



Page 1/106

Environment characteristics

Conformity to standards	Products	IEC 60947-5-1, EN 60947-5-1, UL 508, CSA C22-2 n° 14
	Machine assemblies	IEC 60204-1, EN 60204-1
Product certifications		UL, CSA, CCC, BV, GOST
Protective treatment	Version	Standard: “TC”, special: “TH”
Ambient air temperature	For operation	- 25…+ 70°C, special sub-assemblies for use at - 40°C or + 120°C
	For storage	- 40…+ 70°C
Vibration resistance	Conforming to IEC 60068-2-6	25 gn (10…500 Hz)
Shock resistance	Conforming to IEC 60068-2-27	50 gn (11 ms)
Electric shock protection		Class I conforming to IEC 61140 and NF C 20-030
Degree of protection		IP 66 conforming to IEC 60529; IK 07 conforming to EN 50102
Repeat accuracy		0.01 mm on the tripping points, with 1 million operating cycles for head with end plunger
Cable entry or connector	Depending on model	Tapped entry for Pg 13.5 cable gland, tapped ISO M20 x 1.5 or tapped 1/2" NPT, or M12 connector
Materials		Bodies and heads in Zamak

Limit switches
OsiSense XC Standard
Industrial format EN 50041
Metal, type XCK J
Conforming to CENELEC EN 50041

Contact block characteristics

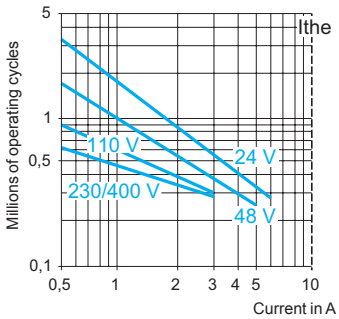
Rated operational characteristics	XE2●P	∼ AC-15; A300 (Ue = 240 V, Ie = 3 A); Ithe = 10 A ⎓ DC-13; Q300 (Ue = 250 V, Ie = 0.27 A), conforming to IEC 60947-5-1 Appendix A, EN 60947-5-1
	XE3●P	∼ AC-15; B300 (Ue = 240 V, Ie = 1.5 A); Ithe = 6 A ⎓ DC-13; R300 (Ue = 250 V, Ie = 0.1 A), conforming to IEC 60947-5-1 Appendix A, EN 60947-5-1
Rated insulation voltage	XE2●P	Ui = 500 V degree of pollution 3 conforming to IEC 60947-1 Ui = 300 V conforming to UL 508, CSA C22-2 n° 14
	XE3●P	Ui = 400 V degree of pollution 3 conforming to IEC 60947-1 Ui = 300 V conforming to UL 508, CSA C22-2 n° 14
Rated impulse withstand voltage	XE2●P	U imp = 6 kV conforming to IEC 60947-1, IEC 60664
	XE3●P	U imp = 4 kV conforming to IEC 60947-1, IEC 60664
Positive operation (depending on model)		NC contacts with positive opening operation conforming to IEC 60947-5-1 Appendix K, EN 60947-5-1
Resistance across terminals		⩽ 25 mΩ conforming to IEC 60255-7 category 3
Short-circuit protection	XE2●P	10 A cartridge fuse type gG (gI)
	XE3●P	6 A cartridge fuse type gG (gI)
Connection (screw clamp terminals)	XE2SP21●1	Clamping capacity, min:1 x 0.34 mm², max: 2 x 1.5 mm²
	XE2NP21●1	Clamping capacity, min:1 x 0.5 mm², max: 2 x 2.5 mm²
	XCKJ plug-in and XESP20●1	Clamping capacity, min:1 x 0.75 mm², max: 2 x 1.5 mm²
	XE3NP and XE3SP	Clamping capacity, min: 1 x 0.34 mm², max: 1 x 1 mm² or 2 x 0.75 mm²
Minimum actuation speed		**XE2SP21●1** and **XE3SP**: 0.01 m/minute
		XE2NP21●1 and **XE3NP**: 6 m/minute

Electrical durability

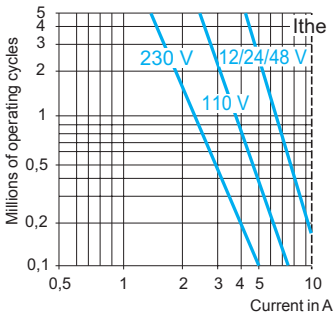
- Conforming to IEC 60947-5-1 Appendix C
- Utilisation categories AC-15 and DC-13
- Maximum operating rate: 3600 operating cycles/hour
- Load factor: 0.5

AC supply 50/60 Hz ∼ ⎍ inductive circuit

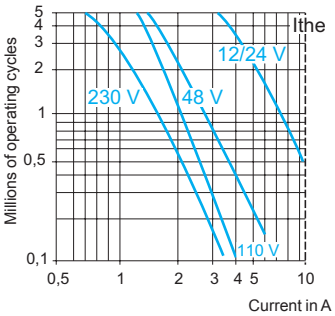
XE2SP21●1, XE2SP2141



XE2NP21●1



XCK J plug-in, XES P20●1



DC supply ⎓

Power broken in W for 5 million operating cycles.

Voltage	V	24	48	120
⎍	W	10	7	4

Power broken in W for 5 million operating cycles.

Voltage	V	24	48	120
⎍	W	13	9	7

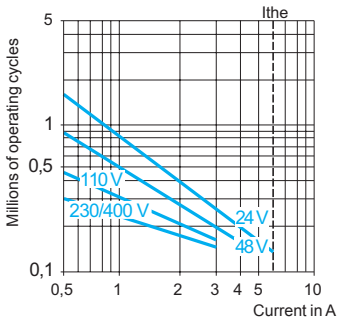
Power broken in W for 5 million operating cycles.

Voltage	V	24	48	120
⎍	W	10	7	4

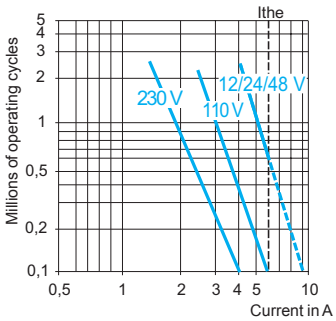
For XE2S P●151 on ∼ or ⎓, NC and NO contacts simultaneously loaded to the values shown with reverse polarity.

AC supply 50/60 Hz ∼ ⎍ inductive circuit

XE3SP●●●●



XE3NP●●●●



DC supply ⎓

Power broken in W for 5 million operating cycles.

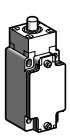
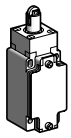
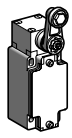
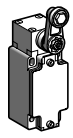
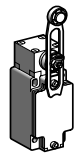
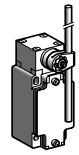
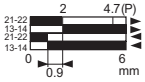
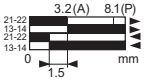
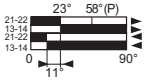
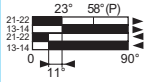
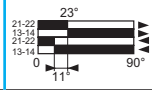
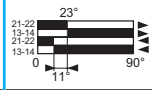
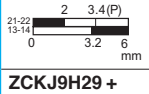
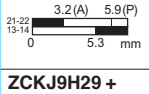
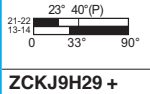
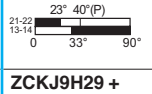
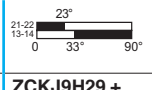
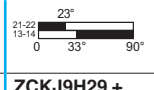
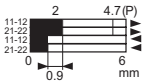
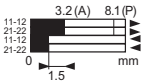
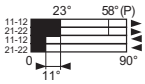
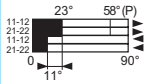
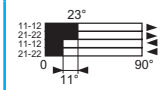
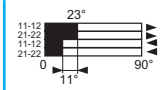
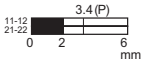
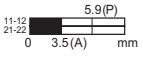
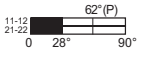
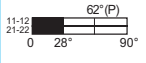
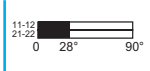
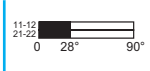
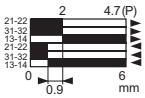
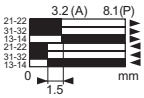
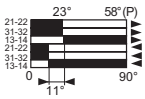
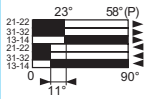
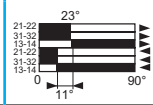
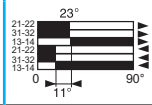
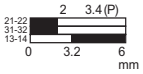
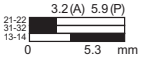
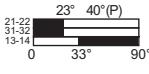
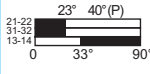
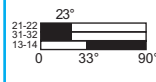
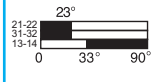
Voltage	V	24	48	120
⎍	W	3	2	1

Power broken in W for 5 million operating cycles.

Voltage	V	24	48	120
⎍	W	4	3	2

Limit switches

OsiSense XC Standard
Industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Complete fixed body switches with 1 cable entry

Type of head	Plunger (fixing by the body)		Rotary (fixing by the body) (switches supplied for actuation from left AND right)			
	Form B *(1)*	Form C *(1)*	Form A *(1)*			Form D *(1)*
						
Type of operator	Metal end plunger	Steel roller plunger	Thermoplastic roller lever *(2)*	Steel roller lever *(2)*	Variable length thermoplastic roller lever *(2)*	Round thermoplastic rod lever, Ø 6 mm *(2) (4)*
References of complete switches with 1 ISO M20 x 1.5 cable entry *(3)*						
2-pole NC + NO snap action (XE2SP2151)	**XCKJ161H29** 	**XCKJ167H29** 	**XCKJ10511H29** 	**XCKJ10513H29** 	**XCKJ10541H29** 	**XCKJ10559H29** 
2-pole NC + NO break before make, slow break (XE2NP2151)	**XCKJ561H29** 	**XCKJ567H29** 	**XCKJ50511H29** 	**XCKJ50513H29** 	**XCKJ50541H29** 	**XCKJ50559H29** 
2-pole NC + NC snap action (XE2SP2141)	**ZCKJ9H29 + ZCKE61** 	**ZCKJ9H29 + ZCKE67** 	**ZCKJ9H29 + ZCKE05 + ZCKY11** 	**ZCKJ9H29 + ZCKE05 + ZCKY13** 	**ZCKJ9H29 + ZCKE05 + ZCKY41** 	**ZCKJ9H29 + ZCKE05 + ZCKY59** 
2-pole NC + NC simultaneous, slow break (XE2NP2141)	**ZCKJ7H29 + ZCKE61** 	**ZCKJ7H29 + ZCKE67** 	**ZCKJ7H29 + ZCKE05 + ZCKY11** 	**ZCKJ7H29 + ZCKE05 + ZCKY13** 	**ZCKJ7H29 + ZCKE05 + ZCKY41** 	**ZCKJ7H29 + ZCKE05 + ZCKY59** 
3-pole NC + NC + NO snap action (XE3SP2141)	**ZCKJD39H29 + ZCKE61** 	**ZCKJD39H29 + ZCKE67** 	**ZCKJD39H29 + ZCKE05 + ZCKY11** 	**ZCKJD39H29 + ZCKE05 + ZCKY13** 	**ZCKJD39H29 + ZCKE05 + ZCKY41** 	**ZCKJD39H29 + ZCKE05 + ZCKY59** 
3-pole NC + NC + NO break before make, slow break (XE3NP2141)	**ZCKJD37H29 + ZCKE61** 	**ZCKJD37H29 + ZCKE67** 	**ZCKJD37H29 + ZCKE05 + ZCKY11** 	**ZCKJD37H29 + ZCKE05 + ZCKY13** 	**ZCKJD37H29 + ZCKE05 + ZCKY41** 	**ZCKJD37H29 + ZCKE05 + ZCKY59** 
Weight (kg)	0.430	0.455	0.480	0.490	0.485	0.485

Contact operation
- ■ *closed*
- □ *open*

(A) = cam displacement
(P) = positive opening point

⊖ *NC contact with positive opening operation*

References of complete switches with 1 Pg 13.5 cable entry *(2)*

For complete switches with entry for Pg 13.5 cable gland, delete **H29** from the end of the reference. Example: XCKJ161H29 becomes **XCKJ161**.

References of complete switches with 1 entry for 1/2" NPT conduit *(2)*

For complete switches with entry for 1/2" NPT (USAS B2-1) conduit, replace H29 at the end of the reference by **H7**. Example: XCKJ161H29 becomes **XCKJ161H7**.

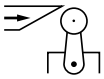
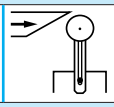
(1) Form conforming to EN 50041, see page 1/137.
(2) Adjustable throughout 360° in 5° steps, or in 45° steps by reversing the lever or its mounting.
(3) Switches with gold contacts or eyelet type connections: please consult our Customer Care Centre.
(4) Value taken with actuation by moving part at 100 mm from the fixing.

Telemecanique Sensors

Limit switches

OsiSense XC Standard
Industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Complete fixed body switches with 1 cable entry

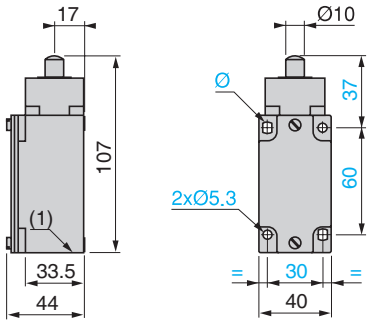
Characteristics

Switch actuation	On end	By 30° cam			By any moving part
Type of actuation					
Maximum actuation speed	0.5 m/s	1 m/s	1.5 m/s		
Mechanical durability *(1)* (in millions of operating cycles)	30	25	30		
Minimum force or torque – For tripping	20 N	16 N	0.25 N.m		
Minimum force or torque – For positive opening	50 N	40 N	0.50 N.m		–
Cable entry *(3)*	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 9 to 12 mm				

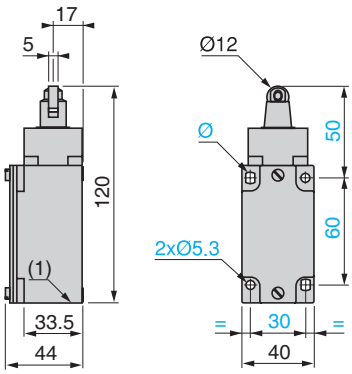
(1) Limited to 15 million operating cycles for switches with contacts XE3●P.

Dimensions

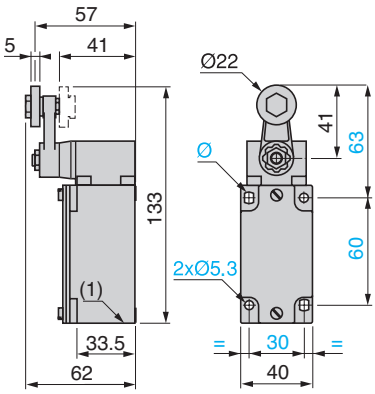
XCKJ●61H29
ZCKJ● + ZCKE61



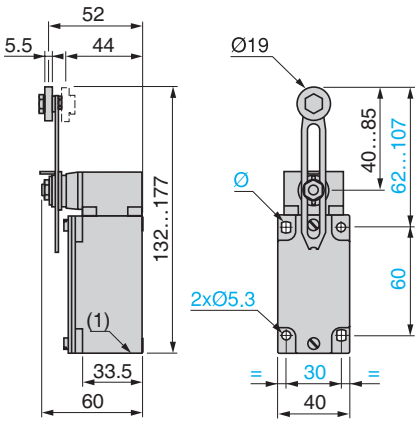
XCKJ●67H29
ZCKJ● + ZCKE67



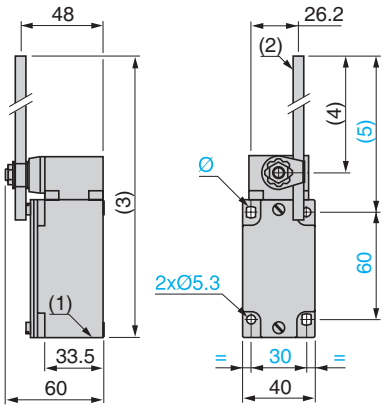
XCKJ●051●H29
ZCKJ● + ZCKE05 + ZCKY11 or Y13



XCKJ●0541H29
ZCKJ● + ZCKE05 + ZCKY41



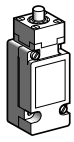
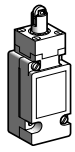
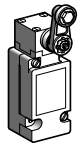
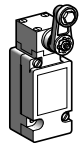
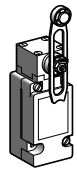
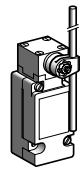
XCKJ●0559H29
ZCKJ● + ZCKE05 + ZCKY59



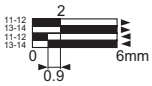
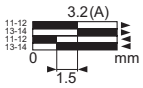
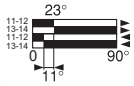
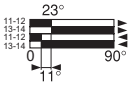
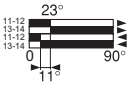
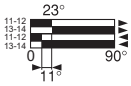
(1) 1 tapped entry for ISO M20 x 1.5 or Pg 13.5 cable gland or tapped 1/2" NPT.
(2) Ø 6 rod, length 200 mm.
(3) 282 max.
(4) 190 max.
(5) 212 max.
Ø: 2 elongated holes Ø 5.3 x 7.3.

Limit switches

OsiSense XC Standard, industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Complete switches, plug-in body
With 1 cable entry

Type of head	Plunger (fixing by the body)		Rotary (fixing by the body) (switches supplied for actuation from left AND right)			
	Form B *(1)*	Form C *(1)*	Form A *(1)*			Form D *(1)*
						
Type of operator	Metal end plunger	Steel roller plunger	Thermoplastic roller lever *(2)*	Steel roller lever *(2)*	Variable length thermoplastic roller lever *(2)*	Round thermoplastic rod lever, Ø 6 mm *(2) (4)*

References of complete switches with 1 ISO M20 x 1.5 cable entry *(3)*

Single-pole CO snap action	**XCKJ1161H29**	**XCKJ1167H29**	**XCKJ110511H29**	**XCKJ110513H29**	**XCKJ110541H29**	**XCKJ110559H29**
						
Weight (kg)	0.430	0.455	0.480	0.490	0.485	0.485
Contact operation	■ *closed*	□ *open*		*(A) = cam displacement*		

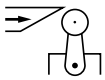
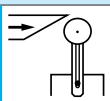
References of complete switches with 1 Pg 13.5 cable entry *(3)*

For complete switches with entry for Pg 13.5 cable gland, delete ***H29*** from the end of the reference.
Example: ***XCKJ1161H29*** becomes ***XCKJ1161***.

References of complete switches with 1 entry for 1/2" NPT conduit *(3)*

For complete switches with entry for 1/2" NPT (USAS B2-1) conduit, replace ***H29*** at the end of the reference by ***H7***.
Example: ***XCKJ1161H29*** becomes ***XCKJ1161H7***.

Characteristics

Switch actuation	On end	By 30° cam			By any moving part
Type of actuation					
Maximum actuation speed	0.5 m/s	1 m/s	1.5 m/s		
Mechanical durability (in millions of operating cycles)	**30**	**25**	**30**		
Minimum tripping force or torque	20 N	16 N	0.25 N.m		
Cable entry	1 entry tapped M20 x 1.5 for ISO cable gland Clamping capacity 7 to 13 mm				

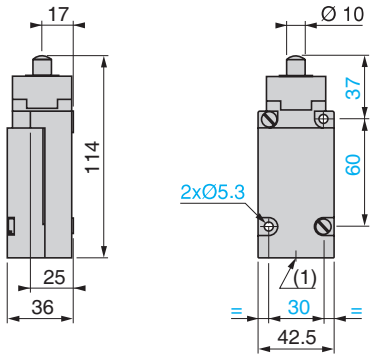
(1) Form conforming to EN 50041, see page 1/137.
(2) Adjustable throughout 360° in 5° steps, or in 45° steps by reversing the lever or its mounting.
(3) Switches with gold contacts: please consult our Customer Care Centre.
(4) Value taken with actuation by moving part at 100 mm from the fixing.

Telemecanique Sensors

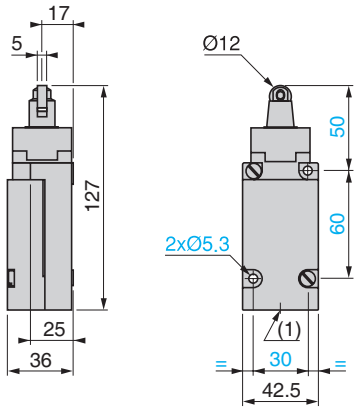
Limit switches

OsiSense XC Standard, industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Complete switches, plug-in body
With 1 cable entry

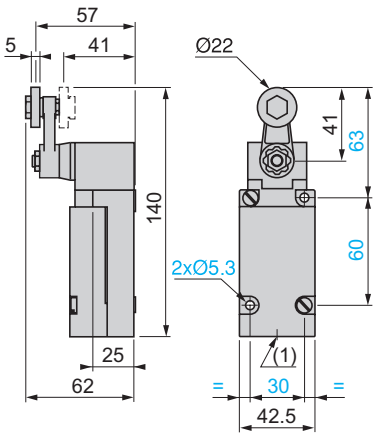
XCKJ1611H29



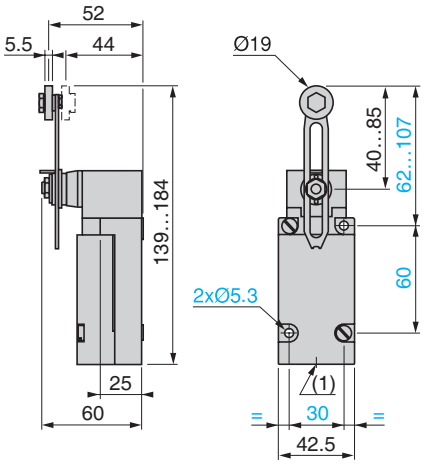
XCKJ1167H29



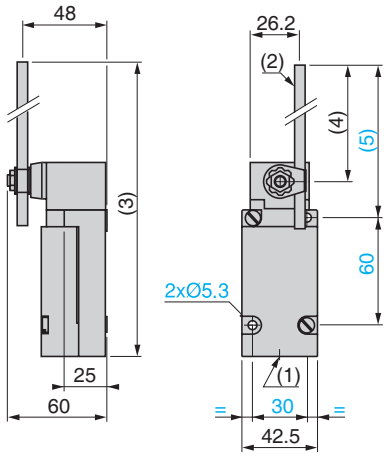
XCKJ110511H29, XCKJ110513H29



XCKJ110541H29



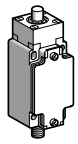
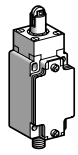
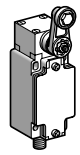
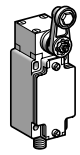
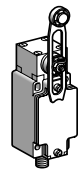
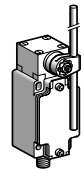
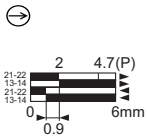
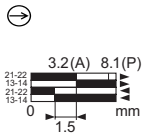
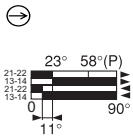
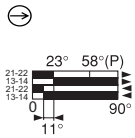
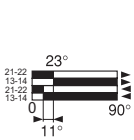
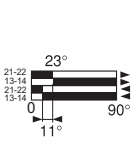
XCKJ110559H29



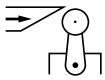
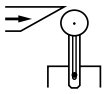
(1) 1 tapped entry for ISO M20 x 1.5 or Pg 13.5 cable gland or for 1/2" NPT conduit.
(2) Ø 6 rod, length 200 mm.
(3) 289 max.
(4) 190 max.
(5) 212 max.

Limit switches

OsiSense XC Standard, industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Complete switches, fixed body
M12 connector

Type of head	Plunger (fixing by the body)		Rotary (fixing by the body) (switches supplied for actuation from left AND right)			
	Form B *(1)*	Form C *(1)*	Form A *(1)*			Form D *(1)*
						
Type of operator	Metal end plunger	Steel roller plunger	Thermoplastic roller lever *(2)*	Steel roller lever *(2)*	Variable length thermoplastic roller lever *(2)*	Round thermoplastic rod lever, Ø 6 mm *(2) (3)*
References *(4)*						
2-pole NC + NO snap action (XE2S P2151)	**XCKJ161D** 	**XCKJ167D** 	**XCKJ10511D** 	**XCKJ10513D** 	**XCKJ10541D** 	**XCKJ10559D** 
Weight (kg)	0.430	0.455	0.480	0.490	0.485	0.485
Contact operation	*closed* / *open*		*(A) = cam displacement* / *(P) = positive opening point*			

Characteristics

Switch actuation	On end	By 30° cam				By any moving part
Type of actuation						
Maximum actuation speed	0.5 m/s	1 m/s	1.5 m/s			
Mechanical durability (in millions of operating cycles)	30	25	30			
Minimum force or torque – For tripping	20 N	16 N	0.25 N.m			
Minimum force or torque – For positive opening	50 N	40 N	0.50 N.m		–	–
Connection	M12 connector, Ui = 60 V, Ie = 4 A (see suitable pre-wired female connectors below).					

(1) Form conforming to EN 50041, see page 1/137.
(2) Adjustable throughout 360° in 5° steps, or in 45° steps by reversing the lever or its mounting.
(3) Value taken with actuation by moving part at 100 mm from the fixing.
(4) Switches with gold contacts: please consult our Customer Care Centre.

References of suitable pre-wired female connectors

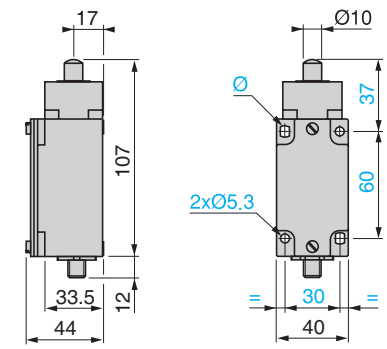
Type of connector		M12 straight, 5-pin, 4 A/24 V max.	M12 elbowed, 5-pin, 4 A/24 V max.
With cable, Ø 5.8 mm (4 x 0.34 mm² + 1 x 0.5 mm²)	L = 2 m	**XZCP1164L2**	**XZCP1264L2**
	L = 5 m	**XZCP1164L5**	**XZCP1264L5**
	L = 10 m	**XZCP1164L10**	**XZCP1264L10**
Weight (kg)	L = 2 m	0.115	
	L = 5 m	0.270	
	L = 10 m	0.520	

Limit switches

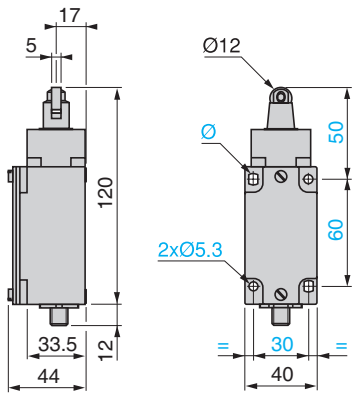
OsiSense XC Standard, industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Complete switches, fixed body
M12 connector

Dimensions

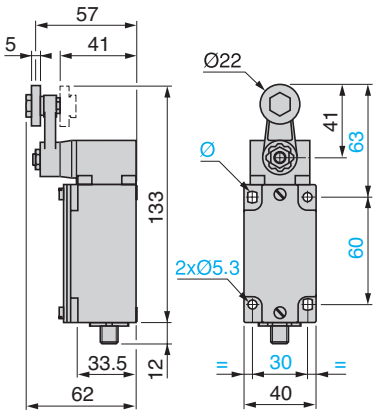
XCKJ161D



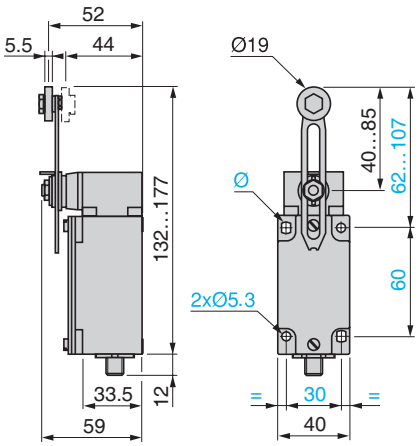
XCKJ167D



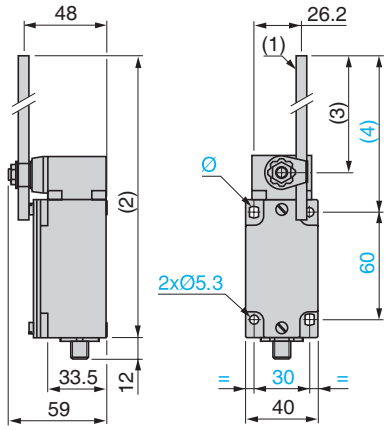
XCKJ1051●D



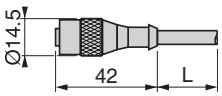
XCKJ10541D



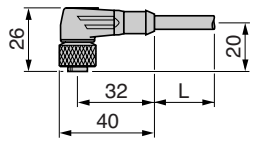
XCKJ10559D



XZCP1164L●



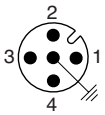
XZCP1264L●



(1) Ø 6 rod, length 200 mm.
(2) 282 max.
(3) 190 max.
(4) 212 max.
Ø: 2 elongated holes Ø 5.3 x 7.3.
L: *Cable length 2, 5 or 10 m.*

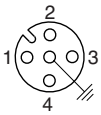
Connections

Limit switch XCKJ●●●●D



1-2 = NC
3-4 = NO
5 = ⏚
4 A / 24 V max.

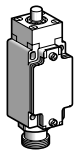
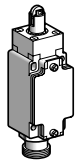
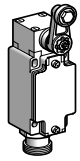
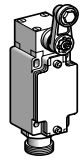
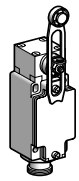
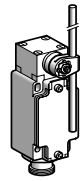
Pre-wired female connector XZCP1●64L●



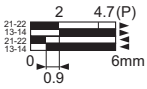
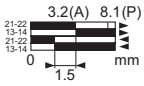
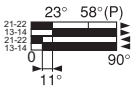
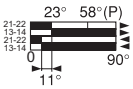
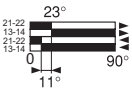
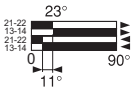
1 = brown
2 = white
3 = blue
4 = black
5 = ⏚ yellow/green

Limit switches

OsiSense XC Standard, industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Complete switches, fixed body
7/8"-16UN connector

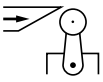
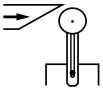
Type of head	Plunger (fixing by the body)		Rotary (fixing by the body) (switches supplied for actuation from left AND right)			
	Form B *(1)*	Form C *(1)*	Form A *(1)*			Form D *(1)*
						
Type of operator	Metal end plunger	Steel roller plunger	Thermoplastic roller lever *(2)*	Steel roller lever *(2)*	Variable length thermoplastic roller lever *(2)*	Round thermoplastic rod lever, Ø 6 mm *(2) (3)*

References *(4)*

2-pole NC + NO snap action (XE2SP2151)	**XCKJ161A** 	**XCKJ167A** 	**XCKJ10511A** 	**XCKJ10513A** 	**XCKJ10541A** 	**XCKJ10559A** 
Weight (kg)	0.430	0.455	0.480	0.490	0.485	0.485

Contact operation: ■ *closed* □ *open* — *(A) = cam displacement* *(P) = positive opening point* — ⊖ *NC contact with positive opening operation*

Characteristics

Switch actuation	On end	By 30° cam				By any moving part
Type of actuation						
Maximum actuation speed	0.5 m/s	1 m/s	1.5 m/s			
Mechanical durability (in millions of operating cycles)	**30**	**25**	**30**			
Minimum force or torque — For tripping	20 N	16 N	0.25 N.m			
Minimum force or torque — For positive opening	50 N	40 N	0.50 N.m		–	–
Connection	7/8"-16UN connector, Ui = 250 V; Ie = 6 A (see suitable pre-wired female connectors below).					

(1) Form conforming to EN 50041, see page 1/137.
(2) Adjustable throughout 360° in 5° steps, or in 45° steps by reversing the lever or its mounting.
(3) Value taken with actuation by moving part at 100 mm from the fixing.
(4) Switches with gold contacts: please consult our Customer Care Centre.

References of suitable pre-wired female connectors

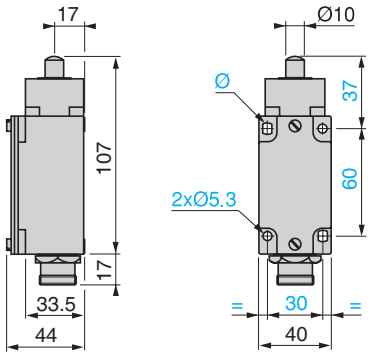
Type of connector		7/8"-16UN straight, 5-pin, 4 A/250 V max.
With cable, Ø 5.9 mm (5 x 0.34 mm²)	L = 2 m	**XZCP1764L2**
	L = 5 m	**XZCP1764L5**
	L = 10 m	**XZCP1764L10**
Weight (kg)	L = 2 m	0.185
	L = 5 m	0.460
	L = 10 m	0.900

Limit switches

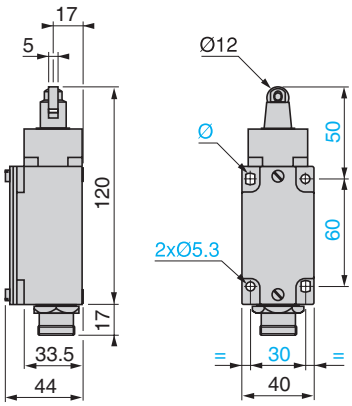
OsiSense XC Standard, industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Complete switches, fixed body
7/8"-16UN connector

Dimensions

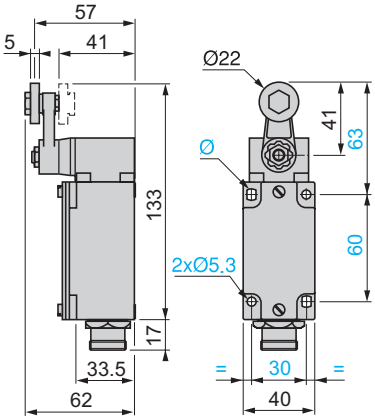
XCKJ161A



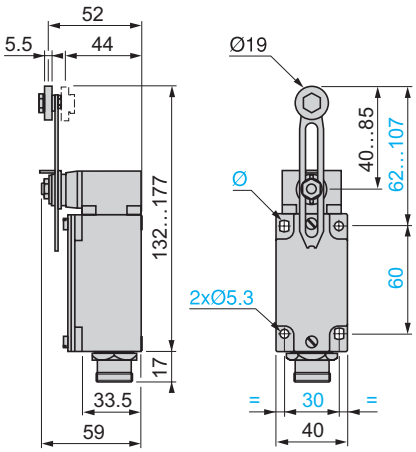
XCKJ167A



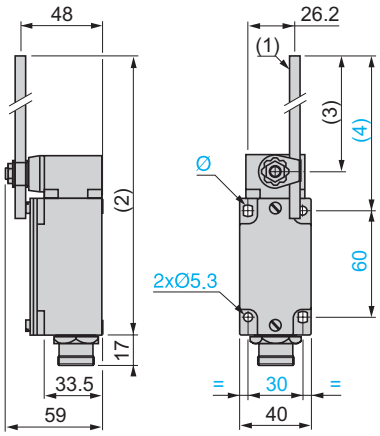
XCKJ1051●A



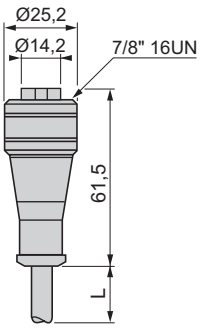
XCKJ10541A



XCKJ10559A



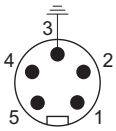
XZCP1764L●



(1) Ø 6 rod, length 200 mm.
(2) 282 max.
(3) 190 max.
(4) 212 max.
Ø: 2 elongated holes Ø 5.3 x 7.3.
L: Cable length 2, 5 or 10 m.

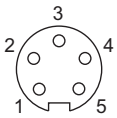
Connections

Limit switch XCKJ●●●●A



1 = 21
2 = 22
3 = ⏚
4 = 14
5 = 13

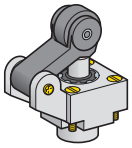
Pre-wired female connector XZCP1764L●



1 = black
2 = blue
3 = yellow/green ⏚
4 = brown
5 = white

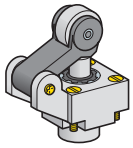
Limit switches

OsiSense XC Standard, industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Fixed or plug-in body
Variable composition: standard bodies



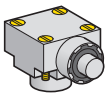
Thermoplastic roller lever plunger, 1 direction of actuation

ZCKE21



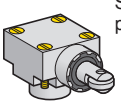
Steel roller lever plunger, 1 direction of actuation

ZCKE23



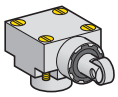
Side metal plunger *(1)*

ZCKE63



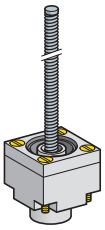
Side steel roller plunger, horizontal *(1)*

ZCKE64



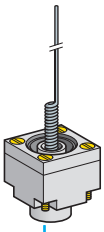
Side steel roller plunger, vertical *(1)*

ZCKE65



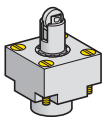
Spring rod *(1)*

ZCKE08



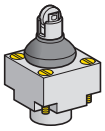
"Cat's whisker" *(1)*

ZCKE06



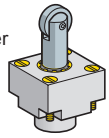
End reinforced steel roller plunger

ZCKE67



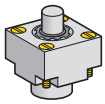
End steel roller plunger with protective boot

ZCKE629



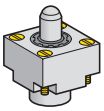
End steel roller plunger

ZCKE62



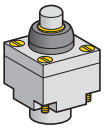
End metal plunger

ZCKE61



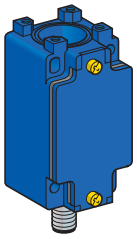
End steel ball bearing plunger

ZCKE66



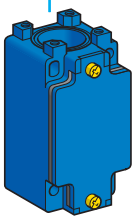
End metal plunger with protective boot

ZCKE619



Body with 2-pole contact, fixed, 1 step, M12 connector *(2)*

ZCKJ1D, J5D, J6D, J7D
ZCKJ8D



Body with contact, cable entry for Pg 13.5, fixed, 1 step *(2) (3)*

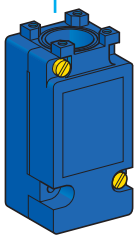
ZCKJD3●,
ZCKJ1, J5, J6, J7, J9

Body with contact, cable entry for Pg 13.5, fixed, 1 step *(2) (3)*

ZCKJ2, J8

Body with contact, cable entry for Pg 13.5, fixed, 2 step *(2) (3)*

ZCKJ4



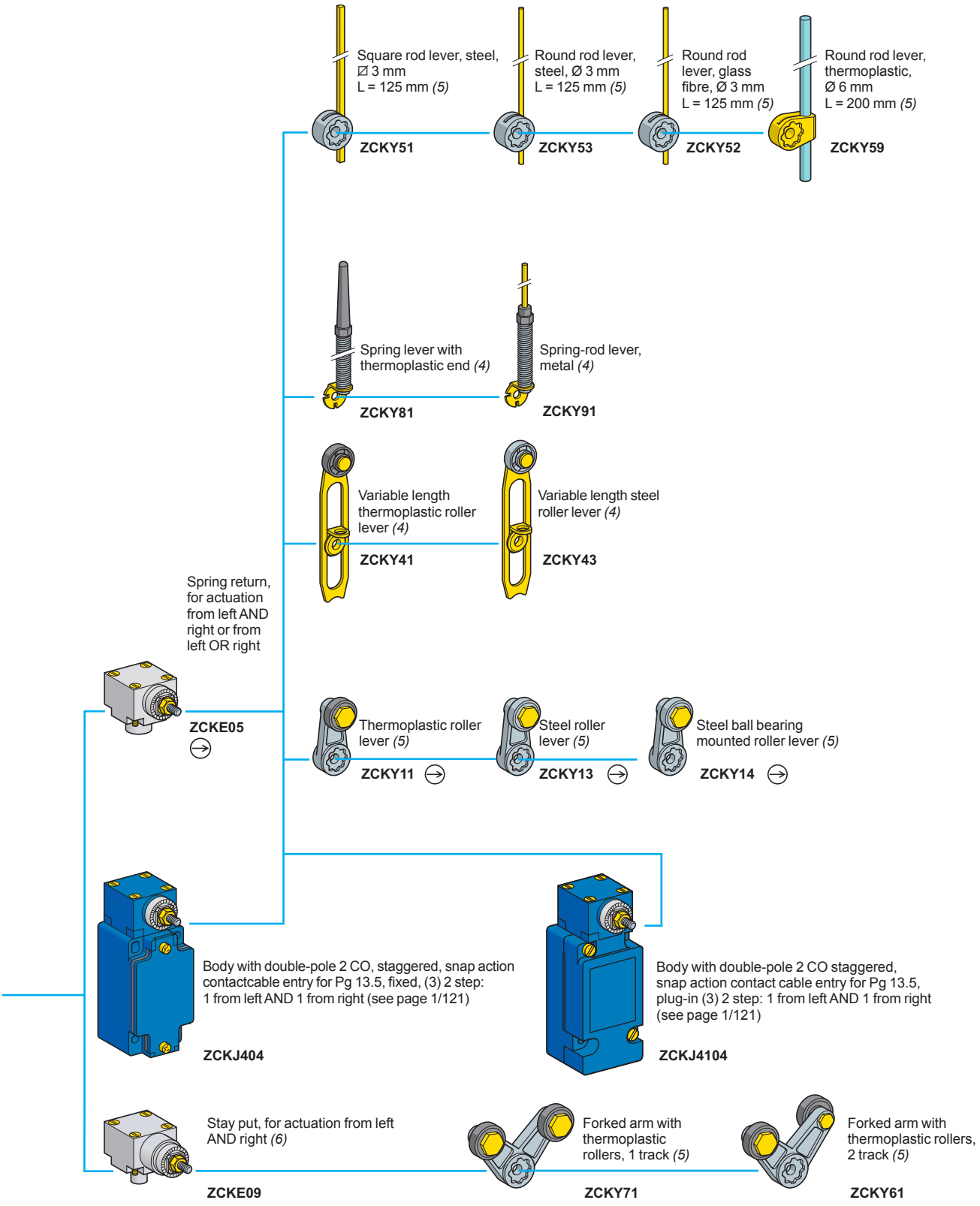
Body with contact, cable entry for Pg 13.5, plug-in, 1 or 2 step *(2) (3)*

ZCKJ11, J21, J41

(1) Cannot be used with bodies ZCKJ4 and ZCKJ41.
(2) For further information, see page 1/114.
*(3) For a cable entry tapped ISO M20 x 1.5, add **H29** to the reference. Example: ZCKJ1 becomes **ZCKJ1H29**.*
*For a cable entry tapped 1/2" NPT, add **H7** to the reference. Example: ZCKJ1 becomes **ZCKJ1H7**.*

Limit switches

OsiSense XC Standard, industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Fixed or plug-in body
Variable composition: standard bodies

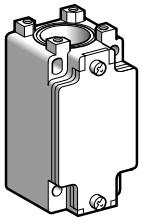


: head assuring positive opening operation.

(4) Adjustable throughout 360° in 5° steps, or in 90° steps by reversing the notched washer.
(5) Adjustable throughout 360° in 5° steps, or in 45° steps by reversing the lever mounting.
(6) Suitable for bodies with contacts ZCKJ1●, J2●, J31, J39.

Limit switches

OsiSense XC Standard, industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Fixed or plug-in body
Adaptable sub-assemblies: standard bodies



ZCKJ●

Fixed bodies with 2-pole contact

Type	With contact block	Scheme	Positive operation *(1)*	Cable entry	Reference	Weight kg
1 step	1 NC + 1 NO snap action (XE2SP2151)	13 21 / 14 22	⊖	Pg 13.5	**ZCKJ1**	0.310
				ISO M20 x 1.5	**ZCKJ1H29**	0.310
				1/2" NPT	**ZCKJ1H7**	0.310
	2 CO simultaneous, snap action (XESP2021)	13 11 23 21 / 14 12 24 22	–	Pg 13.5	**ZCKJ2**	0.310
				ISO M20 x 1.5	**ZCKJ2H29**	0.310
				1/2" NPT	**ZCKJ2H7**	0.310
	1 NC + 1 NO break before make, slow break (XE2NP2151)	13 21 / 14 22	⊖	Pg 13.5	**ZCKJ5**	0.310
				ISO M20 x 1.5	**ZCKJ5H29**	0.310
				1/2" NPT	**ZCKJ5H7**	0.310
	1 NO + 1 NC make before break, slow break (XE2NP2161)	21 13 / 22 14	⊖	Pg 13.5	**ZCKJ6**	0.310
				ISO M20 x 1.5	**ZCKJ6H29**	0.310
				1/2" NPT	**ZCKJ6H7**	0.310
	2 NC simultaneous, slow break (XE2NP2141)	11 21 / 12 22	⊖	Pg 13.5	**ZCKJ7**	0.310
				ISO M20 x 1.5	**ZCKJ7H29**	0.310
				1/2" NPT	**ZCKJ7H7**	0.310
	2 NO simultaneous, slow break (XE2NP2131)	13 23 / 14 24	–	Pg 13.5	**ZCKJ8**	0.310
				ISO M20 x 1.5	**ZCKJ8H29**	0.310
				1/2" NPT	**ZCKJ8H7**	0.310
	2 NC snap action (XE2SP2141)	11 21 / 12 22	⊖	Pg 13.5	**ZCKJ9**	0.310
				ISO M20 x 1.5	**ZCKJ9H29**	0.310
				1/2" NPT	**ZCKJ9H7**	0.310
2 step	2 CO staggered snap action (XESP2031)	13 11 23 21 / 14 12 24 22	–	Pg 13.5	**ZCKJ4**	0.310
				ISO M20 x 1.5	**ZCKJ4H29**	0.310
				1/2" NPT	**ZCKJ4H7**	0.310

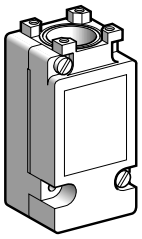
Fixed bodies with 3-pole contact

Type	With contact block	Scheme	Positive operation *(1)*	Cable entry	Reference	Weight kg
–	1 NC + 2 NO snap action (XE3SP2151)	21 33 13 / 22 34 14	⊖	Pg 13.5	**ZCKJD31**	0.310
				ISO M20 x 1.5	**ZCKJD31H29**	0.310
				1/2" NPT	**ZCKJD31H7**	0.310
	2 NC + 1 NO snap action (XE3SP2141)	31 21 13 / 32 22 14	⊖	Pg 13.5	**ZCKJD39**	0.310
				ISO M20 x 1.5	**ZCKJD39H29**	0.310
				1/2" NPT	**ZCKJD39H7**	0.310
	2 NC + 1 NO break before make, slow break (XE3NP2141)	31 21 13 / 32 22 14	⊖	Pg 13.5	**ZCKJD37**	0.310
				ISO M20 x 1.5	**ZCKJD37H29**	0.310
				1/2" NPT	**ZCKJD37H7**	0.310
	1 NC + 2 NO break before make, slow break (XE3NP2151)	21 33 13 / 22 34 14	⊖	Pg 13.5	**ZCKJD35**	0.310
				ISO M20 x 1.5	**ZCKJD35H29**	0.310
				1/2" NPT	**ZCKJD35H7**	0.310

(1) ⊖: NC contact with positive opening operation.

Limit switches

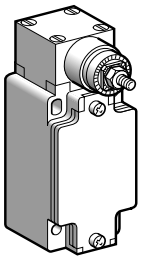
OsiSense XC Standard, industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Fixed or plug-in body
Adaptable sub-assemblies: standard bodies



ZCKJ●1

Plug-in bodies with contact

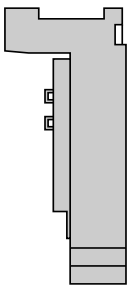
Type	With contact block	Scheme	Positive operation *(1)*	Cable entry	Reference	Weight kg
1 step	Single-pole 1 CO snap action	13 11 / 14 12	–	Pg 13.5	**ZCKJ11**	0.300
				ISO M20 x 1.5	**ZCKJ11H29**	0.300
				1/2" NPT	**ZCKJ11H7**	0.300
	Double-pole 2 CO simultaneous, snap action	13 11 23 21 / 14 12 24 22	–	Pg 13.5	**ZCKJ21**	0.300
				ISO M20 x 1.5	**ZCKJ21H29**	0.300
				1/2" NPT	**ZCKJ21H7**	0.300
2 step	Double-pole 2 CO staggered, snap action	13 11 23 21 / 14 12 24 22	–	Pg 13.5	**ZCKJ41**	0.300
				ISO M20 x 1.5	**ZCKJ41H29**	0.300
				1/2" NPT	**ZCKJ41H7**	0.300



ZCKJ404

Bodies with contact, with rotary head (without operating lever)

Type	With contact block	Scheme	Positive operation *(1)*	Cable entry	Reference	Weight kg
Fixed body						
2 step 1 from left AND 1 from right (see page 1/125)	Double-pole 2 CO staggered, snap action	13 11 23 21 / 14 12 24 22	–	Pg 13.5	**ZCKJ404**	0.455
				ISO M20 x 1.5	**ZCKJ404H29**	0.455
				1/2" NPT	**ZCKJ404H7**	0.455
Plug-in body						
2 step 1 from left AND 1 from right (see page 1/125)	Double-pole 2 CO staggered, snap action	13 11 23 21 / 14 12 24 22	–	Pg 13.5	**ZCKJ4104**	0.465
				ISO M20 x 1.5	**ZCKJ4104H29**	0.465
				1/2" NPT	**ZCKJ4104H7**	0.465



ZCKJ0●

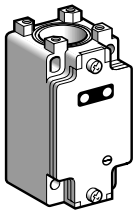
Plug-in housing only

Description	For use with	Contacts	Reference	Weight kg
Single-pole 1 CO with positive opening operation	ZCKJ11	Silver	**ZCKJ01**	0.150
Double-pole 2 CO with positive opening operation	ZCKJ21	Silver	**ZCKJ02**	0.160
Double-pole 2 CO staggered	ZCKJ41	Silver	**ZCKJ04**	0.160

(1) ⊖: NC contact with positive opening operation.

Limit switches

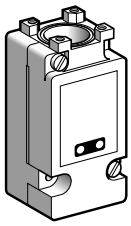
OsiSense XC Standard, industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Fixed or plug-in body. Adaptable sub-assemblies:
bodies with indicator light module



ZCKJ●●●

Fixed bodies with 2-pole contact

Type	With contact block	Scheme	Positive operation (1)	Cable entry	Reference	Weight kg
With module comprising 1 LED, 24 V ⎓						
1 step	1 NC + 1 NO snap action (XE2SP2151)	13 21 / 14 22	⊖	Pg 13.5	**ZCKJ120**	0.320
	1 NC + 1 NO break before make, slow break (XE2NP2151)	13 21 / 14 22	⊖	Pg 13.5	**ZCKJ520**	0.320
With module comprising 2 LEDs, 24 V ⎓						
1 step	1 NC + 1 NO snap action (XE2SP2151)	13 21 / 14 22	⊖	Pg 13.5	**ZCKJ121**	0.320
				ISO M20 x 1.5	**ZCKJ121H29**	0.320
	1 NC + 1 NO break before make, slow break (XE2NP2151)	13 21 / 14 22	⊖	Pg 13.5	**ZCKJ521**	0.320
				ISO M20 x 1.5	**ZCKJ521H29**	0.320
With module comprising 2 LEDs, 110/240 V ∼						
1 step	1 NC + 1 NO snap action (XE2SP2151)	13 21 / 14 22	⊖	Pg 13.5	**ZCKJ134**	0.320
				ISO M20 x 1.5	**ZCKJ134H29**	0.320
	1 NC + 1 NO break before make, slow break (XE2NP2151)	13 21 / 14 22	⊖	Pg 13.5	**ZCKJ534**	0.320
				ISO M20 x 1.5	**ZCKJ534H29**	0.320



ZCKJ1●●●

Plug-in bodies with single-pole contact

Type	With contact block	Scheme	Positive operation (1)	Cable entry	Reference	Weight kg
With module comprising 2 LEDs, 24 V ⎓						
1 step	CO snap action	13 11 / 14 12	–	Pg 13.5	**ZCKJ1121**	0.340
				ISO M20 x 1.5	**ZCKJ1121H29**	0.340
With module comprising 2 LEDs, 110/240 V ∼						
1 step	CO snap action	13 11 / 14 12	–	Pg 13.5	**ZCKJ1134**	0.340
				ISO M20 x 1.5	**ZCKJ1134H29**	0.340

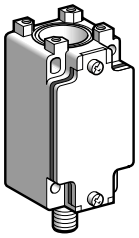
(1) ⊖: NC contact with positive opening operation.

Indicator light module characteristics

Type of indicator	1 LED or 2 LEDs	2 LEDs
Rated insulation voltage	50 V ⎓, conforming to IEC 60947-1	250 V ∼, conforming to IEC 60947-1
Current consumption	7 mA per LED	9 mA per LED
Rated operational voltage	24 V ⎓	110/240 V ∼
Voltage limits	20…30 V ⎓ (including ripple)	95…264 V ∼
Service life	100 000 hours	100 000 hours
Reverse polarity protection	Yes	–

Limit switches

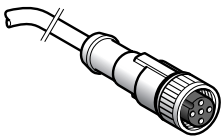
OsiSense XC Standard, industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Fixed or plug-in body. Adaptable sub-assemblies:
bodies with M12 connector



ZCKJ●D

Fixed bodies with 2-pole contact

Type	With contact block	Scheme	Positive operation *(1)*	Reference	Weight kg
1 step	1 NC + 1 NO snap action (XE2SP2151)	13 21 / 14 22	⊖	**ZCKJ1D**	0.320
	1 NC + 1 NO break before make, slow break (XE2NP2151)	13 21 / 14 22	⊖	**ZCKJ5D**	0.320
	1 NO + 1 NC make before break, slow break (XE2NP2161)	21 13 / 22 14	⊖	**ZCKJ6D**	0.320
	2 NC simultaneous, slow break (XE2NP2141)	11 21 / 12 22	⊖	**ZCKJ7D**	0.320
	2 NO simultaneous, slow break (XE2NP2131)	13 23 / 14 24	–	**ZCKJ8D**	0.320



XZCP1164L●

Female pre-wired connectors

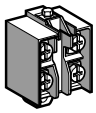
Description	Cable length	Reference	Weight kg
Female pre-wired connectors, M12, straight Ø 5,0 mm cable Conductor c.s.a: 5 x 0.34 mm² Nominal current : 4 A Nominal voltage: ∿ 30 V, ⎓ 36 V	1 m	**XZCP1164L2**	0.115
	5 m	**XZCP1164L5**	0.270
	10 m	**XZCP1164L10**	0.520

(1) NC contact with positive opening operation.

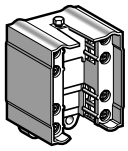
Limit switches

OsiSense XC Standard, industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Fixed or plug-in body
Adaptable sub-assemblies: contact blocks

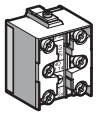
XE2SP21●1



XE2NP21●1

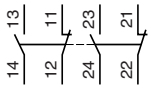
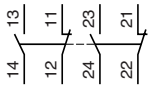
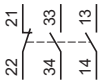
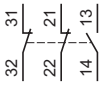
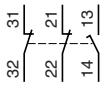
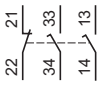


XESP20●1



XE3●P21●1

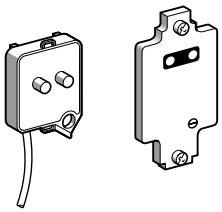
Contact blocks

Type of contact	Scheme	For bodies	Positive operation *(1)*	Reference	Weight kg
2-pole contact					
1 NC + 1 NO snap action		ZCKJ1 ZCKJ1D	⊖	**XE2SP2151**	0.020
1 NC + 1 NO break before make, slow break		ZCKJ5 ZCKJ5D	⊖	**XE2NP2151**	0.020
2 CO simultaneous snap action		ZCKJ2	–	**XESP2021**	0.045
2 CO staggered, snap action		ZCKJ4	–	**XESP2031**	0.045
1 NO + 1 NC make before break, slow break		ZCKJ6 ZCKJ6D	⊖	**XE2NP2161**	0.020
2 NC simultaneous, slow break		ZCKJ7 ZCKJ7D	⊖	**XE2NP2141**	0.020
2 NO simultaneous, slow break		ZCKJ8 ZCKJ8D	–	**XE2NP2131**	0.020
2 NC snap action		ZCKJ9	⊖	**XE2SP2141**	0.020
3-pole contact					
1 NC + 2 NO snap action		ZCKJD31	⊖	**XE3SP2151**	0.035
2 NC + 1 NO snap action		ZCKJD39	⊖	**XE3SP2141**	0.035
2 NC + 1 NO break before make, slow break		ZCKJD37	⊖	**XE3NP2141**	0.035
1 NC + 2 NO break before make, slow break		ZCKJD35	⊖	**XE3NP2151**	0.035

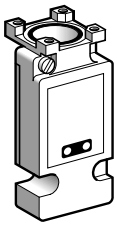
(1) ⊖: NC contact with positive opening operation.

Limit switches

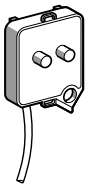
OsiSense XC Standard, industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Fixed or plug-in body
Adaptable sub-assemblies: add-ons



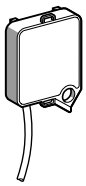
ZCKZ0●●



ZCKJ01●●



ZCKJ90●



ZCKJ82A

Covers + indicator light module

For use with	Number and type of indicators	Voltage	Reference	Weight kg
Fixed body	1 LED	24 V ⎓	**ZCKZ020**	0.060
	2 LEDs	24 V ⎓	**ZCKZ021**	0.060
	2 LEDs	110/240 V ∿	**ZCKZ034**	0.060
Plug-in body	2 LEDs	24 V ⎓	**ZCKJ0121**	0.200
	2 LEDs	110/240 V ∿	**ZCKJ0134**	0.200

Indicator light modules

For use with	Number and type of indicators	Voltage	Reference	Weight kg
Fixed body	1 LED	24 V ⎓	**ZCKJ902**	0.030
	2 LEDs	24 V ⎓	**ZCKJ906**	0.030
	2 LEDs	110/240 V ∿	**ZCKJ904**	0.030

Module with resistor for machine diagnostics

For use with	Resistor value	Reference	Weight kg
Fixed body (ZCKJ1 only)	15 kΩ, 1/4 W	**ZCKJ82A**	0.030

Other versions Covers + indicator light module for other supply voltages.
Please consult our Customer Care Centre.

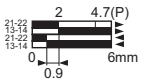
Limit switches

OsiSense XC Standard, industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Fixed or plug-in body
Adaptable sub-assemblies

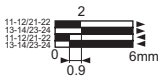
Function diagrams (positive operation assured only if the associated sub-assemblies are ⊖)

Heads ZCKE61, ZCKE619, ZCKE66 with body

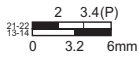
ZCKJ1●



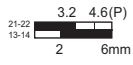
ZCKJ2●



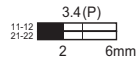
ZCKJ5●



ZCKJ6●

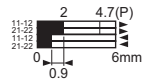


ZCKJ7●

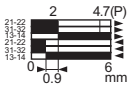


ZCKJ8●

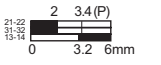
ZCKJ9



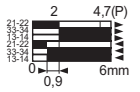
ZCKJD39



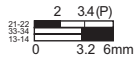
ZCKJD37



ZCKJD31

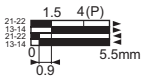


ZCKJD35



Head ZCKE63 with body

ZCKJ1●



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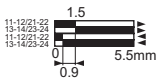
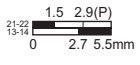
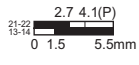


ZCKJ5●



ZCKJ6



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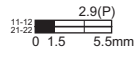

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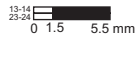

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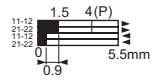

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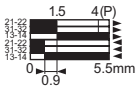

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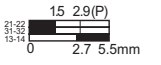

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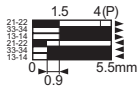

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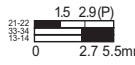
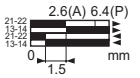


Heads ZCKE64, ZCKE65 with body

ZCKJ1●



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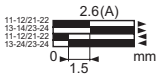

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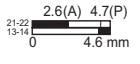

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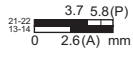
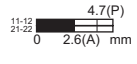


ZCKJ7



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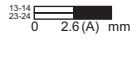

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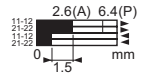

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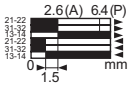

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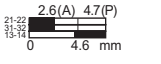

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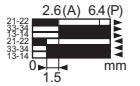

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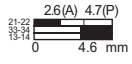
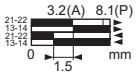


Heads ZCKE67, ZCKE629 with body

ZCKJ1●



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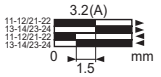
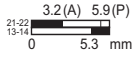
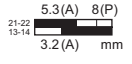


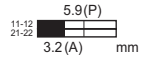
ZCKJ5●



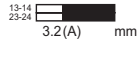
ZCKJ6



ZCKJ7



ZCKJ8



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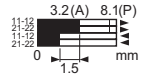

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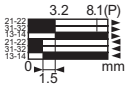
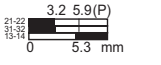
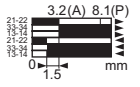


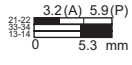
ZCKJD37



ZCKJD31

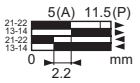


ZCKJD35

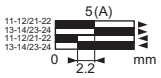


Heads ZCKE21, ZCKE23 with body

ZCKJ1●



ZCKJ2●



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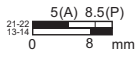

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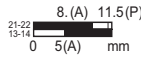

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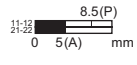

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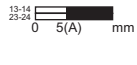
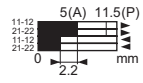


ZCKJ9



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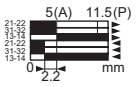

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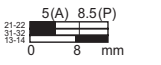
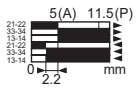


ZCKJD31



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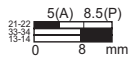
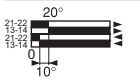


Heads ZCKE06, ZCKE08 with body

ZCKJ1●



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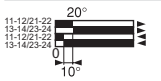
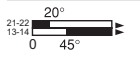


ZCKJ5●



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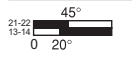

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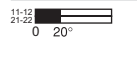
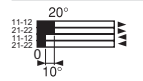


ZCKJ8

ZCKJ9



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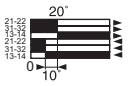

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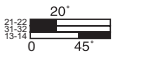

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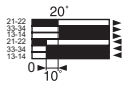

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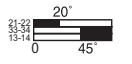
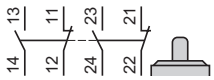
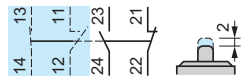


ZCKJ4●

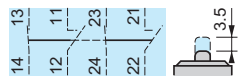
Unactuated



1st step



2nd step



Contact operation

■ closed
□ open

(A) = cam displacement
(P) = positive opening point

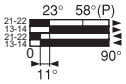
Limit switches

OsiSense XC Standard, industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Fixed or plug-in body
Adaptable sub-assemblies

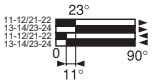
Function diagrams (positive operation assured only if the associated sub-assemblies are ⊖)

Head ZCKE05 with body

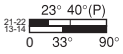
ZCKJ1●



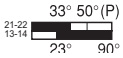
ZCKJ2●



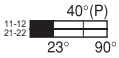
ZCKJ5●



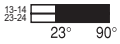
ZCKJ6



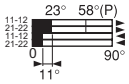
ZCKJ7



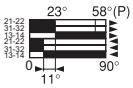
ZCKJ8



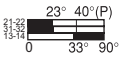
ZCKJ9



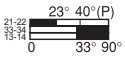
ZCKJD39



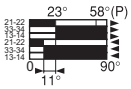
ZCKJD37



ZCKJD39

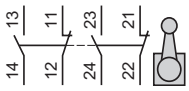


ZCKJD31

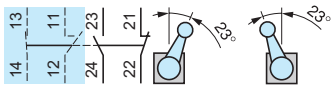


ZCKJ4●

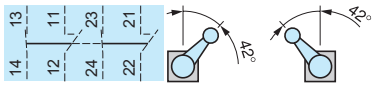
Unactuated



1st step, actuated from left or right

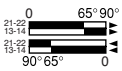


2nd step, actuated from left or right

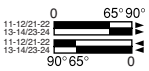


Head ZCKE09 with body

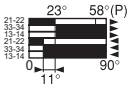
ZCKJ1●



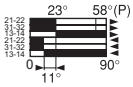
ZCKJ2●



ZCKJD31

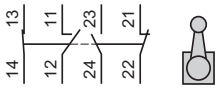


ZCKJD39

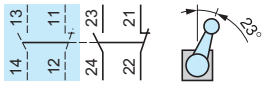


ZCKJ404, J4104 (body with head)

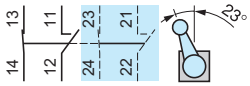
Unactuated



Actuated from left



Actuated from right

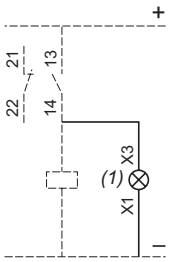


Contact operation ■ closed □ open (P) = positive opening point

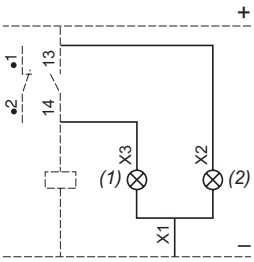
Wiring schemes

Indicator light modules

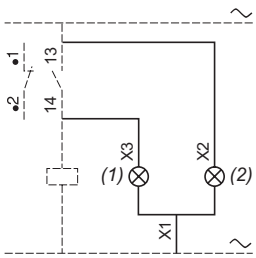
1 LED, 24 V ⎓



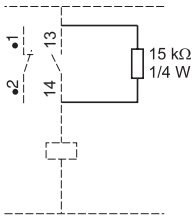
2 LEDs, 24 V ⎓



2 LEDs, 110/240 V ∼

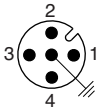


Module with resistor



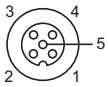
(1) Orange indicator
(2) Green indicator

ZCKJ●D



1 - 2 = NC
3 - 4 = NO
5 = ⏚
4 A / 24 V max.

Pre-wired connectors XZCP1164●



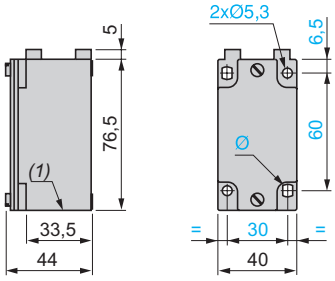
1 = brown
2 = white/black
3 = blue
4 = black
5 = yellow/green

Limit switches

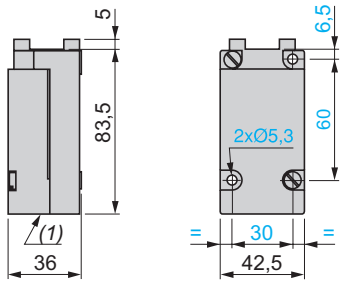
OsiSense XC Standard, industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Fixed or plug-in body
Adaptable sub-assemblies

Bodies

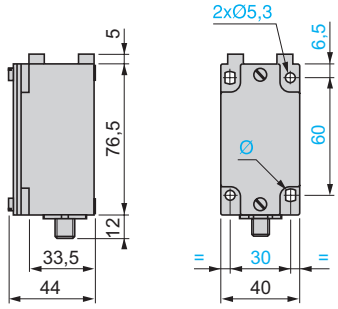
ZCKJ1, J2, J5, J4, J•2•, J•3•, J6, J7, J8, J9
ZCKJ1H29, J2H29, J5H29, J4H29, J•2•H29, J•3•H29, J6H29, J7H29, J8H29, J9H29
ZCKJ1H7, J2H7, J5H7, J4H7, J•2•H7, J•3•H7, J6H7, J7H7, J8H7, J9H7



ZCKJ11, J21, J41, J11••
ZCKJ11H29, J21H29, J41H29, J11••H29
ZCKJ11H7, J21H7, J41H7, J11••H7

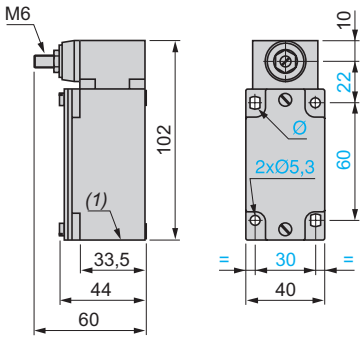


ZCKJ1D, J5D, J6D, J7D, J8D

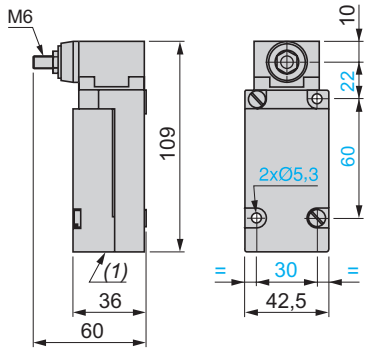


Bodies with rotary head mounted

ZCKJ404, ZCKJ404H29, ZCKJ404H7

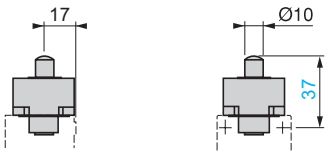


ZCKJ4104, ZCKJ4104H29, ZCKJ4104H7

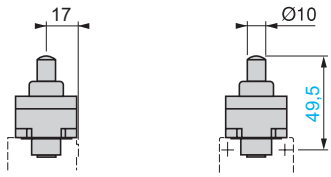


Plunger heads

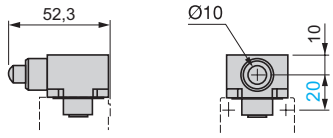
ZCKE61



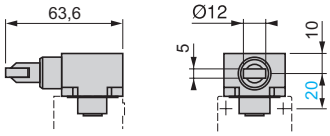
ZCKE619



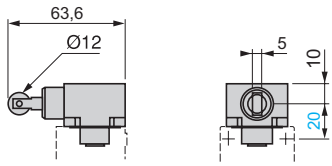
ZCKE63



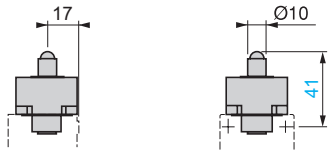
ZCKE64



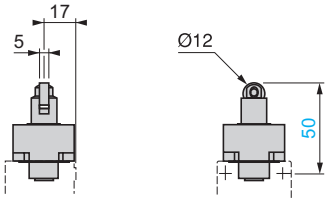
ZCKE65



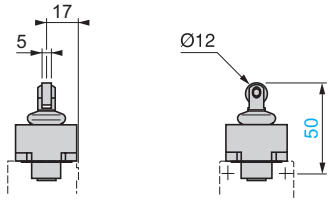
ZCKE66



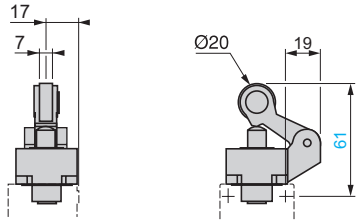
ZCKE62, ZCKE67



ZCKE629



ZCKE21, ZCKE23



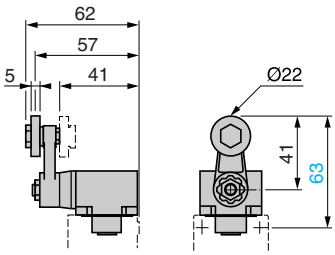
(1) 1 tapped entry for ISO M20 x 1.5 or Pg 13.5 cable gland or tapped 1/2" NPT.
Ø: 2 elongated holes Ø 5.3 x 7.3.

Limit switches

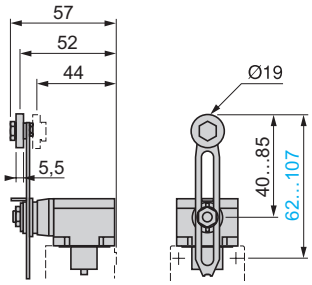
OsiSense XC Standard, industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Fixed or plug-in body
Adaptable sub-assemblies

Rotary head ZCKE05 with operating lever

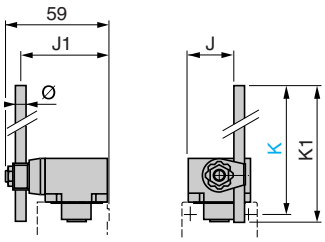
ZCKY11, Y13, Y14



ZCKY41, Y43

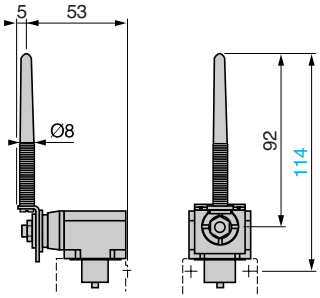


ZCKY51, Y52, Y53, Y59

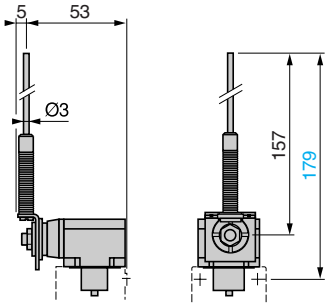


	J	J1	K max.	K1	Ø
ZCKY51	20	49	137	123	⌀ 3
ZCKY52	20	49	137	125	Ø 3
ZCKY53	20	49	137	125	Ø 3
ZCKY59	26.2	48	212	200	Ø 6

ZCKY81

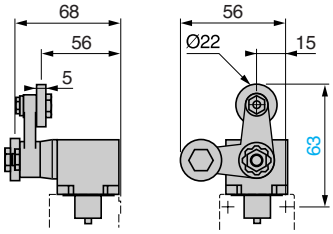


ZCKY91

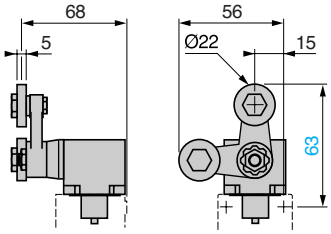


Rotary head ZCKE09 with operating lever

ZCKY61

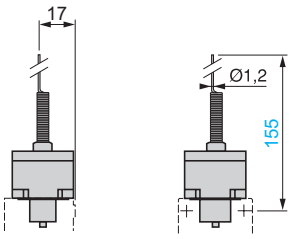


ZCKY71

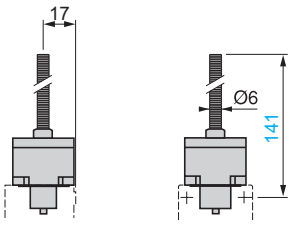


Multi-directional heads

ZCKE06

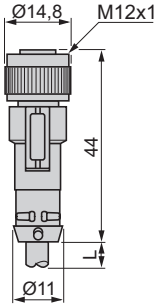


ZCKE08



Note: *operating lever spindle threaded M6.*

Pre-wired connectors XZCP1164L●

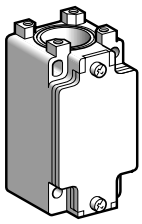


L = 2, 5 or 10 m.

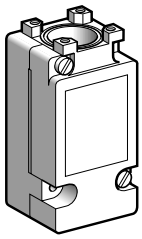
Limit switches

OsiSense XC Standard, industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Fixed or plug-in body

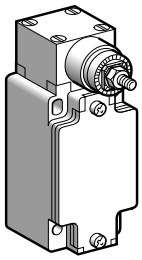
Adaptable sub-assemblies for low temperature applications (- 40°C)



ZCKJ1



ZCKJ11



ZCKJ4046

Bodies with contacts For plunger or rotary head

Type	With contact block	Scheme	Positive operation (1)	Cable entry	Reference	Weight kg
Fixed bodies						
1 step	2-pole NC + NO snap action (XE2SP2151)	13 21 / 14 22	⊖	Pg 13.5	**ZCKJ1**	0.310
				ISO M20 x 1.5	**ZCKJ1H29**	0.310
				1/2" NPT	**ZCKJ1H7**	0.310
	Double-pole 2 CO simultaneous, snap action (XESP2021)	13 11 23 21 / 14 12 24 22	–	Pg 13.5	**ZCKJ2**	0.310
				ISO M20 x 1.5	**ZCKJ2H29**	0.310
				1/2" NPT	**ZCKJ2H7**	0.310
	2-pole NC + NO break before make, slow break (XE2NP2151)	13 21 / 14 22	⊖	Pg 13.5	**ZCKJ5**	0.310
				ISO M20 x 1.5	**ZCKJ5H29**	0.310
				1/2" NPT	**ZCKJ5H7**	0.310
	2-pole NO + NC make before break, slow break (XE2NP2161)	21 13 / 22 14	⊖	Pg 13.5	**ZCKJ6**	0.310
				ISO M20 x 1.5	**ZCKJ6H29**	0.310
				1/2" NPT	**ZCKJ6H7**	0.310
	2-pole NC + NC simultaneous, slow break (XE2NP2141)	11 21 / 12 22	⊖	Pg 13.5	**ZCKJ7**	0.310
				ISO M20 x 1.5	**ZCKJ7H29**	0.310
				1/2" NPT	**ZCKJ7H7**	0.310
	2-pole NO + NO simultaneous, slow break (XE2NP2131)	13 23 / 14 24	–	Pg 13.5	**ZCKJ8**	0.310
				ISO M20 x 1.5	**ZCKJ8H29**	0.310
				1/2" NPT	**ZCKJ8H7**	0.310
	2-pole NC + NC snap action (XE2SP2141)	11 21 / 12 22	⊖	Pg 13.5	**ZCKJ9**	0.310
				ISO M20 x 1.5	**ZCKJ9H29**	0.310
				1/2" NPT	**ZCKJ9H7**	0.310
2 step	Double-pole 2 CO staggered, snap action (XESP2031)	13 11 23 21 / 14 12 24 22	–	Pg 13.5	**ZCKJ4**	0.310
				ISO M20 x 1.5	**ZCKJ4H29**	0.310
				1/2" NPT	**ZCKJ4H7**	0.310
Plug-in bodies						
1 step	Single-pole CO snap action	13 11 / 14 12	–	Pg 13.5	**ZCKJ11**	0.300
				ISO M20 x 1.5	**ZCKJ11H29**	0.300
				1/2" NPT	**ZCKJ11H7**	0.300
	Double-pole 2 CO simultaneous snap action	13 11 23 21 / 14 12 24 22	–	Pg 13.5	**ZCKJ21**	0.300
				ISO M20 x 1.5	**ZCKJ21H29**	0.300
				1/2" NPT	**ZCKJ21H7**	0.300
2 step	Double-pole 2 CO staggered, snap action	13 11 23 21 / 14 12 24 22	–	Pg 13.5	**ZCKJ41**	0.300
				ISO M20 x 1.5	**ZCKJ41H29**	0.300
				1/2" NPT	**ZCKJ41H7**	0.300

Bodies with contacts With spring return rotary head (without operating lever)

Type	With contact block	Scheme	Positive operation (1)	Cable entry	Reference	Weight kg
Fixed body						
2 step 1 from the left AND 1 from the right	Double-pole 2 CO staggered, snap action	13 11 23 21 / 14 12 24 22	–	Pg 13.5	**ZCKJ4046**	0.455
				ISO M20 x 1.5	**ZCKJ4046H29**	0.455
				1/2" NPT	**ZCKJ4046H7**	0.455
Plug-in body						
2 step 1 from the left AND 1 from the right	Double-pole 2 CO staggered, snap action	13 11 23 21 / 14 12 24 22	–	Pg 13.5	**ZCKJ41046**	0.465
				ISO M20 x 1.5	**ZCKJ41046H29**	0.465
				1/2" NPT	**ZCKJ41046H7**	0.465

(1) ⊖: head assuring positive opening operation.

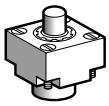
Operation:
pages 1/120 and 1/121

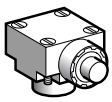
Dimensions:
pages 1/122 and 1/123

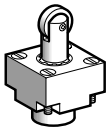
Limit switches

OsiSense XC Standard, industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Fixed or plug-in body

Adaptable sub-assemblies for low temperature applications (- 40°C)


ZCKE616


ZCKE636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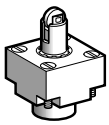
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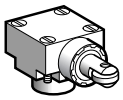
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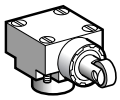
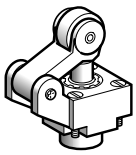

ZCKE656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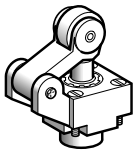
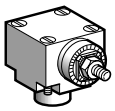
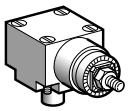
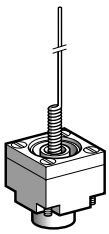
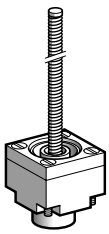

ZCKE236


ZCKE056


ZCKE096


ZCKE066


ZCKE086

Plunger heads

Type of operator		Compatible bodies	Maximum actuation speed	Positive operation *(1)*	Reference	Weight kg
For actuation on end						
End plunger metal		ZCKJ●, ZCKJ●●	0.5 m/s	⊖	**ZCKE616**	0.140
Side plunger metal		ZCKJ●, ZCKJ●●, except ZCKJ4 and J41	0.5 m/s	⊖	**ZCKE636**	0.200
For actuation by 30° cam						
Roller plunger steel		ZCKJ●, ZCKJ●●	1 m/s	⊖	**ZCKE626**	0.155
End reinforced roller plunger steel		ZCKJ●, ZCKJ●●	1 m/s	⊖	**ZCKE676**	0.155
Side roller plunger steel	Horizontal	ZCKJ●, ZCKJ●●, except ZCKJ4 and J41	0.6 m/s	⊖	**ZCKE646**	0.205
	Vertical	ZCKJ●, ZCKJ●●, except ZCKJ4 and J41	0.6 m/s	⊖	**ZCKE656**	0.205
Roller lever plunger (1 direction of actuation)	Thermoplastic	ZCKJ●, ZCKJ●●	1.5 m/s	⊖	**ZCKE216**	0.185
	Steel	ZCKJ●, ZCKJ●●	1.5 m/s	⊖	**ZCKE236**	0.195

Rotary heads (without operating lever)

Type	Compatible bodies	Maximum actuation speed	Positive operation *(1)*	Reference	Weight kg
Spring return, for actuation from left **AND** right or from left **OR** right (see page 1/136)	ZCKJ●, ZCKJ●●	1.5 m/s by 30° cam	⊖	**ZCKE056**	0.165
Stay put, for actuation from left **AND** right (see page 1/136)	ZCKJ1, J11 ZCKJ2, J21	0.5 m/s	–	**ZCKE096**	0.190

Multi-directional heads

Type of operator	Compatible bodies	Maximum actuation speed	Positive operation *(1)*	Reference	Weight kg
For actuation by any moving part					
"Cat's whisker"	ZCKJ●, ZCKJ●●, except ZCKJ4 and ZCKJ41	1 m/s in any direction	–	**ZCKE066**	0.115
Spring rod	ZCKJ●, ZCKJ●●, except ZCKJ4 and ZCKJ41	0.5 m/s in any direction	–	**ZCKE086**	0.125

(1) ⊖: head assuring positive opening operation.

Operation:
pages 1/120 and 1/121

Dimensions:
pages 1/122 and 1/123

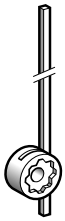
Limit switches

OsiSense XC Standard, industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Fixed or plug-in body

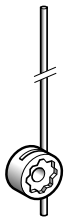
Adaptable sub-assemblies for low temperature applications (- 40°C)

ZCKY1●

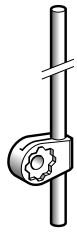
ZCKY4●



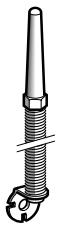
ZCKY51



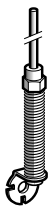
ZCKY5●



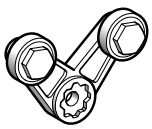
ZCKY59



ZCKY81



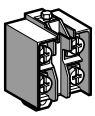
ZCKY91



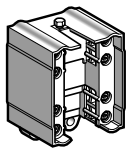
ZCKY71

ZCKY61

XE2SP21●1



XE2NP21●1



XES P20●1

Operating levers for rotary heads

Description		Positive operation (1)	Reference	Weight kg
For actuation by 30° cam				
Roller lever (2)	Thermoplastic	⊖	**ZCKY11**	0.025
	Steel	⊖	**ZCKY13**	0.035
	Steel, ball bearing mounted	⊖	**ZCKY14**	0.030
Variable length roller lever (3)	Thermoplastic	–	**ZCKY41**	0.030
	Steel	–	**ZCKY43**	0.040
For actuation by any moving part				
Square rod (2)	Ø 3 mm steel, L = 125 mm	–	**ZCKY51**	0.025
Round rod (2)	Ø 3 mm steel, L = 125 mm	–	**ZCKY53**	0.025
	Ø 3 mm glass fibre, L = 125 mm	–	**ZCKY52**	0.020
	Ø 6 mm thermoplastic, L = 200 mm	–	**ZCKY59**	0.030
Spring lever (3)		–	**ZCKY81**	0.020
Spring-metal rod lever (3)		–	**ZCKY91**	0.025
For actuation by specific cam (only for operation with head ZCKE096)				
Forked arm with rollers (2) thermoplastic	1 track	–	**ZCKY71**	0.035
	2 track	–	**ZCKY61**	0.035

2-pole and double-pole contact blocks

Type of contact	Scheme	For body	Positive operation (1)	Reference	Weight kg
NC + NO snap action	13 21 / 14 22	ZCKJ1	⊖	**XE2SP2151**	0.020
NC + NO break before make, slow break	13 21 / 14 22	ZCKJ5	⊖	**XE2NP2151**	0.020
2 CO simultaneous, snap action	13 11 23 21 / 14 12 24 22	ZCKJ2	–	**XESP2021**	0.045
2 CO staggered, snap action	13 11 23 21 / 14 12 24 22	ZCKJ4	–	**XESP2031**	0.045
NC + NO make before break, slow break	21 13 / 22 14	ZCKJ6	⊖	**XE2NP2161**	0.020
NC + NC simultaneous, slow break	11 21 / 12 22	ZCKJ7	⊖	**XE2NP2141**	0.020
NO + NO simultaneous, slow break	13 23 / 14 24	ZCKJ8	–	**XE2NP2131**	0.020
NC + NC snap action	11 21 / 12 22	ZCKJ9	⊖	**XE2SP2141**	0.020

(1) ⊖: NC contact with positive opening operation or sub-assembly assuring positive opening operation.
(2) Adjustable throughout 360° in 5° steps, or in 45° steps by reversing the lever or its mounting.
(3) Adjustable throughout 360° in 5° steps.

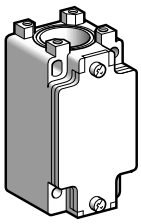
Operation:
pages 1/120 and 1/121

Dimensions:
pages 1/122 and 1/123

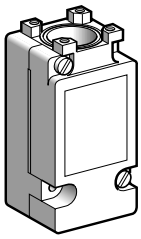
Limit switches

OsiSense XC Standard, industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Fixed or plug-in body

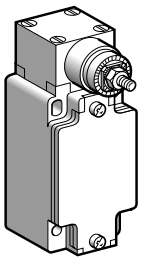
Adaptable sub-assemblies for high temperature applications (+ 120°C)



ZCKJ●



ZCKJ●15



ZCKJ4045

Bodies with contacts — For plunger or rotary head

Type	With contact block	Scheme	Positive operation (1)	Cable entry	Reference	Weight kg
Fixed bodies						
1 step	2-pole NC + NO snap action (XE2SP2151)	13 21 / 14 22	⊖	Pg 13.5	**ZCKJ1**	0.310
				ISO M20 x 1.5	**ZCKJ1H29**	0.310
				1/2" NPT	**ZCKJ1H7**	0.310
	Double-pole 2 CO simultaneous, snap action (XESP20215)	13 11 23 21 / 14 12 24 22	–	Pg 13.5	**ZCKJ25**	0.310
				ISO M20 x 1.5	**ZCKJ25H29**	0.310
				1/2" NPT	**ZCKJ25H7**	0.310
	2-pole NC + NO break before make, slow break (XE2NP2151)	13 21 / 14 22	⊖	Pg 13.5	**ZCKJ5**	0.310
				ISO M20 x 1.5	**ZCKJ5H29**	0.310
				1/2" NPT	**ZCKJ5H7**	0.310
	2-pole NO + NC make before break, slow break (XE2NP2161)	21 13 / 22 14	⊖	Pg 13.5	**ZCKJ6**	0.310
				ISO M20 x 1.5	**ZCKJ6H29**	0.310
				1/2" NPT	**ZCKJ6H7**	0.310
	2-pole NC + NC simultaneous, slow break (XE2NP2141)	11 21 / 12 22	⊖	Pg 13.5	**ZCKJ7**	0.310
				ISO M20 x 1.5	**ZCKJ7H29**	0.310
				1/2" NPT	**ZCKJ7H7**	0.310
	2-pole NO + NO simultaneous, slow break (XE2NP2131)	13 23 / 14 24	–	Pg 13.5	**ZCKJ8**	0.310
				ISO M20 x 1.5	**ZCKJ8H29**	0.310
				1/2" NPT	**ZCKJ8H7**	0.310
	2-pole NC + NC snap action (XE2SP2141)	11 21 / 12 22	⊖	Pg 13.5	**ZCKJ9**	0.310
				ISO M20 x 1.5	**ZCKJ9H29**	0.310
				1/2" NPT	**ZCKJ9H7**	0.310
2 step	Double-pole 2 CO staggered, snap action (XESP20315)	13 11 23 21 / 14 12 24 22	–	Pg 13.5	**ZCKJ45**	0.310
				ISO M20 x 1.5	**ZCKJ45H29**	0.310
				1/2" NPT	**ZCKJ45H7**	0.310
Plug-in bodies						
1 step	Single-pole CO snap action	13 11 / 14 12	–	Pg 13.5	**ZCKJ115**	0.300
				ISO M20 x 1.5	**ZCKJ115H29**	0.300
				1/2" NPT	**ZCKJ115H7**	0.300
	Double-pole 2 CO simultaneous, snap action	13 11 23 21 / 14 12 24 22	–	Pg 13.5	**ZCKJ215**	0.300
				ISO M20 x 1.5	**ZCKJ215H29**	0.300
				1/2" NPT	**ZCKJ215H7**	0.300
2 step	Double-pole 2 CO staggered, snap action	13 11 23 21 / 14 12 24 22	–	Pg 13.5	**ZCKJ415**	0.300
				ISO M20 x 1.5	**ZCKJ415H29**	0.300
				1/2" NPT	**ZCKJ415H7**	0.300

Bodies with contacts — With spring return rotary head (without operating lever)

Type	With contact block	Scheme	Positive operation (1)	Cable entry	Reference	Weight kg
Fixed body						
2 step 1 from the left **AND** 1 from the right	Double-pole 2 CO staggered, snap action	13 11 23 21 / 14 12 24 22	–	Pg 13.5	**ZCKJ4045**	0.455
				ISO M20 x 1.5	**ZCKJ4045H29**	0.455
				1/2" NPT	**ZCKJ4045H7**	0.455
Plug-in body						
2 step 1 from the left **AND** 1 from the right	Double-pole 2 CO staggered, snap action	13 11 23 21 / 14 12 24 22	–	Pg 13.5	**ZCKJ41045**	0.465
				ISO M20 x 1.5	**ZCKJ41045H29**	0.465
				1/2" NPT	**ZCKJ41045H7**	0.465

(1) ⊖: head assuring positive opening operation.

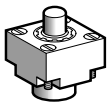
Operation:
pages 1/120 and 1/121

Dimensions:
pages 1/122 and 1/123

Limit switches

OsiSense XC Standard, industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Fixed or plug-in body

Adaptable sub-assemblies for high temperature applications (+ 120°C)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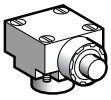
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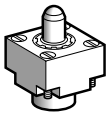
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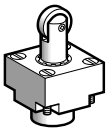
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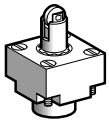
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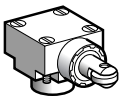
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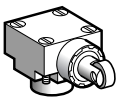
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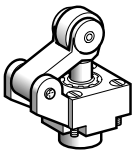
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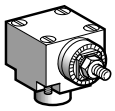
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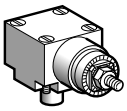
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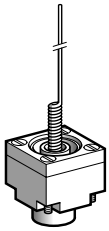
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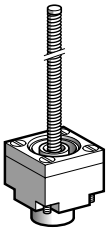

ZCKE085

Plunger heads

Type of operator		Compatible bodies	Maximum actuation speed	Positive operation (1)	Reference	Weight kg
For actuation on end						
End plunger	Metal	ZCKJ1, J2, J4, ZCKJ115, J215, J415, ZCKJ5, J6, J7, J8, J9	0.5 m/s	⊖	**ZCKE615**	0.140
Side plunger	Metal	ZCKJ1, J2, ZCKJ115, J215, ZCKJ5, J6, J7, J8, J9	0.5 m/s	⊖	**ZCKE635**	0.200
For actuation by 30° cam						
End ball bearing plunger	Steel	ZCKJ1, J2, J4, ZCKJ115, J215, J415, ZCKJ5, J6, J7, J8, J9	0.1 m/s	⊖	**ZCKE665**	0.150
End roller plunger	Steel	ZCKJ1, J2, J4, ZCKJ115, J215, J415, ZCKJ5, J6, J7, J8, J9	1 m/s	⊖	**ZCKE625**	0.155
End reinforced roller plunger	Steel	ZCKJ1, J2, J4, ZCKJ115, J215, J415, ZCKJ5, J6, J7, J8, J9	1 m/s	⊖	**ZCKE675**	0.155
Side roller plunger	Steel Horizontal	ZCKJ1, J2, ZCKJ115, J215, ZCKJ5, J6, J7, J8, J9	0.6 m/s	⊖	**ZCKE645**	0.205
	Steel Vertical	ZCKJ1, J2, ZCKJ115, J215, ZCKJ5, J6, J7, J8, J9	0.6 m/s	⊖	**ZCKE655**	0.205
Roller lever plunger (1 direction of actuation)	Steel	ZCKJ1, J2, J4, ZCKJ115, J215, J415, ZCKJ5, J6, J7, J8, J9	1.5 m/s	⊖	**ZCKE235**	0.195
	Thermoplastic	ZCKJ1, J2, J4, ZCKJ115, J215, J415, ZCKJ5, J6, J7, J8, J9	1.5 m/s	⊖	**ZCKE215**	0.185

Rotary heads (without operating lever)

Type	Compatible bodies	Maximum actuation speed	Positive operation (1)	Reference	Weight kg
Spring return, for actuation from left **AND** right or from left **OR** right (see page 1/136)	ZCKJ1, J2, J4, ZCKJ115, J215, ZCKJ415, ZCKJ5, J6, J7, J8, J9	1.5 m/s by 30° cam	⊖	**ZCKE055**	0.165
Stay put, actuation from left **AND** right (see page 1/136)	ZCKJ1, J2, ZCKJ115, J215	0.5 m/s	–	**ZCKE095**	0.190

Multi-directional heads

Type of operator	Compatible bodies	Maximum actuation speed	Positive operation (1)	Reference	Weight kg
For actuation by any moving part					
"Cat's whisker"	ZCKJ1, J2, ZCKJ115, J215, ZCKJ5, J6, J7, J8, J9	1 m/s in any direction	–	**ZCKE065**	0.115
Spring rod	ZCKJ1, J2, ZCKJ115, J215, ZCKJ5, J6, J7, J8, J9	0.5 m/s in any direction	–	**ZCKE085**	0.125

(1) ⊖: head assuring positive opening operation.

Operation:
pages 1/120 and 1/121

Dimensions:
pages 1/122 and 1/123

Telemecanique Sensors

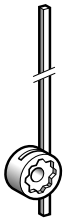
Limit switches

OsiSense XC Standard, industrial format EN 50041
Metal, conforming to CENELEC EN 50041, type XCKJ
Fixed or plug-in body

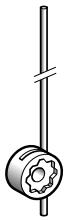
Adaptable sub-assemblies for high temperature applications (+ 120°C)

ZCKY1●

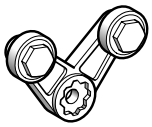
ZCKY43



ZCKY51



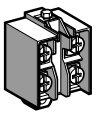
ZCKY5●



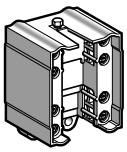
ZCKY715

ZCKY615

XE2SP21●1



XE2NP21●1



XESP20●15

Operating levers for rotary heads

Description		Positive operation (1)	Reference	Weight kg
For actuation by 30° cam				
Roller lever *(2)*	Thermoplastic	⊖	**ZCKY115**	0.025
	Steel	⊖	**ZCKY13**	0.035
	Steel, ball bearing mounted	⊖	**ZCKY14**	0.030
Variable length roller lever *(3)*	Thermoplastic	–	**ZCKY415**	0.030
	Steel	–	**ZCKY43**	0.040
For actuation by any moving part				
Square rod *(2)*	⌀ 3 mm steel, L = 125 mm	–	**ZCKY51**	0.025
Round rod *(2)*	Ø 3 mm steel, L = 125 mm	–	**ZCKY53**	0.025
	Ø 3 mm glass fibre, L = 125 mm	–	**ZCKY52**	0.020
For actuation by specific cam (only for operation with head ZCKE095)				
Forked arm with rollers (2) thermoplastic	1 track	–	**ZCKY715**	0.035
	2 track	–	**ZCKY615**	0.035

2-pole and double-pole contact blocks

Type of contact	Scheme	For bodies	Positive operation (1)	Reference	Weight kg
NC + NO snap action	13 21 / 14 22	ZCKJ1	⊖	**XE2SP2151**	0.020
NC + NO break before make, slow break	13 21 / 14 22	ZCKJ5	⊖	**XE2NP2151**	0.020
2 CO simultaneous, snap action	13 11 23 21 / 14 12 24 22	ZCKJ25	–	**XESP20215**	0.045
2 CO staggered, snap action	13 11 23 21 / 14 12 24 22	ZCKJ45	–	**XESP20315**	0.045
NC + NO make before break, slow break	21 13 / 22 14	ZCKJ6	⊖	**XE2NP2161**	0.020
NC + NC simultaneous, slow break	11 21 / 12 22	ZCKJ7	⊖	**XE2NP2141**	0.020
NO + NO simultaneous, slow break	13 23 / 14 24	ZCKJ8	–	**XE2NP2131**	0.020
NC + NC snap action	11 21 / 12 22	ZCKJ9	⊖	**XE2SP2141**	0.020

(1) ⊖: NC contact with positive opening operation or sub-assembly assuring positive opening operation.
(2) Adjustable throughout 360° in 5° steps, or in 45° steps by reversing the lever or its mounting.
(3) Adjustable throughout 360° in 5° steps.

Operation:
pages 1/120 and 1/121

Dimensions:
pages 1/122 and 1/123

Limit switches
OsiSense XC
General

Presentation

Electromechanical detection

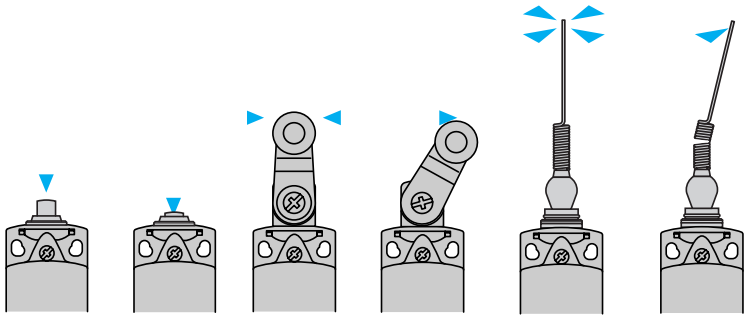
Limit switches are used in all automated installations and also in a wide variety of applications, due to the numerous advantages inherent to their technology.
They transmit data to the logic processing system regarding:
- presence/absence,
- passing,
- positioning,
- end of travel.

Simplicity of installation, advantages

- **From an electrical viewpoint**
  - galvanic separation of circuits,
  - models suitable for low power switching combined with good electrical durability,
  - very good short-circuit withstand in coordination with appropriate fuses,
  - total immunity to electromagnetic interference,
  - high rated operational voltage.
- **From a mechanical viewpoint**
  - NC contacts with positive opening operation,
  - high resistance to the different ambient conditions encountered in industry (standard tests and specific tests under laboratory conditions),
  - high repeat accuracy, up to 0.01 mm on the tripping points.

Detection movements

- Linear movement (plunger)
- Rotary movement (lever)
- Multi-directional movement



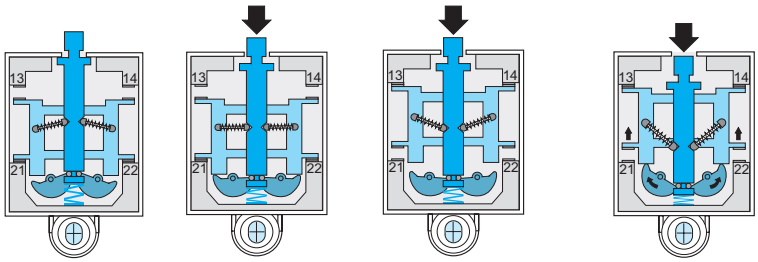
Terminology

Rated value of a quantity	■ This replaces the term “nominal value”. ■ It is the fixed value for a specific function.
Utilisation categories:	■ AC-15 replaces AC-11: control of an electromagnet on AC, test 10 Ie/Ie. ■ AC-12: control of a resistive load on AC or static load isolated by opto-coupler. ■ DC-13 replaces DC-11: control of an electromagnet on DC, test Ie/Ie.
Positive opening travel	■ Minimum travel from the initial movement of contact actuator to the position required to accomplish positive opening operation.
Positive opening force	■ The force required on the contact actuator to accomplish positive opening operation.
Switching capacity	■ Ithe is no longer a rated value but a conventional current used for heating tests. **Example:** for category A300 the corresponding operational current, Ie maximum, is 6 A-120 V or 3 A-240 V, the equivalent Ithe being 10 A.
Positive opening operation	■ A limit switch complies to this specification when all the closed contact elements of the switch can be changed, with certainty, to the open position (no flexible link between the moving contacts and the operator of the switch, to which an actuating force is applied). ■ All limit switches incorporating either a slow break contact block or a snap action NC + NO (form Zb), NC + NO + NO, NC + NC + NO, NC + NC + NO + NO contact block are positive opening operation, in complete conformity with standard IEC 60947-5-1 Appendix K.

Contact blocks

Snap action contacts

- Snap action contacts are characterised by different tripping and reset points (differential travel).
- The displacement speed of the moving contacts is not related to the speed of the operator.
- This feature ensures satisfactory electrical performance in applications involving low speed actuators.

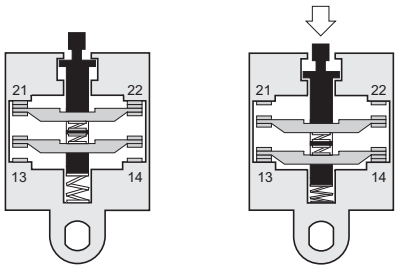


Unactuated state *Approach travel* *Contact change of state* *Positive opening*

Slow break contacts

- Slow break contacts are characterised by identical tripping and resetting points.
- The displacement speed of the moving contacts is equal, or proportional, to the speed of the operator (which must not be less than 0.1 m/s = 6 m/minute).

The opening distance is also dependent on the distance travelled by the operator.



Electrical durability for normal loads

- Normally, for inductive loads, the current value is less than 0.1 A (sealed), i.e. values of 3 to 40 VA sealed and 30 to 1000 VA inrush, depending on the voltage.
  For this type of application the electrical durability will exceed 10 million operating cycles.

Application example: XCKJ161 + LC1D12●●●● (7 VA sealed, 70 VA inrush).
Electrical durability = 10 million operating cycles.

Switching capacity

1 *Normal industrial PLC input type 1 (PLC: industrial programmable logic controllers)*
2 *Normal industrial PLC input type 2*
3 *Switching capacity conforming to IEC 60947-5-5, utilisation category AC-15, DC-13*

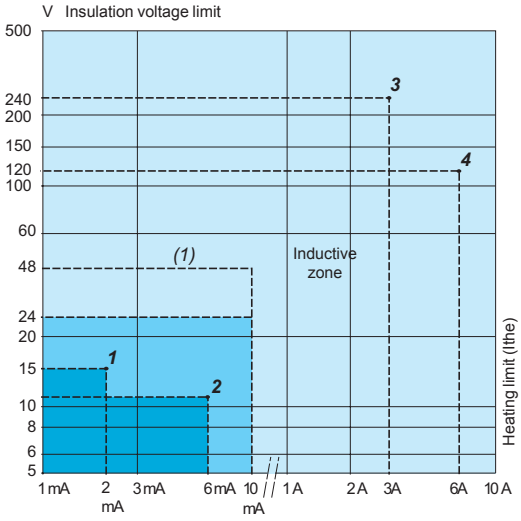
A300	240 V	3 A	B300	240 V	1.5 A
Q300	250 V	0.27 A	R300	250 V	0.13 A

4 *Switching capacity conforming to IEC 60947-5-1, utilisation category AC-15, DC-13*

A300	120 V	6 A	B300	120 V	3 A
Q300	125 V	0.55 A	R300	125 V	0.27 A

Electrical durability for small loads

- The use of limit switches with programmable controllers is becoming more common.
- With small loads, limit switches offer the following levels of reliability:
  - failure rate of less than 1 for 100 million operating cycles using snap action contacts (contacts XE2SP),
  - failure rate of less than 1 for 20 million operating cycles using slow break contacts (contacts XE●NP and XE3SP).
  - failure rate of less than 1 for 5 million operating cycles using contacts XCMD.

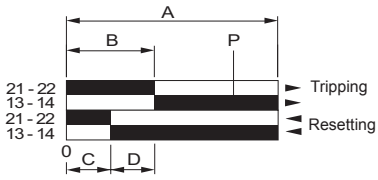


		Range of use
Standard contacts Continuous service (frequent switching)	XE2SP2151, P3151	
	XE2NP●●●●	
	Contacts of XCMD XE3●P●●●●	
Gold flashed contacts on resistive load	Occasional service Infrequent switching, ≤ 1 operating cycle/ day, and/or corrosive atmosphere	(1)

(1) Usable up to 48 V/10 mA.

1

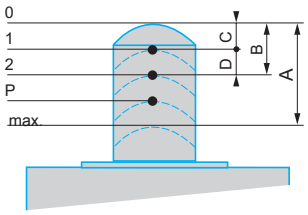
Contact blocks (continued)



Functional diagrams of snap action contacts

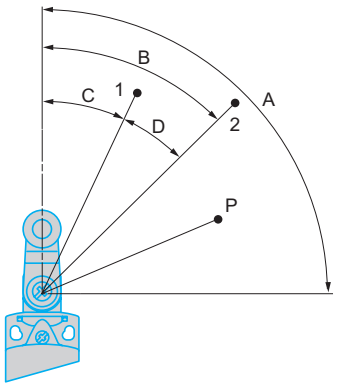
■ **Example: NC + NO**

A - Maximum travel of operator in millimetres or degrees.
B - Tripping travel of contact.
C - Resetting travel of contact.
D - Differential travel = B - C.
P - Point from which positive opening is assured.



□ Linear movement (plunger)

1 - Resetting point of contact.
2 - Tripping point of contact.
A - Maximum travel of operator in millimetres.
B - Tripping travel of contact.
C - Resetting travel of contact.
D - Differential travel = B - C.
P - Point from which positive opening is assured.



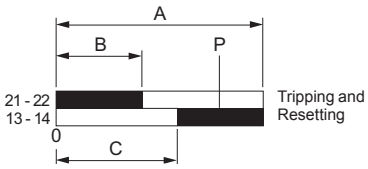
□ Rotary movement (lever)

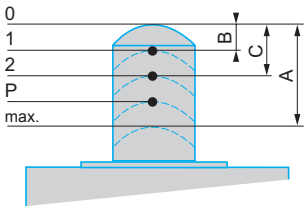
1 - Resetting point of contact.
2 - Tripping point of contact.
A - Maximum travel of operator in degrees.
B - Tripping travel of contact.
C - Resetting travel of contact.
D - Differential travel = B - C.
P - Point from which positive opening is assured.

Functional diagrams of slow break contacts

■ **Example: NC + NO break before make**

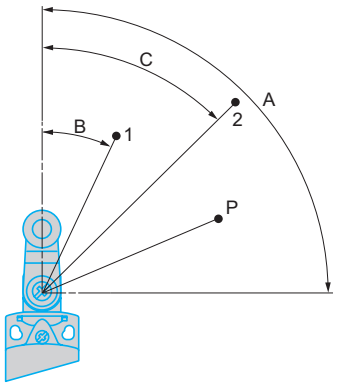
A - Maximum travel of operator in millimetres or degrees.
B - Tripping and resetting travel of contact 21-22.
C - Tripping and resetting travel of contact 13-14.
P - Point from which positive opening is assured.





□ Linear movement (plunger)

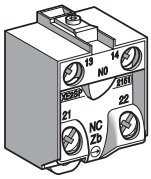
1 - Tripping and resetting points of contact 21-22.
2 - Tripping and resetting points of contact 13-14.
A - Maximum travel of operator in millimetres.
B - Tripping and resetting travel of contact 21-22.
C - Tripping and resetting travel of contact 13-14.
P - Positive opening point.



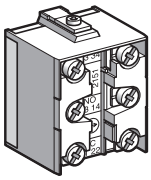
□ Rotary movement (lever)

1 - Tripping and resetting points of contact 21-22.
2 - Tripping and resetting points of contact 13-14.
A - Maximum travel of operator in degrees.
B - Tripping and resetting travel of contact 21-22.
C - Tripping and resetting travel of contact 13-14.
P - Positive opening point.

Contact blocks (continued)



XE2●P screw clamp terminal connections

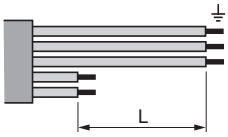


XE3●P screw clamp terminal connections

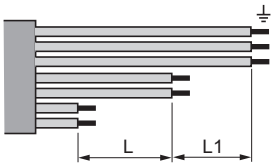
Mounting

Contact connections

- Tightening torque:
  - minimum tightening torque ensuring the nominal characteristics of the contact: 0.8 N.m,
  - maximum tightening torque without damage to the terminals: 1.2 N.m for **XE2●P**, 1 N.m for **XE3●P**.
- Connecting cable: cable preparation lengths:
  - for **XE2●P**, L = 22 mm,
  - for **XE2●P3●●●**, L = 45 mm,

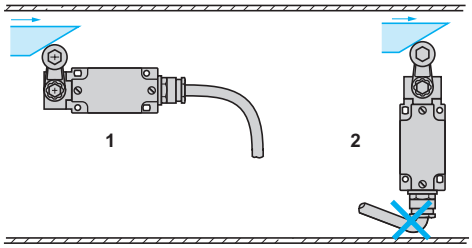


  - for **XE3●P**, L = 14 mm, L1 = 11 mm.



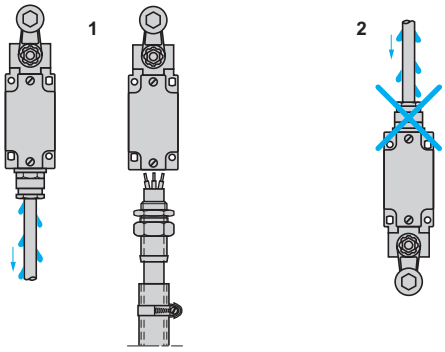
Sweep of connecting cable

1 Recommended
2 To be avoided



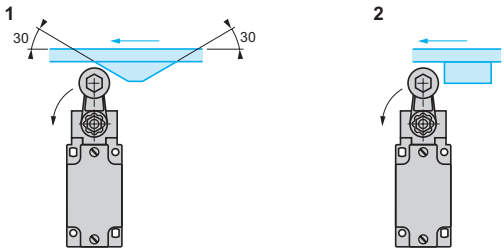
Position of cable gland

1 Recommended
2 To be avoided



Type of cam

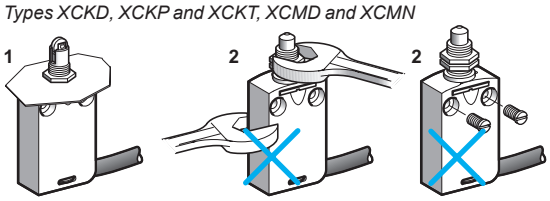
1 Recommended
2 To be avoided



Mounting and fixing limit switches by the head

1 Recommended
2 Forbidden

Types XCKD, XCKP and XCKT, XCMD and XCMN



1

Setting-up

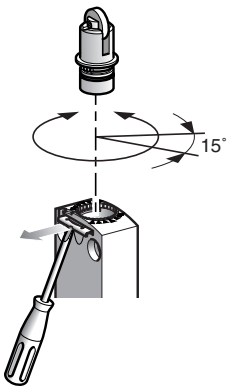
Tightening torque

- The minimum torque is that required to ensure correct operation of the switch.
- The maximum torque is the value which, if exceeded, will damage the switch.

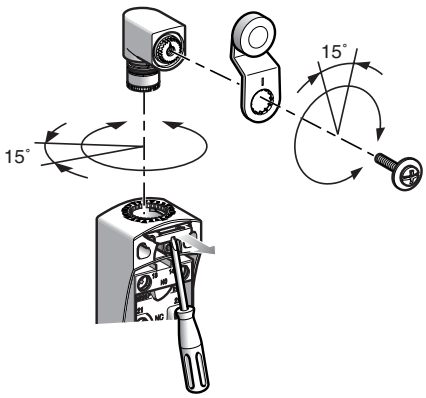
Range	Item	Torque (N.m) Min.	Max.
Compact design XCKD, XCKP, XCKT	Cover	0.8	1.2
	Fixing screw for lever on rotary head	1	1.5
Miniature design XCMD, XCMN	–	–	–
	Fixing screw for lever on rotary head	1	1.5
Compact design XCKN	Cover	0.8	1.2
	Fixing screw for lever on rotary head	1	1.5
Classic design XCKJ	Cover	1	1.5
	Fixing nut for lever on rotary head	1	1.5
Classic design XCKS	Cover	0.8	1.2
	Fixing nut for lever on rotary head ZCKD	1	1.5
	Fixing nut for lever on rotary head XCKS	0.8	1.2
	Fixing head on body	0.8	1.2
Classic design XCKM, XCKML, XCKL	Cover	0.8	1.2
	Fixing nut for lever on rotary head	1	1.5

Types XCKD, XCKP, XCKT, XCMD

- Adjustable in 3 planes:



All the heads can be adjusted in 15° steps throughout 360°, in relation to the body.

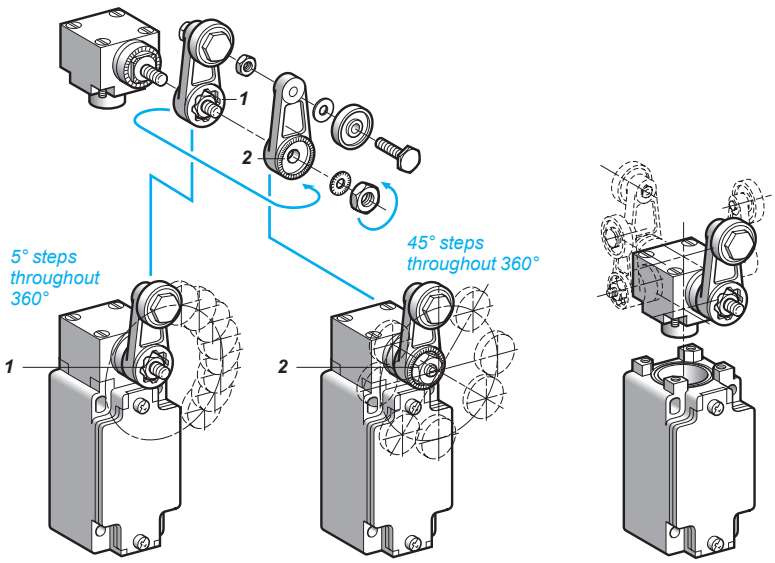


All the levers can be adjusted in 15° steps throughout 360°, in relation to the horizontal axis of the head.

Type XCKJ

- Adjustable throughout 360° in 5° steps, or in 45° steps by reversing the lever or its mounting.

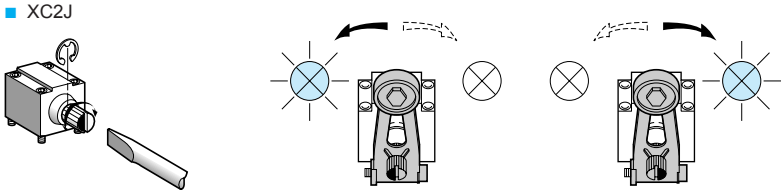
1 *Reversed α = 5°*
2 *Forward α = 45°*



Setting-up (continued)

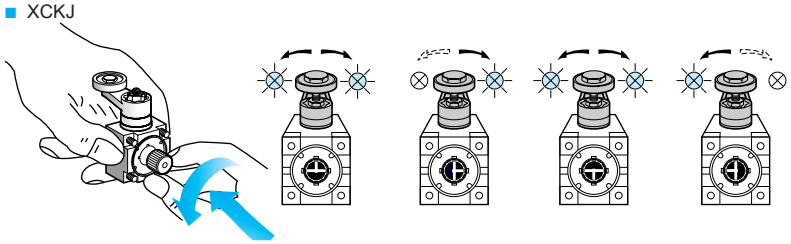
Direction of actuation programming

■ XC2J



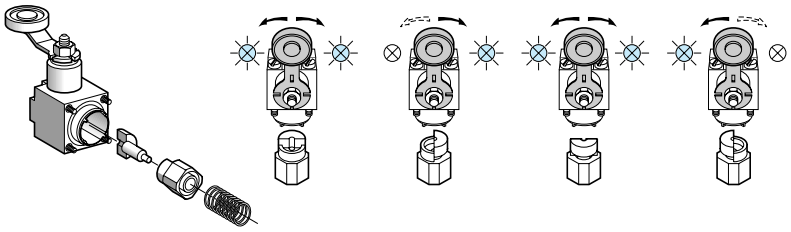
Head ZC2JE05

■ XCKJ



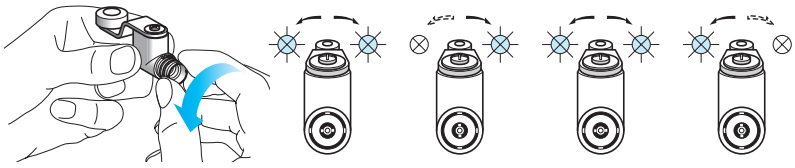
Head ZCKE05

■ XCKS



Head ZCKD05

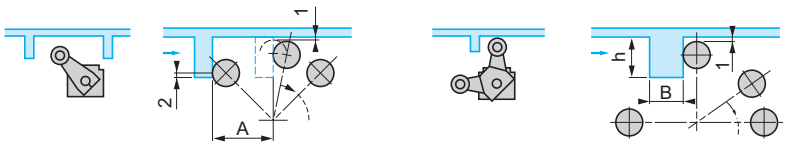
■ XCKD, XCKP, XCKT and XCMD



Head ZCE05

Specific cams for heads ZCKE09 and ZC2JE09

1 *0.5 mm min.*
2 *2 mm min.*



A = length of lever + 11 mm
ZCKE09*: 13 < h < 18 mm and B = 12 mm max.*
ZC2JE09*: 14 < h < 24 mm and B = 6 mm max.*

1

Reminder of the standards

The majority of Schneider Electric products comply to national standards (for example French NF C standards, German DIN standards), European standards (for example CENELEC) or international standards (for example IEC). These standards rigidly stipulate the characteristic requirements of the designated products (for example IEC 60947 relating to low voltage switchgear and control gear).
These products, when correctly used, enable the production of control equipment assemblies, machine control equipment or installations conforming to their own specific standards (for example IEC 60204 for the electrical equipment of industrial machines).

IEC 60947-5-1

Insulation coordination (and dielectric strength)	■ The standard IEC 60664 defines 4 categories of prospective transient overvoltages. It is important for the user to select control circuit components which are able to withstand these overvoltages. To these ends, the manufacturer states the rated impulse withstand voltage (U imp) applicable to the product.
Terminal connections	■ The cabling capacity, mechanical robustness and durability of the terminals, as well as the ability to resist loosening, are verified by standardised tests. ■ Terminal reference marking conforms to standard IEC 60947-5-1 Appendix M .
Switching capacity	■ With maximum electrical load. A single designation (A300 for example) enables indication of the contact block characteristics related to its utilisation category.
Positive opening operation (IEC 60947-5-1 Appendix K)	■ For contacts used in safety applications (end of travel, emergency stop device, etc.) the assurance of positive opening is required (see IEC 60204, EN 60204) after each test, the opening of the contact being verified by testing with an impulse voltage (2500 V).
Electrical symbols for contacts	■ Form Za, the 2 contacts (NO + NC) are the same polarity. ■ Form Zb, the 2 contacts (NO + NC) are electrically separate.
Symbol for positive opening	■ Simplified version ■ Complete symbol

CENELEC EN 50047

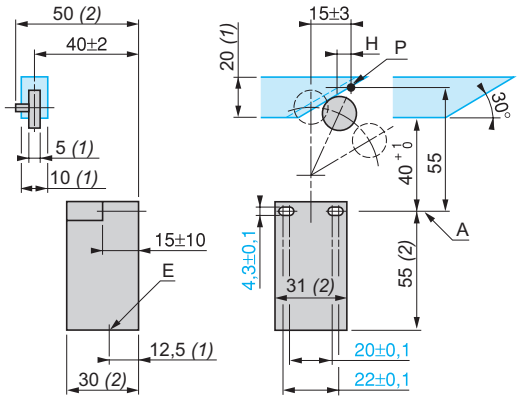
The European standards organisation CENELEC, which has 14 member countries, has defined in this standard the first type of limit switch.

It defines 4 variants of devices (forms A, B, C, E).
Limit switches XCKP, XCKD and XCKT conform to standard EN 50047.

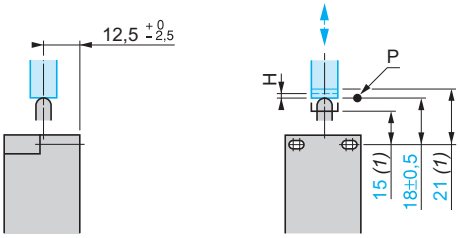
(1) Minimum value
(2) Maximum value

A: reference axis
H: differential travel
P: tripping point
E: cable entry

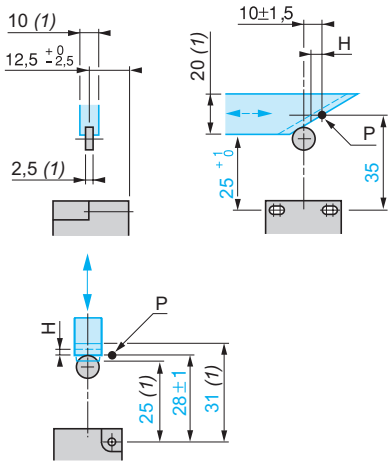
Form A, with roller lever



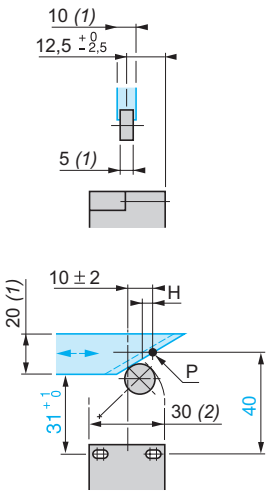
Form B, with end plunger (rounded)



Form C, with end roller plunger



Form E, with roller lever for 1 direction of actuation



Telemecanique Sensors

Reminder of the standards (continued)

CENELEC EN 50041

The European standards organisation CENELEC, which has 14 member countries, has defined in this standard the second type of limit switch.

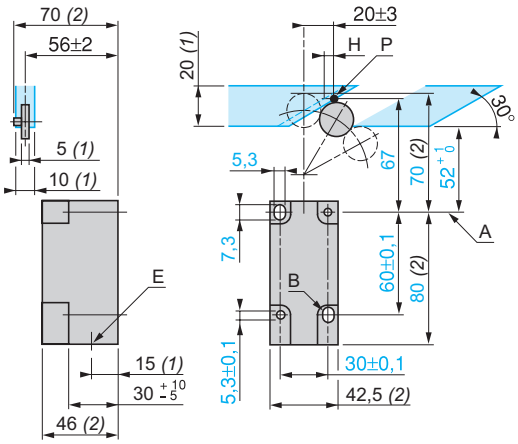
It defines 6 variants of devices (forms A, B, C, D, F, G). Limit switches XCKJ and XCKS conform to standard EN 50041.

(1) Minimum value
(2) Maximum value

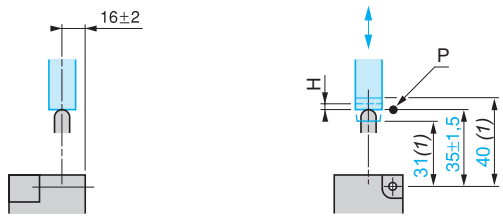
A: reference axis
B: optional elongated holes
H: differential travel
P: tripping point
E: cable entry

Za: tripping zone
Sa: tripping threshold

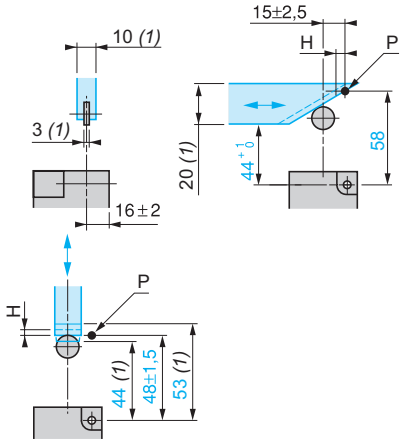
Form A, with roller lever



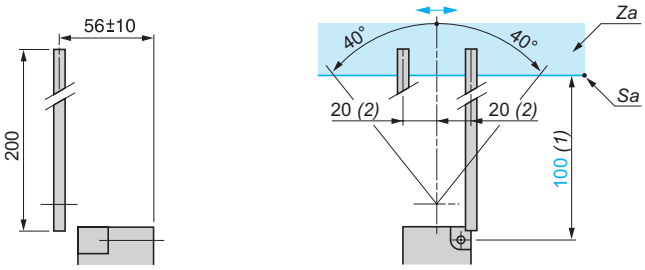
Form B, with end plunger (rounded)



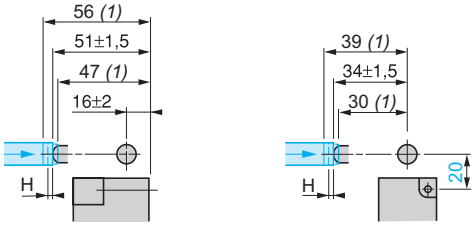
Form C, with end roller plunger



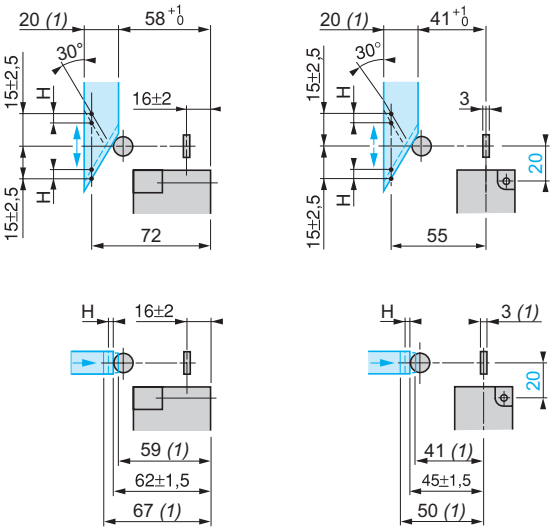
Form D, with rod lever



Form F, with side plunger (rounded)



Form G, with side roller plunger



Limit switches
OsiSense XCKW
Wireless and batteryless limit switches

Product type		Transmitters: plunger head and rotary head limit switches			
Actuator type		Metal end plunger	Steel roller plunger	Thermoplastic roller lever	Steel roller lever
Radio transmission	Transmission protocol	ZigBee® Green Power at 2.4 GHz (IEEE 802.15.4)			
	Maximum range	100 m in free field. 300 m with a relay antenna in free field. 25 m when the receiver is placed in a metal enclosure.			
	Transmission power	3 mW			
	Activation time	2 ms			
	Transmission time	< 2 ms			
Certifications and directives	Product certifications	EN/IEC 60947-5, EMC 2004/108/EC directive, R&TTE 1999/5/EC directive, EAC, CE			
	Radio approvals	FCC (USA), IC (Canada), RCM (Australia)			
Mechanical characteristics	Mechanical life	400,000 operating cycles			
	Maximum operating rate	3600 operating cycles per hour			
	Maximum tripping force	50 N		0.5 N.m	
	Materials	Plastic bodies and heads			
Environment	Ambient air temperature	Operation: - 25…+ 55°C Storage: - 40…+ 70°C			
	Degree of protection	IP 66 and IP 67 conforming to EN/IEC 60529			
	Degree of protection	IK 05 conforming to EN/IEC 50102			
Electromagnetic compatibility (EMC)	Electrostatic discharges	8 kV (air) and 6 kV (contact) conforming to IEC 61000-4-2			
	Electromagnetic fields	10 V/m from 80 to 2000 MHz, conforming to EN/IEC 61947-5-1 and IEC 61000-4-3 **3 V/m from 80 to 2700 MHz and a distance of 20 m, conforming to IEC 61000-4-3, EN 301-489-1 and EN 301-489-3**			
	Radiated emissions	Conforming to standards EN 300-440-1 and EN 300-440-2			
References		**XCKW101**	**XCKW102**	**XCKW131**	**XCKW133**
Pages		1/144			

(1) Adjustable throughout 360° in 5° steps, or in 90° steps by reversing the notched washer.
(2) Adjustable throughout 360° in 5° steps, or in 45° steps by reversing the lever mounting.

Variable length thermoplastic roller lever (*1*)

Variable length steel roller lever (*1*)

Elastomer roller lever, Ø 50 mm

Variable length elastomer roller lever, Ø 50 mm *(1)*

Round thermoplastic rod lever, Ø 6 mm *(2)*

ZigBee® Green Power at 2.4 GHz (IEEE 802.15.4)

100 m in free field.
300 m with a relay antenna in free field.
25 m when the receiver is placed in a metal enclosure.

3 mW

2 ms

< 2 ms

EN/IEC 60947-5, EMC 2004/108/EC directive, R&TTE 1999/5/EC directive, EAC, CE

FCC (USA), IC (Canada), RCM (Australia)

400,000 operating cycles

3600 operating cycles per hour

0.5 N.m

Plastic bodies and heads

Operation: - 25…+ 55°C
Storage: - 40…+ 70°C

IP 66 and IP 67 conforming to EN/IEC 60529

IK 05 conforming to EN/IEC 50102

8 kV (air) and 6 kV (contact) conforming to IEC 61000-4-2

10 V/m from 80 to 2000 MHz, conforming to EN/IEC 61947-5-1 and IEC 61000-4-3

3 V/m from 80 to 2700 MHz and a distance of 20 m, conforming to IEC 61000-4-3, EN 301-489-1 and EN 301-489-3

Conforming to standards EN 300-440-1 and EN 300-440-2

XCKW141	XCKW143	XCKW139	XCKW149	XCKW159

1/144

Limit switches
OsiSense XCKW
Wireless and batteryless limit switches

Product type		Receivers for wireless radio communication		
Maximum number of transmitters		2	32	32
Number and type of outputs		2 PNP outputs	4 PNP outputs	2 relays C/O type outputs
Radio transmission	Transmission protocol	ZigBee® Green Power at 2.4 GHz (IEEE 802.15.4)		
	Maximum range	100 m in free field. 300 m with a relay antenna in free field. 25 m when the receiver is placed in a metal enclosure.		
	Response time	< 30 ms		
Certifications and directives	Product certifications and radio approvals	EN/IEC 60947-5-1 CE		EN/IEC 60947-5, UL 508, CSA C22.2 no. 14, CCC, GOST, EMC 2004/108/EC directive, R&TTE 1999/5/EC directive, FCC, RSS, C-Tick, ANATEL, SRRC, CE
Power supply	Nominal supply voltage	24 V ⎓ (-15…+ 15%)		24…240 V ∿/⎓ (-10…+ 10%)
Output characteristics	Nominal current and voltage	0.2 A/24 V ⎓		0.3 A/48 V ⎓ 3 A/120 V ∿ conforming to IEC 60947-5-1 3 A/250 V ∿ conforming to UL 508 and CSA C22.14
Environment	Ambient air temperature	Operation: - 25…+ 55°C Storage: - 40…+ 70°C		
	Degree of protection	IP 20 conforming to EN/IEC 60529	IP 20 conforming to EN/IEC 60529	
References		**XZBWR2STT24**	**ZBRRC** *(1)*	**ZBRRD** *(1)*
Pages		1/145		

(1) Schneider Electric products.

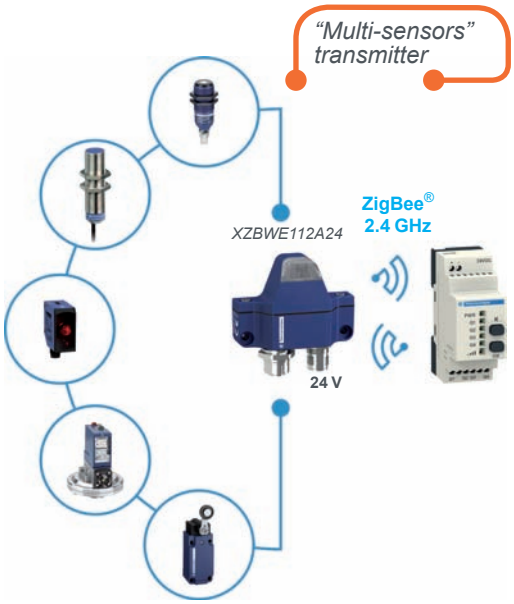
Access points for wireless and batteryless limit switches		Accessories		
		Relay antenna	External antenna for ZBRN1 and ZBRN2	Communication module for ZBRN1
60	60	–	–	–
Ethernet Modbus/TCP communication protocol	Communication via Modbus serial link 2 RS485 ports	–	–	–
ZigBee® Green Power at 2.4 GHz (IEEE 802.15.4)		ZigBee® Green Power at 2.4 GHz (IEEE 802.15.4)		–
100 m in free field 300 m with a relay antenna in free field 25 m when the receiver is placed in a metal enclosure		300 m maximum depending on environment	100 m in free field	–
< 30 ms		–	–	–
EN/IEC 60947-5, UL 508, CSA C22.2 no. 14, CCC, GOST, EMC 2004/108/EC directive, R&TTE 1999/5/EC directive, FCC, RSS, C-Tick, ANATEL, SRRC, CE		CCC, CSA, C-Tick, GOST, UL 508, BT 2006/95/EC, CE	–	CSA, UL 508, UL 873, UL 60730-1, BTL, CE
24…240 V ∿/⎓ (-10…+ 10%)		24…240 V ∿/⎓	–	–
–	–	–	–	–
Operation: - 25…+ 55°C Storage: - 40…+ 70°C		Operation: - 25…+ 55°C Storage: - 40…+ 70°C	–	Operation: - 20…+ 65°C Storage: - 25…+ 70°C
IP 20 conforming to EN/IEC 60529		IP 65 conforming to EN/IEC 60529 IK 05 conforming to EN/IEC 50102	–	IP 20 conforming to EN/IEC 60529
ZBRN1 *(1)*	**ZBRN2** *(1)*	**ZBRA1** *(1)*	**ZBRA2** *(1)*	**ZBRCETH** *(1)*
1/146		1/147		

Limit switches
OsiSense XCKW
Wireless and batteryless limit switches

1

OsiSense XCKW

Wireless offer:
*one-way **pulsed** transmission*



"Less-wire" offer:
*two-way **continuous** transmission*

No battery to replace, recycle or recharge

Telemecanique Sensors has expanded its offer of wireless products with the launch of a range of limit switches based on an automatic radio wave generator system.

This range includes transmitters and receivers which communicate via 2.4 GHz radio transmission.
There is no need to use batteries, as the radio pulse is emitted while the actuator moves.
Operation is therefore one-way towards the receiver.

The OsiSense XCKW offer can be used to find the position of an item or part of a machine remotely, without a wired connection. The transmitter is equipped with a "dynamo" generator which converts the mechanical energy produced by the actuator movement to electrical energy. A radio-encoded message (2.4 GHz ZigBee protocol) is then sent, by a single pulse, to one or more receivers located several dozen metres away.
There are therefore no batteries, as the system is self-powered.

Each transmitter has a unique identification code, which enables optimum management of each one. To incorporate this code, a simple teach sequence should be performed on the receiver using 2 buttons on the front face.

Thanks to this technology, the industrial applications field has diversified and now meets the requirements of machine manufacturers in terms of flexibility and modularity. It is the ideal product for confirming the position of a part remotely after a manual operation by an operator *(1)*.
OsiSense XCKW wireless limit switches are therefore particularly suitable *(2)* for:

- automatic doors
- expandable conveyors
- wheel chocks for lorries
- rotary machines
- turntables

Reminder: With the XZBWE112A24 multi-sensors transmitter, our "less-wire" offer allows continuous communication between the transmitter and the receiver.

***NB**: Receivers can be actuated by Schneider Electric's **OsiSense XCKW** limit switches or **ZB●RTA●** pushbuttons.*

Simplified installation

> Faster installation: no wiring between the limit switch and the receiver.
> No configuration necessary, thanks to the Plug and Play ready-to-use solution.
> Freedom of movement around the machine or process, in order to detect parts that are moving or difficult to access.

Reduced maintenance

> No battery maintenance required.
> Optimum availability of control functions.
> Minimal post-installation maintenance (no need for periodic retightening of contact terminal connections, no cables to be replaced or repaired).

(1) The operating speed must be faster than 10 mm/s.
(2) OsiSense XCKW wireless and batteryless limit switches are not suitable for hoisting applications or dangerous machines.
For these applications and machines, OsiSense XC Standard cabled switches are ideal.
Please contact our Customer Care Centre.

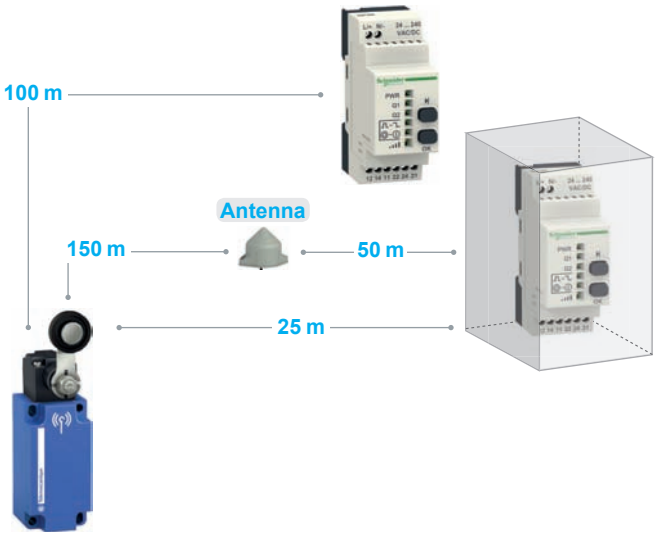
Wireless and batteryless switches for simplified installation

Limit switches
OsiSense XCKW
Wireless and batteryless limit switches

Improved performance

A relay antenna to increase the signal range

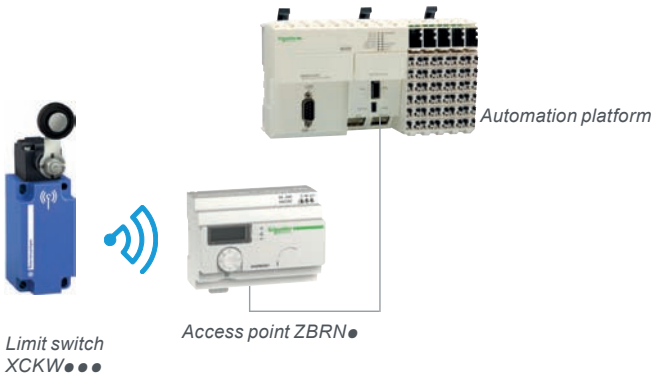
> Range of 300 metres, in free field, using an external relay antenna.
> Range of 200 metres when the receiver is installed in a metal enclosure, using an external relay antenna.
> Range of 100 metres in free field.
> Range of 25 metres when the receiver is installed in a metal enclosure *(1)*.



Open protocols for easy integration

Large I/O capacity

> The offer includes a receiver that can manage up to 60 transmitters. The signals received are converted to communication protocols.
> The proposed access points can be connected to an automation platform by either Modbus RS485 serial link or Modbus/TCP protocol.



(1) The distances stated may vary depending on the environment.

Limit switches
OsiSense XCKW
Wireless and batteryless limit switches

ZigBee®
2.4 GHz

Description

"Components" offer

The OsiSense XCKW offer is available as separate parts and consists of:

■ **9 wireless and batteryless limit switches**, consisting of a plastic body and an actuator head taken from existing ranges (OsiSense XCKS and OsiSense XCKM).

■ **3 receivers**, which can be programmed using buttons on the front face.
□ with 2 contact relay outputs, 24…240 V ∿/⎓.
□ with 2 or 4 PNP transistor outputs, 24 V ⎓.

■ **2 access points** which provide network connectivity openness by operating as an intermediate device between the transmitter and the PLC. The access point receives radio signals from the OsiSense XCKW limit switches and converts them to communication protocols.
The access point is connected to the PLC using:
□ an Ethernet Modbus/TCP communication protocol, for ZBRN1.
□ a Modbus RS485 serial link communication, for **ZBRN2**.

■ **accessories:**
□ 1 active relay antenna to boost the signal when the receiver is in a metal enclosure or to get round obstacles in the case of a complex installation.
□ 1 external antenna for entry points **ZBRN1** or **ZBRN2** to increase the range.
□ 1 communication module for Ethernet Modbus/TCP network.

Ready-to-use pack offer

To make it easier to install OsiSense XCKW switches, ready-to-use packs are also available.
The transmitter (limit switch) and receiver are factory-paired.

Each pack contains:
■ a limit switch
□ a version with steel roller plunger
□ a version with plastic roller lever

■ a receiver with 2 relay outputs

XCKW101

XCKW102

XCKW159

XCKW131

XCKW133

XCKW139

XCKW141

XCKW143

XCKW149

References

Limit switches

Actuator type	Reference	Weight kg
Metal plunger	**XCKW101**	0.210
Steel roller plunger	**XCKW102**	0.220
Thermoplastic roller lever	**XCKW131**	0.240
Steel roller lever	**XCKW133**	0.245
Variable length thermoplastic roller lever	**XCKW141**	0.260
Variable length steel roller lever	**XCKW143**	0.265
Elastomer roller lever, Ø 50 mm	**XCKW139**	0.220
Variable length elastomer roller lever, Ø 50 mm	**XCKW149**	0.270
Round thermoplastic rod lever, Ø 6 mm	**XCKW159**	0.230

Limit switches
OsiSense XCKW
Wireless and batteryless limit switches

PF150521 - PF100766

XCKWD02

PF150522 - PF100766

XCKWD31

PF100706

ZBRRC

PF100766

ZBRRD

PF150002

XZBWR2STT24

References (continued)

Ready-to-use packs

Composition	Reference	Weight kg
■ 1 limit switch with steel roller plunger **XCKW102**. ■ 1 receiver with 2 relay outputs **ZBRRD**.	**XCKWD02** *(1)*	0.410
■ 1 limit switch with thermoplastic roller lever **XCKW131**. ■ 1 receiver with 2 relay outputs **ZBRRD**.	**XCKWD31** *(1)*	0.410

***NB**: The transmitter (limit switch) and receiver are factory-paired.*

Receivers

Configurable receivers are equipped with:
- 2 buttons (teach and parameter setting).
- 6 LED indicators (power ON, output status, signal strength).

Number and type of outputs	Power supply	Number of transmitters	Reference	Weight kg
4 PNP outputs 200 mA/24 V	24 V ⎓	32	**ZBRRC** *(1)*	0.130
2 relay outputs type C/O 3A	24…240 V ∿/⎓	32	**ZBRRD** *(1)*	0.130
2 PNP outputs 200 mA/24 V	24 V ⎓	2	**XZBWR2STT24** *(2)*	0.130

*(1) Schneider Electric product, also compatible with **ZB●RTA●** wireless pushbuttons (with a software version above or equal to V2.0).*
*(2) Also compatible with **ZB●RTA●** wireless pushbuttons and the **XZBWE112A24** wireless "multi-sensors" transmitter (with a software version above or equal to V1.0).*

Limit switches
OsiSense XCKW
Wireless and batteryless limit switches
Network access points

Description

Standard access point with communication module

Access point **ZBRN1** has an empty slot for the **ZBRCETH** communication module to support Modbus/TCP protocol.

This communication module has 2 standard Ethernet RJ45 connectors that provide connectivity for daisy chain operation and daisy chain loop operation (when used with Schneider Electric ConneXium Ethernet switches) and thus avoids the use of a hub or an external switch.

Access point for Modbus serial link protocol

Access point **ZBRN2** has 2 embedded RS485 connectors that avoid the use of an external hub for an RS485 serial link connection. The supported bps are 2400 bps, 4800 bps, 9200 bps, 9600 bps, 38,400 bps, and 115,200 bps.

References

Access points

Description	Data function	Output type	Receiver voltage	Reference	Weight
			V		kg
Configurable access points equipped with: - 7-segment display - jog dial - 8 LED indicators (power ON, function modes, communication status, signal strength) - external antenna connector and protective cap - for 60 transmitters max.	Set/Reset	2 RS485 connectors that provide Modbus RS485 serial link connectivity	24...240 ∿/⎓	**ZBRN2** *(1)*	0.270
	Set/Reset	1 slot for communication module **ZBRCETH** (to be ordered separately)	24...240 ∿/⎓	**ZBRN1** *(1)*	0.270

*(1) Schneider Electric product, also compatible with **ZB●RTA●** wireless pushbuttons (with a software version above or equal to V1.5).*

PF121503E

ZBRN2

PF121500E

ZBRN1

Limit switches
OsiSense XCKW
Wireless and batteryless limit switches
Accessories

PF121506B

ZBRCETH

PF121508A

ZBRA2

PF1100707

ZBRA1

References

Modbus/TCP network communication module

Description	Communication port	Reference	Weight kg
Communication module for access point **ZBRN1** Modbus/TCP protocol with embedded web pages, available in 5 languages, for configuration, monitoring and diagnostics	2 RJ45 connectors for daisy chain or daisy chain loop operation	**ZBRCETH** *(1)*	0.044

Relay antenna

Use	Description	Reference	Weight kg
Increases the distance between the limit switches and the receivers	24…240 V ∿/⎓ 5 m cable 1 power ON LED 2 reception/ transmission LEDs	**ZBRA1** *(2)*	0.200

External antenna

Use	Description	Reference	Weight kg
Connected to access point (**ZBRN1** or **ZBRN2**) to increase the transmission distance	2 m cable 1 RF connector	**ZBRA2** *(1)*	0.040

(1) Schneider Electric product.
*(2) Schneider Electric product, also compatible with **ZB●RTA●** wireless pushbuttons.*

Limit switches
OsiSense XC Special

Design/Applications	Very severe applications	Very severe material handling applications	For hoisting and material handling applications (XCR); for conveyor belt shift monitoring (XCRT)	For hoisting and material handling applications	Subminiature format and microswitch. Applications requiring high precision and a low operating force
	Metal, 1 cable entry	Metal, 3 cable entries	Metal or polyester, 1 cable entry	Metal or plastic, 3 cable entries	Plastic, pre-cabled
Enclosure	Metal	Metal	Metal or polyester	Metal or plastic	Polyester
Features	Head and body modularity	–	–	–	–
Conformity/Certifications	UL, CSA, GOST	CSA, GOST	CSA (XCR) CCC (XCR), GOST	CE, UL, CSA, CCC, GOST	CE, UL
Body dimensions (w x h x d) in mm	40 x 81 x 41	77 x 83 x 44	85 x 95 x 75	118 x 77 x 59 (metal) 118 x 77 x 67 (plastic)	Depending on type
Head	Linear movement (plunger) or rotary movement (lever)	Linear movement (plunger)	Rotary movement (lever)	Rotary movement (lever)	–
Contact blocks					
2 electrically separate contacts					
snap action with positive opening operation	–	–	–	–	–
slow break with positive opening operation	–	●	–	–	–
2 same polarity contacts					
snap action	●	–	–	–	●
slow break	–	●	–	–	–
3 electrically separate contacts					
snap action with positive opening operation	–	–	–	–	–
slow break with positive opening operation	–	–	–	–	–
4 electrically separate contacts					
snap action with positive opening operation	–	–	●		–
slow break with positive opening operation	–	–	●	●	–
4 contacts (2 x 2 same polarity contacts), snap action	●	–	●	–	–
Degree of protection IP/IK	IP 65/IK 08	IP 65	IP 54/IK 07 or IP 65 depending on model	IP 66/IK 07 (metal) IP 65/IK 04 (plastic)	IP 67 or IP 40 depending on model IP 00 (tags)
Operating temperature	- 25°C... + 70°C; - 40° C or + 120° C (XC2J depending on model)				
Connection					
Screw terminals (entry for cable gland)	1 entry with integral cable gland	3 tapped entries for Pg 13.5 cable gland	1 tapped entry for Pg 13.5 cable gland	3 tapped entries for Pg 13.5 cable gland or tapped M20 x 1.5	Tag connections or pre-wired depending on model
Pre-cabled	–				
Connector	–				
Type reference	**XC2J**	**XC1AC**	**XCR XCRT**	**XCKMR XCKVR**	**XEP**
Pages	1/152, 1/178	1/170	1/176	1/177	

Limit switches

Preventa XCS
Safety switches

Safety limit switches and guard switches Preventa XCS								
Standard		**With lever or hinge**	**Actuator operated**					**Coded magnetic for detection without contact**
Miniature format	**Compact format**	**Compact format**	**Miniature format**	**Compact format**	**Industrial format with or without locking**		**Rectangular format with solenoid interlocking**	**Rectangular or cylindrical format**
Metal, pre-cabled	**Metal or plastic, 1 cable entry**	**Plastic, 1 or 2 cable entries**	**Plastic, pre-cabled**	**Plastic, 1 or 2 cable entries**	**Metal, 1 cable entry**		**Metal, 2 cable entries or plastic, 1 cable entry**	**Coded magnetic switch or coded magnetic system, pre-cabled or connector**
					Without locking	With locking, manual unlocking		

Metal	Metal or plastic	Plastic, double insulated	Plastic, double insulated		Metal		Metal / Plastic, double insulated	Plastic
–		–	–		–		–	
UL, CSA		UL, CSA	UL, CSA	UL, CSA, GOST	UL, CSA, GOST		UL, CSA, GOST	CE, UL, CSA, TÜV, GOST depending on model
30 x 50 x 16	34 x 65 x 34.5	Depending on type	30 x 78 x 15	30 x 93 x 30 52 x 114 x 30	40 x 60 x 44		98 x 146 x 44 110 x 93.5 x 33	Depending on type
Linear movement (plunger) or rotary movement (lever)		Rotary movement (lever)	Turret head		Turret head		Turret head	–
–		–	–	●	–		–	Depending on model
–		●	●		–		– / ●	
–		–	–	●	–		–	
–		●	●		–		– / ●	
●		●	–	●	–		–	
●		●	●		●		● / –	
–		–	–		–		–	
–		–	–		–		–	
●	–	–	–		–		–	
IP 66, IP 67 IP 68 (XCSM) IK 06 (XCSM & XCSD) IK 04 (XCSP)		IP 67	IP 67		IP 67		IP 67	IP 66, IP 67 IP 69K depending on model
- 25°C... + 70°C		- 25°C... + 70°C	- 25°C... + 70°C		- 25°C... + 70°C		- 25°C... + 70°C	- 25°C... + 70°C
XCSP and XCSD: 1 entry for Pg 13.5 or M20 cable gland or 1/2" NPT		Depending on model: 1 or 2 entries for Pg 13.5 or ISO M20 cable gland or 1/2" NPT	Depending on model: 1 or 2 entries for ISO M16 or Pg 11 cable gland or 1/2" NPT		1 entry for ISO M20 or Pg 13.5 cable gland or 1/2" NPT		Depending on model: 1 or 2 entries for Pg 13.5 or ISO M20 cable gland or 1/2" NPT	–
XCSM: Ø 7.5 cable, PvR		–	XCSMP: Ø 7.5 cable, PvR		–		–	PVC cable
–		–	–		–		–	Remote M8, remote M12 or integral M12 depending on model
XCSM	**XCSP XCSD**	**XCSPL, XCSPR XCSTL, XCSTR**	**XCSMP**	**XCSPA XCSTA**	**XCSA**	**XCSB XCSC**	**XCSE** / **XCSTE**	**XCSDM/C/P/R XCSDM3/4**

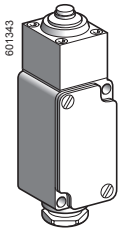
Limit switches

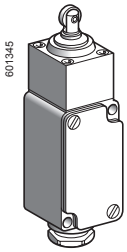
OsiSense XC Special

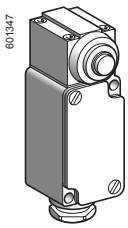
For very severe applications, type XC2J

■ XC2J
with 1 cable entry

□ With head for linear movement (plunger)

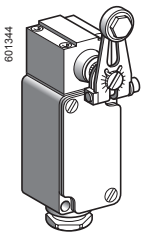


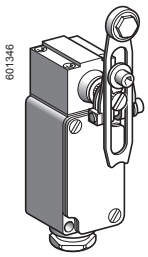


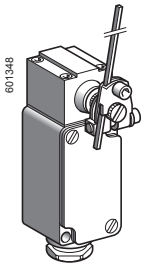


Page 1/152

□ With head for rotary movement (lever)







Page 1/152

Limit switches

OsiSense XC Special

For very severe applications, type XC2J

Environment characteristics

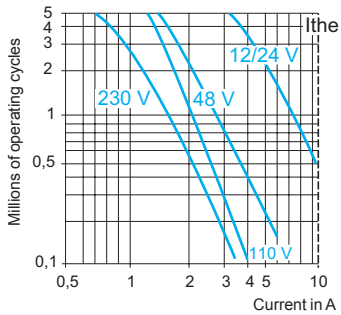
Conformity to standards	Products	IEC/EN 60947-5-1, IEC 60337-1, VDE 0660-200, UL 508, CSA C22-2 n° 14
	Machine assemblies	IEC/EN 60204-1, NF C 79-130
Product certifications	Standard version	CSA 300 V ⎓ HD, 60 W ∿
	Special version	UL 250 V ∿ HD Listed, CSA 300 V ∿ HD, 60 W with 1/2" NPT tapped cable entry
Protective treatment	Standard version	"TC"
Ambient air temperature	For operation	- 25…+ 70°C. Special adaptable sub-assemblies: - 40°C or + 120°C
	For storage	- 40…+ 70°C
Vibration resistance		10 gn (10…500 Hz) conforming to IEC 60068-2-6
Shock resistance		25 gn (18 ms) conforming to IEC 60068-2-27
Electric shock protection		Class I conforming to IEC 60536 and NF C 20-030
Degree of protection		**IP 65 conforming to IEC 60529, IP 657 conforming to NF C 20-010**
Repeat accuracy		0.01 mm on the tripping points, with 1 million operating cycles for head with end plunger
Cable entry		1 entry incorporating cable gland. Clamping capacity: 6…13.5 mm

Contact block characteristics

Rated operational characteristics		**∿ AC-15; A300 (Ue = 240 V, Ie = 3 A)** **⎓ DC-13; Q300 (Ue = 250 V, Ie = 0.27 A), conforming to IEC 60947-5-1 Appendix A, EN 60947-5-1**
Rated insulation voltage		500 V conforming to IEC 60947-5-1, group C conforming to NF C 20-040, 300 V conforming to CSA C22-2 n° 14
Resistance across terminals		≤ 25 mΩ conforming to NF C 93-050 method A or IEC 60255-7 category 3
Short-circuit protection		10 A cartridge fuse type gG (gI)
Connection	Screw clamp terminals	**XCKZ01**: clamping capacity, min: 1 x 0.5 mm², max: 2 x 2.5 mm² **XESP10●1**: clamping capacity, min: 1 x 0.75 mm², max: 2 x 1.5 mm²
Minimum actuation speed		0.001 m/minute
Electrical durability		■ Conforming to IEC 60947-5-1 Appendix C ■ Utilisation categories AC-15 and DC-13 ■ Maximum operating rate: 3600 operating cycles/hour ■ Load factor: 0.5

XCKZ01, XESP1021, XESP1031

AC supply
50/60 Hz ∿
inductive circuit



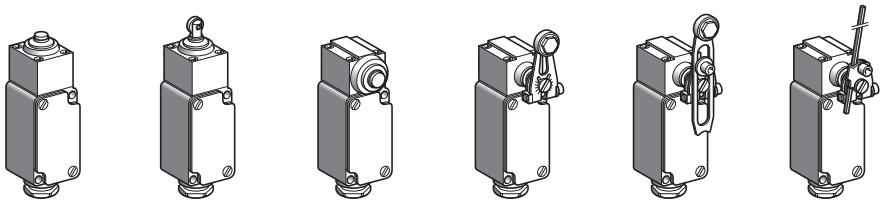
DC supply ⎓

Voltage **V**	**24**	**48**	**120**
Power broken in W for 5 million operating cycles **W**	10	7	4

Limit switches

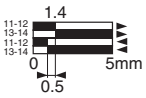
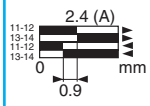
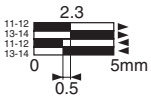
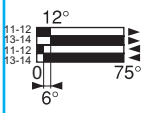
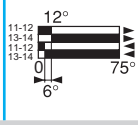
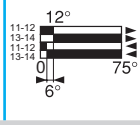
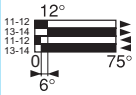
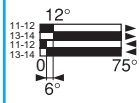
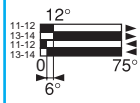
OsiSense XC Special

For very severe applications, type XC2J
Complete switches, fixed body,
1 cable entry incorporating cable gland

Type of head	Plunger			Rotary		
						
Type of operator	Metal end plunger	Steel roller plunger	Metal side plunger	Thermoplastic roller lever *(1)*	Variable length thermoplastic roller lever *(1)*	Steel rod lever ∅ 3 mm *(1)*

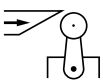
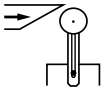
(1) Adjustable throughout 360°.

References

Single-pole CO snap action XCKZ01				**Actuation from left AND right**		
	ZC2JC1 + ZC2JE61 	**ZC2JC1 + ZC2JE62** 	**ZC2JC1 + ZC2JE63** 	**ZC2JC1 + ZC2JE01 + ZC2JY11** 	**ZC2JC1 + ZC2JE01 + ZC2JY31** 	**ZC2JC1 + ZC2JE01 + ZC2JY51** 
				Actuation from left OR right		
				ZC2JC1 + ZC2JE05 + ZC2JY11 	**ZC2JC1 + ZC2JE05 + ZC2JY31** 	**ZC2JC1 + ZC2JE05 + ZC2JY51** 
Weight (kg)	0.555	0.560	0.600	0.605	0.620	0.605

Contact operation ■ *closed* □ *open* *(A) = cam displacement*

Complementary characteristics not shown under general characteristics (page 1/151)

Switch actuation	On end	By 30° cam	On end	By 30° cam		By any moving part
Type of actuation						
Maximum actuation speed	0.5 m/s			1.5 m/s		
Mechanical durability (in millions of operating cycles)	**30**	**25**	**30**			
Minimum tripping force or torque	18 N		26 N	**With head ZC2JE01**: 0.30 N.m **With head ZC2JE05**: 0.20 N.m		
Cable entry	1 tapped entry incorporating metal cable gland. Clamping capacity 6 to 13.5 mm					

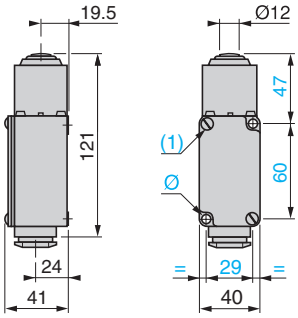
Other versions Switches with gold flashed contacts. Special protective treatments.
Please consult our Customer Care Centre.

Limit switches

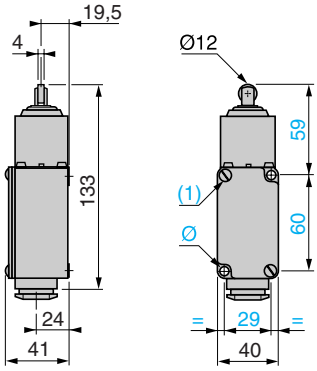
OsiSense XC Special

For very severe applications, type XC2J
Complete switches, fixed body,
1 cable entry incorporating cable gland

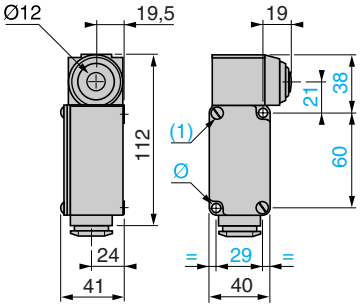
ZC2JC1 + ZC2JE61



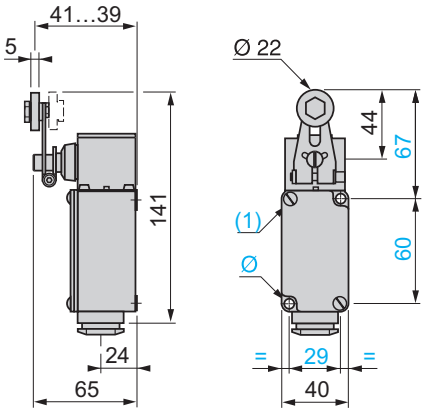
ZC2JC1 + ZC2JE62



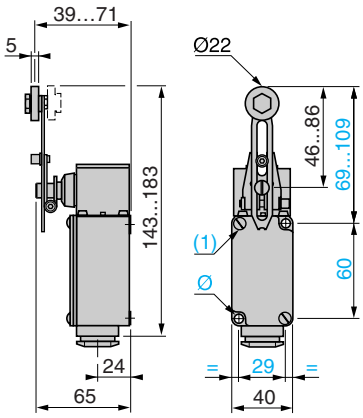
ZC2JC1 + ZC2JE63



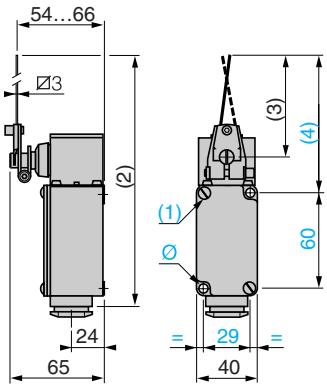
ZC2JC1 + ZC2JE0● + ZC2JY11



ZC2JC1 + ZC2JE0● + ZC2JY31



ZC2JC1 + ZC2JE0● + ZC2JY51

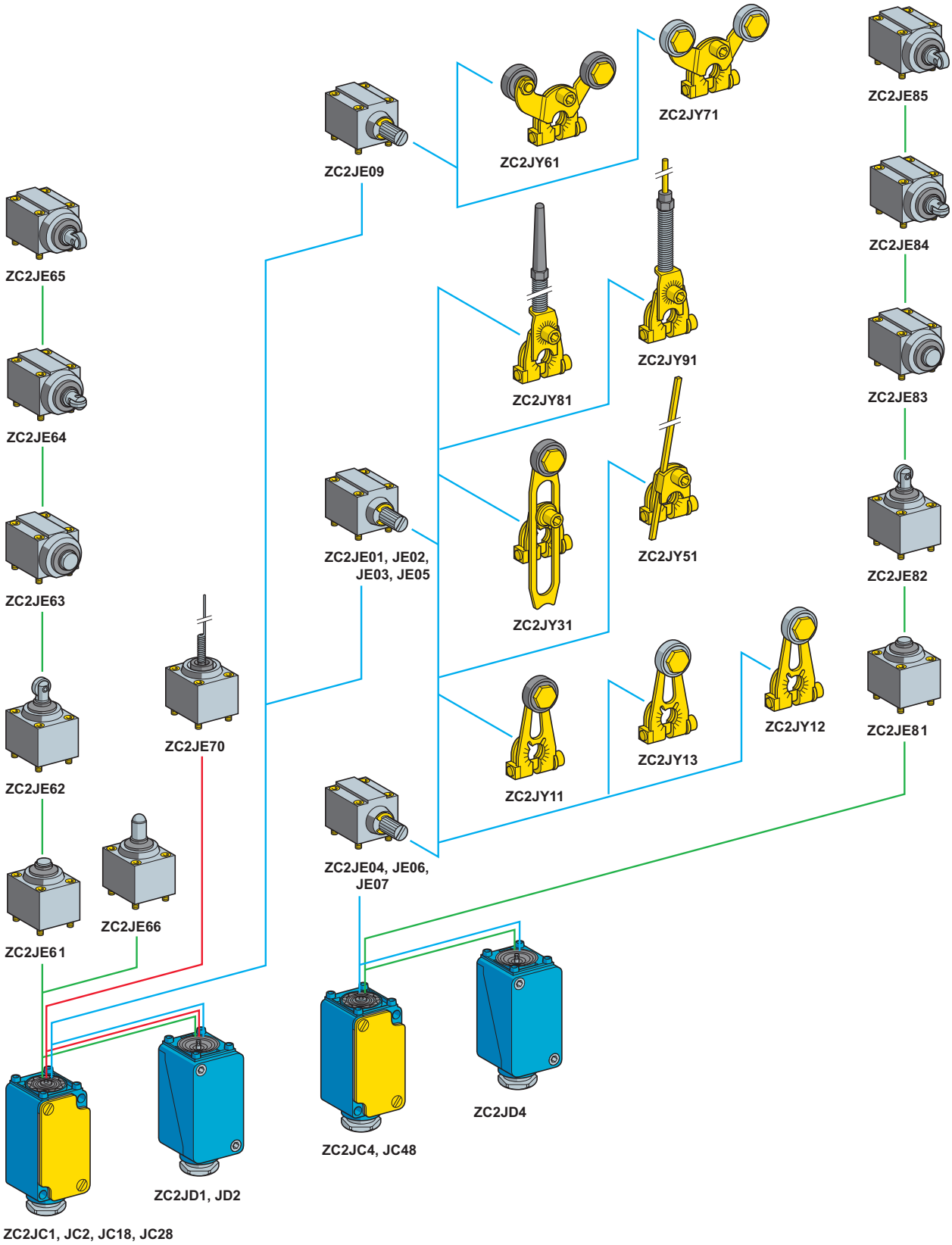


(1) Fixing from the rear: by 2 M5 screws.
Depth of thread on switch: 10 mm.
(2) 222 max.
(3) 125 max.
(4) 148 max.
Ø: Fixing from the front via 2 holes Ø 5.5.
Cable gland incorporated (all XC2JC models).

Limit switches

OsiSense XC Special

For very severe applications, type XC2J
Fixed or plug-in body
Variable composition

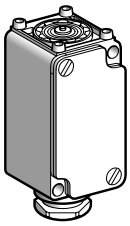


Plunger head
Rotary head
Multi-directional head

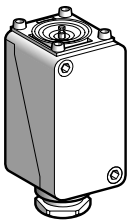
Limit switches

OsiSense XC Special

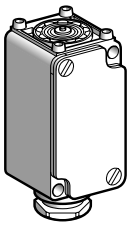
For very severe applications, type XC2J
Fixed or plug-in body
Adaptable sub-assemblies



ZC2JC●



ZC2JD●



ZC2JC●8

Bodies with contacts for plunger or rotary head

Type	With contact block	Scheme	Reference	Weight kg
Fixed bodies (see operation page 1/160)				
1 step	Single-pole 1 CO snap action (XCKZ01)	13 11 / 14 12	**ZC2JC1**	0.355
	Double-pole 2 CO simultaneous, snap action (XESP1021)	13 11 23 21 / 14 12 24 22	**ZC2JC2**	0.355
2 step	Double-pole 2 CO staggered, snap action (XESP1031)	13 11 23 21 / 14 12 24 22	**ZC2JC4**	0.355
Plug-in bodies (see operation page 1/160)				
1 step	Single-pole CO snap action	13 11 / 14 12	**ZC2JD1**	0.380
	Double-pole 2 CO simultaneous, snap action	13 11 23 21 / 14 12 24 22	**ZC2JD2**	0.380
2 step	Double-pole 2 CO staggered, snap action	13 11 23 21 / 14 12 24 22	**ZC2JD4**	0.380

Bodies incorporating gold flashed contacts, for plunger or rotary head

Type	With contact block	Scheme	Reference	Weight kg
Fixed bodies (see operation page 1/160)				
1 step	Single-pole 1 CO snap action (XCKZ018)	13 11 / 14 12	**ZC2JC18**	0.355
	Double-pole 2 CO simultaneous, snap action (XESP1028)	13 11 23 21 / 14 12 24 22	**ZC2JC28**	0.360
2 step	Double-pole 2 CO staggered, snap action (XESP1038)	13 11 23 21 / 14 12 24 22	**ZC2JC48**	0.360

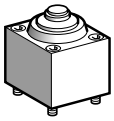
Operation:
page 1/160

Dimensions:
pages 1/160 and 1/161

Limit switches

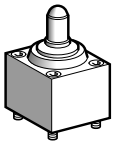
OsiSense XC Special

For very severe applications, type XC2J
Fixed or plug-in body
Adaptable sub-assemblies

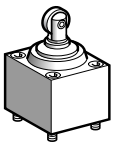


ZC2JE●1

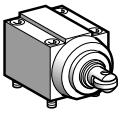
ZC2JE●3



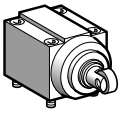
ZC2JE66



ZC2JE●2



ZC2JE●4



ZC2JE●5

Plunger heads

Type of operator	Compatible bodies	Maximum actuation speed	Reference	Weight kg
For actuation on end				
End plunger metal	ZC2J●1 ZC2J●2	0.5 m/s	**ZC2JE61**	0.195
	ZC2J●4	0.5 m/s	**ZC2JE81**	0.195
Side plunger metal	ZC2J●1 ZC2J●2	0.5 m/s	**ZC2JE63**	0.240
	ZC2J●4	0.5 m/s	**ZC2JE83**	0.240
For actuation by 30° cam				
End ball bearing plunger	ZC2J●1 ZC2J●2	0.1 m/s	**ZC2JE66**	0.205
End roller plunger steel	ZC2J●1 ZC2J●2	1 m/s	**ZC2JE62**	0.200
	ZC2J●4	1 m/s	**ZC2JE82**	0.200
Side plunger with horizontal roller steel	ZC2J●1 ZC2J●2	0.6 m/s	**ZC2JE64**	0.245
	ZC2J●4	0.6 m/s	**ZC2JE84**	0.245
Side plunger with vertical roller steel	ZC2J●1 ZC2J●2	0.6 m/s	**ZC2JE65**	0.245
	ZC2J●4	0.6 m/s	**ZC2JE85**	0.245

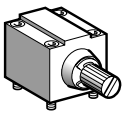
Operation:
page 1/160

Dimensions:
pages 1/160 and 1/161

Limit switches

OsiSense XC Special

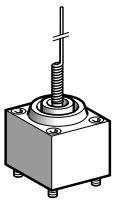
For very severe applications, type XC2J
Fixed or plug-in body
Adaptable sub-assemblies



ZC2JE0●

Rotary heads (without operating lever)

Type	Compatible bodies	Maximum actuation speed	Reference	Weight kg
Spring return (see operation page 1/160)				
Actuation from left **AND** right	ZC2J●1 ZC2J●2	1.5 m/s	**ZC2JE01**	0.210
	ZC2J●4	1.5 m/s	**ZC2JE04**	0.210
Actuation from left	ZC2J●1 ZC2J●2	1.5 m/s	**ZC2JE02**	0.210
	ZC2J●4	1.5 m/s	**ZC2JE06**	0.210
Actuation from right	ZC2J●1 ZC2J●2	1.5 m/s	**ZC2JE03**	0.210
	ZC2J●4	1.5 m/s	**ZC2JE07**	0.210
Actuation from left **OR** right (see page 1/136)	ZC2J●1 ZC2J●2	1.5 m/s	**ZC2JE05**	0.210
Stay put (see page 1/136)				
Actuation from left **AND** right	ZC2J●1 ZC2J●2	1.5 m/s	**ZC2JE09**	0.210



ZC2JE70

Multi-directional head (with operator)

Type of operator	Compatible bodies	Maximum actuation speed	Reference	Weight kg
For actuation by any moving part (see operation page 1/160)				
"Cat's whisker"	ZC2J●1 ZC2J●2	1 m/s in any direction	**ZC2JE70**	0.190

Operation:
page 1/160

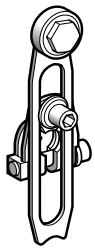
Dimensions:
pages 1/160 and 1/161

Limit switches

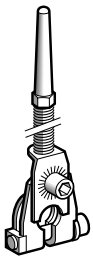
OsiSense XC Special

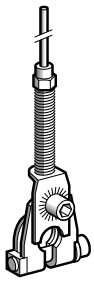
For very severe applications, type XC2J
Fixed or plug-in body
Adaptable sub-assemblies

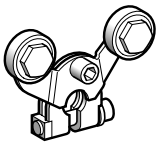
ZC2JY1●

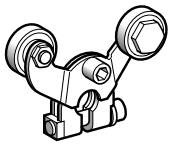

ZC2JY31

ZC2JY51


ZC2JY81


ZC2JY91


ZC2JY71


ZC2JY61

Operating levers for rotary heads

Description		Reference	Weight kg
For actuation by 30° cam			
Roller lever *(1)*	Thermoplastic	**ZC2JY11**	0.030
	Steel	**ZC2JY13**	0.040
	Steel, ball bearing mounted	**ZC2JY12**	0.040
Variable length roller lever *(1)*	Thermoplastic	**ZC2JY31**	0.045
For actuation by any moving part			
Rigid rod lever	Steel ∅ 3 mm, L = 125 mm (1)	**ZC2JY51**	0.035
Spring lever *(1)*		**ZC2JY81**	0.040
Spring-rod lever *(1)*		**ZC2JY91**	0.040
For actuation by specific cam (only for operation with head ZC2 JE09, see page 1/190)			
Forked arm with rollers thermoplastic *(1)*	1 track	**ZC2JY71**	0.055
	2 track	**ZC2JY61**	0.055

(1) Adjustable throughout 360°

Other versions Other operating levers for rotary heads.
Please consult our Customer Care Centre.

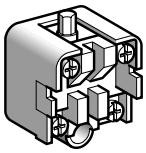
Operation:
page 1/160

Dimensions:
pages 1/160 and 1/161

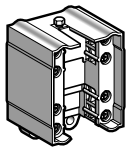
Limit switches

OsiSense XC Special

For very severe applications, type XC2J
Fixed or plug-in body
Adaptable sub-assemblies



XCKZ01



XESP10●1

Contact blocks

Type of contact	Scheme	For body	Reference	Weight kg
Single-pole 1 CO snap action	13 11 14 12	ZC2JC1	**XCKZ01**	0.050
Double-pole 2 CO simultaneous, snap action	13 11 23 21 14 12 24 22	ZC2JC2	**XESP1021**	0.045
Double-pole 2 CO staggered, snap action	13 11 23 21 14 12 24 22	ZC2JC4	**XESP1031**	0.045

Contact blocks with gold flashed contacts

Type of contact	Scheme	For body	Reference	Weight kg
Single-pole 1 CO snap action	13 11 14 12	ZC2JC18	**XCKZ018**	0.050
Double-pole 2 CO simultaneous, snap action	13 11 23 21 14 12 24 22	ZC2JC28	**XESP1028**	0.055
Double-pole 2 CO staggered, snap action	13 11 23 21 14 12 24 22	ZC2JC48	**XESP1038**	0.055

Operation:
page 1/160

Dimensions:
pages 1/160 and 1/161

Limit switches

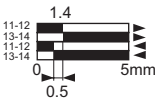
OsiSense XC Special

For very severe applications, type XC2J
Fixed or plug-in body
Adaptable sub-assemblies

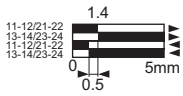
Operation (function diagrams)

Heads ZC2JE61, ZC2JE66 with body

ZC2J•1

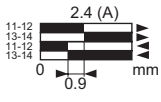


ZC2J•2

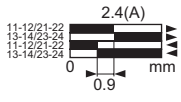


Head ZC2JE62 with body

ZC2J•1

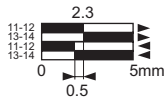


ZC2J•2

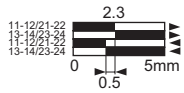


Head ZC2JE63 with body

ZC2J•1

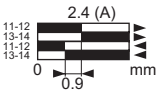


ZC2J•2

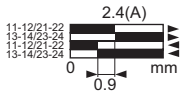


Heads ZC2JE64, ZC2JE65 with body

ZC2J•1

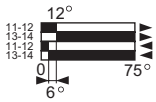


ZC2J•2

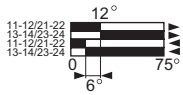


Heads ZC2JE01, ZC2JE02, ZC2JE03, ZC2JE05 with body

ZC2J•1

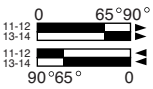


ZC2J•2

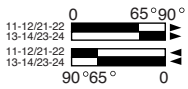


Head ZC2JE09 with body

ZC2J•1

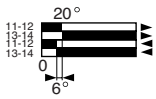


ZC2J•2

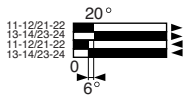


Head ZC2JE70 with body

ZC2J•1



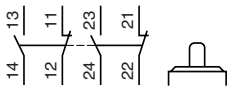
ZC2J•2



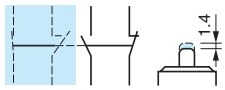
Contact operation ■ closed □ open (A) = cam displacement

Heads ZC2JE81, ZC2JE82 with body ZC2J•4

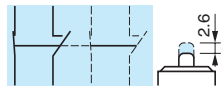
Unactuated



1st step

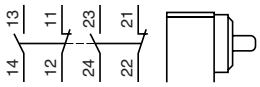


2nd step

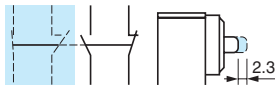


Heads ZC2JE83, ZC2JE84, ZC2JE85 with body ZC2J•4

Unactuated



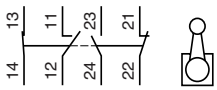
1st step



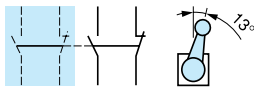
2nd step

Heads ZC2JE04 with body ZC2J•4

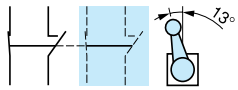
Unactuated



Actuated from left

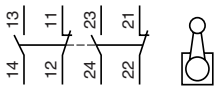


Actuated from right

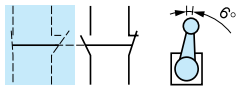


Heads ZC2JE06, ZC2JE07 with body ZC2J•4

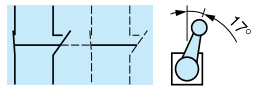
Unactuated



1st step



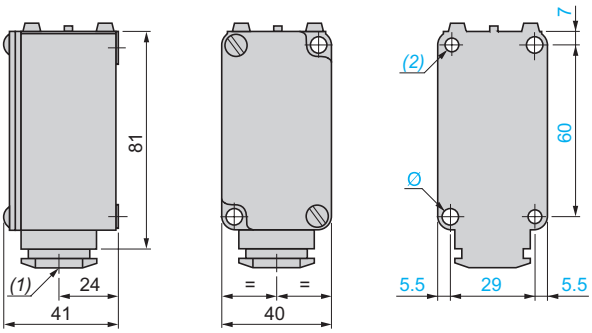
2nd step



Dimensions

Fixed bodies

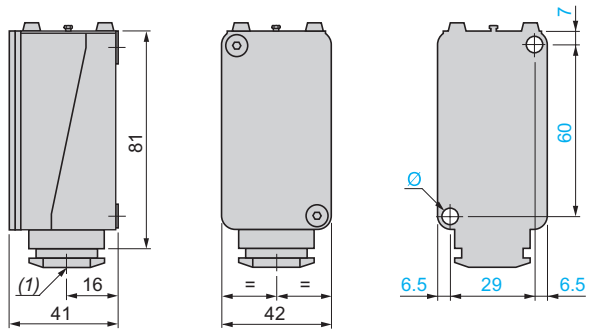
ZC2JC1, ZC2JC2, ZC2JC4



(1) Incorporated cable gland
(2) Fixing from the rear by 2 M5 screws, depth of thread on switch: 10 mm
Ø: Fixing from the front via 2 holes Ø 5.5

Plug-in bodies

ZC2JD1, ZC2JD2, ZC2JD4



(1) Incorporated cable gland
Ø: Fixing from the rear by 2 M6 screws
Fixing from the front via 2 holes Ø 5.5 (remove front part of switch for access)

References:
pages 1/155 to 1/159

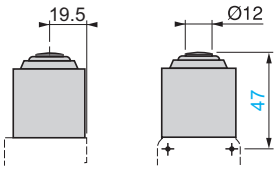
Limit switches

OsiSense XC Special

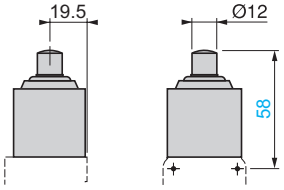
For very severe applications, type XC2J
Fixed or plug-in body
Adaptable sub-assemblies

Plunger heads

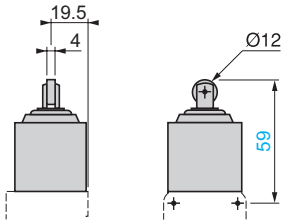
ZC2JE61, ZC2JE81



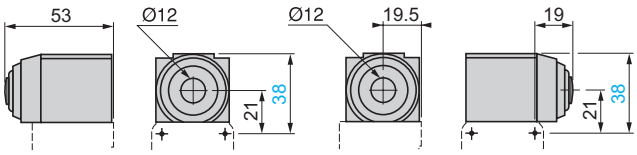
ZC2JE66



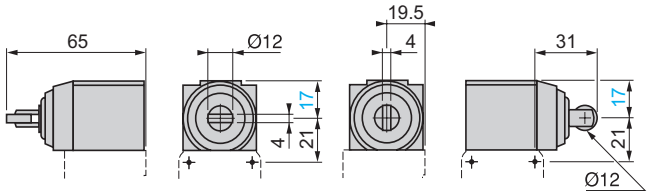
ZC2JE62, ZC2JE82



ZC2JE63, ZC2JE83 (2 position)

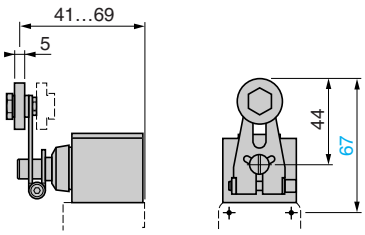


ZC2JE64, ZC2JE84, ZC2JE65, ZC2JE85 (2 position)

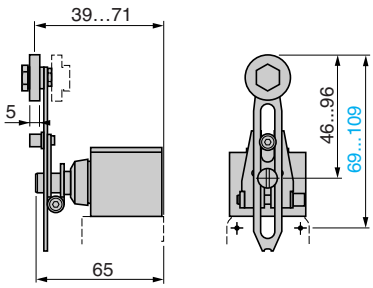


Rotary heads (ZC2JE01 to ZC2JE07) with operating lever

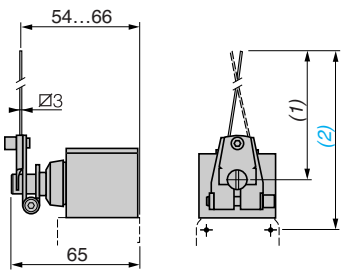
ZC2JY11, ZC2JY12, ZC2JY13



ZC2JY31

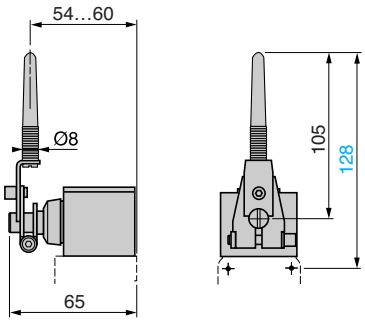


ZC2JY51

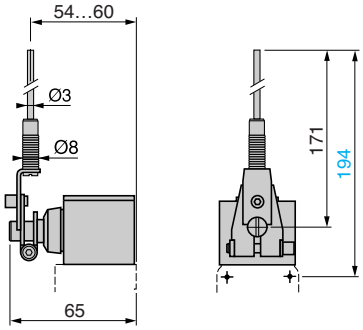


(1) 125 max. *(2) 148 max.*

ZC2JY81

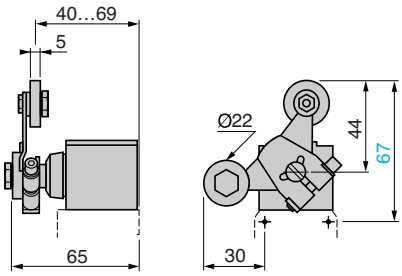


ZC2JY91

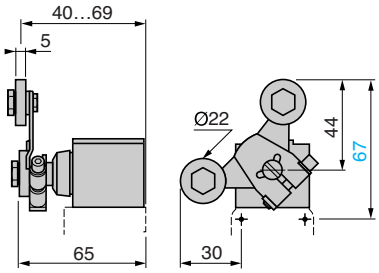


Rotary heads (ZC2JE09) with operating lever

ZC2JY61

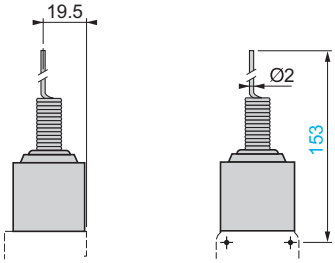


ZC2JY71



Multi-directional heads

ZC2JE70



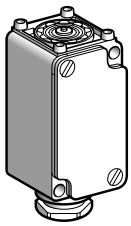
References:
pages 1/155 to 1/159

Operation:
page 1/160

Limit switches

OsiSense XC Special

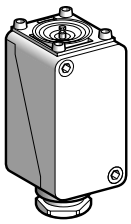
For very severe applications, type XC2J
Fixed or plug-in body, adaptable sub-assemblies for low temperature applications (- 40°C)



ZC2JC●6

Bodies with contacts for plunger or rotary head

Type	With contact block	Scheme	Reference	Weight kg
Fixed bodies				
1 step	Single-pole 1 CO snap action (XCK Z01)	13 11 / 14 12	**ZC2JC16**	0.355
	Double-pole 2 CO simultaneous, snap action (XES P1021)	13 11 23 21 / 14 12 24 22	**ZC2JC26**	0.355
2 step	Double-pole 2 CO staggered, snap action (XES P1031)	13 11 23 21 / 14 12 24 22	**ZC2JC46**	0.355

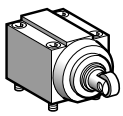


ZC2JD●6

Type	With contact block	Scheme	Reference	Weight kg
Plug-in bodies				
1 step	Single-pole CO snap action	13 11 / 14 12	**ZC2JD16**	0.380
	Double-pole 2 CO simultaneous, snap action	13 11 23 21 / 14 12 24 22	**ZC2JD26**	0.380
2 step	Double-pole 2 CO staggered, snap action	13 11 23 21 / 14 12 24 22	**ZC2JD46**	0.380

Plunger heads

Type of operator	Compatible bodies	Maximum actuation speed	Reference	Weight kg
For actuation on end				
End plunger metal	ZC2J●16 ZC2J●26	0.5 m/s	**ZC2JE616**	0.195
	ZC2J●46	0.5 m/s	**ZC2JE816**	0.195
Side plunger metal	ZC2J●16 ZC2J●26	0.5 m/s	**ZC2JE636**	0.240
	ZC2J●46	0.5 m/s	**ZC2JE836**	0.240
For actuation by 30° cam				
End ball bearing plunger	ZC2J●16 ZC2J●26	0.1 m/s	**ZC2JE666**	0.205
End roller plunger steel	ZC2J●16 ZC2J●26	1 m/s	**ZC2JE626**	0.200
	ZC2J●46	1 m/s	**ZC2JE826**	0.200
Side plunger with horizontal roller steel	ZC2J●16 ZC2J●26	0.6 m/s	**ZC2JE646**	0.245
	ZC2J●46	0.6 m/s	**ZC2JE846**	0.245
Side plunger with vertical roller steel	ZC2J●16 ZC2J●26	0.6 m/s	**ZC2JE656**	0.245
	ZC2J●46	0.6 m/s	**ZC2JE856**	0.245



ZC2JE●56

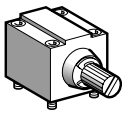
Operation:
page 1/160

Dimensions:
pages 1/160 and 1/161

Limit switches

OsiSense XC Special

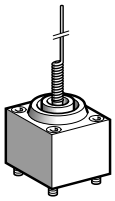
For very severe applications, type XC2J
Fixed or plug-in body, adaptable sub-assemblies for low temperature applications (- 40°C)



ZC2JE0●6

Rotary heads (without operating lever)

Type	Compatible bodies	Maximum actuation speed	Reference	Weight kg
Spring return				
Actuation from left **AND** right	ZC2J●16 ZC2J●26	1.5 m/s	**ZC2JE016**	0.210
	ZC2J●46	1.5 m/s	**ZC2JE046**	0.210
Actuation from left	ZC2J●16 ZC2J●26	1.5 m/s	**ZC2JE026**	0.210
	ZC2J●46	1.5 m/s	**ZC2JE066**	0.210
Actuation from right	ZC2J●16 ZC2J●26	1.5 m/s	**ZC2JE036**	0.210
	ZC2J●46	1.5 m/s	**ZC2JE076**	0.210
Actuation from left **OR** right (see page 1/190)	ZC2J●16 ZC2J●26	1.5 m/s	**ZC2JE056**	0.210
Stay put (see page 1/190)				
Actuation from left **AND** right	ZC2J●16 ZC2J●26	1.5 m/s	**ZC2JE096**	0.210



ZC2JE706

Multi-directional head (with operator)

Type of operator	Compatible bodies	Maximum actuation speed	Reference	Weight kg
For actuation by any moving part				
"Cat's whisker"	ZC2J●16 ZC2J●26	1 m/s in any direction	**ZC2JE706**	0.190

Operation:
page 1/160

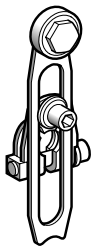
Dimensions:
pages 1/160 and 1/161

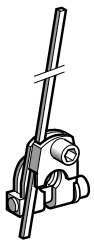
Limit switches

OsiSense XC Special

For very severe applications, type XC2J
Fixed or plug-in body, adaptable sub-assemblies for low temperature applications (- 40°C)

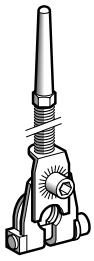
ZC2JY1●

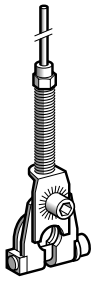

ZC2JY31


ZC2JY51

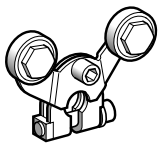
Operating levers for rotary heads

Description		Reference	Weight kg
For actuation by 30° cam			
Roller lever *(1)*	Thermoplastic	**ZC2JY11**	0.030
	Steel	**ZC2JY13**	0.040
	Steel, ball bearing mounted	**ZC2JY12**	0.040
Variable length roller lever *(1)*	Thermoplastic	**ZC2JY31**	0.045

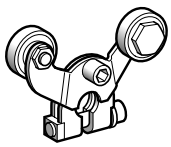

ZC2JY81


ZC2JY91

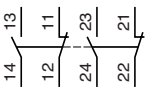
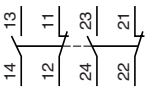
For actuation by any moving part			
Rigid rod lever	Steel ∅ 3 mm, L = 125 mm *(1)*	**ZC2JY51**	0.035
Spring lever *(1)*		**ZC2JY81**	0.040
Spring-rod lever *(1)*		**ZC2JY91**	0.040

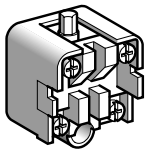

ZC2JY71

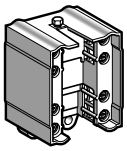
For actuation by specific cam **(only for operation with head ZC2 JE096, see page 1/190)**			
Forked arm with rollers thermoplastic *(1)*	1 track	**ZC2JY71**	0.055
	2 track	**ZC2JY61**	0.055


ZC2JY61

Contact blocks

Type of contact	Scheme	For body	Reference	Weight kg
Single-pole 1 CO snap action		ZC2JC16	**XCKZ01**	0.050
Double-pole 2 CO simultaneous, snap action		ZC2JC26	**XESP1021**	0.045
Double-pole 2 CO staggered, snap action		ZC2JC46	**XESP1031**	0.045


XCKZ01


XESP10●1

(1) Adjustable throughout 360°

Other versions Other operating levers for rotary heads.
Please consult our Customer Care Centre.

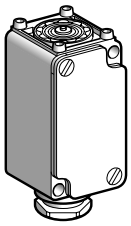
Operation:
page 1/160

Dimensions:
pages 1/160 and 1/161

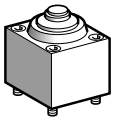
Limit switches

OsiSense XC Special

For very severe applications, type XC2J
Fixed body, adaptable sub-assemblies for high temperature applications (+ 120°C)

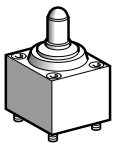


ZC2JC●5

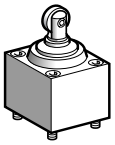


ZC2JE●15

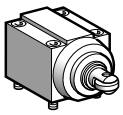
ZC2JE●35



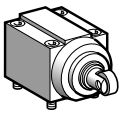
ZC2JE665



ZC2JE●25

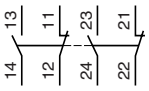
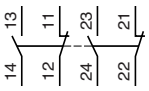


ZC2JE●45



ZC2JE●55

Bodies with contacts for plunger or rotary head

Type	With contact block	Scheme	Reference	Weight kg
Fixed bodies				
1 step	Single-pole 1 CO snap action (XCK Z015)		**ZC2JC15**	0.355
	Double-pole 2 CO simultaneous, snap action (XES P10215)		**ZC2JC25**	0.355
2 step	Double-pole 2 CO staggered, snap action (XES P10315)		**ZC2JC45**	0.355

Plunger heads

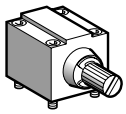
Type of operator	Compatible bodies	Maximum actuation speed	Reference	Weight kg
For actuation on end				
End plunger metal	ZC2JC15 ZC2JC25	0.5 m/s	**ZC2JE615**	0.195
	ZC2JC45	0.5 m/s	**ZC2JE815**	0.195
Side plunger metal	ZC2JC15 ZC2JC25	0.5 m/s	**ZC2JE635**	0.240
	ZC2JC45	0.5 m/s	**ZC2JE835**	0.240
For actuation by 30° cam				
End ball bearing plunger	ZC2JC15 ZC2JC25	0.1 m/s	**ZC2JE665**	0.205
End roller plunger steel	ZC2JC15 ZC2JC25	1 m/s	**ZC2JE625**	0.200
	ZC2JC45	1 m/s	**ZC2JE825**	0.200
Side plunger with horizontal roller steel	ZC2JC15 ZC2JC25	0.6 m/s	**ZC2JE645**	0.245
	ZC2JC45	0.6 m/s	**ZC2JE845**	0.245
Side plunger with vertical roller steel	ZC2JC15 ZC2JC25	0.6 m/s	**ZC2JE655**	0.245
	ZC2JC45	0.6 m/s	**ZC2JE855**	0.245

Operation: page 1/160
Dimensions: pages 1/160 and 1/161

Limit switches

OsiSense XC Special

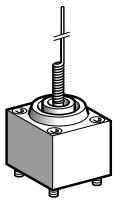
For very severe applications, type XC2J
Fixed body, adaptable sub-assemblies for high temperature applications (+ 120°C)



ZC2JE0●5

Rotary heads (without operating lever)

Type	Compatible bodies	Maximum actuation speed	Reference	Weight kg
Spring return				
Actuation from left **AND** right	ZC2JC15 ZC2JC25	1.5 m/s	**ZC2JE015**	0.210
	ZC2JC45	1.5 m/s	**ZC2JE045**	0.210
Actuation from left	ZC2JC15 ZC2JC25	1.5 m/s	**ZC2JE025**	0.210
	ZC2JC45	1.5 m/s	**ZC2JE065**	0.210
Actuation from right	ZC2JC15 ZC2JC25	1.5 m/s	**ZC2JE035**	0.210
	ZC2JC45	1.5 m/s	**ZC2JE075**	0.210
Stay put (see page 1/190)				
Actuation from left **AND** right	ZC2JC15 ZC2JC25	1.5 m/s	**ZC2JE095**	0.210



ZC2JE705

Multi-directional head (with operator)

Type of operator	Compatible bodies	Maximum actuation speed	Reference	Weight kg
For actuation by any moving part				
"Cat's whisker"	ZC2JC15 ZC2JC25	1 m/s in any direction	**ZC2JE705**	0.190

Operation:
page 1/160

Dimensions:
pages 1/160 and 1/161

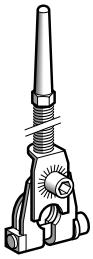
Limit switches

OsiSense XC Special

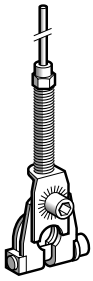
For very severe applications, type XC2J
Fixed body, adaptable sub-assemblies for high temperature applications (+ 120°C)

ZC2JY1●

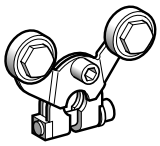
ZC2JY51



ZC2JY815



ZC2JY915



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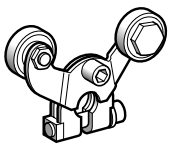
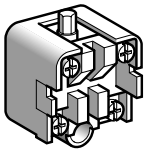
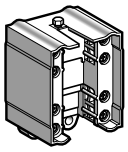


ZC2JY615



XCKZ015



XESP10●15

Operating levers for rotary heads

Description		Reference	Weight kg
For actuation by 30° cam			
Roller lever *(1)*	Thermoplastic	**ZC2JY115**	0.030
	Steel	**ZC2JY13**	0.040
	Steel, ball bearing mounted	**ZC2JY12**	0.040
Offset roller lever *(1)*	Thermoplastic	**ZC2JY215**	0.035
Variable length roller lever *(1)*	Thermoplastic	**ZC2JY315**	0.035
Variable length offset roller lever *(1)*	Thermoplastic	**ZC2JY415**	0.040
For actuation by any moving part			
Rigid rod lever	Steel ∅ 3 mm, L = 125 mm *(1)*	**ZC2JY51**	0.035
Spring lever *(1)*		**ZC2JY815**	0.040
Spring-rod lever *(1)*		**ZC2JY915**	0.040
For actuation by specific cam **(only for operation with head ZC2JE095, see page 1/190)**			
Forked arm with rollers thermoplastic *(1)*	1 track	**ZC2JY715**	0.055
	2 track	**ZC2JY615**	0.055

Contact blocks

Type of contact	Scheme	For body	Reference	Weight kg
Single-pole 1 CO snap action	13 11 / 14 12	ZC2JC15	**XCKZ015**	0.050
Double-pole 2 CO simultaneous, snap action	13 11 23 21 / 14 12 24 22	ZC2JC25	**XESP10215**	0.045
Double-pole 2 CO staggered, snap action	13 11 23 21 / 14 12 24 22	ZC2JC45	**XESP10315**	0.045

(1) Adjustable throughout 360°

Other versions Other operating levers for rotary heads.
Please consult our Customer Care Centre.

Operation:
page 1/160

Dimensions:
pages 1/160 and 1/161

Limit switches

OsiSense XC Special

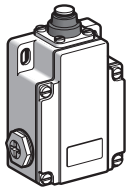
For material handling applications, type XC1AC

1

■ XC1AC
with slow break contacts

□ With head for linear movement (plunger)

DF601611



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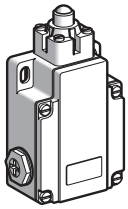

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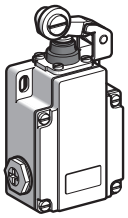
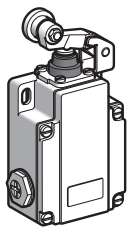


Page 1/170

DF601614



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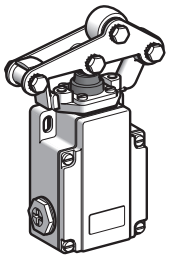


Page 1/170

Limit switches

OsiSense XC Special

For material handling applications, type XC1AC

Environment characteristics

Conformity to standards		IEC/EN 60947-5-1, IEC 60337-1, VDE 0660-200, CSA C22-2 n° 14
Product certifications	Special version	CSA 600 V (ac) HD
Protective treatment	Version	Standard: “TC”. Special: “TH”
Ambient air temperature	For operation	- 25…+ 70°C
	For storage	- 40…+ 70°C
Operating position		All positions
Vibration resistance		9 gn (10…500 Hz) conforming to IEC 60068-2-6
Shock resistance		95 gn (11 ms) conforming to IEC 60068-2-27
Electric shock protection		Class I conforming to IEC 60536 and NF C 20-030
Degree of protection		**IP 65 conforming to IEC 60529 and NF C 20-010**
Mechanical durability		10 million operating cycles
Cable entry		3 tapped entries for n° 13 cable gland

Contact block characteristics

Conventional thermal current		10 A
Rated insulation voltage	Slow break contact blocks	**500 V ∿ and 600 V ⎓ conforming to IEC 60947-5-1, NF C 20-040** **∿ and 600 V ⎓ conforming to CSA C22-2 n° 14**
Resistance across terminals		≤ 8 mΩ
Minimum tripping force		**XC1AC1●1**: 33 N, **XC1AC1●6**: 23 N, **XC1AC1●7**: 29 N
Terminal referencing		Conforming to CENELEC EN 50013
Short-circuit protection		10 A cartridge fuse type gG (gl)
Electrical durability		■ Conforming to IEC 60947-5-1 Appendix C ■ Utilisation categories AC-15 and DC-13 ■ Maximum operating rate: 3600 operating cycles/hour ■ Load factor: 0.5

Slow break contact blocks

AC supply 50/60 Hz ∿ — inductive circuit

Power broken in **VA**

Voltage **V**	**48**	**110**	**230**
For 1 million operating cycles	450	900	1900
For 3 million operating cycles	170	350	430

DC supply ⎓ — inductive circuit

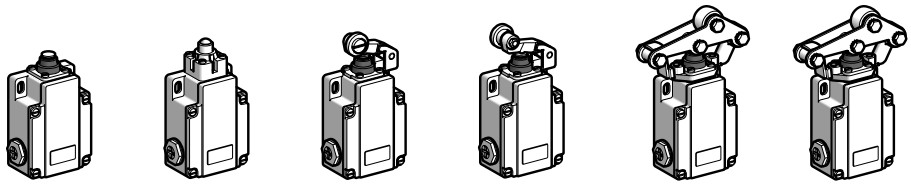
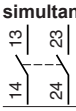
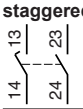
Power broken in **W**

Voltage **V**	**48**	**110**	**230**
For 1 million operating cycles	100	100	95
For 3 million operating cycles	35	40	33

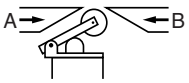
Limit switches

OsiSense XC Special

For material handling applications, type XC1AC
Complete switches with slow break contacts

Type of head	Plunger					
						
Type of operator	End plunger	End ball bearing plunger	Roller lever plunger	Offset roller lever plunger	Reinforced roller lever plunger	Needle bearing mounted roller lever plunger
References of complete switches						
Single-pole CO slow break ZC1AZ11	**XC1AC111** 2,1 9 / 5,6 mm	**XC1AC115** 2,1 9 / 5,6 mm	**XC1AC116** 2,3 12 / 7,3 mm	**XC1AC118** 2,3 12 / 7,3 mm	**XC1AC117** 1,6 11,5 / 6,2 mm	**XC1AC119** 1,6 11,5 / 6,2 mm
2-pole NC + NO break before make, slow break ZC1AZ12	**XC1AC121** 6 7,5 / 6,8 mm	**XC1AC125** 6 7,5 / 6,8 mm	**XC1AC126** 7 11,5 / 8 mm	**XC1AC128** 7 11,5 / 8 mm	**XC1AC127** 5,2 11,5 / 6,8 mm	**XC1AC129** 5,2 11,5 / 6,8 mm
2-pole NO + NC make before break ZC1AZ13	**XC1AC131** 4,8 8 / 3,5 mm	**XC1AC135** 4,8 8 / 3,5 mm	**XC1AC136** 7 10,5 / 4,5 mm	**XC1AC138** 7 10,5 / 4,5 mm	**XC1AC137** 6,5 11,5 / 4,4 mm	**XC1AC139** 6,5 11,5 / 4,4 mm
2-pole NC + NC simultaneous, slow break ZC1AZ14	**XC1AC141** 4,3 9,3 / mm	**XC1AC145** 4,3 9,3 / mm	**XC1AC146** 5,5 12 / mm	**XC1AC148** 5,5 12 / mm	**XC1AC147** 5 12,5 / mm	**XC1AC149** 5 12,5 / mm
2-pole NO + NO simultaneous, slow break ZC1AZ15 	**XC1AC151** 5,6 9 / mm	**XC1AC155** 5,6 9 / mm	**XC1AC156** 7,2 11,5 / mm	**XC1AC158** 7,2 11,5 / mm	**XC1AC157** 7 11,5 / mm	**XC1AC159** 7 11,5 / mm
2-pole NC + NC staggered, slow break ZC1AZ16	**XC1AC161** 3,7 9 / 4,9 mm	**XC1AC165** 3,7 9 / 4,9 mm	**XC1AC166** 4,5 12 / 6,2 mm	**XC1AC168** 4,5 12 / 6,2 mm	**XC1AC167** 4 12 / 5,5 mm	**XC1AC169** 4 12 / 5,5 mm
2-pole NO + NO staggered, slow break ZC1AZ17 	**XC1AC171** 4,8 8,5 / 6 mm	**XC1AC175** 4,8 8,5 / 6 mm	**XC1AC176** 5,8 12 / 7,6 mm	**XC1AC178** 5,8 12 / 7,6 mm	**XC1AC177** 6 12 / 7,5 mm	**XC1AC179** 6 12 / 7,5 mm
Weight (kg)	0.530	0.530	0.595	0.595	0.870	0.870
Contact operation	*closed* / *open*					

Complementary characteristics

Switch actuation	On end	By 30° cam	
Type of actuation			
Maximum actuation speed	0.5 m/s	1 m/s (direction A), 0.5 m/s (direction B) *(1)*	
Cable entry	3 tapped entries for n° 13 (DIN Pg 13.5) cable gland, clamping capacity 9 to 12 mm (2 entries fitted with blanking plug)		
Connection	Screw terminals. Clamping capacity: min. 1 x 0.5 mm², max. 1 x 2.5 mm²		

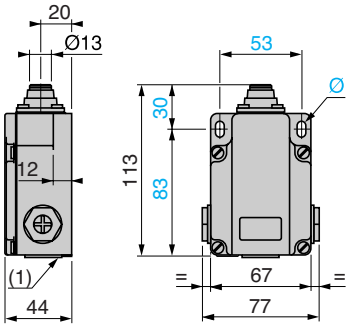
(1) For a 45° cam the maximum actuation speed becomes 0.5 m/s and for a 15° cam, 1 m/s.

Limit switches

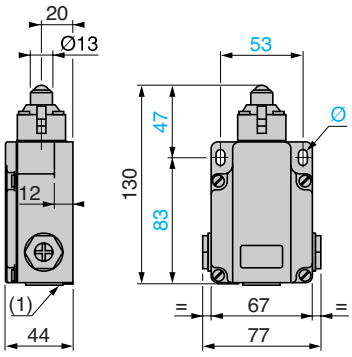
OsiSense XC Special

For material handling applications, type XC1AC
Complete switches with slow break contacts

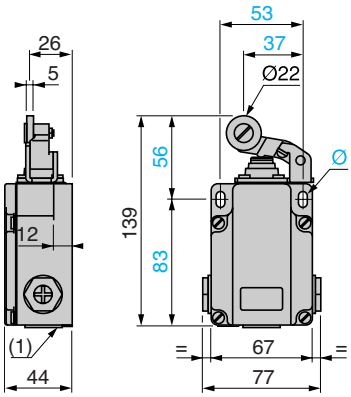
XC1AC1●1



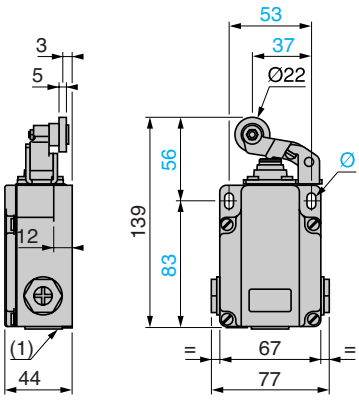
XC1AC1●5



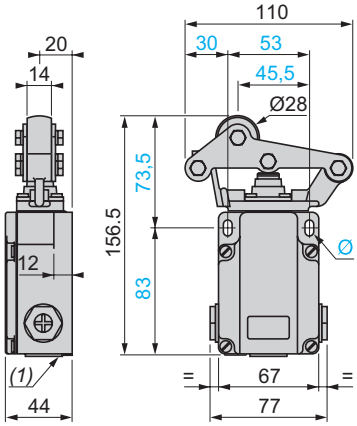
XC1AC1●6



XC1AC1●8



XC1AC1●7, XC1AC1●9



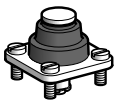
(1) 3 tapped entries for n° 13 cable gland or ISO 20 with adaptor DE9RA1620.
Ø: 2 elongated holes Ø 6.5 x 10.

Limit switches

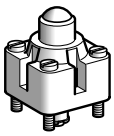
OsiSense XC Special

For material handling applications, type XC1AC

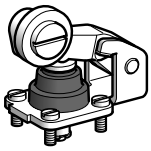
Replacement parts



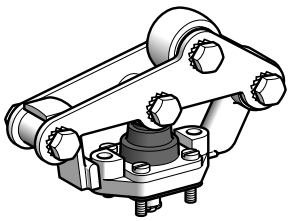
ZC1AC001



ZC1AC005



ZC1AC006



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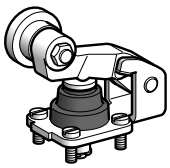
ZC1AC009



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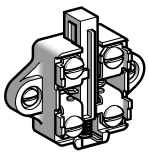
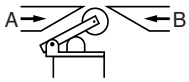
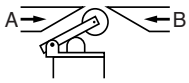
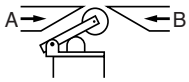
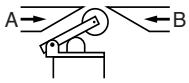


ZC1AZ1●

Plunger heads

Type of operator	Maximum actuation speed	Type of actuation	Reference	Weight kg
For actuation on end				
End plunger	0.5 m/s		**ZC1AC001**	0.035
For actuation by 30° cam				
End ball bearing plunger	0.5 m/s		**ZC1AC005**	0.050
Roller lever plunger	1 m/s (direction A) 0.5 m/s (direction B)		**ZC1AC006**	0.100
Reinforced roller lever plunger	1 m/s (direction A) 0.5 m/s (direction B)		**ZC1AC007**	0.375
Offset roller lever plunger	1 m/s (direction A) 0.5 m/s (direction B)		**ZC1AC008**	0.100
Needle bearing mounted roller lever plunger	1 m/s (direction A) 0.5 m/s (direction B)		**ZC1AC009**	3.380

Contact blocks

Type of contact	Scheme	Reference	Weight kg
CO, single-pole		**ZC1AZ11**	0.040
NC + NO break before make		**ZC1AZ12**	0.045
NO + NC make before break		**ZC1AZ13**	0.040
NC + NC simultaneous		**ZC1AZ14**	0.045
NO + NO simultaneous		**ZC1AZ15**	0.045
NC + NC staggered		**ZC1AZ16**	0.040
NO + NO staggered		**ZC1AZ17**	0.040

Adaptation plate

Description	Reference	Weight kg
Mounting plate (For replacing an old version type RN-67522 limit switch by an XC1AC limit switch)	**ZC1AZ8**	3.380

Limit switches

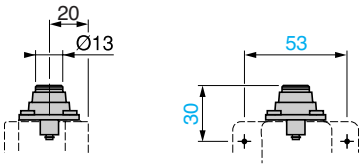
OsiSense XC Special

For material handling applications, type XC1AC

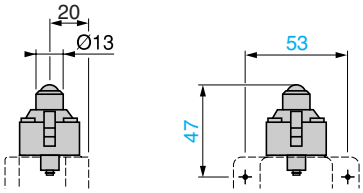
Replacement parts

Dimensions

ZC1AC001



ZC1AC005



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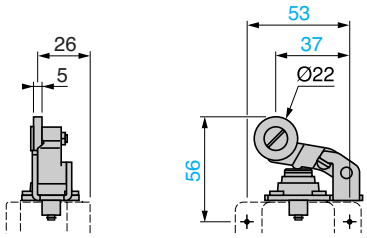
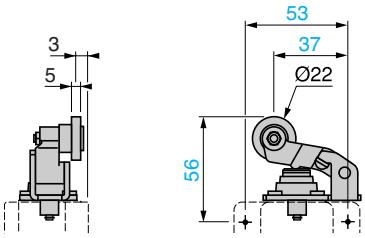
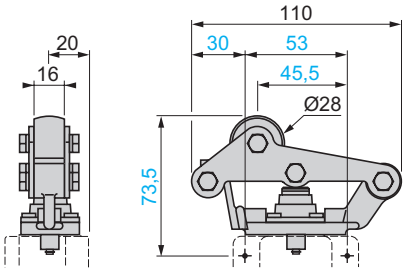


ZC1AC008



ZC1AC007, ZC1AC009



Limit switches

OsiSense XC Special

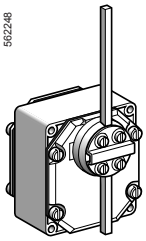
For hoisting and material handling applications XCR

■ XCR

□ With head for rotary movement operators, spring return to off position

1 contact actuation position per direction

562248



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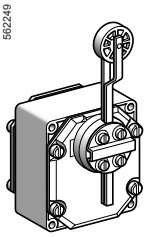
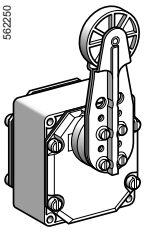


562250

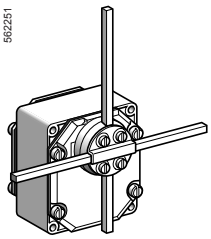


Page 1/178

□ With head for rotary movement operators, stay put

1 contact actuation position per direction

562251



Page 1/178

Limit switches

OsiSense XC Special

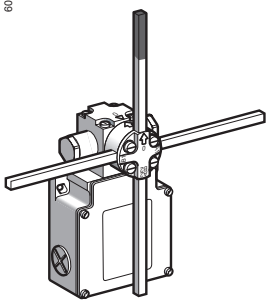
For hoisting and material handling applications XCKMR and XCKVR
For conveyor belt shift monitoring applications XCRT

■ XCKMR (metal)

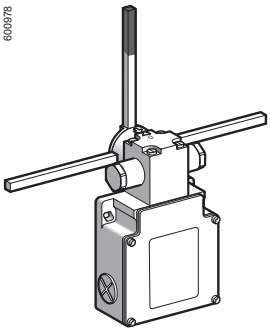
□ With head for rotary movement operators, stay put

4 mechanical actuation positions of 4 contacts
From 2 to 5 electrical positions depending on model

600977



600978



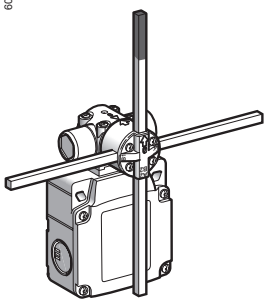
Page 1/196

■ XCKVR (plastic)

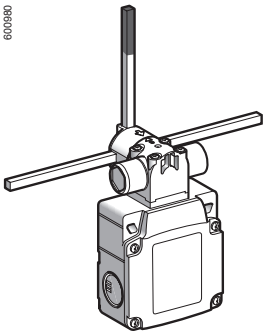
□ With head for rotary movement operators, stay put

4 mechanical actuation positions of 4 contacts
From 2 to 5 electrical positions depending on model

600979



600980



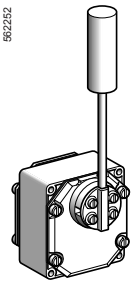
Page 1/196

■ XCRT

□ With head for rotary movement operators, spring return to off position

2 contact actuation positions per direction
1 contact actuated at 10°, other contact at 18°

562252



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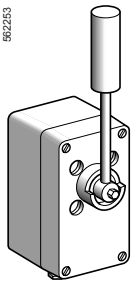


Page 1/192

Limit switches

OsiSense XC Special

For hoisting and material handling applications XCR, XCKMR and XCKVR
For conveyor belt shift monitoring applications XCRT

Environment characteristics

Limit switches		XCR and XCRT	XCKMR (metal)	XCKVR (plastic)
Conformity to standards	Products	EN/IEC 60947-5-1, CSA C22-2 n° 14, CCC	EN/IEC 60947-5-1, CSA C22-2 n° 14, UL 508, CCC	
	Machine assemblies	EN/IEC 60204-1		
Product certifications		**XCRA, B, E, F**: CE, CSA, CCC, GOST	CE, UL, CSA, CCC, GOST	
Protective treatment	Standard version	"TC"		
Ambient air temperature	For operation	- 25…+ 70 °C	- 25…+ 70 °C	- 25…+ 70 °C
	For storage	- 40…+ 70 °C	- 40…+ 85 °C	- 40…+ 70 °C
Vibration resistance	Conforming to EN/IEC 60068-2-6	9 gn (10…500 Hz)	25 gn (10…500 Hz)	25 gn (10…500 Hz)
Shock resistance	Conforming to EN/IEC 60068-2-27	**XCRA, B, E, F:** 68 gn, **XCRT:** 30 gn (18 ms)	50 gn	50 gn
Electric shock protection		Class I conforming to IEC 60536		Class II conforming to IEC 60536
Degree of protection	Conforming to EN/IEC 60529	**XCRA, B, E, F**: IP 65 **XCRT**: IP 65	IP 66	IP 65
Degree of protection against mechanical impacts	Conforming to EN 50102	IK 07	IK 07	IK 04
Materials	Enclosure	Metal (except **XCRT315**: polyester)	Zamak ZP3	(PBT + PC) - GF 30 FR (Valox)
	Cover	Metal (except **XCRT315**: polyester)	DC03 steel	(PBT + PC) - GF 30 FR (Valox)
	Head	Metal	Zamak ZP3	(PBT + PC) - GF 30 FR (Valox)
Cable entry		1 tapped entry for n°13 cable gland	3 tapped entries for n°13 cable gland or tapped M20 x 1.5	1 tapped entry M20 x 1.5. 2 breakout holes for ISO M20 cable gland

Contact block characteristics

Rated operational characteristics	Conforming to EN/IEC 60947-5-1 Appendix A	**XCRA, B, E, F:** ∼ AC-15; A300 (Ue = 240 V, Ie = 3 A), Ithe = 10 A ⎓ DC-13 ; Q300 (Ue = 250 V, Ie = 0.27 A) **XCRT:** ∼ AC-15; B300 (Ue = 240 V, Ie = 1.5 A/ Ue = 120 V, Ie = 3 A) ⎓ DC-13 ; R300 (Ue = 250 V, Ie = 0.1 A)	∼ AC-15 ; A300 (Ue = 240 V, Ie = 3 A), Ithe = 10 A ⎓ DC-13 ; Q150 (Ue = 125 V, Ie = 0.55 A)	
Rated insulation voltage		Ui = 500 V degree of pollution 3 conforming to EN/IEC 60947-1 Ui = 300 V conforming to UL 508, CSA C22-2 n° 14		
Rated impulse withstand voltage		U imp = 6 kV conforming to EN/IEC 60947-1, IEC 60664		
Positive operation (depending on model)		NC contacts with positive opening operation conforming to EN/IEC 60947-5-1 Section 3 (except XCRT)	NC contacts with positive opening operation conforming to EN/IEC 60947-5-1 Section 3 (contacts 21-22)	
Resistance across terminals		≤ 25 m Ω conforming to NF C 93-050 method A or IEC 60255-7 category 3		
Short-circuit protection		10 A cartridge fuse type gG (gI)		
Connection	Screw clamp terminals	Clamping capacity **XE2N P2151** ou **XCRT**: min: 1 x 0.5 mm², max: 2 x 2.5 mm² **XE2S P2151**: min: 1 x 0.34 mm², max: 2 x 1.5 mm²	Clamping capacity min: 1 x 0.5 mm² max: 2 x 2.5 mm²	

Limit switches

OsiSense XC Special

For hoisting and material handling applications XCR, XCKMR and XCKVR
For conveyor belt shift monitoring applications XCRT

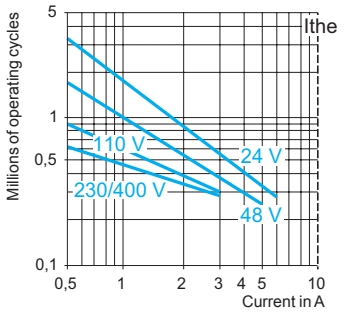
Contact block characteristics (continued)

Electrical durability

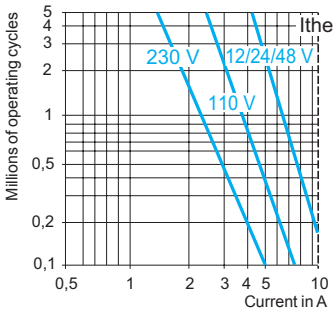
- Conforming to EN/IEC 60947-5-1 Appendix C
- Utilisation categories AC-15 and DC-13
- Maximum operating rate: 3600 operating cycles/hour
- Load factor: 0.5

AC supply
∿ 50/60 Hz
inductive circuit

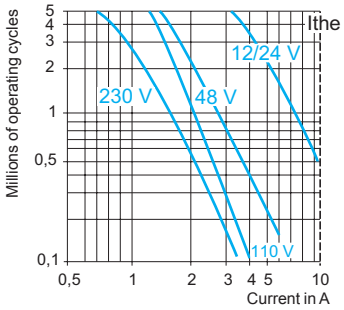
XE2SP2151



XE2NP2151



XCRT contacts



DC supply ⎓

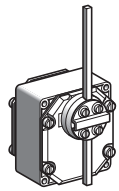
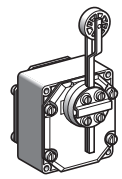
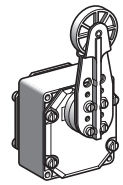
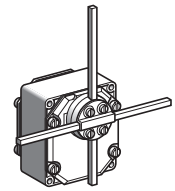
		Voltage **V**	**24**	**48**	**120**
Power broken in W for 5 million operating cycles **W**		**XE2S P2151**	10	7	4
		XE2N P2151	13	9	7
		XCRT contacts	10	7	4

For XE2SP2151 on ∿ or ⎓ NC and NO contacts simultaneously loaded to the values shown with reverse polarity.

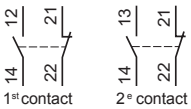
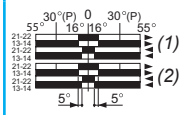
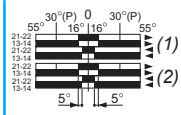
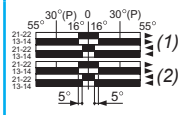
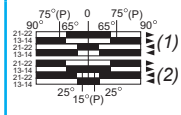
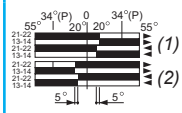
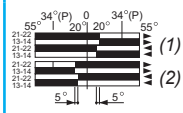
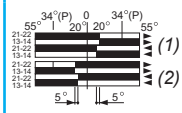
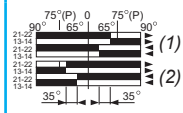
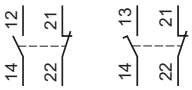
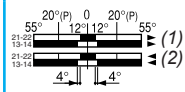
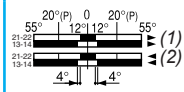
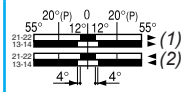
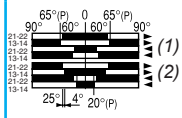
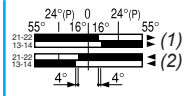
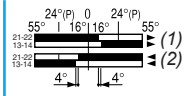
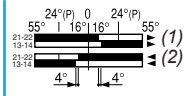
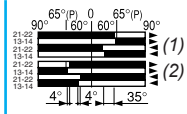
Limit switches

OsiSense XC Special

For hoisting and material handling applications XCR
Complete switches with 1 cable entry

Type of head	Rotary with spring return to off position			Stay put
Maximum displacement	55° in each direction			90° in each direction
				
Type of operator	Metal rod, ∅ 6 mm	Thermoplastic roller lever	Large thermoplastic roller lever	Metal rods, ∅ 6 mm, *crossed rods for XCRE●8, "T" rods for XCRF●7*
Rod length	1 rod of 200 mm	–	–	**XCRE●●**: 2 rods of 200 mm **XCRF●●**: 1 rod of 200 mm and 1 rod of 300 mm

References of complete switches (⊖ NC contact with positive opening operation)

Two 2-pole NC + NO snap action XE2SP2151  1st contact 2e contact	Both contacts operate in each direction	**XCRA11** ⊖ *(3)* 	**XCRA12** ⊖ *(3)* 	**XCRA15** ⊖ *(3)* 	**XCRE18** ⊖ *(3)* 
	1 contact operates in each direction	**XCRB11** ⊖ *(3)* 	**XCRB12** ⊖ *(3)* 	**XCRB15** ⊖ *(3)* 	**XCRF17** ⊖ *(3)* 
Two 2-pole NC + NO break before make, slow break XE2NP2151  1st contact 2e contact	Both contacts operate in each direction	**XCRA51** ⊖ *(3)* 	**XCRA52** ⊖ *(3)* 	**XCRA55** ⊖ *(3)* 	**XCRE58** ⊖ *(3)* 
	1 contact operates in each direction	**XCRB51** ⊖ *(3)* 	**XCRB52** ⊖ *(3)* 	**XCRB55** ⊖ *(3)* 	**XCRF57** ⊖ *(3)* 
Weight (kg)		1.110	1.145	1.155	1.135

Contact operation

▬ *closed*
▭ *open*

(P) = positive opening point
(1) 1st contact
(2) 2nd contact

Complementary characteristics

Lever maximum actuation speed		1.5 m/s	
Mechanical durability		10 million operating cycles	
Minimum torque	For tripping	0.45 N.m	0.60 N.m
	For positive opening	0.75 N.m	0.70 N.m
Cable entry		1 entry tapped for n° 13 cable gland conforming to NF C 68-300 (DIN Pg 13.5) Clamping capacity 9 to 12 mm	

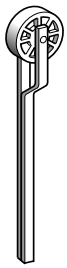
*(3) For a limit switch with watertight reinforced seal (IP 65), add **1** to the end of the reference. Example: **XCRF17** becomes **XCRF171**.*

Dimensions:
page 1/194

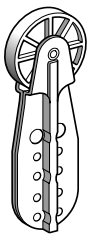
Limit switches

OsiSense XC Special

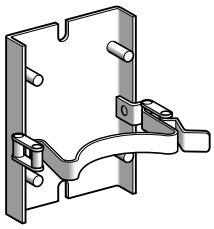
For hoisting and material handling applications XCR



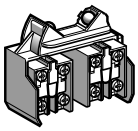
XCRZ02



XCRZ05



XCRZ09



XCRZ1●

Separate components

Description	For switches	Type	Reference	Weight kg
Rod, ⌀ 6 mm	XCRA XCRB XCRE XCRF	L = 200 mm	**XCRZ03**	0.020
	XCRF	L = 300 mm	**XCRZ04**	0.030
Roller lever thermoplastic roller	XCRA XCRB	–	**XCRZ02**	0.050
Large roller lever thermoplastic roller	XCRA XCRB	–	**XCRZ05**	0.090
Quick fixing/ release bracket	XCRA, XCRB XCRE, XCRF	–	**XCRZ09**	0.520
Contact block (2 contacts) with mounting plate	XCRA, XCRB XCRE, XCRF	2-pole NC + NO snap action	**XCRZ12**	0.135
		2-pole NC + NO break before make, snap action	**XCRZ15**	0.135

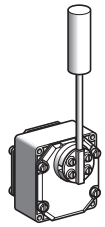
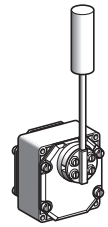
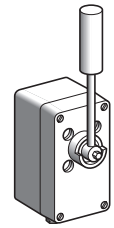
Description	Application	Sold in lots of	Unit reference	Weight kg
Adaptor	Pg 13.5 to ISO M20 x 1.5	5	**DE9RP13520**	0.032

Dimensions:
page 1/194

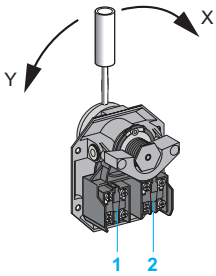
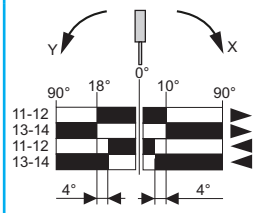
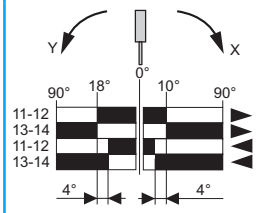
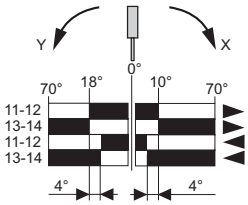
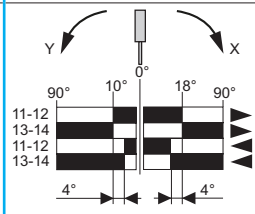
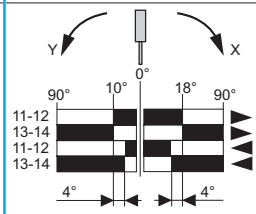
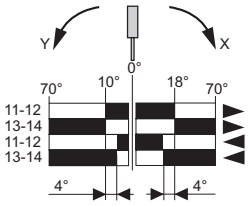
Limit switches

OsiSense XC Special

For conveyor belt shift monitoring applications XCRT
Complete switches with 1 cable entry

Type of switch	Standard	For corrosive atmospheres	
			
Features	Zinc alloy enclosure Colour: industrial blue Zinc plated steel lever, spring return to off position Cam angles: 10° and 18° Maximum displacement: 90°	Zinc alloy enclosure Colour: blue Stainless steel lever, spring return to off position Cam angles: 10° and 18° Maximum displacement: 90°	Glass reinforced polyester enclosure Colour: grey Stainless steel lever, spring return to off position Cam angles: 10° and 18° Maximum displacement: 70°

References of complete switches

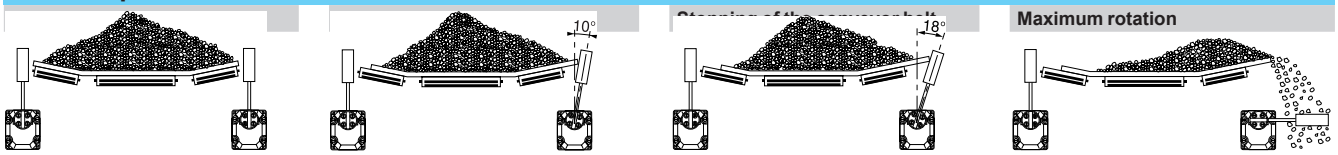
2 single-pole CO snap action	XCRT115	XCRT215	XCRT315
			
2: 2nd contact			
Weight (kg)	1.170	1.170	1.520

Contact operation
- ■ *closed*
- □ *open*

Complementary characteristics

Lever maximum actuation speed	1.5 m/s
Belt maximum speed	4 m/s
Machnical durability	0.3 million operating cycles
Minimum tripping torque	1.7 N.m
Cable entry	1 entry tapped for n° 13 cable gland conforming to NF C 68-300 (DIN Pg 13.5) Clamping capacity 9 to 12 mm

Switch operation

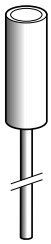


Dimensions:
page 1/182

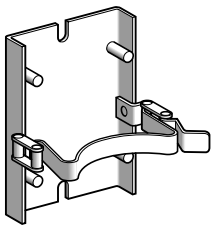
Limit switches

OsiSense XC Special

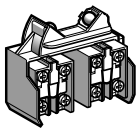
For conveyor belt shift monitoring applications XCRT



XCRZ9●●



XCRZ09



XCRZ42

Separate components

Description	Type	For switches	Reference	Weight kg
Roller with lever	Zinc plated steel	XCRT115 XCRT215	**XCRZ901**	0.230
	Stainless steel	XCRT115 XCRT215	**XCRZ902**	0.230
		XCRT315	**XCRZ903**	0.230
Quick fixing/release bracket	–	XCRT115 XCRT215	**XCRZ09**	0.520
Contact block (2 contacts) with mounting plate	Single-pole CO snap action	XCRT●15	**XCRZ42**	0.135

Description	Application	Sold in lots of	Unit reference	Weight kg
Adaptor	Pg 13.5 to ISO M20 x 1.5	5	**DE9RP13520**	0.032

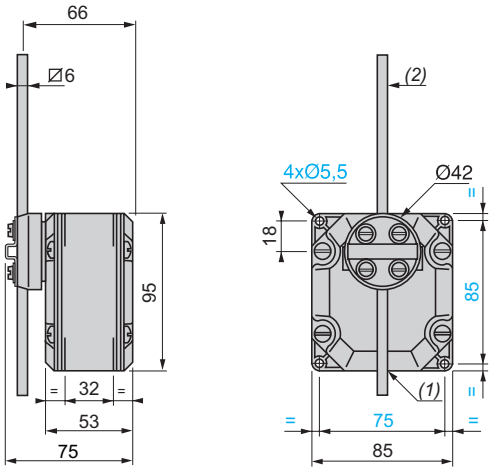
Dimensions:
page 1/182

Limit switches

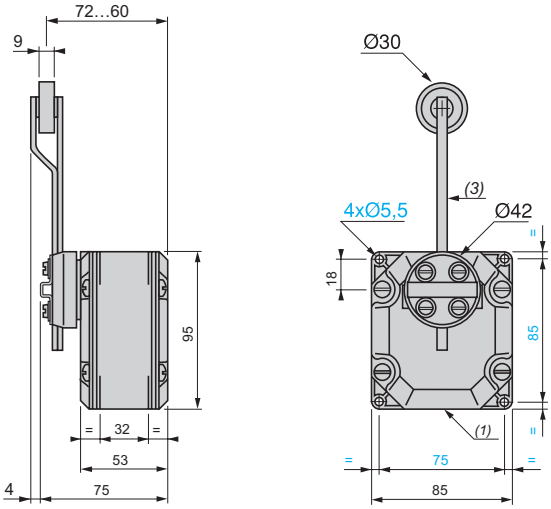
OsiSense XC Special

For hoisting and material handling applications XCR

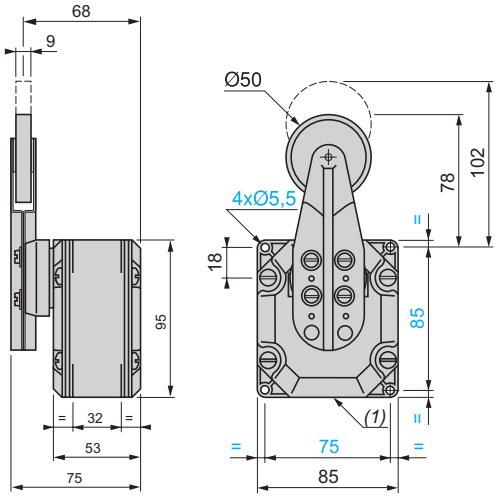
XCRA11, XCRB11, XCRA51, XCRB51



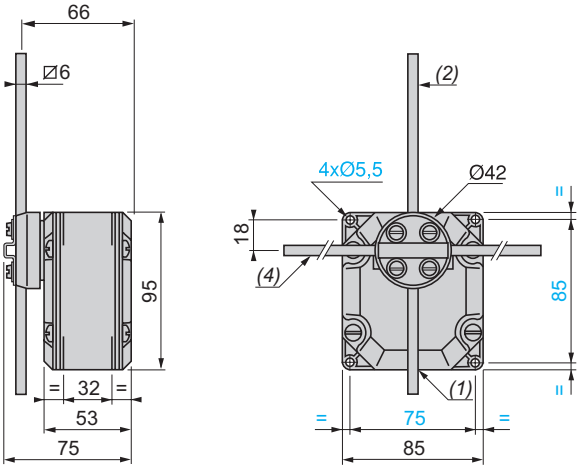
XCRA12, XCRB12, XCRA52, XCRB52



XCRA15, XCRB15, XCRA55, XCRB55



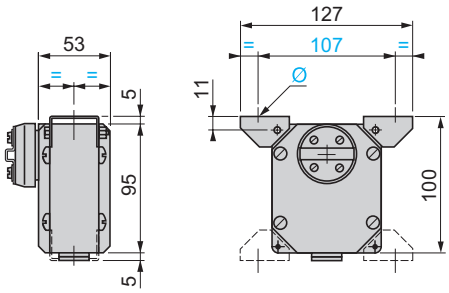
XCRE18, XCRE58, XCRF17, XCRF57



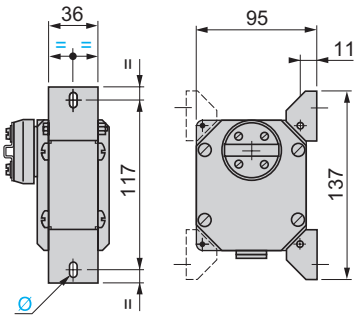
(1) 1 tapped entry for n° 13 cable gland.
(2) Rod length: 200 mm.
(3) Rod + roller length: 160 mm.
(4) Rod length: 300 mm for XCRF17 and XCRF57, 200 mm for XCRE18 and XCRE58.

Supplementary fixing using 2 adjustable lugs (included with switch)

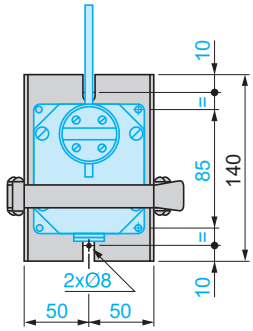
Horizontally positioned



Vertically positioned



Quick fixing/release bracket XCRZ09



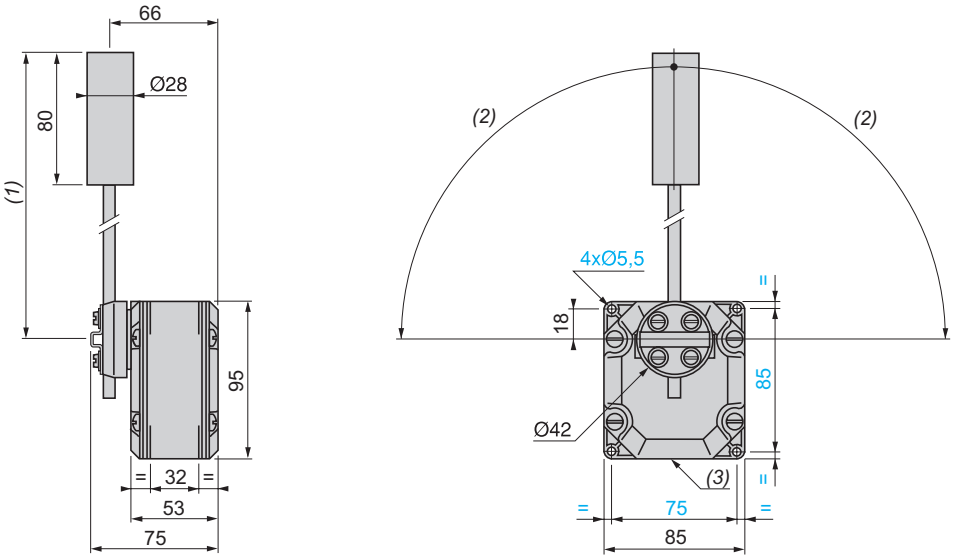
Ø: 1 elongated hole Ø 6 x 8.

Characteristics:
pages 1/174 to 1/178

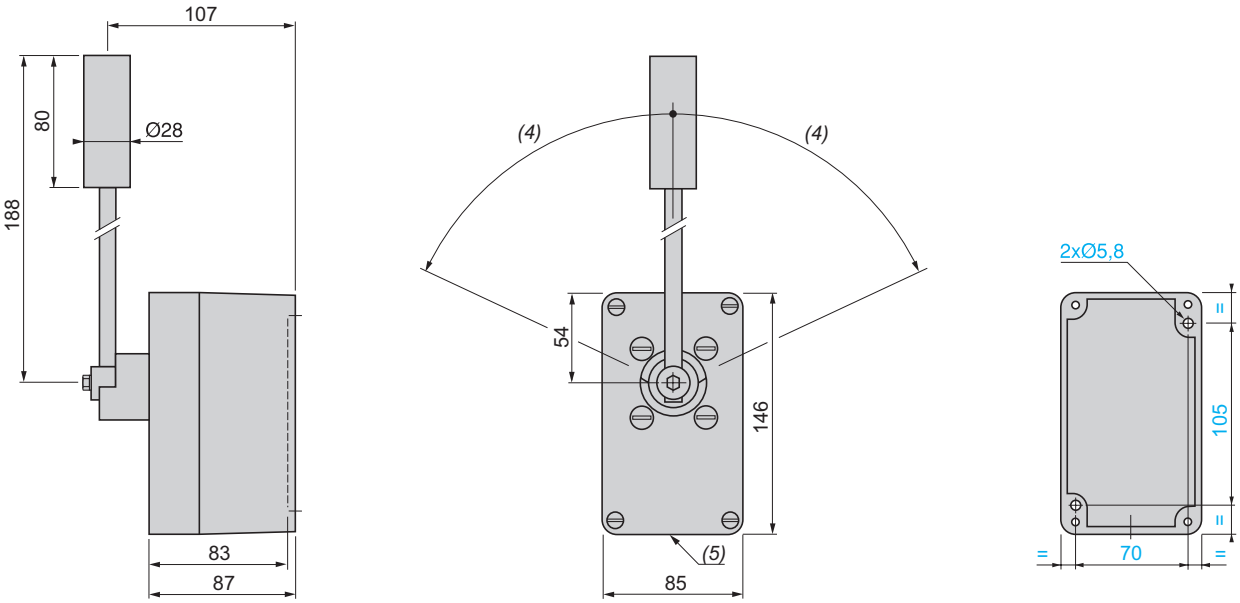
References:
page 1/178

Telemecanique Sensors

XCRT115, XCRT215



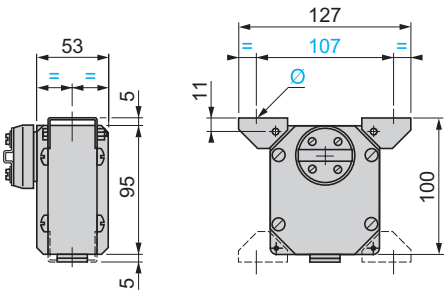
XCRT315



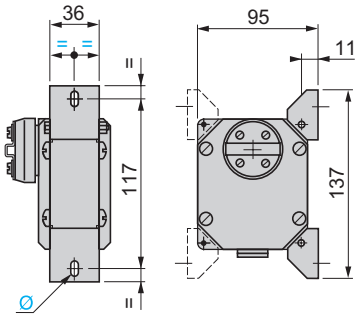
(1) 200 max., 104 min.
(2) 90° max.
(3) 1 tapped entry for n° 13 cable gland.
(4) 70° max.
(5) 1 plain entry for n° 13 cable gland.

Supplementary fixing using 2 adjustable lugs (included with XCRT115 and XCRT215)

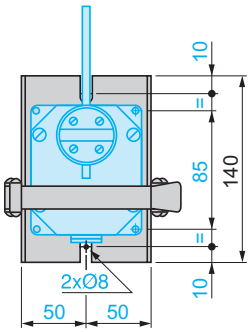
Horizontally positioned



Vertically positioned



Quick fixing/release bracket XCRZ09



Ø: 1 elongated hole Ø 6 x 8.

Characteristics:
pages 1/174 to 1/192

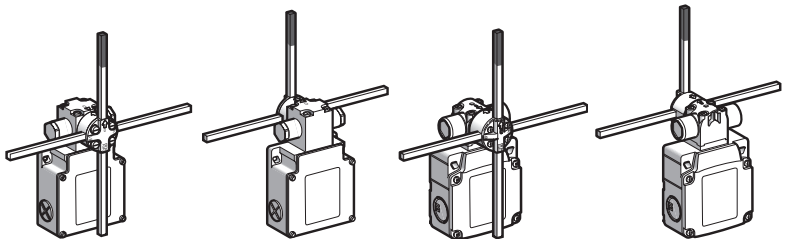
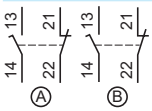
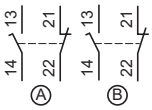
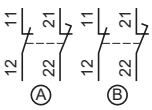
References:
page 1/178

Operation:
page 1/192

Limit switches

OsiSense XC Special

For hoisting and material handling applications
XCKMR and XCKVR
Complete switches with 3 cable entries

Type of operating head	Rotary			
				
Material	Metal		Plastic	
Type of operator	With cruciform metal rods	With cruciform metal rods, reversed head	With cruciform metal rods	With cruciform metal rods, reversed head
References				
"By pass" switches				
 **2 x 2-pole NC+NO break before make, slow break (XE2NP2151)**	**XCKMR24SR1H29**	–	**XCKVR24SR1H29**	–
"Single speed" switches				
 **2 x 2-pole NC+NO break before make, slow break (XE2NP2151)**	**XCKMR44D1H29**	**XCKMR44D2H29**	**XCKVR44D1H29**	**XCKVR44D2H29**
"Double speed" switches (⊖ NC contact with positive opening operation on contacts 21-22)				
 **2 x 2-pole NC+NC break before make, slow break (non interchangeable contacts)**	**XCKMR54D1H29** *(1)*	**XCKMR54D2H29** *(1)*	**XCKVR54D1H29**	**XCKVR54D2H29**
Weight (kg)	0.684	0.684	0.320	0.320

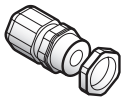
Complementary characteristics

Switch actuation		Horizontal	Horizontal
Permissible actuation area on the rods		Between 65 and 95 mm from the axis of the fixing screws on the body	
Minimum actuation speed		0.1 m/mn	0.1 m/mn
Maximum actuation speed *(2)*		1.5 m/s	1.5 m/s
Minimum force or torque	For tripping	0.5 N.m	0.5 N.m
	For positive opening	0.75 N.m	0.75 N.m
Mechanical durability		2 million operating cycles	1 million operating cycles
Setting up		Rods included with the switch: for customer assembly	

References of separate components

XCRZ03

XCRZ03R



DE9PEM20010

Description	Reference	Weight kg
Rod ⌀ 6 mm, L = 200 mm	**XCRZ03**	0.020
Rod ⌀ 6 mm, L = 200 mm with red mark	**XCRZ03R**	0.020
Plastic cable gland ISO M20	**DE9PEM20010**	0.010

*(1) For complete switches with entry for Pg 13.5 cable gland, delete H29 from the end of the reference. Example: **XCKMR54D1H29** becomes **XCKMR54D1**.*
(2) For an actuation point on the rod between 65 and 95 mm from the axis of the fixing screws on the body.

Limit switches

OsiSense XC Special

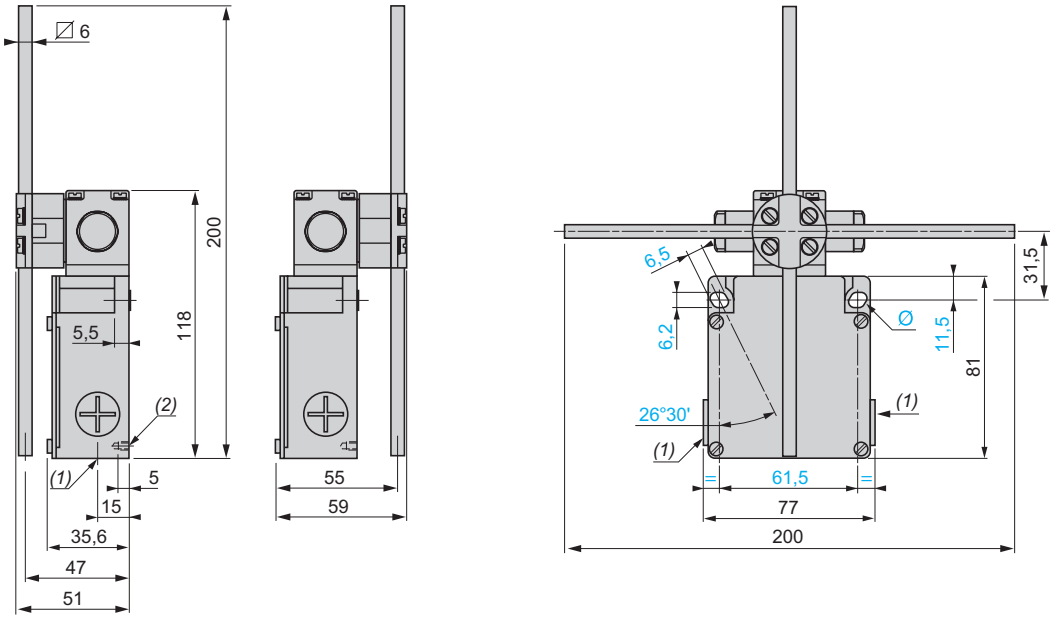
For hoisting and material handling applications
XCKMR and XCKVR
Complete switches with 3 cable entries

Dimensions

Metal limit switches

XCKMR24SR1H29, XCKMR44D1H29 and **XCKMR54D1H29**

XCKMR44D2H29 and **XCKMR54D2H29**

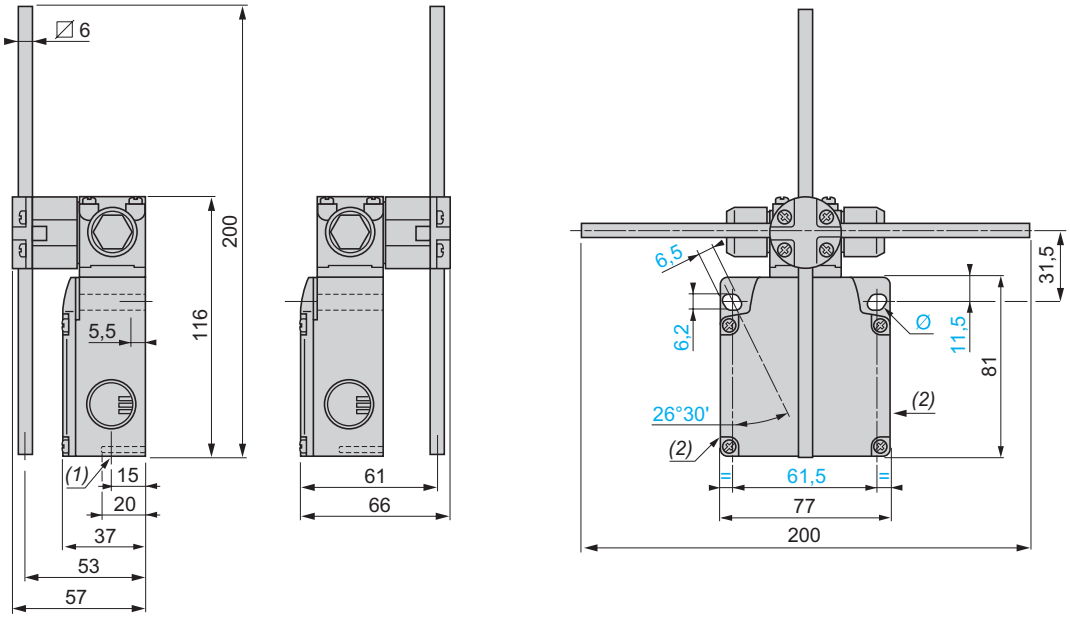


(1) XCKMR●●●●H29 = 3 tapped entries ISO M20 x 1.5.
XCKMR●●● = 3 tapped entries for Pg 13.5 cable gland.
(2) 2 centring holes Ø 3.9 ± 0.2, for cover fixing holes alignment.
Ø: 2 elongated holes 6.2 x 6.5, inclined at 26°30' to the vertical axis, for M5 screws.

Plastic limit switches

XCKVR24SR1H29, XCKVR44D1H29 and **XCKVR54D1H29**

XCKVR44D2H29 and **XCKVR54D2H29**



(1) 1 tapped entry ISO M20 x 1.5.
*(2) 2 knock-out holes for ISO M20 cable gland (reference: **DE9 PEM20010**).*
Ø: 2 elongated holes 6.2 x 6.5, inclined at 26°30' to the vertical axis, for M5 screws.

Limit switches

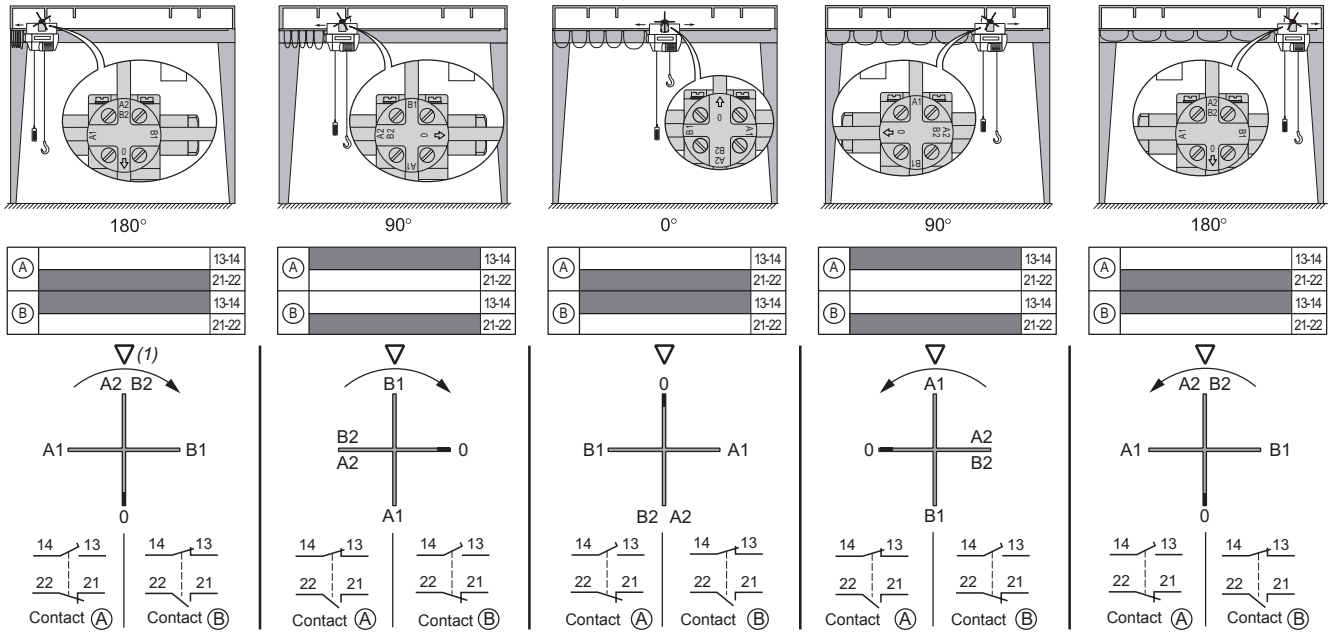
OsiSense XC Special

For hoisting and material handling applications
XCKMR and XCKVR
Complete switches with 3 cable entries

1

Operation

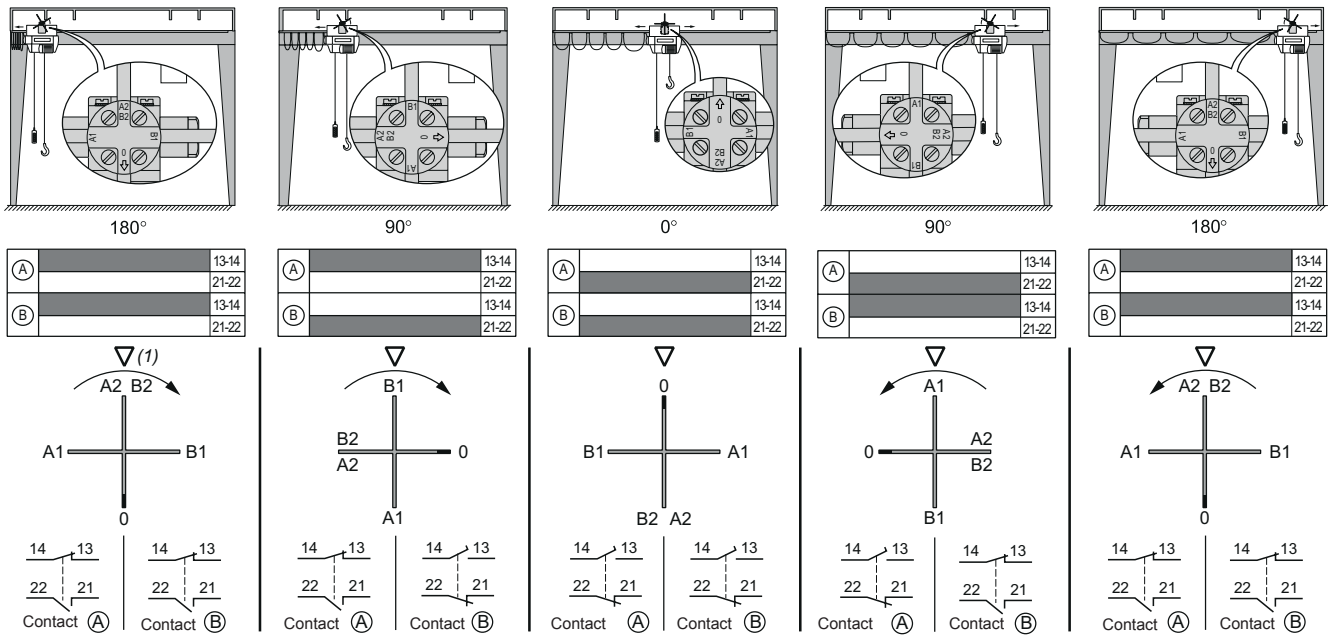
Limit switches XCK●R24SR1H29: “By pass”



(1) Triangle symbol marked on top of head.

or : direction of rotation.

Limit switches XCK●R44D●H29: “Single speed”

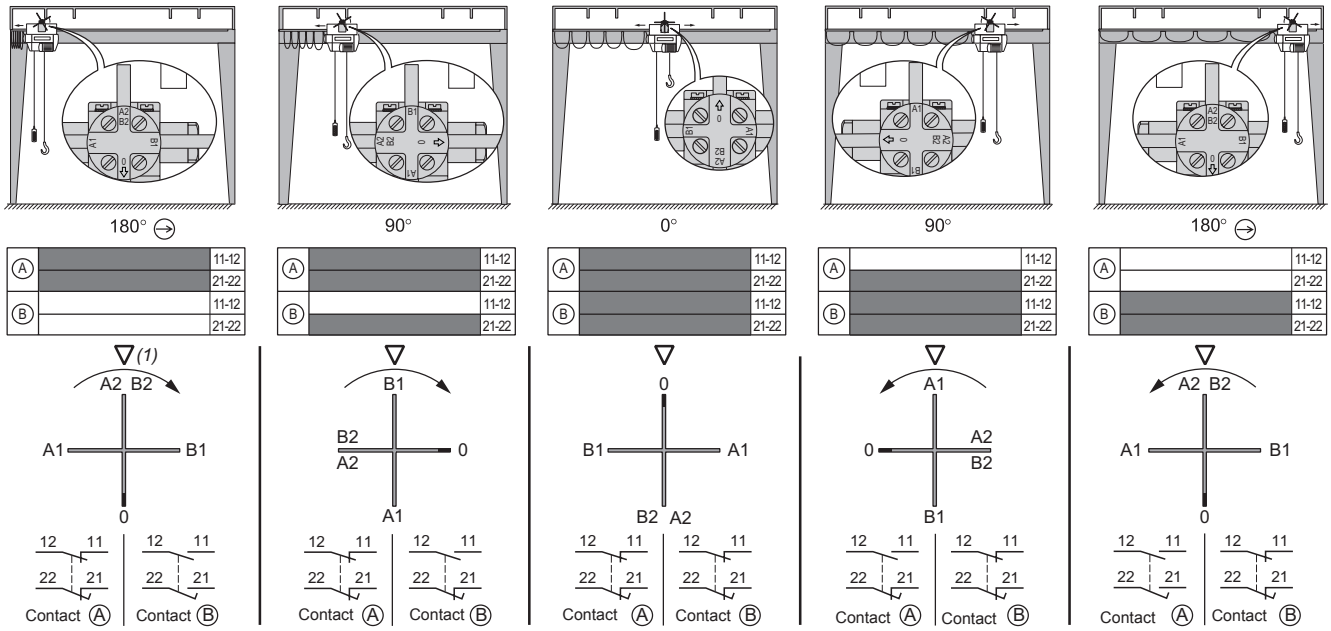


(1) Triangle symbol marked on top of head.

or : direction of rotation.

Operation (continued)

Limit switches XCK●R54D●●●●: "Double speed"



(1) Triangle symbol marked on top of head.

or : direction of rotation.

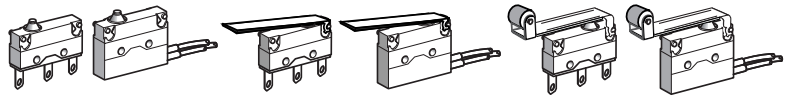
Miniature snap switches

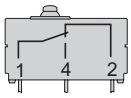
OsiSense XC Special

Subminiature design, DIN 41635 B format, sealed
Sub-subminiature design, DIN 41635 D format

References

Subminiature design, DIN 41635 B format, sealed



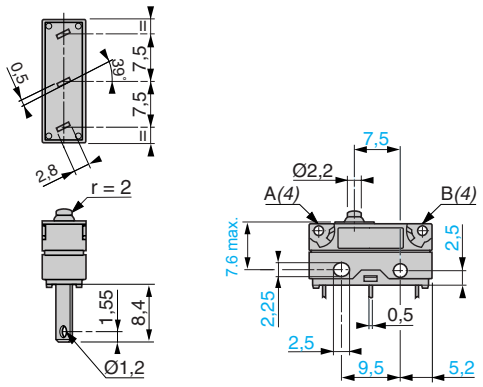
Type of operator			Plunger	Flat lever *(1)*	Roller lever *(1)*
	**Single-pole CO snap action** Wiring: 1 Black 2 Grey 4 Blue	**2.8 mm cable clip tag connections**	**XEP4E1W7** *(3)*	**XEP4E1W7A326** *(3)*	**XEP4E1W7A454** *(3)*
		Weight (g)	2.4	3.1	3.2
		Pre-cabled connections	**XEP4E1FD** *(3)*	**XEP4E1FDA326** *(3)*	**XEP4E1FDA454** *(3)*
		Weight (g)	14.1	14.8	14.9
Separate components		**Flat lever** *(2)*	**ZEP4L326** *(3)*	–	–
		Weight (g)	0.7	–	–
		Roller lever *(2)*	**ZEP4L454** *(3)*	–	–
		Weight (g)	0.8	–	–

Sub-subminiature design, DIN 41635 D format

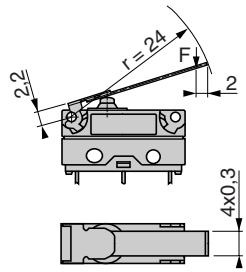
Type of operator			Plunger	Flat lever *(1)*
	Single-pole CO snap action	**Solder tag connections**	**XEP5P1W2** *(3)*	**XEP5P1W2Z55B** *(3)*
		Weight (g)	1.4	1.9

Dimensions

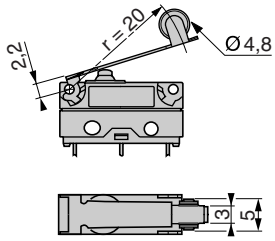
XEP4E1W7



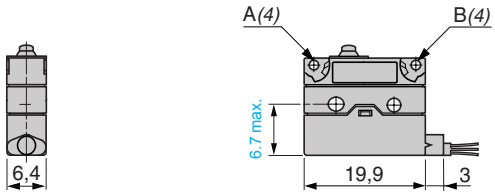
XEP4E1W7A326



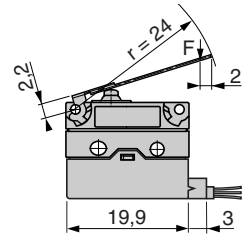
XEP4E1W7A454



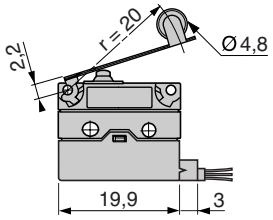
XEP4E1FD



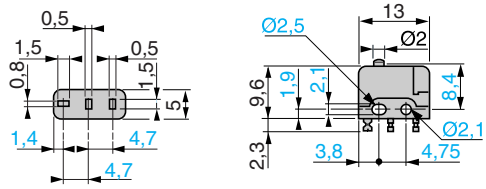
XEP4E1FDA326



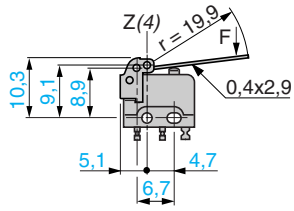
XEP4E1FDA454



XEP5P1W2



XEP5P1W2Z55B



(1) In order to avoid damage to the fixing spigots, removal of the lever from complete products is not recommended.
*(2) Levers only for mounting on basic (plunger) snap switches (**XEP4E1W7** and **XEP4E1FD**).*
(3) Switches sold in lots of 5.
(4) A, B, Z: lever fixing positions.

Miniature snap switches

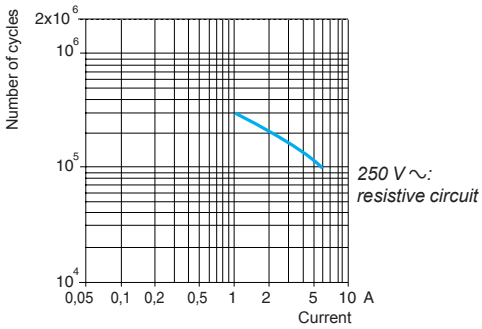
OsiSense XC Special

Subminiature design, DIN 41635 B format, sealed
Sub-subminiature design, DIN 41635 D format

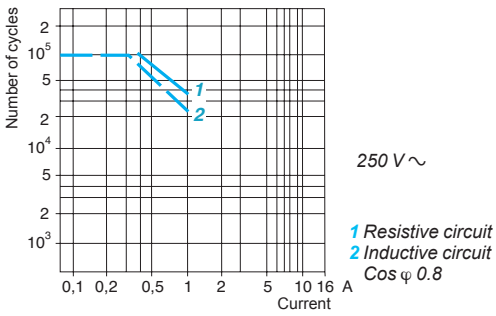
Switch type			XEP4E1●●, XEP5P1W2 Plunger	XEP4E1●●A326, XEP5P1W2Z55B Flat lever	XEP4E1●●A454 Roller lever
Environment characteristics					
Lever fixing position *(1)*			–	A	A
Switch actuation			On end	Horizontal	
Product certifications			CE, IEC 60947-5-1, EN 60947-5-1, c UR us, UL 1054, EN 61058		
Degree of protection			IP 67 **XEP4E1FD●●**, case IP 67 and tags IP 00 **XEP4E1W7●●**, case IP 40 and tags IP 00 **XEP5P1W2●●**		
Operating temperature			- 40...+ 105°C **XEP4E1FD●●**, - 40...+ 125°C **XEP4E1W●●●●** and **XEP5P1●●●**		
Materials	Case		Polyester **XEP4**, diallyl-phtalate **XEP5**		
	Lever		–	Stainless steel	Stainless steel, glass reinforced polyamide roller
	Contact		AgCdO **XEP4E1●●**, Ag **XEP5**		
	Tags		Tinned brass **XEP4E1W●●●**, gold plated brass **XEP5P1●●**		
Mechanical characteristics					
		Lever fixing position *(1)*			
Maximum tripping force	XEP4	A	2.5 N	0.63 N	0.83 N
		B	2.5 N	1.25 N	1.67 N
	XEP5		2 N	0.80 N	–
Minimum release force	XEP4	A	0.80 N	0.20 N	0.27 N
		B	0.80 N	0.40 N	0.53 N
	XEP5		0.40 N	0.15 N	–
Maximum permissible end of travel force	XEP4	A	10 N	2.5 N	3.33 N
		B	10 N	5 N	6.67 N
	XEP5		10 N	–	–
Tripping point (TP) *(2)*	XEP4	A	8.40 +/- 0.3 mm	10.7 +/- 1.7 mm	15.5 +/- 1.4 mm
		B	8.40 +/- 0.3 mm	9.6 +/- 1.0 mm	14.5 +/- 0.9 mm
	XEP5		8.40 mm	9.20 mm	–
Maximum differential travel	XEP4	A	0.13 mm	0.52 mm	0.39 mm
		B	0.13 mm	0.26 mm	0.20 mm
	XEP5		0.06 mm	0.25 mm	–
Minimum overtravel	XEP4	A	0.60 mm	2.40 mm	1.80 mm
		B	0.60 mm	1.20 mm	0.90 mm
	XEP5		0.10 mm	–	–
Inter-contact distance	XEP4		0.4 mm		
	XEP5		0.3 mm		
Mechanical durability	XEP4		2 million operating cycles		
	XEP5		0.1 million operating cycles		
Electrical characteristics					
Operational characteristics	XEP4		AC-15: B300 (Ue: 240 V, Ie: 1.5 A) DC-13: R300 (Ue: 250 V, Ie: 0.1 A) conforming to IEC 60947-5-1, EN 60947-5-1 Appendix A 125-250 V AC 6.0 A conforming to UL 1054 6 (1) A 250 V AC 10 000 cycles conforming to EN 61058		
	XEP5		AC-15: D300 (Ue: 240 V, Ie: 0.3 A) conforming to IEC 60947-5-1, EN 60947-5-1 Appendix A		
Thermal current	XEP4		7.5 A on 250 V (50/60 Hz)		
	XEP5		8.5 A on 250 V (50/60 Hz)		
Connection	XEP4		**XEP4E1W7●**: 2.8 mm clip tags **XEP4E1FD**: Pre-cabled (horizontally in-line), 3 x 0.5 mm², length 0.5 m		
	XEP5		Solder tags		

Operating curves

XEP4E1●●



XEP5P1●●



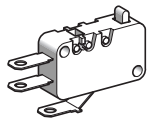
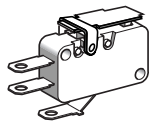
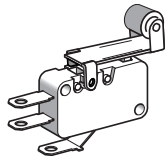
(1) Miniature snap switches fitted with a lever are supplied with the lever fixed in position A (see page 1/188). For basic (plunger) snap switches, it is possible to fix the lever in position A or B, depending on the required tripping conditions (see page 1/188).
(2) Position of the operator in relation to the switch fixings (fixing hole centre line) at the instant the switch contact changes state.

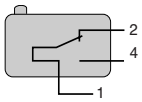
Miniature snap switches

OsiSense XC Special

Miniature design, DIN 41635 A format

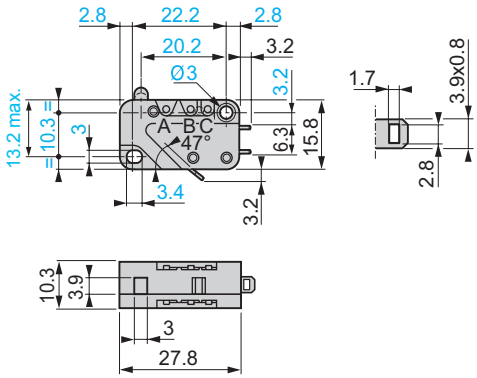
References

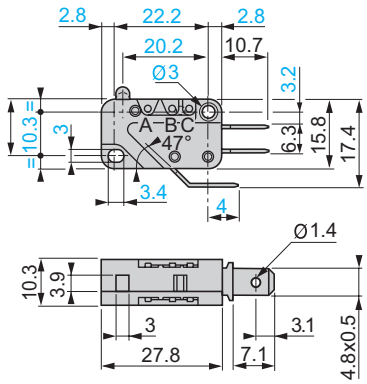
Type of operator			Plunger	Flat lever *(1)*	Roller lever *(1)*
	**Single-pole CO snap action**	**Standard contacts** — **Solder tags**	**XEP3S1W2** *(2)*	**XEP3S1W2B524** *(2)*	**XEP3S1W2B529** *(2)*
		4.8 mm cable clip tags	**XEP3S1W6** *(2)*	**XEP3S1W6B524** *(2)*	**XEP3S1W6B529** *(2)*
		6.35 mm cable clip tags	**XEP3S1W3** *(2)*	**XEP3S1W3B524** *(2)*	**XEP3S1W3B529** *(2)*
		Weight (g)	5.6	6.3	6.6
		Very low operating force contacts — **Solder tags**	**XEP3S2W2** *(2)*	**XEP3S2W2B524** *(2)*	**XEP3S2W2B529** *(2)*
		4.8 mm cable clip tags	**XEP3S2W6** *(2)*	**XEP3S2W6B524** *(2)*	**XEP3S2W6B529** *(2)*
		6.35 mm cable clip tags	**XEP3S2W3** *(2)*	**XEP3S2W3B524** *(2)*	**XEP3S2W3B529** *(2)*
		Weight (g)	5.6	6.3	6.6
Separate components	**Flat lever** *(3)*		**ZEP3L524** *(2)*		
	Weight (g)		0.7		
	Roller lever *(3)*		**ZEP3L529** *(2)*		
	Weight (g)		1		

Dimensions

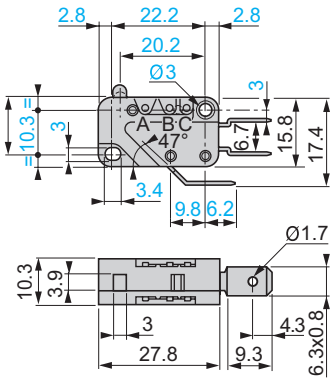
XEP3S●W2



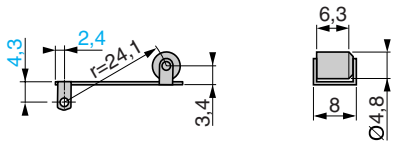
XEP3S●W6



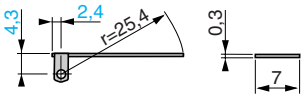
XEP3S●W3



ZEP3L529



ZEP3L524



(1) In order to avoid damage to the fixing spigots, removal of the lever from complete products is not recommended.
(2) Switches sold in lots of 10.
(3) Levers only for mounting on basic (plunger) snap switches (XEP3S●W2, XEP3S●W3, XEP3S●W6), in fixing positions A, B or C.

Miniature snap switches

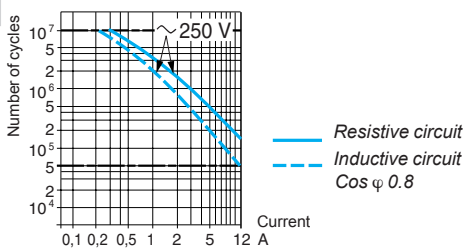
OsiSense XC Special

Miniature design, DIN 41635 A format

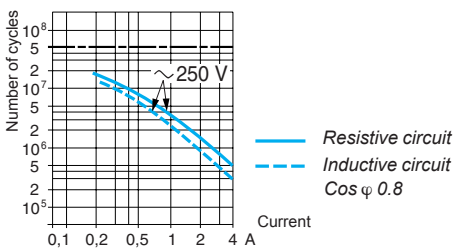
Switch type Type of operator			XEP3S●W2 Plunger	XEP3S●W2B254 Flat lever	XEP3S●W2B259 Roller lever
Environment characteristics					
Lever fixing position *(1)*			–	B	B
Switch actuation			On end	Horizontal	
Product certifications			⎓ UR us, CE, IEC/EN 60947-5-1, UL 1054, EN 61058-1		
Degree of protection			Case IP 40 and tags IP 00		
Operating temperature			- 25...+ 125°C		
Materials	Case		Polyester		
	Lever		–	Stainless steel	Stainless steel, glass reinforced polyamide roller
	Contact		AgNi		
Mechanical characteristics					
	Lever fixing position *(1)*				
Maximum tripping force	Standard	A	0.8 N	0.2 N	
		B	0.8 N	0.4 N	
		C	0.8 N	0.53 N	
	Very low force	A	0.25 N	0.06 N	
		B	0.25 N	0.13 N	
		C	0.25 N	0.17 N	
Minimum release force	Standard	A	0.20 N	0.05 N	
		B	0.20 N	0.10 N	
		C	0.20 N	0.13 N	
	Very low force	A	0.05 N	0.01N	
		B	0.05 N	0.03 N	
		C	0.05 N	0.03 N	
Maximum permissible end of travel force	Standard, very low force	A	20 N	5 N	
		B	20 N	10 N	
		C	20 N	13 N	
Tripping point (TP) *(2)*	Standard, very low force	A	14.70 $^{+/-0.4}$ mm	15.20 $^{+/-2.5}$ mm	20.5 $^{+/-2.9}$ mm
		B	14.70 $^{+/-0.4}$ mm	15.20 $^{+/-1.0}$ mm	20.5 $^{+/-1.5}$ mm
		C	14.70 $^{+/-0.4}$ mm	15.20 $^{+/-0.8}$ mm	20.5 $^{+/-1.2}$ mm
Maximum differential travel	Standard, very low force	A	0.35 mm	1.40 mm	
		B	0.35 mm	0.70 mm	
		C	0.35 mm	0.53 mm	
Minimum overtravel	Standard	A	1.20 mm	4.80 mm	
		B	1.20 mm	2.40 mm	
		C	1.20 mm	1.80 mm	
	Very low force	A	1.10 mm	4.40 mm	
		B	1.10 mm	2.20 mm	
		C	1.10 mm	1.65 mm	
Inter-contact distance			0.40 mm		
Mechanical durability for 2/3 overtravel	Standard		20 million operating cycles		
	Very low force		50 million operating cycles		
Electrical characteristics					
Operational characteristics	Standard		AC-15: B300 (Ue: 240 V, Ie: 1.5 A) DC-13: R300 (Ue: 250 V, Ie: 0.1 A) conforming to IEC/EN 60947-5-1 Appendix A 125-250 V AC 10,1 A - 1/2 HP conforming to UL 1054 12 (3) A 250 V AC 10 000 cycles conforming to EN 61058-1		
	Very low force		AC-15: D300 (Ue: 240 V, Ie: 0.3 A) conforming to IEC/EN 60947-5-1 Appendix A 125-250 V AC 4 A - 1/10 HP conforming to UL 1054 4 *(1)* A 250 V AC 50 000 cycles conforming to EN 61058-1		
Thermal current	Standard		15 A on 250 V (50/60 Hz)		
	Very low force		5 A on 250 V (50/60 Hz)		
Connection			**XEP3S●W2**: solder tags, **XEP3S●W6**: 4.8 mm cable clip tags, **XEP3S●W3**: 6.35 mm cable clip tags		

Operating curves

XEP3S1●●



XEP3S2●●



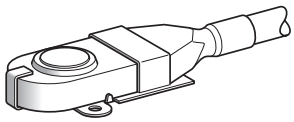
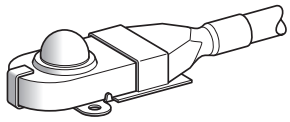
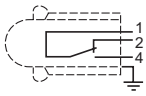
(1) Miniature snap switches fitted with a lever are supplied with the lever fixed in position B (see page 1/190). For basic (plunger) snap switches, it is possible to fix the lever in position A, B or C, depending on the required tripping conditions (see page 1/190).

(2) Position of the operator in relation to the switch fixings (fixing hole centre line) at the instant the switch contact changes state.

Miniature snap switches

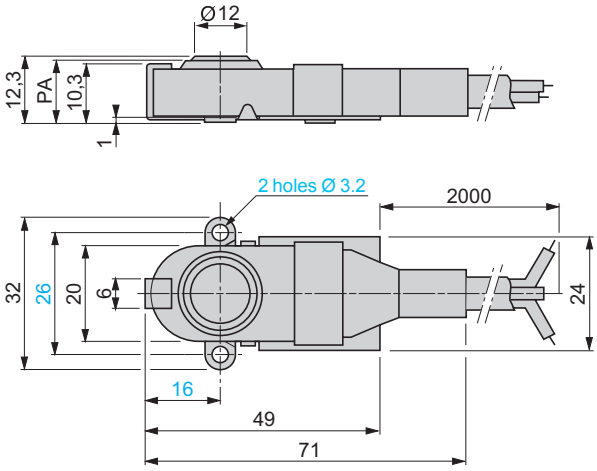
OsiSense XC Special

Sealed design
Pre-cabled

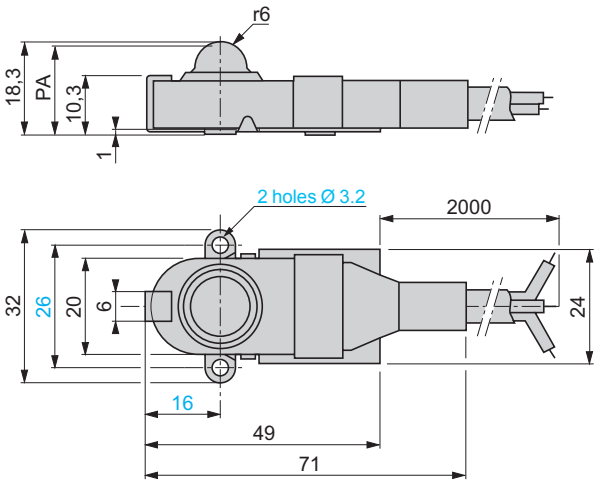
Type of head	Plunger (fixing by the body)	
		
Type of operator	Head with flat plunger	Head with domed encased plunger
References		
 **Single-pole CO snap action** Wiring: 1 Black 2 Brown 4 Blue	**XC010L2**	**XC011L2**
Weight (kg)	0.145	0.150

Dimensions

XC010L2



XC011L2



Miniature snap switches

OsiSense XC Special

Sealed design

Pre-cabled

Switch type		XC010L2	XC011L2
Environment characteristics			
Switch actuation		On end, flat plunger *(1)*	On end, domed plunger *(1)*
Product certifications		CE, IEC 60947-5-1	
Degree of protection		IP 66	
Operating temperature		0...+ 85°C	
Materials	Internal housing	Metal	
	Casing	Nitrile	
	Fixing support	Steel, zinc passivated	
	Contact	Ag	
Mechanical characteristics			
Maximum tripping force		5.3 N	
Minimum release force		1.5 N	
Maximum permissible end of travel force		30 N	
Tripping point (TP) *(2)*		$11.4^{\pm 0.4}$ mm	$17.4^{\pm 0.5}$ mm
Maximum differential travel		0.2 mm	
Minimum overtravel		0.2 mm	
Inter-contact distance		0.5 mm	
Mechanical durability		2 million operating cycles	
Electrical characteristics			
Operational current		1 A on 24 V (50/60 Hz)	
Thermal current/insulation voltage		12 A/60 V	
Connection		A05 VVF cable, 3 x 0.75 mm^2, length 2 metres, external diameter ⩽ 7.6 mm	
Electrical durability		AC-15: 0.5 million operating cycles	

(1) Manual actuation must be made by an intermediate insulated part, in order to meet basic safety requirements.
One of the two fixing holes must also be used as an earth protection terminal.
(2) Distance between the base of the switch and the top of the plunger at the instant the contact changes state (see dimensions, page 1/192).

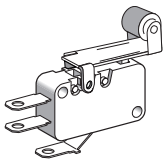
Miniature snap switches

OsiSense XC

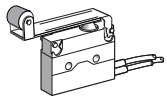
Miniature design

General

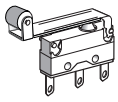
Presentation



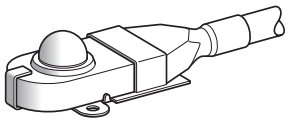
XEP3



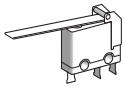
XEP4E1W●



XEP4E1FD●



XC0



XEP5

Electromechanical detection

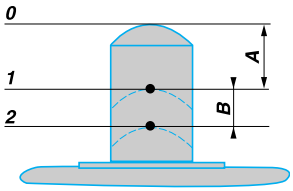
- OsiSense XC miniature snap switches, featuring electromechanical technology, assure the following functions:
  - detection of presence or absence,
  - detection of position.

Actuation of the operator (plunger or lever) on the miniature snap switch causes the electrical contact to change state. This information can then be processed by a PLC controlling the installation.
OsiSense XC miniature snap switches can be used both in industrial applications and the building sector.

Features

- OsiSense XC miniature snap switches incorporate a CO snap action, single break, contact. They are characterised by:
  - high electrical ratings for their very small size,
  - short tripping travel,
  - low tripping force,
  - high repeat accuracy on the tripping points,
  - long service life.

Terminology



Forces

- Maximum tripping force:
  maximum force which must be applied to the operator to move it from the rest (unactuated) position to the trip position (tripping point).
- Minimum release force:
  value to which the force on the operator must be reduced to allow the snap action mechanism to return to its rest (unactuated) position.
- Maximum permissible end of travel force:
  maximum force that can be applied to the operator at the end of its travel without damaging the switch.

Position/Travel

1 Tripping point: position of the operator in relation to the switch fixings (fixing hole centre line) at the instant the switch contact changes state.

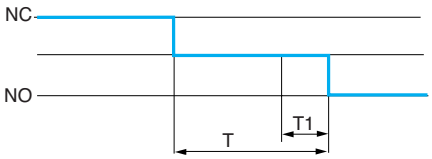
A Differential travel: distance between the tripping point and the position at which the snap action mechanism returns to its initial state on release of the operator.

2 Overtravel limit: position of the operator when an extreme force has moved it to the effective end of its available travel.

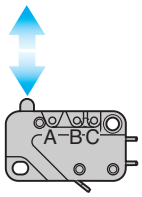
B Overtravel: distance between the tripping point and the overtravel limit.

The reference point for the figures given for forces and travel is a point F, which is situated on the plunger in the case of a basic switch or at 3 mm from the end of the plain lever in the case of a lever operated switch.

Mechanical characteristics



T1: bounce time
T: changeover time



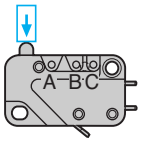
Changeover time

- This is the time taken by the moving contact when moving from one fixed contact to another until it becomes fully stable (contact bounce included).
- This time is related to the inter-contact distance, the mechanical characteristics of the snap action mechanism and the mass of the moving element. However, due to the snap action mechanisms used, the time is largely independent to the speed of operation. It is normally less than 20 milliseconds (including bounce times of less than 5 ms).

Operating speed and maximum usable operating rate

- Our miniature snap switches are suitable for a wide range of operating speeds: generally, from 1 mm/mn to 1 m/s.
- The maximum usable operating rate on a light electrical load may be as high as 10 operations/second.

Mounting



Mounting and operation

- To conform to the leakage paths and air gaps in standards EEC 24 - EN/IEC 61058 - EN/IEC 60947:
  - an insulation pad must be inserted between the snap switch and the fixing surface if the latter is metal.
  - manual operation of a metal actuator must only be carried out with the aid of an intermediate actuator made of an insulating material.
- The installer must ensure adequate protection against direct contact with the output terminals.

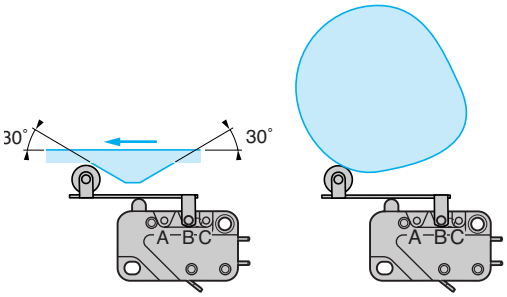
Actuation method

- Direct operation:
  - the plunger should preferably be actuated along its axis. However, the majority of our miniature snap switches will accept skewed operation provided the angle of actuation is not more than 45°.
    The travel of the actuator must not be limited to only reaching the tripping point. The actuator must always be operated in such a manner so that the plunger reaches a point at least 0.5 times the stated overtravel value of the switch. Steps must also be taken to ensure that it does not reach its end of travel nor exceed the maximum permissible end of travel force.

Miniature snap switches

OsiSense XC
Miniature design
General

Characteristics (continued)



Actuation method (continued)

- Lever operators
  - when actuation is by a roller lever, force should preferably be applied in the direction shown in the diagrams opposite.
  - where the movements involved are fast, the ramp should be so designed as to ensure that the operator is not subjected to any violent impact or abrupt release.

Fixing - Tightening torque

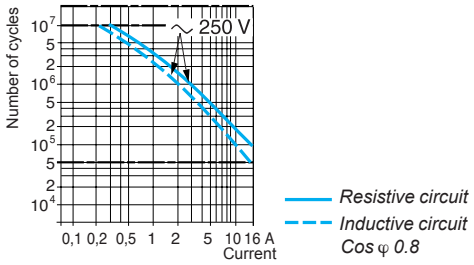
- The tightening torque of the fixing screws must conform to the following values:

Ø of fixing screw		2	2.5	3	3.5	4
Tightening torque (cm.N)	Maximum	25	35	60	100	150
	Minimum	15	25	40	60	100

Resistance to mechanical shock and vibration

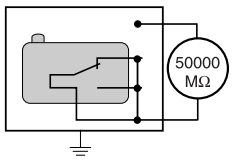
- Resistance to shock and vibration depends on the mass of the moving parts and on the forces holding the contacts together.
- In general, for a miniature snap switch without accessory:
  - vibration > 10 gn, 10 to 500 Hz,
  - shock > 50 gn, 11 ms 1/2 sine wave.

Electrical characteristics



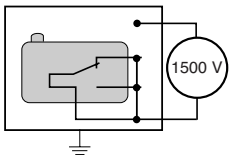
Operating curves

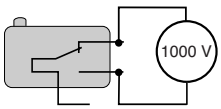
- These indicate the electrical life of the miniature snap switches under standard conditions (20°C, 1 cycle/2 seconds), by showing the number of switching operations which can be performed with given types of load. For sealed snap switches, the operating rate is 1 cycle/6s.



Insulation resistance

- The insulation resistance of the miniature snap switches is generally greater than 50,000 MΩ, measured at 500 V DC.





Dielectric strength

- The dielectric strength of our miniature snap switches is generally superior to:
  - 1500 Volts between live parts and earth,
  - 1000 Volts between contacts,
  - 600 Volts between contacts for switches with an inter-contact distance less than 0.3 mm.

Limit switches
OsiSense XC
General

Presentation

Electromechanical detection

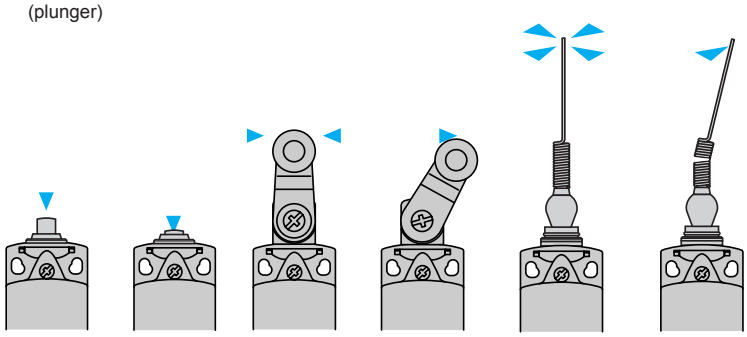
Limit switches are used in all automated installations and also in a wide variety of applications, due to the numerous advantages inherent to their technology.
They transmit data to the logic processing system regarding:
- presence/absence,
- passing,
- positioning,
- end of travel.

Simplicity of installation, advantages

- From an electrical viewpoint
  - galvanic separation of circuits,
  - models suitable for low power switching combined with good electrical durability,
  - very good short-circuit withstand in coordination with appropriate fuses,
  - total immunity to electromagnetic interference,
  - high rated operational voltage.
- From a mechanical viewpoint
  - NC contacts with positive opening operation,
  - high resistance to the different ambient conditions encountered in industry (standard tests and specific tests under laboratory conditions),
  - high repeat accuracy, up to 0.01 mm on the tripping points.

Detection movements

- Linear movement (plunger)
- Rotary movement (lever)
- Multi-directional movement



Unactuated *Tripped* *Unactuated* *Tripped* *Unactuated* *Tripped*

Terminology

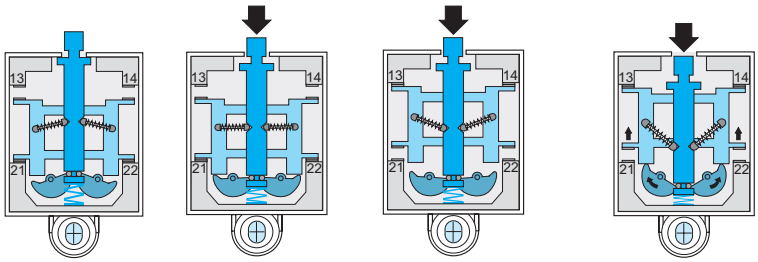
Rated value of a quantity	■ This replaces the term “nominal value”. ■ It is the fixed value for a specific function.
Utilisation categories:	■ AC-15 replaces AC-11: control of an electromagnet on AC, test 10 Ie/Ie. ■ AC-12: control of a resistive load on AC or static load isolated by opto-coupler. ■ DC-13 replaces DC-11: control of an electromagnet on DC, test Ie/Ie.
Positive opening travel	■ Minimum travel from the initial movement of contact actuator to the position required to accomplish positive opening operation.
Positive opening force	■ The force required on the contact actuator to accomplish positive opening operation.
Switching capacity	■ Ithe is no longer a rated value but a conventional current used for heating tests. Example: for category A300 the corresponding operational current, Ie maximum, is 6 A-120 V or 3 A-240 V, the equivalent Ithe being 10 A.
Positive opening operation	■ A limit switch complies to this specification when all the closed contact elements of the switch can be changed, with certainty, to the open position (no flexible link between the moving contacts and the operator of the switch, to which an actuating force is applied). ■ All limit switches incorporating either a slow break contact block or a snap action NC + NO (form Zb), NC + NO + NO, NC + NC + NO, NC + NC + NO + NO contact block are positive opening operation, in complete conformity with standard IEC 60947-5-1 Appendix K.

Limit switches
OsiSense XC
General

Contact blocks

Snap action contacts

- Snap action contacts are characterised by different tripping and reset points (differential travel).
- The displacement speed of the moving contacts is not related to the speed of the operator.
- This feature ensures satisfactory electrical performance in applications involving low speed actuators.

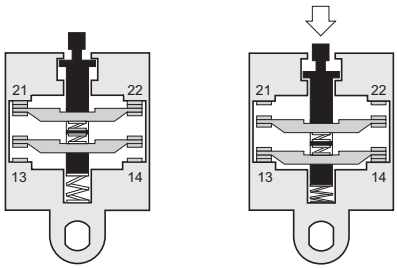


Unactuated state *Approach travel* *Contact change of state* *Positive opening*

Slow break contacts

- Slow break contacts are characterised by identical tripping and resetting points.
- The displacement speed of the moving contacts is equal, or proportional, to the speed of the operator (which must not be less than 0.1 m/s = 6 m/minute).

The opening distance is also dependent on the distance travelled by the operator.



Electrical durability for normal loads

- Normally, for inductive loads, the current value is less than 0.1 A (sealed), i.e. values of 3 to 40 VA sealed and 30 to 1000 VA inrush, depending on the voltage.
  For this type of application the electrical durability will exceed 10 million operating cycles.

Application example: XCKJ161 + LC1D12●●●● (7 VA sealed, 70 VA inrush).
Electrical durability = 10 million operating cycles.

Switching capacity

1 *Normal industrial PLC input type 1 (PLC: industrial programmable logic controllers)*
2 *Normal industrial PLC input type 2*
3 *Switching capacity conforming to IEC 60947-5-5, utilisation category AC-15, DC-13*

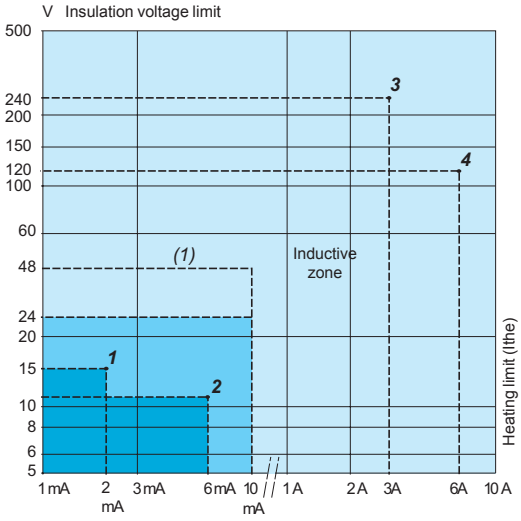
A300	240 V	3 A	B300	240 V	1.5 A
Q300	250 V	0.27 A	R300	250 V	0.13 A

4 *Switching capacity conforming to IEC 60947-5-1, utilisation category AC-15, DC-13*

A300	120 V	6 A	B300	120 V	3 A
Q300	125 V	0.55 A	R300	125 V	0.27 A

Electrical durability for small loads

- The use of limit switches with programmable controllers is becoming more common.
- With small loads, limit switches offer the following levels of reliability:
  - failure rate of less than 1 for 100 million operating cycles using snap action contacts (contacts XE2SP),
  - failure rate of less than 1 for 20 million operating cycles using slow break contacts (contacts XE●NP and XE3SP).
  - failure rate of less than 1 for 5 million operating cycles using contacts XCMD.

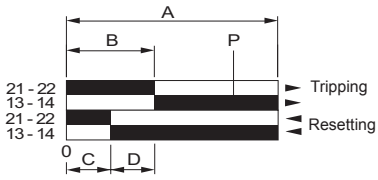


		Range of use
Standard contacts Continuous service (frequent switching)	XE2SP2151, P3151	
	XE2NP●●●●	
	Contacts of XCMD XE3●P●●●●	
Gold flashed contacts on resistive load	Occasional service Infrequent switching, ≤ 1 operating cycle/ day, and/or corrosive atmosphere	(1)

(1) Usable up to 48 V/10 mA.

1

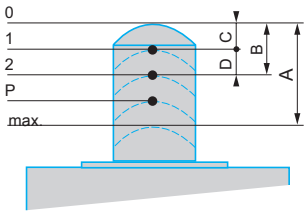
Contact blocks (continued)



Functional diagrams of snap action contacts

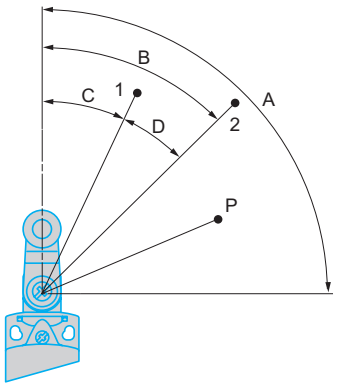
■ Example: NC + NO

A - Maximum travel of operator in millimetres or degrees.
B - Tripping travel of contact.
C - Resetting travel of contact.
D - Differential travel = B - C.
P - Point from which positive opening is assured.



□ Linear movement (plunger)

1 - Resetting point of contact.
2 - Tripping point of contact.
A - Maximum travel of operator in millimetres.
B - Tripping travel of contact.
C - Resetting travel of contact.
D - Differential travel = B - C.
P - Point from which positive opening is assured.



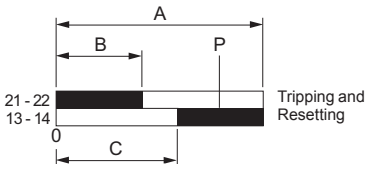
□ Rotary movement (lever)

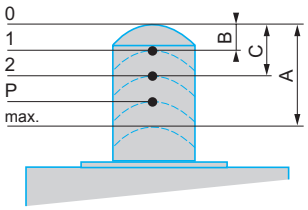
1 - Resetting point of contact.
2 - Tripping point of contact.
A - Maximum travel of operator in degrees.
B - Tripping travel of contact.
C - Resetting travel of contact.
D - Differential travel = B - C.
P - Point from which positive opening is assured.

Functional diagrams of slow break contacts

■ Example: NC + NO break before make

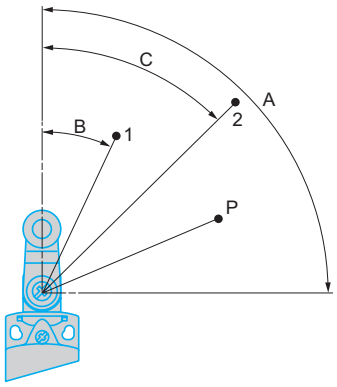
A - Maximum travel of operator in millimetres or degrees.
B - Tripping and resetting travel of contact 21-22.
C - Tripping and resetting travel of contact 13-14.
P - Point from which positive opening is assured.





□ Linear movement (plunger)

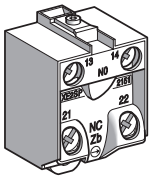
1 - Tripping and resetting points of contact 21-22.
2 - Tripping and resetting points of contact 13-14.
A - Maximum travel of operator in millimetres.
B - Tripping and resetting travel of contact 21-22.
C - Tripping and resetting travel of contact 13-14.
P - Positive opening point.



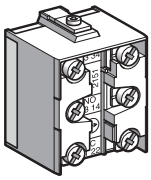
□ Rotary movement (lever)

1 - Tripping and resetting points of contact 21-22.
2 - Tripping and resetting points of contact 13-14.
A - Maximum travel of operator in degrees.
B - Tripping and resetting travel of contact 21-22.
C - Tripping and resetting travel of contact 13-14.
P - Positive opening point.

Contact blocks (continued)



XE2●P screw clamp terminal connections

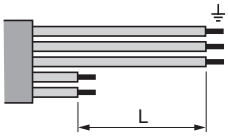


XE3●P screw clamp terminal connections

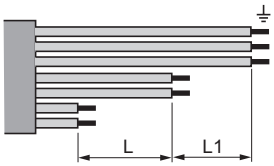
Mounting

Contact connections

- Tightening torque:
  - minimum tightening torque ensuring the nominal characteristics of the contact: 0.8 N.m,
  - maximum tightening torque without damage to the terminals: 1.2 N.m for XE2pP, 1 N.m for XE3pP.
- Connecting cable: cable preparation lengths:
  - for XE2pP, L = 22 mm,
  - for XE2pP3●●●, L = 45 mm,

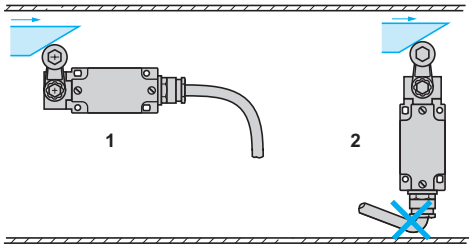


- for XE3pP, L = 14 mm, L1 = 11 mm.



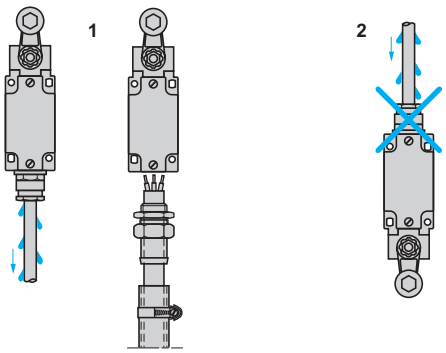
Sweep of connecting cable

1 Recommended
2 To be avoided



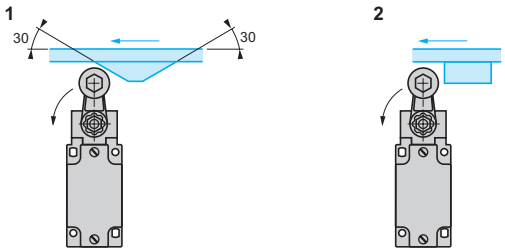
Position of cable gland

1 Recommended
2 To be avoided



Type of cam

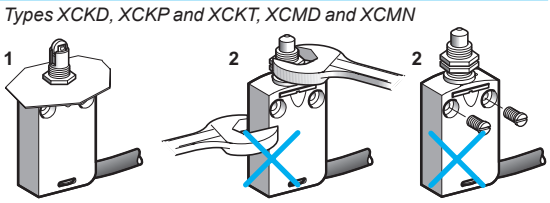
1 Recommended
2 To be avoided



Mounting and fixing limit switches by the head

1 Recommended
2 Forbidden

Types XCKD, XCKP and XCKT, XCMD and XCMN



1

Setting-up

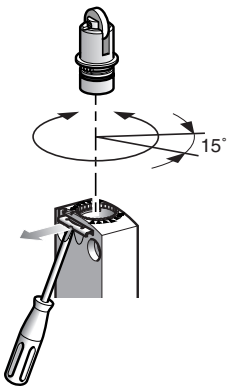
Tightening torque

- The minimum torque is that required to ensure correct operation of the switch.
- The maximum torque is the value which, if exceeded, will damage the switch.

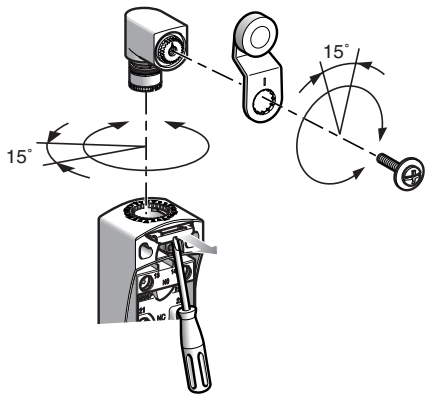
Range	Item	Torque (N.m) Min.	Max.
Compact design XCKD, XCKP, XCKT	Cover	0.8	1.2
	Fixing screw for lever on rotary head	1	1.5
Miniature design XCMD, XCMN	–	–	–
	Fixing screw for lever on rotary head	1	1.5
Compact design XCKN	Cover	0.8	1.2
	Fixing screw for lever on rotary head	1	1.5
Classic design XCKJ	Cover	1	1.5
	Fixing nut for lever on rotary head	1	1.5
Classic design XCKS	Cover	0.8	1.2
	Fixing nut for lever on rotary head ZCKD	1	1.5
	Fixing nut for lever on rotary head XCKS	0.8	1.2
	Fixing head on body	0.8	1.2
Classic design XCKM, XCKML, XCKL	Cover	0.8	1.2
	Fixing nut for lever on rotary head	1	1.5

Types XCKD, XCKP, XCKT, XCMD

- Adjustable in 3 planes:



All the heads can be adjusted in 15° steps throughout 360°, in relation to the body.

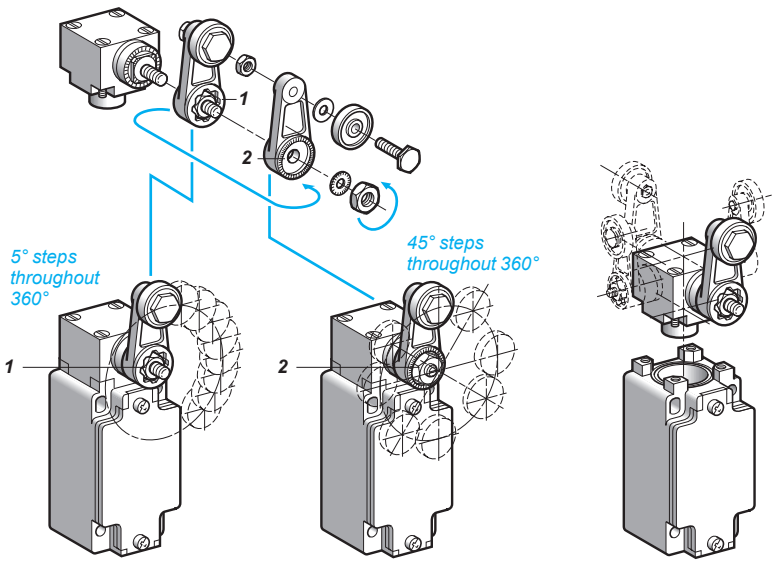


All the levers can be adjusted in 15° steps throughout 360°, in relation to the horizontal axis of the head.

Type XCKJ

- Adjustable throughout 360° in 5° steps, or in 45° steps by reversing the lever or its mounting.

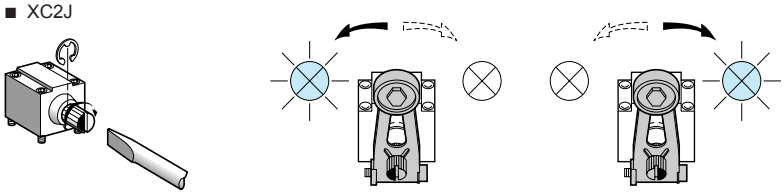
1 *Reversed α = 5°*
2 *Forward α = 45°*



Setting-up (continued)

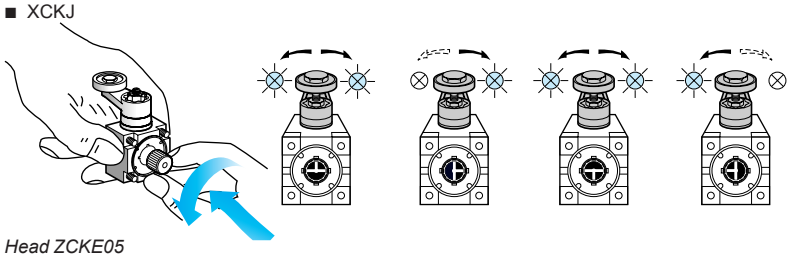
Direction of actuation programming

■ XC2J



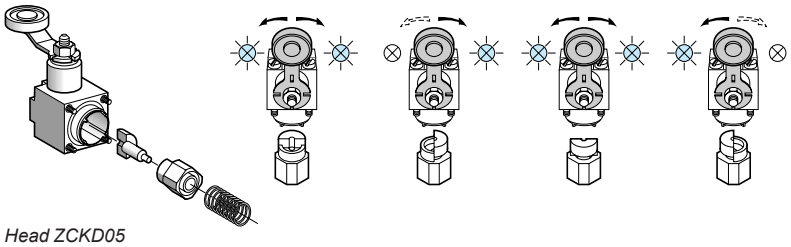
Head ZC2JE05

■ XCKJ



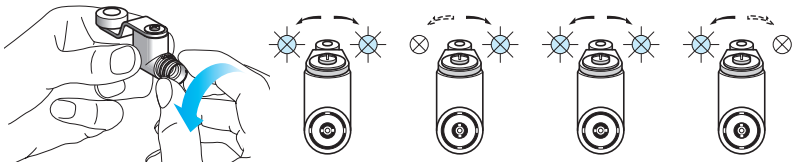
Head ZCKE05

■ XCKS



Head ZCKD05

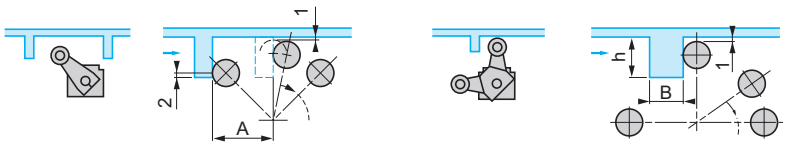
■ XCKD, XCKP, XCKT and XCMD



Head ZCE05

Specific cams for heads ZCKE09 and ZC2JE09

1 *0.5 mm min.*
2 *2 mm min.*



A = length of lever + 11 mm
ZCKE09*: 13 < h < 18 mm and B = 12 mm max.*
ZC2JE09*: 14 < h < 24 mm and B = 6 mm max.*

1

Reminder of the standards

The majority of Schneider Electric products comply to national standards (for example French NF C standards, German DIN standards), European standards (for example CENELEC) or international standards (for example IEC). These standards rigidly stipulate the characteristic requirements of the designated products (for example IEC 60947 relating to low voltage switchgear and control gear).
These products, when correctly used, enable the production of control equipment assemblies, machine control equipment or installations conforming to their own specific standards (for example IEC 60204 for the electrical equipment of industrial machines).

IEC 60947-5-1

Insulation coordination (and dielectric strength)	■ The standard IEC 60664 defines 4 categories of prospective transient overvoltages. It is important for the user to select control circuit components which are able to withstand these overvoltages. To these ends, the manufacturer states the rated impulse withstand voltage (U imp) applicable to the product.
Terminal connections	■ The cabling capacity, mechanical robustness and durability of the terminals, as well as the ability to resist loosening, are verified by standardised tests. ■ Terminal reference marking conforms to standard IEC 60947-5-1 Appendix M .
Switching capacity	■ With maximum electrical load. A single designation (A300 for example) enables indication of the contact block characteristics related to its utilisation category.
Positive opening operation (IEC 60947-5-1 Appendix K)	■ For contacts used in safety applications (end of travel, emergency stop device, etc.) the assurance of positive opening is required (see IEC 60204, EN 60204) after each test, the opening of the contact being verified by testing with an impulse voltage (2500 V).
Electrical symbols for contacts	■ Form Za, the 2 contacts (NO + NC) are the same polarity. ■ Form Zb, the 2 contacts (NO + NC) are electrically separate.
Symbol for positive opening	■ Simplified version ■ Complete symbol

CENELEC EN 50047

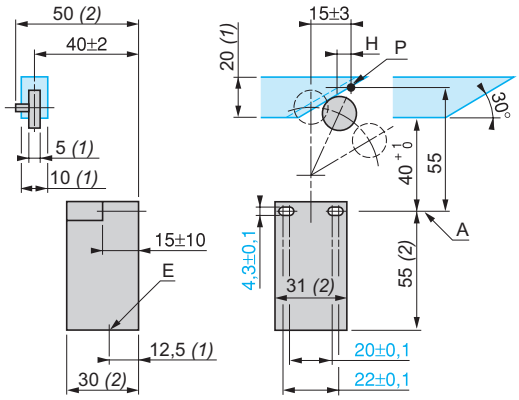
The European standards organisation CENELEC, which has 14 member countries, has defined in this standard the first type of limit switch.

It defines 4 variants of devices (forms A, B, C, E).
Limit switches XCKP, XCKD and XCKT conform to standard EN 50047.

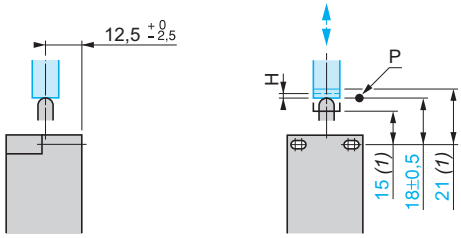
(1) Minimum value
(2) Maximum value

A: reference axis
H: differential travel
P: tripping point
E: cable entry

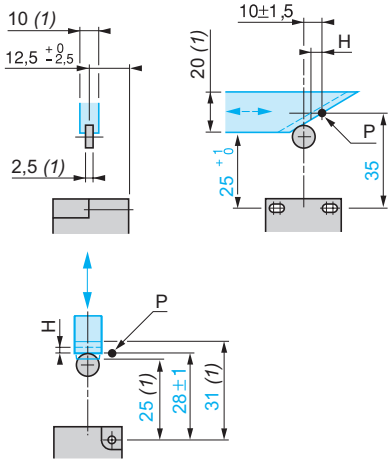
Form A, with roller lever



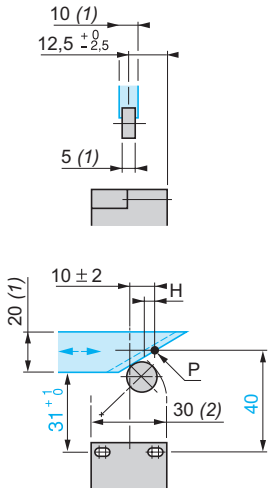
Form B, with end plunger (rounded)



Form C, with end roller plunger



Form E, with roller lever for 1 direction of actuation



Reminder of the standards (continued)

CENELEC EN 50041

The European standards organisation CENELEC, which has 14 member countries, has defined in this standard the second type of limit switch.

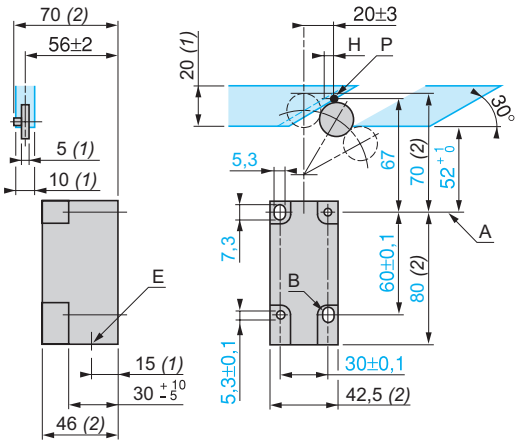
It defines 6 variants of devices (forms A, B, C, D, F, G). Limit switches XCKJ and XCKS conform to standard EN 50041.

(1) Minimum value
(2) Maximum value

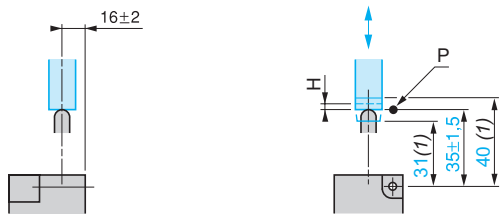
A: reference axis
B: optional elongated holes
H: differential travel
P: tripping point
E: cable entry

Za: tripping zone
Sa: tripping threshold

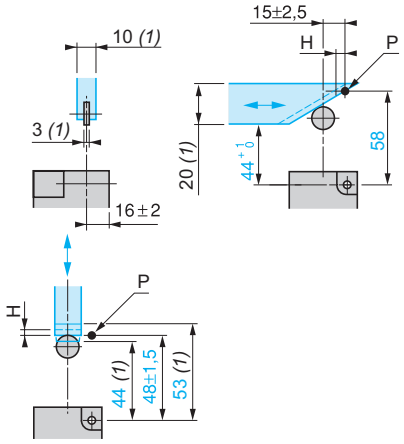
Form A, with roller lever



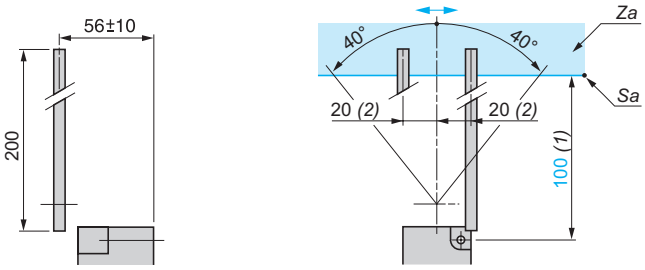
Form B, with end plunger (rounded)



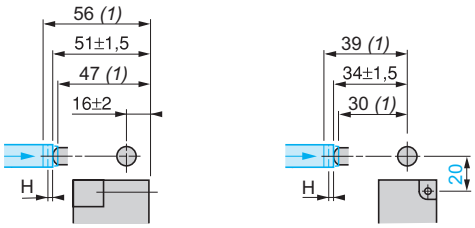
Form C, with end roller plunger



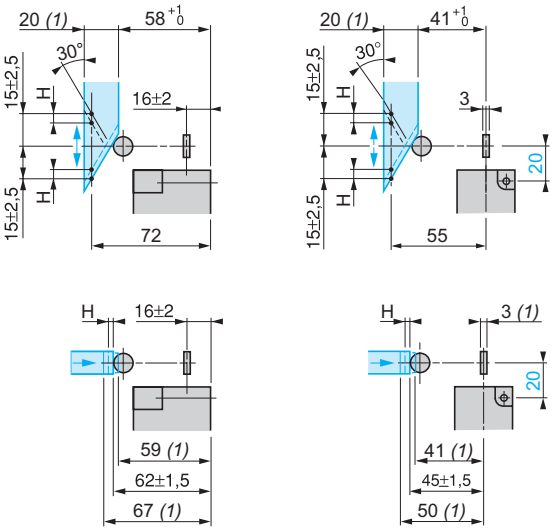
Form D, with rod lever



Form F, with side plunger (rounded)



Form G, with side roller plunger



Screw limit switches OsiSense XRBA and XR2

Applications	Standard duty ∿ or ⎓ (Ithe = 10 A)	Heavy duty ∿ or ⎓ (Ithe = 10 A)
Number of contacts	4 or 6	3, 4, 6, 10, 14, 20, 24 or 28
Conventional thermal current (Ithe)	10 A	10 A
Type of contacts	Single-pole C/O, snap action	Single-pole C/O, snap action
Reduction gear ratio	For 1 revolution of cams: 13/1, 17/1, 46/1, 60/1, 78/1, 210/1, 274/1 or 960/1	For 6 turns of threaded shaft: 0.4/6, 0.8/6, 1.6/6, 3/6, 6/6, 10/6, 20/6, 40/6, 80/6, 150/6, 300/6, 560/6 or 1100/6
Adaptation for potentiometer	•	–
Conformity to standards	IEC/EN 60947-5-1	IEC/EN 60947-5-1
Degree of protection	XRBA4: IP 55 conforming to IEC/EN 60529, IP 557 conforming to NF C 20-010 XRBA6: IP 55 conforming to IEC/EN 60529, IP 555 conforming to NF C 20-010	IP 54 conforming to IEC/EN 60529
Cable entry	1 tapped entry for n° 9 cable gland Clamping capacity 5 to 8 mm 1 tapped entry for n° 16 cable gland Clamping capacity 10 to 14 mm	2 tapped entries for n° 13 cable gland Clamping capacity 9 to 12 mm
Materials	Stainless steel input drive shaft Aluminium alloy body housing XRBA4: aluminium alloy cover XRBA6: polyphenylene oxide cover	Aluminium alloy body housing, insulated cover
Type reference	**XRBA**	**XR2AA**
Pages	1/208	1/215

Heavy duty ∿ or ⎓ (Ithe = 10 A)	Heavy duty ∿ or ⎓ (Ithe = 20 A)
3, 4, 6, 10, 14, 20, 24 or 28	3, 5, 9, 13, 19, 23 or 27
10 A	20 A
Single-pole C/O, snap action	Single-pole N/C or N/O, with snap action mechanism
For 6 turns of threaded shaft: 0.4/6, 0.8/6, 1.6/6, 3/6, 6/6, 10/6, 20/6, 40/6, 80/6, 150/6, 300/6, 560/6 or 1100/6	For 6 turns of threaded shaft: 0.4/6, 0.8/6, 1.6/6, 3/6, 6/6, 10/6, 20/6, 40/6, 80/6, 150/6, 300/6, 560/6 or 1100/6
–	–
IEC/EN 60947-5-1	IEC/EN 60947-5-1
IP 54 conforming to IEC/EN 60529	IP 54 conforming to IEC/EN 60529
Removable gland plate	Removable gland plate
Sheet steel enclosure	Sheet steel enclosure
XR2AB	**XR2B**
1/215	1/215

Screw limit switches
Standard duty, OsiSense XRBA

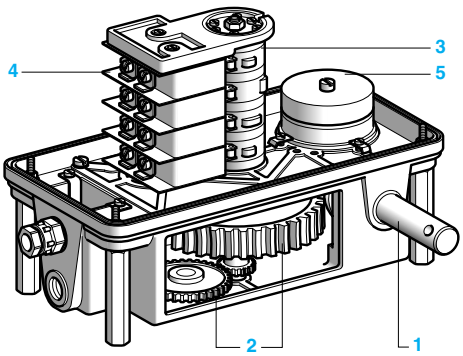
Functions

These switches are designed to monitor the movement of an object via an input drive shaft coupled to the actuator. Detection of position is ensured by a system of independently adjustable cams which actuate the electrical contact blocks.

They are usually used for applications where it is either impossible or impractical to mount standard type position sensors that are actuated directly by the moving object.

Main applications:
- position control of moving parts of hoisting or materials handling equipment (winches, travelling cranes, gantries, cranes, rotary excavators, etc.).
- liquid level control in pumping systems.

Description



1 Input drive shaft
2 Reduction gear
3 Cams
4 Contact blocks
5 Potentiometer (option)

Operation

The input drive shaft, which is coupled to the machine part being controlled, is normally fitted on the right-hand side. This transmits the movement by means of a worm screw and reduction gear to a set of 4 or 6 independent cams which, in turn, operate the contact blocks.

A choice of 3 cam types (20°, 50° and 80°) enables a wide range of cam arrangements to be achieved.

The cams are easily accessible and individual adjustment of the cams is a simple operation, without risk of affecting the setting of adjacent cams.

As an option, a potentiometer can be fitted in order to provide an analogue output.

Screw limit switches
Standard duty, OsiSense XRBA

Environment

Conformity to standards			IEC/EN 60947-5-1
Protective treatment	Standard version		"TC"
	Special version		"TH" on request
Ambient air temperature	For storage	**°C**	- 40…+ 70
	For operation	**°C**	- 25…+ 70
Shock resistance			80 gn (11 ms)
Vibration resistance			> 5 gn (10…60 Hz)
Degree of protection			**XRBA4●●●●**: IP 55 conforming to IEC/EN 60529, IP 557 conforming to NF C 20-010 **XRBA6●●●●**: IP 55 conforming to IEC/EN 60529, IP 555 conforming to NF C 20-010
Materials			Stainless steel input shaft. Aluminium alloy body housing. Aluminium alloy cover for **XRBA4●●●●** Polyphenylene oxide cover for **XRBA6●●●●**
Cable entry			1 tapped entry for n° 9 cable gland (clamping capacity 5 to 8 mm) and 1 tapped entry for n° 16 cable gland (clamping capacity 10 to 14 mm)

Mechanical characteristics

Reduction gear ratio	For 1 revolution of cams		13/1, 17/1, 46/1, 60/1, 78/1, 210/1, 274/1 or 960/1
Average drive torque	At 20°C	**N.cm**	5
Maximum speed of input drive shaft		**rpm**	1000
Mechanical durability			15 x 10^6 drive shaft revolutions

Electrical characteristics of contacts

Type of contacts			Single-pole C/O, snap action
Rated operational characteristics	Conforming to IEC/EN 60947-5-1		∿ AC-15, A300 (Ue = 240 V, Ie = 3 A), ⎓ DC-13, Q300 (Ue = 250 V, Ie = 0.27 A)
Conventional thermal current		**A**	Ithe = 10
Rated insulation voltage	Conforming to IEC/EN 60947-1	**V**	Ui = 250
Rated impulse withstand voltage	Conforming to IEC/EN 60947-1	**kV**	Uimp = 6
Resistance across terminals		**mW**	≤ 25
Short-circuit protection			10 A cartridge fuse type gG
Connection			Screw and captive cable clamp terminals. Clamping capacity: 2 x 1.5 mm^2 with cable end Clips or solder tags available on request

Electrical durability

Conforming to IEC/EN 60947-5-1
Utilisation categories: AC-15 and DC-13
Operating rate: 3600 operating cycles/hour
Load factor: 0.5

a.c. supply ∿ 50/60 Hz

Power broken in VA for 0.5 million operating cycles

Voltage (V)	12	24	48	127	220
∿	18	35	700	165	220
⎍	65	108	216	450	530

d.c. supply ⎓

Power broken in W for 0.5 million operating cycles

Voltage (V)	12	24	48	110	220
∿	27	39	50	65	67
⎍	55	84	110	130	135

Optional potentiometer characteristics (analogue output)

Rotation ratio between cams and potentiometer			1, 1.5 (1.333) or 2 (1.933)
Maximum rotation angle of potentiometer			350°
Potentiometer type			Type SI, size 15, ball bearing mounted Power: 3 W Withstand voltage: 1500 V Ohmic value: 10 000 Ω (other values available on request)

References:
page 1/208

Dimensions:
page 1/220

Screw limit switches
Standard duty, OsiSense XRBA

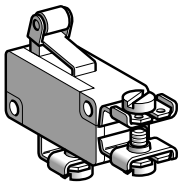
534926

XRBA4●●●●

XRBA901

XRBA902

XRBA903



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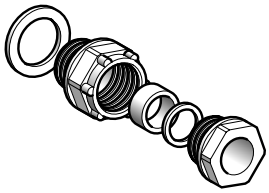

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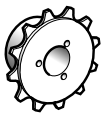
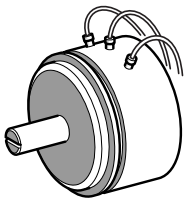


XRBZ91●



XRBZ9●●

Screw limit switches

Description	Number of contacts	Basic reference, to be completed *(1)*	Weight kg
Screw limit switches (with bare drive shaft)	4	**XRBA4●●●●**	1.500
	6	**XRBA6●●●●**	1.350

Separate components and replacement parts

Description	Type	Reference	Weight kg
Cams	20° *(2)*	**XRBA901**	0.002
	50° *(2)*	**XRBA902**	0.002
	80° *(2)*	**XRBA903**	0.002
Contact block Short roller lever actuator 1 C/O snap action contact	2 4 1	**XEPA1081D64**	0.011
Cable glands	N° 16 plastic, clamping capacity 10 to 14 mm	**DE9PL116044**	0.008
Chain sprockets 12.7 mm pitch, for switch input drive shaft	12 teeth	**XRBZ912**	0.080
	14 teeth	**XRBZ914**	0.090
	16 teeth	**XRBZ916**	0.100
Chains (12.7 mm pitch) conforming to standard NF E 26-101, chromium plated, with joining link *(3)*	L = 2 metres	**XR2AZ302**	0.600
	L = 5 metres	**XR2AZ305**	1.500
	L = 10 metres	**XR2AZ310**	3.000
Potentiometer Type SI, size 15, 3 W	10 000 Ω	**XRBZ9100**	0.060
	Other Ohmic values: please consult our Customer Care Centre.		

(1) For completion of the basic reference, please refer to Order form on page 1/209.
(2) Average values.
(3) For liquid level control applications, the length of the chain should at least be equal to the difference between the upper and lower liquid levels + 0.50 m.

Characteristics: page 1/208
Dimensions: page 1/220

Order form
(specimen suitable for photocopying)

Screw limit switches
Standard duty, OsiSense XRBA

Customer			Schneider Electric	
Company	**Order N°**	**Delivery date**	**Sales Office - Subsidiary Co.**	**Order N°**

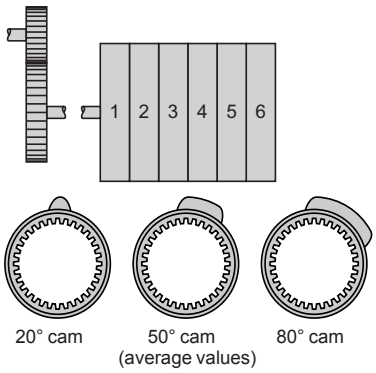
To use this order form:
- State the number of identical screw limit switches required
- Complete the basic reference with the 9 or 11 digits indicating the various switch options
- Mark the required cam arrangement on the drawing below.

For examples showing completion of the basic reference, refer to pages 1/224 and 1/225.

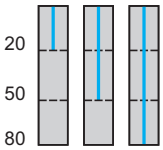
Number of identical switches	Basic reference, to be completed	Number of contacts	Reduction gear ratio	Drive shaft position	Adaptation for 10 kΩ potentiometer	Option cam N°1	N°2	N°3	N°4	N°5 (1)	N°6 (1)
	XRBA										
Number of contacts											
Switch with 4 contacts		**4**									
Switch with 6 contacts		**6**									
Reduction gear ratio (for 1 revolution of cams)											
13/1											
17/1											
46/1											
60/1											
78/1											
210/1											
274/1											
960/1											
Drive shaft position											
Right-hand side (standard model)											
Left-hand side											
Adaptation for 10 kΩ potentiometer											
Without adaptation											
With adaptation, ratio 1											
With adaptation, ratio 1.5 (1.333)											
With adaptation, ratio 2 (1.933)											
Choice of cams (3 different angles, 4 or 6 positions)											
To select a cam, add 4 digits for XRBA4 switches or 6 digits for XRBA6 switches.											
20° cam						2	2	2	2	2 *(1)*	2 *(1)*
50° cam						5	5	5	5	5 *(1)*	5 *(1)*
80° cam						8	8	8	8	8 *(1)*	8 *(1)*

Required cam arrangement

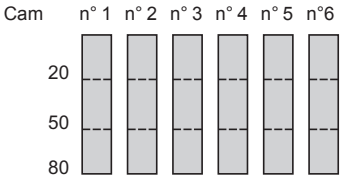
The cam positioned nearest to the plate is considered as cam n° 1



Marking guide for cam arrangement diagram



Mark the required cam arrangement



(1) Do not add these digits for XRB4 switches (with 4 contacts).

Note: *If the above cam arrangement is left blank, the cams will be factory-mounted as standard as shown below:*

Cam n°	1	2	3	4	5	6
XRBA4●●●●	20°	50°	80°	20°	–	–
XRBA6●●●●	20°	20°	50°	50°	80°	80°

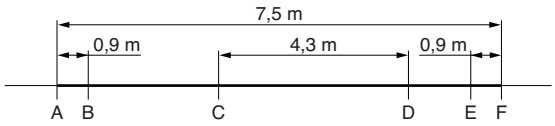
*Example of a standard product: reference **XRBA45100** corresponds to a switch with 4 contacts, a reduction gear ratio of 78/1, a right-hand side shaft input and no potentiometer. The cams are positioned in the following order: 20°, 50°, 80° and 20°.*

1

Application: monitoring the movement of a machine part

Example:
Monitoring the movement of a machine part from A to F (AF = 7.5 m) with potentiometer linked display.
Chain sprocket on switch input drive shaft: 16 teeth on 12.7 mm pitch.

Point A	Stop position, direction F ➡ A
Point B	Slow-down position, direction F ➡ A
Points C and D	Specific points
Point E	Slow-down position, direction A ➡ F
Point F	Stop position, direction A ➡ F



Selection of switch and completion of basic reference

- **Number of contacts: 6 positions to monitor, therefore, 6 contacts.** — **1st digit of reference: 6**
- **Reduction gear ratio: Distance AF = 7.5 m, therefore, number of turns of input drive shaft:** $\frac{7.5}{16 \times 0.0127} = 37$
- **Select a reduction ratio whereby the number of turns of the input drive shaft is greater than 37**

	Reduction ratio between number of turns of drive shaft and 1 revolution of cams	Rotation ratio between cams and the potentiometer (actual value)	Maximum rotation of cams for 37 turns of switch input drive shaft	Maximum rotation of potentiometer
1st solution	46/1	1	$\frac{360 \times 37}{46} = 289°$	$\frac{360 \times 37}{46} \times 1 = 269°$
2nd solution	60/1	1.5 (1,333)	$\frac{360 \times 37}{60} = 222°$	$\frac{360 \times 37}{60} \times 1.333 = 296°$
3rd solution	78/1	2 (1.933)	$\frac{360 \times 37}{78} = 171°$	$\frac{360 \times 37}{78} \times 1.933 = 330°$

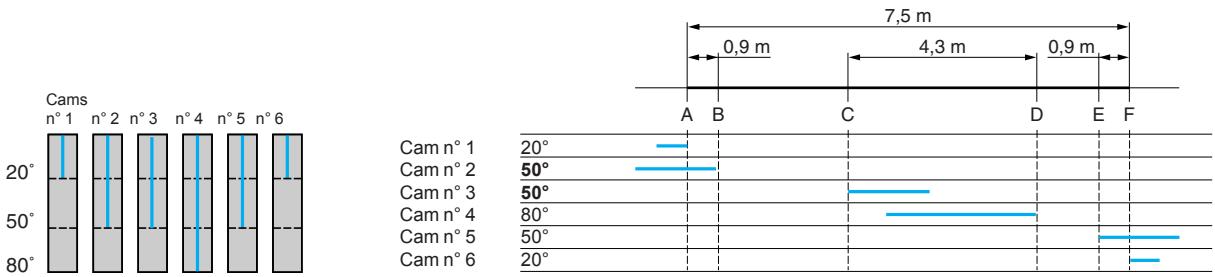
Assume the 3rd solution is best suited for the application, which offers a wide potentiometer operating angle (330°) whilst maintaining cam setting flexibility (171° operating angle).

- **Reduction gear ratio: 78/1** — **2nd digit of reference: 5**
- **Input drive shaft position: Right-hand side preferred** — **3rd digit of reference: 1**
- **Adaptation for potentiometer: Value of 10 kΩ and a ratio of 2** — **4th and 5th digits of reference: 33**

Reference of screw limit switch to be entered on Order form on page 1/209 **XRBA** | 6 | 5 | 1 | 33 |

Selection of cams, marking cam arrangement diagram

- **Point A - cam n° 1:** 20° cam (stop cam).
- **Point B - cam n° 2:** The selection of cam n° 2 is determined by the distance BA (0.90 m), giving:
A 20° cam could be used, but a 50° cam is more suitable in order to ensure an overlap with the stop cam. $\frac{171° \times 0.90}{7.5} \approx 20°$
- **Points C and D - cams n° 3 and 4:** The distance CD = 4.30 m, giving:
2 overlapping cams are required, for example: cam n° 3 = 50°, cam n° 4 = 80°. $\frac{171° \times 4.30}{7.5} \approx 98°$
- **Point E - cam n° 5:** The selection of cam n° 5 is determined by the distance EF (0.9 m), giving:
A 50° cam is therefore selected, for the same reasons as the cam for point B. $\frac{171° \times 0.90}{7.5} \approx 20°$
- **Point F - cam n° 6:** 20° cam (stop cam).



Telemecanique Sensors

Specific application: liquid level control *(1)*

Selection guide table for reduction ratio between number of turns of switch input drive shaft and 1 revolution of the cams and chain sprocket size to be fitted to switch input drive shaft.

Change in level to be controlled (in metres)	Screw limit switches without potentiometer			Screw limit switches with potentiometer				
	Reduction gear ratio	Chain sprocket Number of teeth (12.7 mm pitch)	Cam rotation angle	Reduction gear ratio	Chain sprocket Number of teeth (12.7 mm pitch)	Adaptation for potentiometer Ratio	Cam rotation angle	Potentiometer rotation angle
0.5	13/1	12	91°	13/1	12	2	91°	182°
1	13/1	12	182°	13/1	14	2	156°	312°
1.5	13/1	12	273°	13/1	14	1.5	233°	350°
2	13/1	14	311°	17/1	16	1.5	208°	312°
2.5	17/1	12	347°	46/1	12	2	128°	256°
3	17/1	16	313°	46/1	12	2	154°	308°
3.5	46/1	12	180°	46/1	14	2	154°	308°
4	46/1	12	205°	46/1	16	2	154°	308°
4.5	46/1	12	231°	46/1	12	1.5	231°	347°
5	46/1	12	257°	60/1	14	2	169°	338°
5.5	46/1	12	282°	78/1	12	2	167°	334°
6	46/1	12	308°	60/1	14	1.5	202°	303°
6.5	46/1	12	334°	78/1	14	2	169°	339°
7	46/1	14	308°	78/1	16	2	159°	318°
7.5	60/1	12	295°	78/1	12	1.5	227°	341°
8	60/1	12	315°	78/1	14	1.5	208°	312°
8.5	60/1	12	335°	78/1	14	1.5	221°	331°
9	46/1	16	347°	78/1	16	1.5	204°	306°
9.5	60/1	14	321°	78/1	16	1.5	216°	324°
10	60/1	14	337°	78/1	16	1.5	227°	341°
10.5	78/1	12	318°	78/1	12	1	318°	318°
11	78/1	12	333°	78/1	12	1	333°	333°
11.5	78/1	12	348°	78/1	12	1	348°	348°
12	78/1	14	311°	78/1	14	1	311°	311°
12.5	78/1	14	324°	78/1	14	1	324°	324°
13	78/1	14	337°	78/1	14	1	337°	337°
13.5	78/1	16	307°	78/1	16	1	307°	307°
14	78/1	16	318°	78/1	16	1	318°	318°
14.5	78/1	16	329°	78/1	16	1	329°	329°
15	78/1	16	341°	78/1	16	1	341°	341°

Example: Controlling a change in liquid level of 5.30 m

Selection of reduction gear ratio

From the above table, select the value immediately superior to 5.30 m, i.e. 5.50 m

■ **Case n° 1: without potentiometer. Recommended solution:**
□ Reduction gear ratio: 46/1, chain sprocket with 12 teeth on 12.7 mm (0.0127 m) pitch.
□ Cam rotation angle:

using above table: $\frac{282 \times 5.30}{5.50} = 272°$ or, by calculation: $\frac{\frac{5.30}{12 \times 0.0127} \times 360}{46} = 272°$

□ Completion of basic switch reference: **2nd digit of reference:** **3**
4th and 5th digits of reference: **00**

■ **Case n° 2: with potentiometer. Recommended solution:**
□ Reduction gear ratio: 78/1, chain sprocket with 12 teeth on 12.7 mm (0.0127 m) pitch.
□ Ratio of potentiometer adaptation: 2
□ Cam rotation angle:

using above table: $\frac{167 \times 5.30}{5.50} = 161°$ or, by calculation: $\frac{\frac{5.30}{12 \times 0.0127} \times 360}{78} = 161°$

□ Potentiometer rotation angle:

using above table: $\frac{334 \times 5.30}{5.50} = 322°$ or, by calculation: $2 \times \left(\frac{\frac{5.30}{12 \times 0.0127} \times 360}{78} \right) = 322°$

□ Completion of basic switch reference: **2nd digit of reference:** **5**
4th and 5th digits of reference: **33**
(10 kΩ potentiometer)

(1) Accessories for liquid level control: see page 1/218.

Screw limit switches
Heavy duty, OsiSense XR2

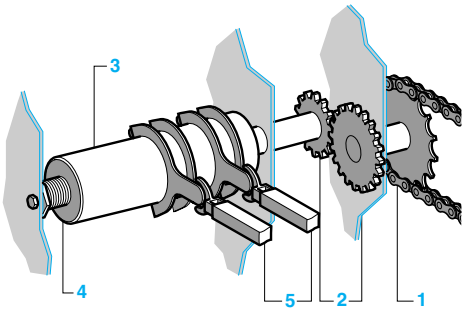
Functions

These switches are designed to monitor the movement of an object via an input drive shaft coupled to the actuator. Detection of position is ensured by a system of adjustable fingers which actuate the electrical contact blocks.

They are usually used for applications where it is either impossible or impractical to mount standard type position sensors that are actuated directly by the moving object.

Main applications:
- position control of moving parts of hoisting or materials handling equipment (winches, travelling cranes, gantries, cranes, rotary excavators, etc.),
- liquid level control in pumping systems.

Description



1 Input drive shaft, with facilities for attaching chain sprocket.
2 2-pinion primary gearbox, with choice of reduction ratio.
3 Internally threaded shaft, driven via gearbox, fitted with adjustable fingers which actuate the electrical contact blocks.
4 Fixed lead screw, along which threaded shaft travels.
5 Snap action contact blocks, actuated by fingers.

Operation

Due to the variable composition 2-pinion primary gearbox, multiple choices of reduction ratio between the input drive shaft and the threaded shaft, which operates the finger actuators, are possible.

The finger actuators, clamped to the rotating threaded shaft, describe a helical path and operate the contacts as and when they are engaged along its length of travel (6 turns maximum).

To avoid damage at the end of travel of the threaded shaft, a clutch is incorporated in the drive mechanism (patented feature).

Screw limit switches
Heavy duty, OsiSense XR2

Environment

Conformity to standards			IEC/EN 60947-5-1
Protective treatment	Standard version		"TC"
	Special version		"TH" on request
Ambient air temperature	For storage	**°C**	- 40…+ 70
	For operation	**°C**	- 25…+ 70
Shock resistance			50 gn (11 ms)
Vibration resistance			> 5 gn (10…55 Hz)
Degree of protection			IP 54 conforming to IEC/EN 60529
Materials			**XR2AA:** Aluminium alloy body housing, insulated cover **XR2AB** and **XR2BB:** Sheet steel enclosure
Cable entry			**XR2AA:** 2 tapped entries for n° 13 cable gland (clamping capacity 9 to 12 mm) **XR2AB** and **XR2BB:** Removable gland plate

Mechanical characteristics

Maximum number of turns of threaded shaft		6
Threaded shaft screw pitch	**mm**	4
Operating finger radius	**mm**	40
Length of developed helical travel	**mm**	4
Contact actuators differential snap-over angle (measured at finger)		30°
Tripping point repeat accuracy		0.02% between 2 successive operations
Number of turns of input drive shaft		For 6 turns of threaded shaft: 0.4, 0.8, 1.6, 3, 6, 10, 20, 40 or 80
Mechanical durability		10 x 10^6 drive shaft revolutions

Electrical characteristics of contacts

Type of contacts		**XR2A:** single-pole C/O, snap action **XR2B:** single-pole N/C or N/O, with snap action mechanism
Rated operational characteristics		∼ AC-15, A300 (Ue = 240 V, Ie = 3 A), ⎓ DC-13, Q300 (Ue = 250 V, Ie = 0.27 A), conforming to IEC/EN 60947-5-1
Conventional thermal current	**A**	**XR2A:** Ithe = 10 **XR2B:** Ithe = 20
Rated insulation voltage	**V**	Ui = 500, conforming to IEC/EN 60947-1 Ui = ⎓ 600, conforming to CSA C 22-2 n° 14
Rated impulse withstand voltage	**kV**	Uimp = 6, conforming to IEC/EN 60947-1
Resistance across terminals	**mW**	⩽ 25
Short-circuit protection		**XR2A:** 10 A cartridge fuse type gG **XR2B:** 20 A cartridge fuse type gG
Connection		Screw clamp terminals. Clamping capacity: 2 x 1.5 mm² with or without cable end, 2 x 2.5 mm² without cable end

Electrical durability

Conforming to IEC/EN 60947-5-1
Utilisation categories: AC-15 and DC-13
Operating rate: 3600 operating cycles/hour
Load factor: 0.5

			a.c. supply ∼ 50/60 Hz Power broken in VA							d.c. supply ⎓ Power broken in W					
		Voltage (V)	**12**	**24**	**48**	**127**	**220**	**380**	**500**	**12**	**24**	**48**	**110**	**220**	**440**
For 3 million operating cycles	**XR2A**	∼	100	200	400	700	750	800	800	100	120	110	95	80	45
		⎓	100	220	480	1050	1150	1150	1200	100	140	130	110	95	65
	XR2B	∼	240	450	800	1300	1500	1500	1500	135	115	105	95	90	85
		⎓	240	450	800	1900	2200	2200	2200	220	450	400	330	280	240
For 10 million operating cycles	**XR2A**	∼	45	75	120	180	200	200	200	45	40	35	30	20	7.5
		⎓	70	120	180	270	290	300	300	100	90	85	80	60	33
	XR2B	∼	220	350	450	500	500	520	520	55	45	38	35	32	30
		⎓	220	440	600	740	750	750	750	220	450	400	330	280	240

References:
page 1/215

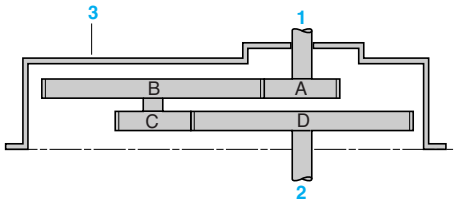
Dimensions:
page 1/220

1

Variable composition primary gearbox characteristics

Primary gearbox reference code *(1) (2)*		04	08	16	3	6	10	20	40	80
Primary gearbox type		Single-stage								
Theoretical number of turns of input drive shaft "K"		0.4	0.8	1.6	3	6	10	20	40	80
Number of teeth per pinion	A	59	59	49	59	Direct drive	49	26	26	16
	B	16	16	26	16		26	49	49	59
	C	59	49	49	26		16	26	16	16
	D	16	26	26	49		59	49	59	59
Number of turns of threaded shaft		6	6	6	6	6	6	6	6	6
Actual number of turns of input drive shaft		0.441	0.863	1.689	3.066	6	11.739	21.3	41.697	81.586
Maximum speed of input drive shaft in rpm		12	25	50	75	150	200	250	300	350

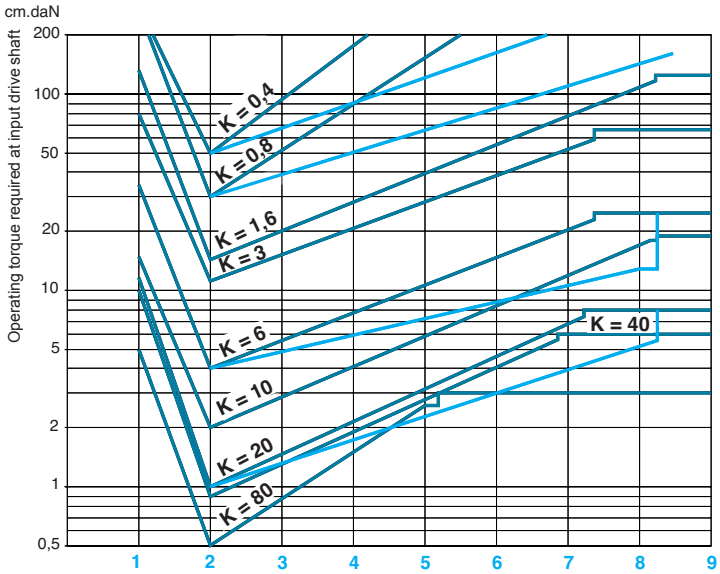
Primary gearbox arrangement (for references of the gearbox only, see page 1/216)



1 Input drive shaft
2 Threaded shaft (6 turns) and contact side
3 Casing

(1) Code required to complete the basic reference of the screw limit switch.
(2) For ratios greater than 80 turns, please consult our Customer Care Centre.

Average drive torque



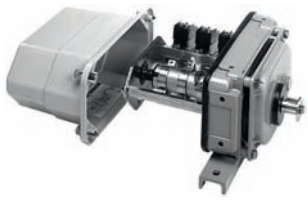
XR2A●●●●●●

XR2B●●●●●●

1 Clutch torque (at front mechanical stop/end of travel)
2 Nominal torque required to drive switch
3 Torque required to operate 1 contact
4 Torque required to operate 2 contacts simultaneously
5 Torque required to operate 3 contacts simultaneously
6 Torque required to operate 4 contacts simultaneously
7 Torque required to operate 6 contacts simultaneously
8 Torque required to operate 8 contacts simultaneously
9 Clutch torque (at rear mechanical stop/end of travel)

Screw limit switches
Heavy duty, OsiSense XR2

534911

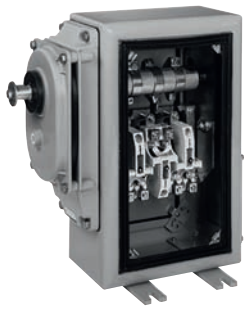


XR2AA03K●●

534912

XR2AB06K●●

534913



XR2BB03K●●

Switches with C/O contacts (Ithe = 10 A) (ZC1ZB211)

Presentation	Drive shaft end fittings	Number of contacts	Basic reference, to be completed by adding primary gearbox code *(1)*	Weight kg
Aluminium alloy body housing, plastic cover	Sprocket key and washer *(2)*	3	**XR2AA03K●●**	6.000
Sheet steel enclosure	Sprocket key and washer *(2)*	4	**XR2AB04K●●**	10.000
		6	**XR2AB06K●●**	12.000
		10	**XR2AB10K●●**	15.000
		14	**XR2AB14K●●**	18.000
		20	**XR2AB20K●●**	23.000
		24	**XR2AB24K●●**	28.000
		28	**XR2AB28K●●**	35.000

Switches with N/C contacts (Ithe = 20 A) (ZC4CB2) *(3)*

Presentation	Drive shaft end fittings	Number of contacts	Reference *(1)*	Weight kg
Sheet steel enclosure	Sprocket key and washer (2)	3	**XR2BB03K●●**	10.000
		5	**XR2BB05K●●**	12.000
		9	**XR2BB09K●●**	15.000
		13	**XR2BB13K●●**	18.000
		19	**XR2BB19K●●**	23.000
		23	**XR2BB23K●●**	28.000
		27	**XR2BB27K●●**	35.000

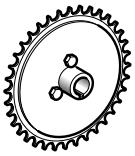
(1) Code corresponding to the required primary gearbox, selected according to number of turns of the switch input drive shaft.
See page 1/214.
*Example: for a screw limit switch with 3 C/O contacts and a theoretical number of input shaft turns "K" = 0.4, the reference becomes: **XR2AA03K04**.*
(2) Switches supplied without input drive shaft chain sprocket. For suitable sprockets and chains, see page 1/216.
(3) For switches fitted with N/O contacts, please consult your Regional Sales Office.

Characteristics:
pages 1/213 and 1/214

Dimensions:
page 1/220

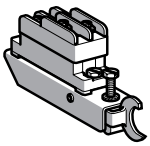
Screw limit switches

Heavy duty, OsiSense XR2

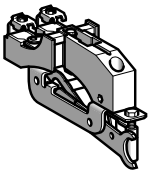


XR2AZ2●●

XR2AZ001



ZC1ZB211



ZC4CB2

534927

XR2AZ●●●

Separate components and replacement parts

Description	Type		Reference	Weight kg
Chain sprockets, 12.7 mm pitch, for switch input drive shaft	Flat sprocket with fixing hub	12 teeth	**XR2AZ212**	0.180
		16 teeth	**XR2AZ216**	0.200
		24 teeth	**XR2AZ224**	0.230
		36 teeth	**XR2AZ236**	0.450
		48 teeth	**XR2AZ248**	0.770
		56 teeth	**XR2AZ256**	1.130
Operating finger			**XR2AZ001**	0.030
Contact blocks with snap-over actuator	C/O (for XR2A)		**ZC1ZB211**	0.120
	N/C (for XR2B)		**ZC4CB2**	0.140
Chains (12.7 mm pitch) conforming to standard NF E 26-101, chromium plated, with joining link *(1)*	L = 2 metres		**XR2AZ302**	0.600
	L = 5 metres		**XR2AZ305**	1.500
	L = 10 metres		**XR2AZ310**	3.000
Replacement primary gearbox kit comprising: - casing with input drive shaft (fitted with sprocket key, washer and screw) - steel pinions	Single-stage	K04	**XR2AZ804**	1.520
		K08	**XR2AZ808**	1.520
		K16	**XR2AZ816**	1.520
		K3	**XR2AZ83**	1.470
		K6	**XR2AZ86**	1.470
		K10	**XR2AZ810**	1.470
		K20	**XR2AZ820**	1.520
		K40	**XR2AZ840**	1.470
		K80	**XR2AZ880**	1.520

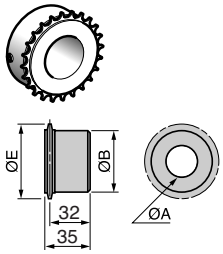
(1) For liquid level control applications, the length of the chain should at least be equal to the difference between the upper and lower liquid levels + 0.50 m.

Characteristics:
pages 1/213 and 1/214

Dimensions:
page 1/220

Screw limit switches

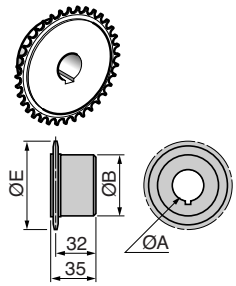
Winch shaft chain sprockets, conforming to standard NF E 23-111, 12.7 mm pitch



XR2AZ3●●●5

Monobloc sprockets with through hub

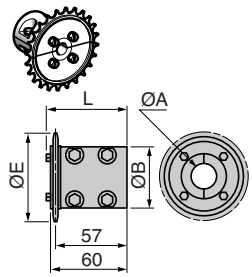
Number of teeth	ØE	ØA (bore Ø in mm) 0…25 ØB	26…35 ØB	Reference	Weight kg
12	57	50	–	**XR2AZ31225**	0.386
16	73	50	55	**XR2AZ31625**	0.424
24	105	50	–	**XR2AZ32425**	0.632
		–	55	**XR2AZ32435**	0.500
48	202	50	55	**XR2AZ34825**	1.000



XR2AZ4●●●5

Monobloc sprockets with keyed through hub

Number of teeth	ØE	ØA (bore Ø in mm) 0…25 ØB	26…35 ØB	Reference	Masse kg
16	73	50	55	**XR2AZ41625**	0.421
24	105	50	–	**XR2AZ42425**	0.580
		–	55	**XR2AZ42435**	0.600
36	153	50	55	**XR2AZ43625**	0.750



XR2AZ52450

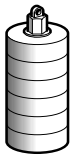
Split sprockets with through hub

Number of teeth	ØE	L	ØA (bore Ø in mm) 21…50 ØB	Reference	Masse kg
24	105	64.5	80	**XR2AZ52450**	0.680

Screw limit switches

Accessories for liquid level control using float *(1)*

XL1DB0111



XR2AZ002

XL1DB04

Accessories

Description	Type	Material	Reference	Weight kg
Ballast float, Ø 270 mm for change in level less than 4.50 m	Without guide lugs	Stainless steel	**XL1DB0111**	5.900
Counterweights	For Ø 270 mm float	–	**XR2AZ002**	2.540
	For Ø 350 mm float	–	**XR2AZ003**	7.500
Pulley assembly	–	–	**XL1DB04**	1.050
Cable, Ø 37 mm, length 6 m (with attachment clamp)	–	Stainless steel	**XL1DB05**	0.250

(1) For mounting example, see page 1/233.

Dimensions:
page 1/220

Screw limit switches
Differential drive units

534928

ZR2FA●

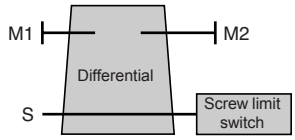
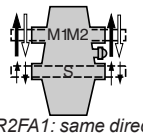
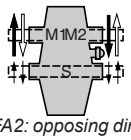


Figure 1



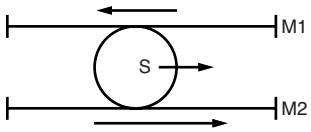
ZR2FA1: same direction

Figure 2



ZR2FA2: opposing directions

Schematic representation



Functions

This unit enables the monitoring of any speed difference between 2 movements which, under normal circumstances, should be identical. Any difference in speed is transmitted to an OsiSense XR2 screw limit switch which, in turn, re-establishes correct operation.

Main applications:
- Controlling movement of grabs on cranes and travelling cranes.
- Liquid level control in decantation tanks.
- Monitoring relative difference between 2 moving parts.

Operation

The difference in rotational speeds of shafts M1 and M2, which are connected to motors or capstans, is transferred to a set of internal pinions which, in turn, control the rotation of shaft S which is connected to one or more screw limit switches.

Relationship between rotational directions

If the rotation of shafts M1 and M2 is synchronised, shaft S does not turn.
If the rotation of shafts M1 and M2 is out of synchronisation, shaft S turns.

This relationship is indicated either by white arrows or black arrows (each shaft having 2 possible directions of rotation).
The rotational direction of shaft S is indicated by the arrow on shaft S immediately below the arrow on shaft M which represents the highest rotational speed (see figures 1 and 2).

M1 = M2: S does not turn
M1 ≠ M2: S turns

Note
In both cases, the rotational speed ratio between shafts M and S is 2/1. It is important to know the maximum number of turns or differential travel that the screw limit switch must control (if necessary, both sides of its initial setting).

References

The differential units are supplied with “bare shafts” fitted with keyed discs, ready for the attachment of numerous types of coupling. They are dust and damp-proof and the internal mechanism is maintenance free. All 3 shafts are steel and are needle roller bearing mounted. A set of duplicate cast steel pinions ensure the accuracy of the differential. The cover is both glued and screwed to the housing.

Description	Type	Reference	Weight kg
Differential units	For input shafts turning in the same direction	**ZR2FA1**	6.510
	For input shafts turning in opposing directions	**ZR2FA2**	6.510
Flexible coupling		**ZR2FA005**	0.120
Winch shaft chain sprockets		See page 1/229	–

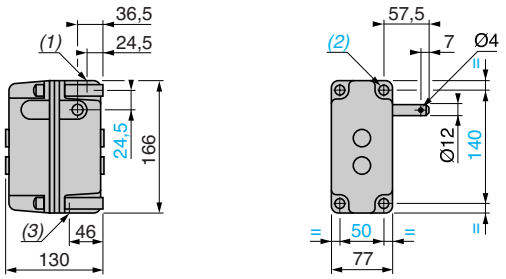
ZR2FA005

Dimensions:
page 1/220

Screw limit switches

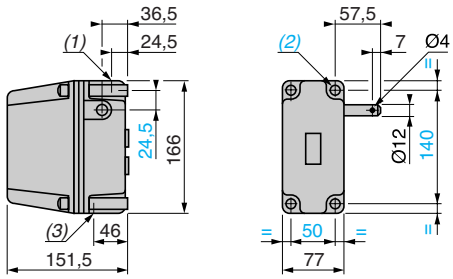
Screw limit switches

XRBA4●●●●



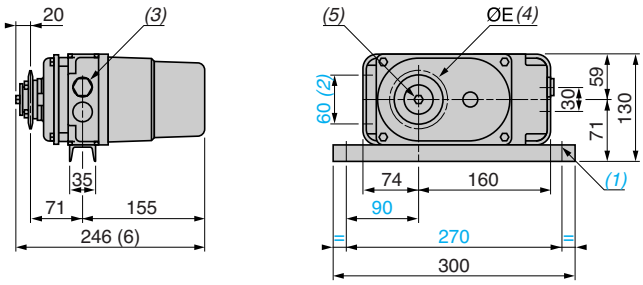
(1) 1 tapped entry for n° 9 cable gland.
(2) 4 tapped fixing holes for M5 screws, depth 20.
(3) 1 tapped entry for n° 16 cable gland.

XRBA6●●●●



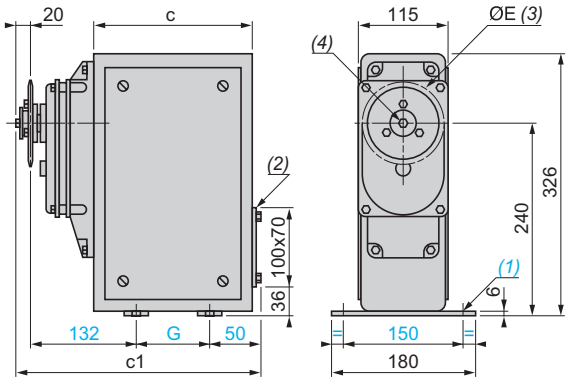
(1) 1 tapped entry for n° 9 cable gland.
(2) 4 tapped fixing holes for M5 screws, depth 20.
(3) 1 tapped entry for n° 16 cable gland.

XR2AA●●●●● with chain sprocket XR2AZ2●● fitted



(1) 2 elongated fixing holes Ø 9 x 11.
(2) Alternative fixings: 2 x M8 threaded holes on same axis as cable glands.
(3) 2 tapped entries for n° 13 cable gland.
*(4) Ø E of chain sprocket **XR2AZ2●●** (see next page).*
*(5) Bore Ø of chain sprocket **XR2AZ2●●**: Ø 16, 2 x 5 keyway.*
(6) + 125 mm for removal of cover.

XR2AB●●●●●, XR2BB●●●●● with chain sprocket XR2AZ2●● fitted



(1) 4 elongated fixing holes Ø 9 x 11.
(2) Removable plate for connections or for mounting cable glands.
*(3) Ø E of chain sprocket **XR2AZ2●●** (see next page).*
*(4) Bore Ø of chain sprocket **XR2AZ2●●**: Ø 16, 2 x 5 keyway.*

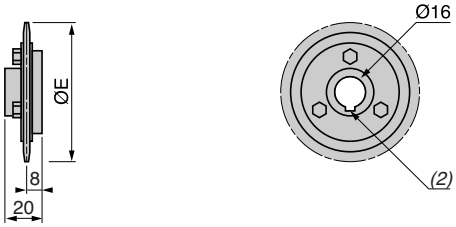
Reference	Number of contacts	c	c1	G
XR2AB04K●●	4	200	310	100
XR2AB06K●●	6	260	370	160
XR2AB10K●●	10	440	550	340
XR2AB14K●●	14	560	670	460
XR2AB20K●●	20	800	910	700
XR2AB24K●●	24	980	1090	880
XR2AB28K●●	28	1100	1210	1000

Reference	Number of contacts	c	c1	G
XR2BB03K●●	3	200	310	100
XR2BB05K●●	5	260	370	160
XR2BB09K●●	9	440	550	340
XR2BB13K●●	13	560	670	460
XR2BB19K●●	19	800	910	700
XR2BB23K●●	23	980	1090	800
XR2BB27K●●	27	1100	1210	1000

References:
pages 1/208 and 1/215

Chain sprockets *(1)* for switch input drive shaft

XR2AZ2●●

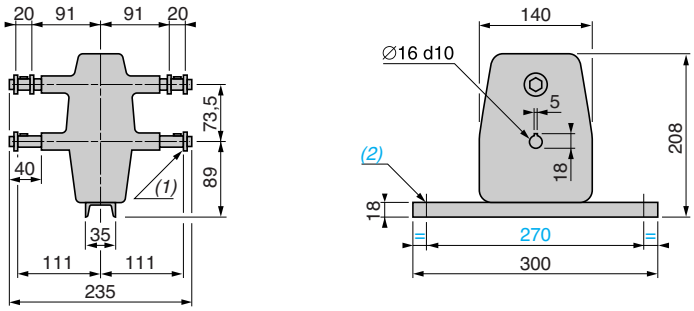


Reference	Number of teeth	Ø E
XR2AZ212	12	57
XR2AZ216	16	73
XR2AZ224	24	105
XR2AZ236	36	153
XR2AZ248	48	202
XR2AZ256	56	234

(1) Chain pitch: 12.7 mm.
(2) Keyway: 2 x 5 mm.

Differential units

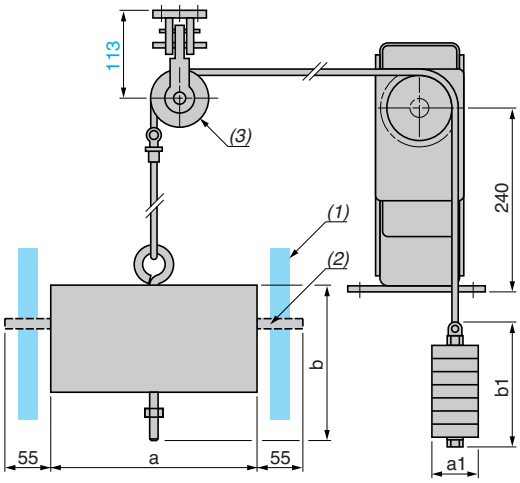
ZR2FA●

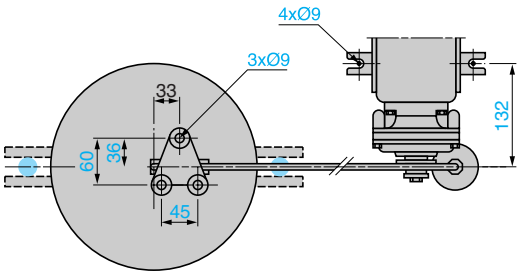


(1) Removable circlips.
(2) 2 elongated fixing holes Ø 9 x 11 for Ø 8 screws.

Application: liquid level control

Mounting details using an XR2●B●●●●● screw limit switch





	a	a1	b	b1
Change in liquid level up to 4.5 m (using **XL1DB01●1** and **XR2AZ002**)	270	60	200	160
Change in liquid level greater than 4.5 m (using **XL1DB02●1** and **XR2AZ003**)	350	148	245	110

(1) Guide rods.
(2) Guide rod lugs.
(3) Pulley, internal Ø 65 mm.

References:
pages 1/216, 1/218 and 1/206

Overtravel limit switches
For power circuits, OsiSense XF9

Functions

The overtravel limit switches for power circuit switching are specifically designed to ensure the safety of hoisting equipment.

They directly break the power supply to the hoist motor if the load being handled accidentally exceeds the operating limits of the equipment.

Their mechanism is designed to ensure breakage of the power supply in the event of a malfunction and therefore, an overtravel limit switch cannot be used in place of an end of travel limit switch. It must only be used as a back-up device in the event of failure of the latter, or any other component forming part of an automated control circuit monitoring for excessive overtravel.

Description

XF9D●●● overtravel limit switches are housed in an aluminium alloy case.
XF9F●●● overtravel limit switches are housed in a sheet steel enclosure.

They are equipped with power contacts from Schneider Electric contactors.

Operation

Mounting and operating precautions

It is recommended that the overtravel limit switch be connected as near as possible to the motor, in order to minimise the risk of shunting.

The switch must be positioned in such a manner so as to avoid any damage in the event of the load exceeding the end of travel limits.

In order to ensure positive operation, the operating lever of the overtravel limit switch must be actuated directly by the moving part being monitored. It is essential that the use of any flexible or deformable intermediate actuators be avoided.

Manual reset switches - resetting after tripping

- Before resetting the overtravel limit switch ensure that the cause of its tripping is located and rectified.
- Rotate and hold lever up against end stop.
- Simultaneously press the reset button (XF9D), using accessory included with switch, or operate the reset lever (XF9F) and turn the control station switch away from the trip position.
- Rotate lever back to its initial position.

Characteristics: page 1/223
References: page 1/224
Dimensions: page 1/225

Overtravel limit switches
For power circuits, OsiSense XF9

Environment

Overtravel limit switch type			XF9D251	XF9D651	XF9F1151 XF9F1152	XF9F1851 XF9F1852	XF9F2651 XF9F2652
Conformity to standards			IEC 60158-1, NF C 63-110, VDE 0660, IEC 60947-1, IEC 60947-4				
Product certification	3-phase		CSA				
			20 HP 40 A, 600 V	20 HP 80 A, 600 V	100 HP 175 A, 600 V	150 HP40 A, 200 A, 600 V	200 HP 428 A, 600 V
	Single-phase, 2-pole		3 HP 40 A, 230 V	10 HP 80 A, 230 V	–	–	–
Protective treatment	Standard version		"TC"				
	Special version		"TH" on request				
Ambient air temperature	For storage	**°C**	- 40…+ 70				
	For operation	**°C**	- 25…+ 70				
Degree of protection	Conforming to IEC/EN 60529		IP 54		IP 43		
Housing			Aluminium alloy case		Sheet steel enclosure		
Cable entry			2 tapped entries for n° 21 cable gland	3 tapped entries for n° 29 cable gland	2 entries incorporating n° 36 plastic cable gland		

Contact block characteristics

Number of poles			4		3		
Rated operational current (Ie)	For 2-pole scheme	**A**	50	130	–	–	–
	For 3-pole scheme on AC-3	**A**	25	65	115	185	265
Conventional thermal current (Ithe) at θ ≤ 40 °C	For 2-pole scheme	**A**	80	160	–	–	–
	For 3-pole scheme	**A**	40	80	200	275	350
Rated insulation voltage (Ui)	Conforming to IEC 60158-1, IEC 947-4, VDE 0110 Group C	**V**	500		660		
	Conforming to CSA 22-2 n° 14	**V**	600				
Rated breaking capacity (I rms)	Conforming to IEC 60158-1 For 2-pole scheme 500 V	**A**	400	1000	1100	1600	2200
	660 V	**A**	180	630	900	1200	1750
Connection Min./max. cable c.s.a. Flexible wiring, without cable end	1 conductor	**mm²**	1.5/10	2.5/25	–	–	–
	2 conductors	**mm²**	1.5/6	2.5/16	–	–	–
Flexible wiring, with cable end	1 conductor	**mm²**	1/6	2.5/16	–	–	–
	2 conductors	**mm²**	1/4	2.5/6	–	–	–
Solid wiring, without cable end	1 conductor	**mm²**	1.5/6	2.5/25	–	–	–
	2 conductors	**mm²**	1.5/6	4/16	–	–	–
Cable	1 conductor	**mm²**	–	–	95	150	240
	2 conductors	**mm²**	–	–	95	150	240

Presentation:
page 1/222

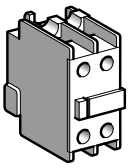
References:
page 1/224

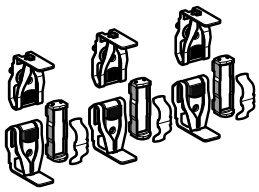
Dimensions:
page 1/225

Overtravel limit switches
For power circuits, OsiSense XF9

XF9D651

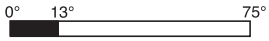
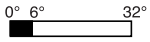
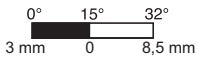
XF9F●●●2


LADN11


LA5FG431

References

Switches without auxiliary contact block

Description	Rated operational current	Conventional thermal current	Disconnection	Reference	Weight
	A	A			kg
With manual latching and resetting restricted by a padlockable device Snap action opening mechanism Maximum travel: 75° in each direction	25 or 50	40 or 80	3-pole or 4-pole 2-pole	**XF9D251**	2.200
	65 or 130	80 or 160	3-pole or 4-pole 2-pole	**XF9D651**	5.000
With manual latching and resetting Horizontal or vertical actuation Snap action opening mechanism	115	200	3-pole	**XF9F1151**	25.500
	185	275	3-pole	**XF9F1851**	26.000
	265	350	3-pole	**XF9F2651**	27.500
With counterweights and automatic resetting Horizontal or vertical actuation Slow break opening mechanism Minimum actuation speed: 2.5m/s	115	200	3-pole	**XF9F1152**	28.500
	185	275	3-pole	**XF9F1852**	29.000
	265	350	3-pole	**XF9F2652**	32.500

Auxiliary contact blocks

Description	For use with switches	Reference	Weight kg
N/C + N/O instantaneous	XF9D●●● and XF9F●●●	**LADN11**	0.030

Replacement parts

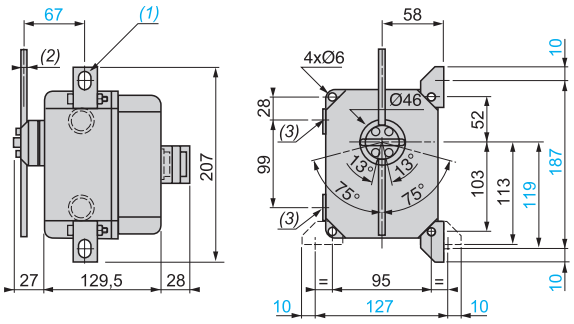
Description	For use with switches	Reference	Weight kg
Contact set comprising per pole: - 2 fixed contacts, - 1 moving contact, - 2 deflectors, - 1 backplate, clamping screw and washers	XF9F115●	**LA5FF431**	0.270
	XF9F185●	**LA5FG431**	0.350
	XF9F265●	**LA5FH431**	0.660
Arc chambers	XF9F115●	**LA511550**	0.490
	XF9F185●	**LA518550**	0.670
	XF9F265●	**LA526550**	0.920

Contacts closed
Contacts open

Presentation: page 1/222
Characteristics: page 1/223
Dimensions: page 1/225

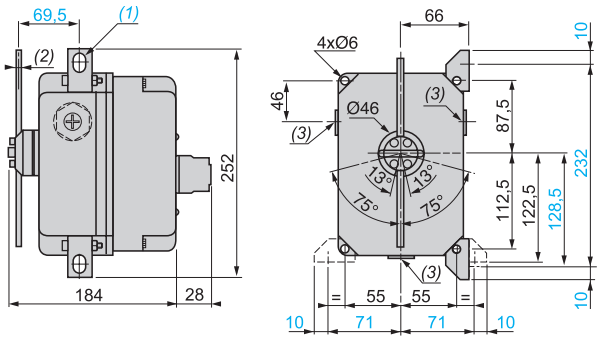
Dimensions

XF9D251



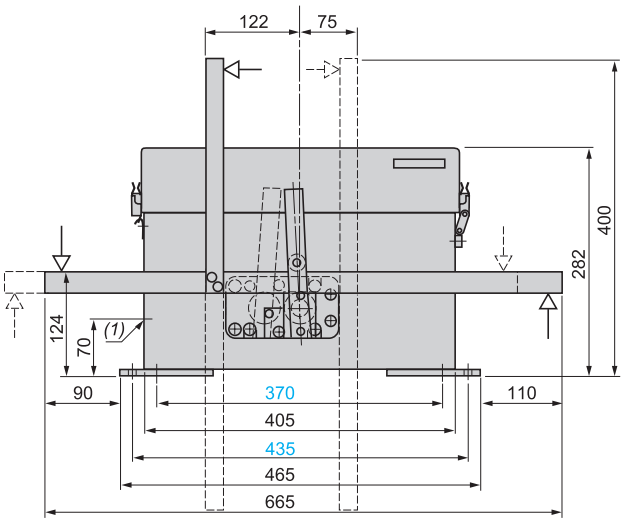
(1) 2 elongated holes Ø 6 x 8.5 (removable fixing lugs).
(2) 6 mm square rod, length 200 (can be mounted at 90°).
(3) 2 tapped entries for n° 21 cable gland.
13° = contact actuation, 75° = maximum travel.

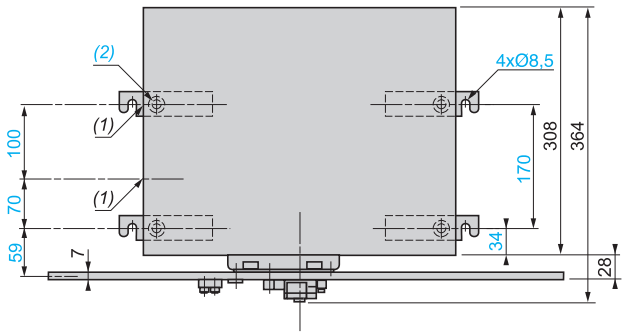
XF9D651



(1) 2 elongated holes Ø 6 x 8.5 (removable fixing lugs).
(2) 6 mm square rod, length 200 (can be mounted at 90°).
(3) 3 plain entries for n° 29 cable gland.
13° = contact actuation, 75° = maximum travel.

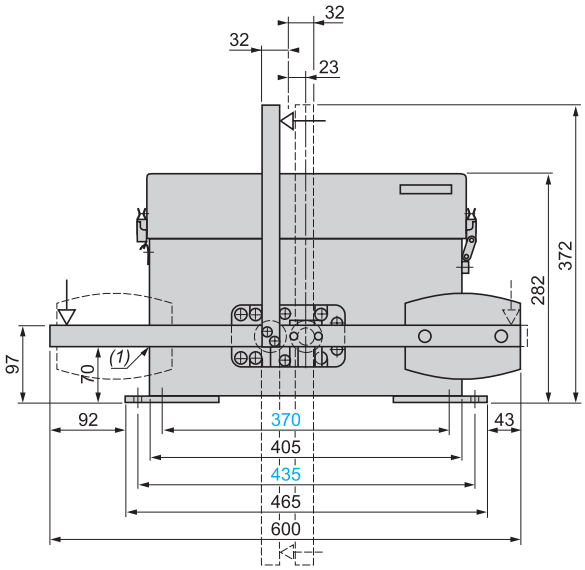
XF9F●●●1
Manual resetting

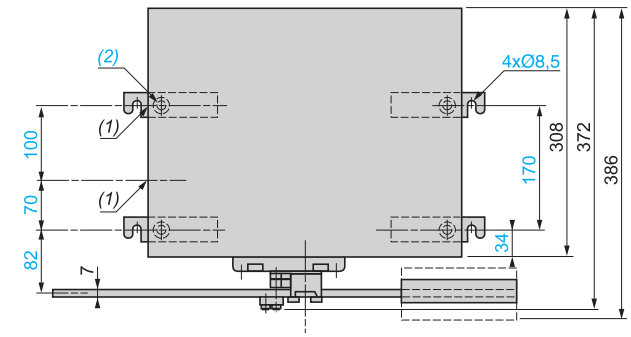




(1) 2 entries incorporating n° 36 plastic cable gland.
(2) 4 holes Ø 8.5 to be drilled by user (for attaching fixing lugs to enclosure base).

XF9F●●●2
Automatic resetting





(1) 2 entries incorporating n° 36 plastic cable gland.
(2) 4 holes Ø 8.5 to be drilled by user (for attaching fixing lugs to enclosure base).

Contents

2 - Electronic pressure sensors OsiSense XM

Selection guide . . . . . *page 2/2*

XMLK pressure transmitters

- Presentation. . . . . *page 2/12*
- References
  - Sizes in bar . . . . . *page 2/13*
  - Sizes in psi . . . . . *page 2/14*
  - Accessories . . . . . *page 2/15*

XMLG pressure transmitters, pressure and vacuum switches

- Presentation. . . . . *page 2/16*
- References
  - Transmetteurs de pression, à sortie analogique. Calibres en bar . . . . *page 2/17*
  - Pressostats et vacuostats . . . . . *page 2/20*
  - Accessoires de raccordement . . . . . *page 2/21*

XMLP pressure transmitters

- Presentation. . . . . *page 2/22*
- References
  - Pressure transmitters . . . . . *page 2/23*
    - Sizes in bar . . . . . *page 2/24*
    - Sizes in psi . . . . . *page 2/32*

ZMLP switches with 4-digit display

- Presentation. . . . . *page 2/38*
- References . . . . . *page 2/39*

XMLR pressure sensors with 4-digit display

- Presentation. . . . . *page 2/40*
- References
  - With analogue and solid-state outputs . . . . . *page 2/42*
  - Accessories . . . . . *page 2/47*

Electromechanical pressure and vacuum switches OsiSense XM

Selection guide . . . . . *page 2/48*

General . . . . . ***page 2/52***

Operating curves . . . . . ***page 2/56***

Electromechanical pressure and vacuum switches for control circuits

- Presentation. . . . . *page 2/62*
- References
  - Calibres de -1 bar à 500 bar . . . . . *pages 2/64 to 2/115*
- OsiSense XMLA, XMLB, XMLC et XMLD
  - Accessoires et éléments de rechange . . . . . *page 2/116*
- Matériaux des appareils en contact avec le fluide . . . . . *page 2/120*

ACW and ADW. For controlling the pressure of air, water, hydraulic oils and corrosive fluids

- Presentation. . . . . page 2/122
  - Sizes 0,07 to 131 bar . . . . . page 2/124
  - Sizes 69 to 340 bar. . . . . page 2/126

XMX. For controlling the pressure of air and water

- Presentation . . . . . page 2/130
  - Sizes 6 to 25 bar (87 to 362,5 psi) . . . . . page 2/132
  - Types XMX and XMA . . . . . page 2/134

2

XM for power circuits

- Presentation. . . . . page 2/136
- References
  - Types FTG . . . . . page 2/136
  - Types FSG . . . . . page 2/138
  - Types FYG . . . . . page 2/140

XM for XMP power circuits

- Presentation . . . . . page 2/14
- References
  - Type XMP, IP 54 . . . . . page 2/144
  - Size 12 bar (174 psi) . . . . . page 2/146
  - Size 25 bar (362,5 psi) . . . . . page 2/148
  - Type XMP, IP 65 . . . . . page 2/150
  - Accessories and replacement parts . . . . . page 2/152

Electronic pressure sensors
OsiSense XM

Applications	Type of installation	**Control circuits**
	Type of sensor and features	**Devices without display** **Pressure transmitters** **Analogue output, 4…20 mA or 0...10 V**

Sizes	0…25 bar (0…362 psi)	0... 300 psi (0... 20.7 bar)
Fluids or products controlled	Air, fresh water (0...+ 80°C)	
Fluid connection	G 1/4 A DIN 3852-E male *(1)*	1/4"-18 NPT male *(1)*
Rated supply voltage	12/24 V ⎓ (4…20 mA), 24 V ⎓ (0…10 V), SELV, PELV *(2)*	
Voltage limits	8…33 V ⎓ (4…20 mA), 16.2…33 V ⎓ (0…10 V)	
Current consumption	< 20 mA (4…20 mA), < 6 mA (0…10 V)	
Electrical connection	M12, EN 175301-803-A (ex-DIN 43650A) or Packard Metri-Pack 150 connector *(3)*	
Type of output	Analogue, 4…20 mA or 0…10 V	
Materials in contact with fluid	Ceramic Al_2O_3, stainless steel type AISI 303, nitrile (NBR)	
Output response time	< 2 ms	
Precision including linearity, hysteresis, repeat accuracy	± 1% of the measuring range	
Service life	> 10 million operating cycles	
Dimensions of case (mm) — Width x height x depth	Ø 36 x 67.5	
Conforming to standards	CE, ROHS, EN/IEC 61326-2-3	
Product certifications	UL, CSA conforming to UL 508 and CSA-22.2 no. 14, EAC, RCM	
Ambient air temperature for operation	0...+ 80°C	
Degree of protection	IP 65 conforming to EN/IEC 60529, NEMA Type 4 conforming to UL/CSA	
Vibration resistance	20 gn (9…2000 Hz) conforming to EN/IEC 60068-2-6	
Shock resistance	25 gn (half sine wave 11 ms) conforming to EN/IEC 60068-2-27	
Type reference	**XMLK•••B2C••, XMLK•••B2C••TQ** *(4)* **XMLK•••B2D••, XMLK•••B2D••TQ** *(4)* **XMLK•••P2C••, XMLK•••P2C••TQ** *(4)* **XMLK•••P2D••, XMLK•••P2D••TQ** *(4)* **XMLK•••P2P••, XMLK•••P2P••TQ** *(4)*	
Pages	2/13 and 2/14	

Other versions

(1) For other fluid connections, please consult our Customer Care Centre.
(2) Safety extra-low voltage, Protected extra-low voltage.
(3) For other electrical connections, please consult our Customer Care Centre.
(4) Sold in lots of 25, minimum order quantity 50.
(5) Phoenix Contact "Quickon" integrated connection.

Control circuits	
Devices without display	
Pressure transmitters **Analogue output, 4…20 mA or 0...10 V.**	**Pressure and vacuum switches** **Factory set switching thresholds** **Solid-state NPN or PNP output**

- 1…400 bar (- 14.5 psi…5800 psi)	
Fresh water (0…+ 125°C) Air, hydraulic oils, corrosive fluids (- 15…+ 125°C)	
G 1/4 A DIN 3852-E male or 1/4"-18 NPT male *(1)*	
12/24 V ⎓ (4…20 mA) 24 V ⎓ (0…10 V)	12/24 V ⎓
8…33 V ⎓ (4…20 mA) 11.4…33 V ⎓ (0…10 V)	8…33 V ⎓
< 20 mA	< 4 mA
M12 connector *(1)* or integrated quick connection *(5)*	
Analogue, 4…20 mA or 0…10 V	Solid-state, NPN or PNP, NC 150 mA, 12/24 V ⎓
Ceramic AL_2O_3, stainless steel type AISI 303, FPM (Viton) PPS (Leakage protection for P > 40 bar)	
< 2 ms	
± 0.3% of the measuring range	
> 10 million operating cycles	
Ø 22.8 x 58.1 (with M12 connector) Ø 22.8 x 66.1 (with quick connection)	
CE, ROHS, EN/IEC 61326-2-3	
UL, CSA conforming to UL 508 and CSA-22.2 no. 14, EAC	
- 15…+ 85 °C	
IP 66, IP 67 conforming to EN/IEC 60529, NEMA Type 4 conforming to UL/CSA	
20 gn (9…2000 Hz) conforming to EN/IEC 60068-2-6	
25 gn (half sine wave 11 ms) conforming to EN/IEC 60068-2-27	
XMLG●●●D21, XMLG●●●D71 **XMLG●●●D21TQ** *(4)* **XMLG●●●D71TQ** *(4)* **XMLG●●●Q21TQ** *(4)* **XMLG●●●Q71TQ** *(4)*	**XMLG●●●D31TQ** *(4)* **XMLG●●●D41TQ** *(4)* **XMLG●●●Q31TQ** *(4)* **XMLG●●●Q41TQ** *(4)*
2/17 to 2/21	

Electronic pressure sensors
OsiSense XM

2

Applications	Type of installation	**Control circuits**
	Type of sensor and features	**Devices without display** **Pressure transmitters** **Analogue output, 4…20 mA, 0...10 V or ratiometric output, 0.5...4.5 V**

Sizes		-1...0 bar, -1...5 bar (-14.5...72.5 psi), 0...6 bar (0...87 psi) -14.5...0 psi, -14.5...60 psi (-1...4.14 bar), 0...50 psi (0...3.45 bar)
Fluids or products controlled		Fresh water (0…+ 125 °C) Air, hydraulic oils (- 15…+ 125 °C)
Fluid connection		G 1/4 A DIN 3852-E male, 1/4"-18NPT male, SAE 7/16-20 UNF-2B female
Rated supply voltage		12/24 V ⎓ (4…20 mA), 24 V ⎓ (0…10 V), 5 V ⎓ (0.5…4.5 V), SELV, PELV *(1)*
Voltage limits		7…33 V ⎓ (4…20 mA), 12…33 V ⎓ (0…10 V), 4.5…5.5 V ⎓ (0.5…4.5 V)
Current consumption		< 23 mA (4…20 mA), < 7 mA (0…10 V and 0.5…4.5 V)
Electrical connection		M12 connector, EN 175301-803-A (ex DIN 43650A) connector, Packard Metri-Pack 150 connector or 2 m PVC cable
Type of output		Analogue, 4…20 mA , 0…10 V or 0.5…4.5 V
Materials in contact with fluid		Ceramic AL_2O_3, stainless steel type AISI 316L, FPM fluorocarbon
Output response time		< 2 ms at 92% of maximum deviation
Precision including linearity, hysteresis, repeat accuracy		± 0.5% of the measuring range (except for size 0.5 bar: ±1.5% and size 0.25 bar: ± 2%)
Service life		> 10 million operating cycles
Dimensions of case (mm)	Width x height x depth	Ø 26 x 32.3 (with M12 connector) Ø 26 x 55 (with EN 175301-803-A connector) Ø 26 x 49.2 (with Packard Metri-Pack 150 connector) Ø 26 x 57 (with cable)
Conforming to standards		CE, ROHS, EN/IEC 61326-2-3, NSF ANSI 61
Product certifications		cULus conforming to UL 61010-1 and CSA-C22.2 n° 61010-1, EAC, RCM
Ambient air temperature for operation		- 30…+ 85 °C
Degree of protection		IP 65 or IP 67 conforming to EN/IEC 60529 IP 69K conforming to DIN 40050 (versions with M12 connector)
Vibration resistance		20 gn (10…2000 Hz) conforming to EN/IEC 60068-2-64
Shock resistance		100 gn (half sine wave 11 ms) conforming to EN/IEC 60068-2-27
Type reference		**XMLP●●●●D●●F** **XMLP●●●●C●●F** **XMLP●●●●L●●F** **XMLP●●●R●●3F**
		XMLP●●●●D●●FQ *(2)* **XMLP●●●●C●●FQ** *(2)* **XMLP●●●●L●●FQ** *(2)* **XMLP●●●R●●3FQ** *(2)*
Pages		2/24 to 2/37
Other versions		*(1) Safety extra-low voltage, Protected extra-low voltage.* *(2) Sold in lots of 25.* *(3) Sold in lots of 40.*

Control circuits

Devices without display

Pressure transmitters
Analogue output, 4…20 mA, 0...10 V or ratiometric output, 0.5...4.5 V

- 1…9 bar (- 14.5…130 psi), 0…600 bar (0…8700 psi), 0…6,000 psi (0 bar…414 bar)	
Fresh water (0…+ 120°C) Air, hydraulic oils, refrigeration fluids (- 20…+ 120°C)	
G 1/4 A DIN 3852-E male (≤ 40 bar), G 1/4 A DIN 3852-A male (≥ 100 bar) SAE 7/16-20 UNF-2A male, SAE 7/16-20 UNF-2B female or 1/4"-18 NPT male	
12/24 V ⎓ (4…20 mA), 24 V ⎓ (0…10 V), 5 V ⎓ (0.5……4.5 V), SELV, PELV *(1)*	
8…30 V ⎓ (4…20 mA), 14…30 V ⎓ (0…10 V), 4.75…5.25 V ⎓ (0.5……4.5 V)	
< 20 mA (4…20 mA), < 10 mA (0…10 V), < 5 mA (0.5……4.5 V)	
M12, EN 175301-803-A (ex-DIN 43650A) or Packard Metri-Pack 150 connector	
Analogue, 4…20 mA , 0…10 V or 0.5…4.5 V	
17-4PH stainless steel, stainless steel type AISI 304, FKM fluorocarbon (Viton)	
< 5 ms at 90% of maximum deviation	
± 0.5% of the measuring range	
> 10 million operating cycles	
Ø 30 x 26 (with M12 connector) Ø 30 x 25 (with EN 175301-803-A connector) Ø 30 x 37 (with Packard Metri-Pack 150 connector)	
CE, ROHS, EN/IEC 61326-1	
cULus conforming to UL 61010-1 and CSA-C22.2 no. 61010-1, EAC, RCM	
- 30…+ 120 °C	
IP 65 or IP 67 conforming to EN/IEC 60529 IP 69K conforming to DIN 40050 (versions with M12 connector)	
20 gn (10…2000 Hz) conforming to EN/IEC 60068-2-64	
25 gn (half sine wave 11 ms) conforming to EN/IEC 60068-2-27	
XMLP•••B••1V **XMLP•••B•••** **XMLP•••P••3**	**XMLP•••B••1VQ** *(3)* **XMLP•••B•••Q** *(3)* **XMLP•••P••3Q** *(3)*
2/24 to 2/37	

Electronic pressure sensors
OsiSense XM

2

Applications	Type of installation	**Control circuits**
	Type reference and features	**Switches with 4-digit display** **- With an analogue output, 4…20 mA and a switching output, PNP or NPN type** **- With two PNP or NPN switching outputs**

Sizes	–	
Fluids or products controlled	–	
Fluid connection	–	
Display	7 segment/4-digit display. Pressure units in bar, psi or pascal. 41 display ranges can be selected, from -14.5 to 6000	
Rated supply voltage	24 V ⎓, SELV, PELV *(1)*	
Voltage limits	17…33 V ⎓	
Current consumption	≤ 50 mA	
Electrical connection	M12, 4-pin connector	
Type of output	■ Analogue, 4…20 mA + one switching output, PNP or NPN, 200 mA	■ 2 switching outputs, PNP or NPN, 200 mA
Materials in contact with fluid	–	
Output response time	≤ 3 ms	
Precision including linearity, hysteresis, repeat accuracy	± 1% of the measuring range	
Service life	> 10 million operating cycles	
Dimensions of case (mm) Width x height x depth	41 x 77 x 42	
Conforming to standards	CE, ROHS, EN/IEC 61000-6-2, EN/IEC 61000-6-4	
Product certifications	cULus conforming to UL 508 and CSA-C22.2 no. 14, EAC, RCM	
Ambient air temperature for operation	- 25...+ 70°C	
Degree of protection	IP 65 or IP 67 conforming to EN/IEC 60529, IP 69K conforming to DIN 40050	
Vibration resistance	5 gn (10…2000 Hz) conforming to EN/IEC 60068-2-6	
Shock resistance	25 gn conforming to EN/IEC 60068-2-27	
Type reference	**ZMLPA1●2S●**	**ZMLPA2●0SH**
Pages	2/39	

Other versions

(1) Safety extra-low voltage, Protected extra-low voltage.
(2) For other fluid connections, please consult our Customer Care Centre.

Control circuits	
Pressure transmitters with 4-digit display	**Pressure and vacuum switches with 4-digit display**
- With one analogue output, 4…20 mA or 0...10 V and one input for diagnosis	**- With one analogue output, 4…20 mA or 0…10 V and one switching output, PNP or NPN type** **- With two switching outputs, PNP or NPN type** **- With one analogue output, 4…20 mA, and two switching outputs, PNP or NPN type**

- 1…600 bar (- 14.5 psi…8700 psi)	
Fresh water (0…+ 80°C). Air, hydraulic oils, refrigeration fluids (- 20…+ 80°C)	
G 1/4 A DIN3852-Y female, 1/4"-18 NPT female or SAE 7/16-20 UNF female *(2)*	
7-segment/4-digit display. Pressure units in bar, psi or pascal. Signalling LED for the pressure unit and output state.	
24 V ⎓, SELV, PELV *(1)*	
17…33 V ⎓	
⩽ 50 mA	
M12, 4-pin connector	M12, 4 or 5-pin connector
■ Analogue, 4…20 mA or 0…10 V	■ Analogue, 4…20 mA or 0…10 V + one switching output, PNP or NPN, 250 mA ■ Two switching outputs, PNP or NPN, 250 mA ■ Analogue, 4...20 mA + two switching outputs, PNP or NPN, 250 mA
⩽ 40 bar: Ceramic AL_2O_3, stainless steel 316L, FPM fluorocarbon ⩾ 100 bar: Stainless steel 316L, FKM fluorocarbon (Viton)	
⩽ 10 ms	⩽ 10 ms (analogue output) ⩽ 5 ms (switching output)
± 1% of the measuring range	
> 10 million operating cycles	
41 x 93 x 42	
CE, ROHS, EN/IEC 61326-2-3, NFS ANSI 61	
cULus conforming to UL 61010-1 and CSA-C22.2 no. 61010-1, EAC, RCM	
- 20…+ 80°C	
IP 66, IP 67 conforming to EN/IEC 60529	
20 gn (10…2000 Hz) conforming to EN/IEC 60068-2-6	
50 gn conforming to EN/IEC 60068-2-27	
XMLR●●●G0●●● **XMLR●●●M0●●●**	**XMLR●●●G1●●●, XMLR●●●G2●●●** **XMLR●●●M1●●●, XMLR●●●M2●●●**
2/43 to 2/47	

Electronic pressure sensors
OsiSense XM
For control circuits

Functions

Electronic pressure sensors

The function of electronic pressure sensors is the control and measurement of pressure or vacuum levels in hydraulic or pneumatic systems.
Being electronic, the sensors have no mechanical moving parts.

Pressure transmitters

Pressure transmitters convert the pressure into an electrical signal which is proportional to the applied pressure.
Their high precision makes them suitable for all industrial applications requiring pressure/vacuum display, control or regulation.

Being very robust, they are equally suitable for applications involving high operating rates.

Pressure and vacuum switches

Electronic pressure switches and vacuum switches convert a change in pressure into a digital electrical signal when the switching points which have been set are reached.
They are distinguished from electromechanical pressure switches and vacuum switches by their very wide switching adjustment ranges.

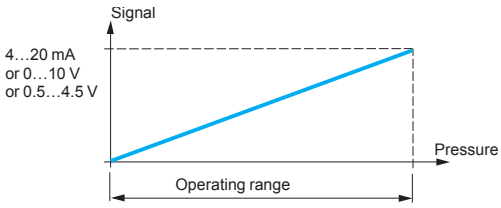
Their robustness, together with their excellent adherence to the set values over a period of time, make them ideal for applications involving high operating rates.
In addition, the high repeat accuracy and fast response time of these sensors make them equally suitable for applications requiring accurate pressure regulation and monitoring.

Note: Some sensors in the OsiSense XM ranges have both one analogue output and one or two digital outputs.

Operating principle

Pressure transmitters

These devices provide an analogue output which has a signal proportional to the pressure applied to the sensor. Depending on the model, this signal can be 4…20 mA, 0…10 V or ratiometric (0.5…4.5 V).



Pressure and vacuum switches

These devices have one or two digital outputs depending on the model. The status of these outputs is defined by high (SP) and low (rP) switching points which can usually be independently adjusted.

Pressure switches and vacuum switches can have 2 different switching modes:
- Hysteresis mode, particularly suited to pumping applications (filling/emptying).
- Window mode, more suitable for applications where the pressure is regulated.

The switching outputs can usually be configured as normally open (NO) or normally closed (NC).

In addition, for the OsiSense XMLR range *(1)*, output switching can be delayed for between 1 and 50 seconds, both on the pressure rising edge and falling edge.

(1) See pages 2/42 to 2/47.

Electronic pressure sensors

OsiSense XM

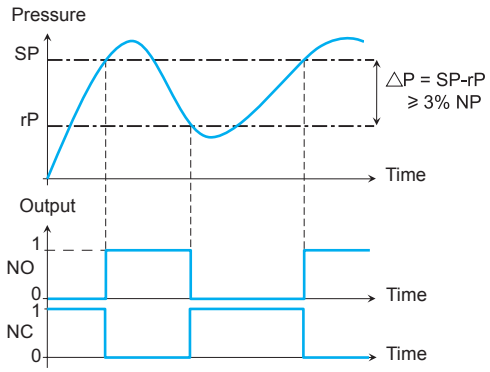
For control circuits

Operating principle (continued)

Pressure and vacuum switches (continued)

Switching output: hysteresis mode

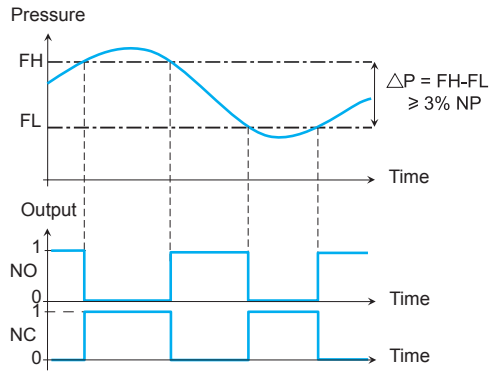
Hysteresis mode is generally used for pumping and/or emptying applications.



SP: High switching point
rP: Low switching point
NP: Nominal pressure

Switching output: Window mode

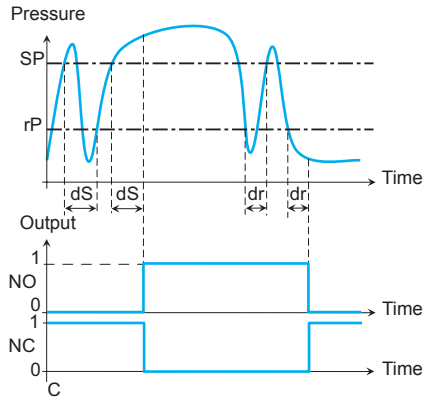
Window mode is generally used for pressure regulation applications.



FH: High switching point
FL: Low switching point
NP: Nominal pressure

Switching output: time delay mode

Time delay mode is generally used to filter fast transient pressures. The output only switches after a “dS” and “dr” time period which can be set between 0 and 50 seconds.



FH: High switching point
FL: Low switching point
NP: Nominal pressure

Electronic pressure sensors
OsiSense XM
For control circuits

Terminology

Nominal pressure NP or size
The nominal pressure is the maximum pressure or vacuum which can be measured by the sensor.

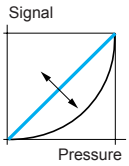
Maximum permissible accidental pressure
This is the maximum pressure, excluding pressure surges, to which the pressure sensor can occasionally be subjected without being damaged.

Destruction pressure
The pressure value which if exceeded is likely to cause serious damage to the sensor i.e. leaking, bursting, component failure, etc.

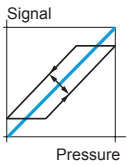
High switching point (SP)
This is the upper pressure setting selected on the pressure or vacuum switch at which the electrical output changes state when this pressure value is reached.

Low switching point (rP)
This is the lower pressure setting selected on the pressure or vacuum switch at which the electrical output changes state when this pressure value is reached.

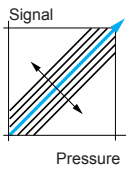
Precision
The sensor's overall precision is the result of several error sources linked to linearity, hysteresis, repeat accuracy and setting tolerances. It is expressed as a % of the nominal pressure.



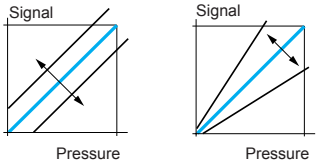
The linearity is the maximum deviation between the actual transmitter curve and the nominal curve.



The hysteresis is the maximum deviation between the rising pressure curve and the falling pressure curve.

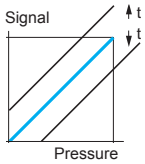


The repeat accuracy is the maximum drift encountered after several successive pressure variation cycles.

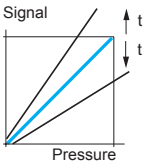


The setting tolerances are the calibration tolerances regarding the zero point and sensitivity set during sensor manufacture (gradient of output signal curve from the pressure transmitter).

Temperature drift
Although the pressure sensor is compensated electronically, its accuracy is still slightly influenced by the temperature to which it is subjected.



Zero point drift
This is proportional to the temperature and is expressed as % NP/°C.



Sensitivity drift
This is proportional to the temperature and is expressed as % NP/°C.

(NP: Nominal pressure)

Main criteria for selecting an electronic pressure sensor

The fluid or gas to be controlled

Our products, including the materials used, are compatible with the majority of fluids or gases encountered in industrial applications.

However some particularly corrosive fluids (sea water, for example) can affect product operation sooner or later.
The fluid temperature can also be an aggravating factor.

The materials in contact with the fluid are described in the technical data sheets which can be found on our website, www.tesensors.com.
If in doubt about compatibility, contact our Customer Care Centre.

The maximum pressure of the fluid to be controlled

The maximum pressure of the fluid to be controlled will determine the nominal pressure (or size) of the product to be used.
Our product ranges include a number of sizes which cover a pressure range from -1 to 600 bar.

It is advisable to choose a size just above the maximum pressure to be controlled, in order to have the best possible accuracy.

However, sometimes it is necessary to take account of transient pressure surges caused by the system operation (for example: the phenomenon of water hammer) and choose a size well above the maximum pressure to be controlled.

The fluid entry

There are a number of formats for the fluid and pneumatic connections.
Our ranges have the 3 most common types of fluid entry:
- G 1/4
- 1/4" - 18 NPT
- SAE 7/16-20UNF

The type and configuration of the electrical output(s)

Depending on the product range, each sensor reference has one, two or three outputs which may be analogue or digital.

It is important to clearly identify the function(s) the pressure sensor has to fulfil in the control system, in order to select the correct product.

The electrical connection

All products in the OsiSense XM ranges offer connection via an M12 x 1, 4 or 5-pin male cylindrical connector.

Some pressure transmitters also have an EN 175301-803-A or Packard Metri-Pack 150 connector.

We recommend connecting our pressure sensors by means of our OsiSense XZ cabling accessories.

Electronic pressure sensors

OsiSense XM

XMLK pressure transmitters
Plastic body, stainless steel 303 fluid entry.
With analogue output

Presentation

XMLK pressure transmitters are characterised by their ceramic pressure measuring cell.
The deformation caused by the pressure is transmitted to the resistors of a Wheatstone bridge screen-printed on the ceramic.
The change in resistance is then processed by the integrated electronics, giving an analogue output signal.

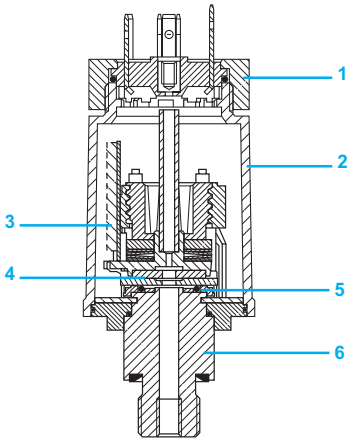
The stainless steel AISI 303 fluid entry and the ceramic cell combined with a nitrile gasket make these transmitters particularly suitable for fluids such as air and fresh water, for temperatures between 0 and + 80°C.

Depending on the model, these devices are supplied:

- With 12 or 24 V ⎓ nominal and operate from 8 to 33 V ⎓ for transmitters with 4…20 mA output
- With 24 V ⎓ nominal and operate from 11.4 to 33 V ⎓ for transmitters with a 0…10 V output

These products have IP 67 and Nema type 4 degree of protection.

In addition to their plastic case and the pressure ratings available, they constitute the optimised solution for water pumping applications.



Description

1 Electrical connection: M12 male, EN 175301-803-A or Packard Metri-Pack 150.
2 Plastic case.
3 Electronics: 4…20 mA or 0…10 V analogue output.
4 Ceramic pressure measuring cell.
5 Nitrile gasket.
6 Fluid entry: G 1/4 male or 1/4" - 18 NPT male.

Functions

Versions with an M12 electrical connector and 4…20 mA analogue output (XMLK●●●●2D2●) can be used with switches with ZMLP 4-digit display *(1)*.

The pressure ranges available are:

- 0...6 bar to 0...25 bar
- 0...100 psi to 0...300 psi

The selling in lots option offers an excellent price/performance ratio (sold individually or in lots of 25).

XMLK electronic pressure sensors are, therefore, mainly intended for machine manufacturers.

(1) See pages 2/48 and 2/39.

Electronic pressure sensors

OsiSense XM

XMLK pressure transmitters
Plastic body, stainless steel 303 fluid entry.
With analogue output. Sizes in bar

XMLK●●●B2D●1

XMLK●●●B2C●1

0 to 6 bar (0 to 87 psi)

Maximum permissible accidental pressure: 12 bar, destruction pressure: 18 bar

Analogue output type	Electrical connection	Reference *(1)*	Weight kg
G 1/4 A (male) fluid connection			
4…20 mA	M12	**XMLK006B2D21**	0.110
	EN 175301-803-A	**XMLK006B2C21** *(2)*	0.110
0…10 V	M12	**XMLK006B2D71**	0.110
	EN 175301-803-A	**XMLK006B2C71**	0.110

0 to 10 bar (0 to 145 psi)

Maximum permissible accidental pressure: 20 bar, destruction pressure: 30 bar

Analogue output type	Electrical connection	Reference *(1)*	Weight kg
G 1/4 A (male) fluid connection			
4…20 mA	M12	**XMLK010B2D21** *(2)*	0.110
	EN 175301-803-A	**XMLK010B2C21** *(2)*	0.110
0…10 V	M12	**XMLK010B2D71**	0.110
	EN 175301-803-A	**XMLK010B2C71**	0.110

0 to 16 bar (0 to 232 psi)

Maximum permissible accidental pressure: 32 bar, destruction pressure: 48 bar

Analogue output type	Electrical connection	Reference *(1)*	Weight kg
G 1/4 A (male) fluid connection			
4…20 mA	M12	**XMLK016B2D21**	0.110
	EN 175301-803-A	**XMLK016B2C21** *(2)*	0.110
0…10 V	M12	**XMLK016B2D71**	0.110
	EN 175301-803-A	**XMLK016B2C71**	0.110

0 to 25 bar (0 to 362.5 psi)

Maximum permissible accidental pressure: 50 bar, destruction pressure: 75 bar

Analogue output type	Electrical connection	Reference *(1)*	Weight kg
G 1/4 A (male) fluid connection			
4…20 mA	M12	**XMLK025B2D21** *(2)*	0.110
	EN 175301-803-A	**XMLK025B2C21** *(2)*	0.110
0…10 V	M12	**XMLK025B2D71**	0.110

(1) For other electrical or fluid connections, or types of output, please consult our Customer Care Centre.
(2) Sold in lots of 25. Add TQ to the end of the reference selected.
*Example: **XMLK006B2C21** becomes **XMLK006B2C21TQ**. Minimum quantity 50.*

Electronic pressure sensors

OsiSense XM

XMLK pressure transmitters
Plastic body, stainless steel 303 fluid entry.
With analogue output. Sizes in psi

XMLK●●0P2D●3

XMLK●●0P2C●3

XMLK●●0P2P●3

0 to 100 psi (0 to 6.9 bar)

Maximum permissible accidental pressure: 200 psi, destruction pressure: 300 psi

Analogue output type	Electrical connection	Reference *(1)*	Weight kg
1/4”- 18 NPT (male) fluid connection			
4…20 mA	M12	**XMLK100P2D23** *(2)*	0.110
	EN 175301-803-A	**XMLK100P2C23** *(2)*	0.110
	Packard Metri-Pack 150	**XMLK100P2P23** *(2)*	0.110
0…10 V	M12	**XMLK100P2D73**	0.110
	EN 175301-803-A	**XMLK100P2C73**	0.110

0 to 150 psi (0 to 10.3 bar)

Maximum permissible accidental pressure: 300 psi, destruction pressure: 450 psi

Analogue output type	Electrical connection	Reference *(1)*	Weight kg
1/4”- 18 NPT (male) fluid connection			
4…20 mA	M12	**XMLK150P2D23**	0.110
	EN 175301-803-A	**XMLK150P2C23**	0.110
	Packard Metri-Pack 150	**XMLK150P2P23**	0.110
0…10 V	M12	**XMLK150P2D73**	0.110
	EN 175301-803-A	**XMLK150P2C73**	0.110

0 to 200 psi (0 to 13.8 bar)

Maximum permissible accidental pressure: 400 psi, destruction pressure: 600 psi

Analogue output type	Electrical connection	Reference *(1)*	Weight kg
1/4”- 18 NPT (male) fluid connection			
4…20 mA	M12	**XMLK200P2D23**	0.110
	EN 175301-803-A	**XMLK200P2C23** *(2)*	0.110
	Packard Metri-Pack 150	**XMLK200P2P23**	0.110
0…10 V	M12	**XMLK200P2D73**	0.110
	EN 175301-803-A	**XMLK200P2C73**	0.110

0 to 300 psi (0 to 20.7 bar)

Maximum permissible accidental pressure: 600 psi, destruction pressure: 900 psi

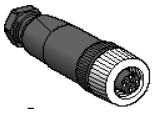
Analogue output type	Electrical connection	Reference *(1)*	Weight kg
1/4”- 18 NPT (male) fluid connection			
4…20 mA	M12	**XMLK300P2D23**	0.110
	EN 175301-803-A	**XMLK300P2C23** *(2)*	0.110
	Packard Metri-Pack 150	**XMLK300P2P23** *(2)*	0.110
0…10 V	M12	**XMLK300P2D73**	0.110
	EN 175301-803-A	**XMLK300P2C73**	0.110

(1) For other electrical or fluid connections, or types of output, please consult our Customer Care Centre.
(2) Sold in lots of 25. Add TQ to the end of the reference selected.
*Example: **XMLK200P2D23** becomes **XMLK200P2D23TQ**. Minimum quantity 50.*

Electronic pressure sensors

OsiSense XM

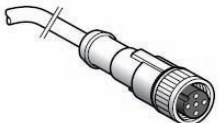
XMLK pressure transmitters
Accessories



XZCC12FDM40B

XZCC12FCM40B

XZCC43FCP40B



XZCP1141L10

XZCP1241L5

Connection accessories

Description	Type	Reference	Weight kg
M12 female connector metal clamping ring *(1)*	Straight	**XZCC12FDM40B**	0.020
	Elbowed	**XZCC12FCM40B**	0.020
Female connector EN 175301-803-A *(1)*	–	**XZCC43FCP40B**	0.035

Description	Length of cable	Reference	Weight kg
Pre-wired M12, straight, female connectors	2 m	**XZCP1141L2**	0.090
	5 m	**XZCP1141L5**	0.190
	10 m	**XZCP1141L10**	0.370
Pre-wired M12, elbowed, female connectors	2 m	**XZCP1241L2**	0.090
	5 m	**XZCP1241L5**	0.190
	10 m	**XZCP1241L10**	0.370

(1) Connector with screw terminal connections.

Electronic pressure sensors

OsiSense XM

XMLG pressure transmitters, pressure and vacuum switches. Metal body, stainless steel 303 fluid entry. With analogue or solid-state output.

Presentation

XMLG pressure transmitters and pressure switches are characterised by their ceramic pressure measuring cell.
The deformation caused by the pressure is transmitted to the resistors of a Wheatstone bridge screen-printed on the ceramic.

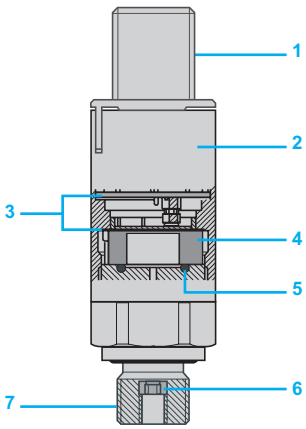
The change in resistance is then processed by the integrated electronics, giving either a digital or analogue output signal.

The stainless steel AISI 303 body and the ceramic cell combined with a viton gasket make these products compatible with industrial fluids such as:
- Air
- Fresh water
- Hydraulic oils

XMLG pressure sensors can control fluids from -15 to + 125°C.

Depending on the model, these sensors are supplied:
- With 12 or 24 V ⎓ nominal and operate from 8 to 33 V ⎓ for transmitters with 4…20 mA output, pressure and vacuum switches;
- With 24 V ⎓ nominal and operate from 11.4 to 33 V ⎓ for transmitters with a 0…10 V output.

Offered with IP 67 and Nema type 4 degree of protection, these compact products, which offer excellent EMC characteristics and typical precision better than 0,3 %, are particularly suitable for the most demanding industrial applications.



Description

1 Electrical connection: M12 male or quick connection for cable.
2 Metal case made of stainless steel 303.
3 Electronics with EMC protection.
4 Ceramic pressure measuring cell.
5 FPM (Viton) gasket.
6 Leakage protection (on sizes ⩾ 40 bar).
7 Fluid entry: G 1/4 male or 1/4" - 18 NPT male.

Functions

Pressure transmitters have an 4…20 mA or 0…10 V analogue output, which is proportional to the measuring range.
Versions with an M12 electrical connector and 4…20 mA analogue output (XMLG●●●D2●) can be used with switches with a 4-digit ZMLP display (1).

Pressure and vacuum switches have a solid-state NPN or PNP normally closed (NC) output. The upper and lower switching points can only be adjusted during manufacture. Neither the customer nor the end user can adjust them.
This makes the product extremely reliable during operation and avoids the product losing its settings throughout its operating life.

The pressure ranges offered are:
- - 1…0 bar
- 0…400 bar

An anti-leakage system integrated in products for pressures ⩾ 40 bar, prevents fluid leakage in the event of the measuring cell destruction pressure being exceeded.

Important ordering requirement

XMLG pressure transmitters are sold individually or in lots of 50. Pressure switches and vacuum switches are only sold in lots of 50.

Since the product is factory-set, please consult our Customer Care Centre before ordering, to specify the desired switching points.

(1) See pages 2/38 and 2/39.

Electronic pressure sensors

OsiSense XM
XMLG pressure transmitters
Metal body, stainless steel 303 fluid entry.
With analogue output. Sizes in bar

XMLG●●●D●●●

-1 to 0 bar (-14.5 to 0 psi)
Maximum permissible accidental pressure: 2.7 bar, destruction pressure: 3 bar

Analogue output type	Electrical connection	Reference *(1)*	Weight kg
G 1/4 A (male) fluid connection			
4…20 mA	M12	**XMLGM01D21** *(2)*	0.095
0…10 V	M12	**XMLGM01D71**	0.095
1/4"- 18 NPT (male) fluid connection			
4…20 mA	M12	**XMLGM01D23** *(2)*	0.095
0…10 V	M12	**XMLGM01D73TQ** *(3)*	0.095

0 to 1 bar (0 to 14.5 psi)
Maximum permissible accidental pressure: 2.7 bar, destruction pressure: 3 bar

Analogue output type	Electrical connection	Reference *(1)*	Weight kg
G 1/4 A (male) fluid connection			
4…20 mA	M12	**XMLG001D21** *(2)*	0.095
0…10 V	M12	**XMLG001D71** *(2)*	0.095
Fluid connection 1/4"- 18 NPT (male)			
4…20 mA	M12	**XMLG001D23** *(2)*	0.095
0…10 V	M12	**XMLG001D73TQ** *(3)*	0.095

0 to 6 bar (0 to 87 psi)
Maximum permissible accidental pressure: 17.6 bar, destruction pressure: 20 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A (male) fluid connection			
4…20 mA	M12	**XMLG006D21**	0.095
0…10 V	M12	**XMLG006D71**	0.095
1/4"- 18 NPT (male) fluid connection			
4…20 mA	M12	**XMLG006D23**	0.095
0…10 V	M12	**XMLG006D73TQ** *(3)*	0.095

(1) For other electrical or fluid connections, or types of output, please contact our Customer Care Centre.
*(2) Sold in lots of 25. Minimum quantity 50. Add TQ to the end of the reference selected. Example: **XMLG001D21** becomes **XMLG001D21TQ**.*
(3) Sold only in lots of 25. Minimum quantity 50.

Electronic pressure sensors

OsiSense XM
XMLG pressure transmitters
Metal body, stainless steel 303 fluid entry.
With analogue output. Sizes in bar

XMLG●●●D●●●

XMLG●●●Q●●●

0 to 10 bar (0 to 145 psi)
Maximum permissible accidental pressure: 22 bar, destruction pressure: 25 bar

Analogue output type	Electrical connection	Reference (1)	Weight kg
G 1/4 A (male) fluid connection			
4…20 mA	M12	**XMLG010D21** (2)	0.095
	Integrated connection (4)	**XMLG010Q21TQ** (3)	0.095
0…10 V	M12	**XMLG010D71** (2)	0.095
	Integrated connection (4)	**XMLG010Q71TQ** (3)	0.095
1/4”- 18 NPT (male) fluid connection			
4…20 mA	M12	**XMLG010D23** (2)	0.095
0…10 V	M12	**XMLG010D73**	0.095

0 to 16 bar (0 to 232 psi)
Maximum permissible accidental pressure: 35.2 bar, destruction pressure: 40 bar

Analogue output type	Electrical connection	Reference (1)	Weight kg
G 1/4 A (male) fluid connection			
4…20 mA	M12	**XMLG016D21** (2)	0.095
0…10 V	M12	**XMLG016D71**	0.095
1/4”- 18 NPT (male) fluid connection			
4…20 mA	M12	**XMLG016D23**	0.095
0…10 V	M12	**XMLG010D73TQ** (3)	0.095

0 to 25 bar (0 to 362.5 psi)
Maximum permissible accidental pressure: 56 bar, destruction pressure: 62.5 bar

Analogue output type	Electrical connection	Reference (1)	Weight kg
G 1/4 A (male) fluid connection			
4…20 mA	M12	**XMLG025D21** (2)	0.095
	Integrated connection (4)	**XMLG025Q21TQ** (3)	0.095
0…10 V	M12	**XMLG025D71** (2)	0.095
1/4”- 18 NPT (male) fluid connection			
4…20 mA	M12	**XMLG025D23** (2)	0.095
0…10 V	M12	**XMLG025D73TQ** (3)	0.095

(1) For other electrical or fluid connections, or types of output, please consult our Customer Care Centre.
*(2) Sold in lots of 25. Minimum quantity 50. Add TQ to the end of the reference selected. Example: **XMLG001D21** becomes **XMLG001D21TQ**.*
(3) Sold only in lots of 25. Minimum quantity 50.
(4) Phoenix Contact “Quickon” type integrated quick connection.

Electronic pressure sensors

OsiSense XM

XMLG pressure transmitters
Metal body, stainless steel 303 fluid entry.
With analogue output. Sizes in bar

XMLG●●●D●●●

XMLG●●●Q●●●

0 to 100 bar (0 to 1450 psi)

Maximum permissible accidental pressure: 225 bar, destruction pressure: 250 bar

Analogue output type *(1)*	Electrical connection	Reference *(1)*	Weight kg
G 1/4 A (male) fluid connection			
4…20 mA	M12	**XMLG100D21**	0.095
	Integrated connection *(4)*	**XMLG100Q21TQ** *(3)*	0.095
0…10 V	M12	**XMLG100D71** *(2)*	0.095
1/4"- 18 NPT (male) fluid connection			
4…20 mA	M12	**XMLG100D23** *(2)*	0.095
0…10 V	M12	**XMLG100D73TQ** *(3)*	0.095

0 to 250 bar (0 to 3625 psi)

Maximum permissible accidental pressure: 560 bar, destruction pressure: 625 bar

Analogue output type	Electrical connection	Reference *(1)*	Weight kg
G 1/4 A (male) fluid connection			
4…20 mA	M12	**XMLG250D21** *(2)*	0.095
0…10 V	M12	**XMLG250D71** *(2)*	0.095
1/4"- 18 NPT (male) fluid connection			
4…20 mA	M12	**XMLG250D23**	0.095
0…10 V	M12	**XMLG250D73TQ** *(3)*	0.095

0 to 400 bar (0 to 5800 psi)

Maximum permissible accidental pressure: 800 bar, destruction pressure: 900 bar

Analogue output type	Electrical connection	Reference *(1)*	Weight kg
G 1/4 A (male) fluid connection			
4…20 mA	M12	**XMLG400D21** *(2)*	0.095
0…10 V	M12	**XMLG400D71** *(2)*	0.095
1/4"- 18 NPT (male) fluid connection			
4…20 mA	M12	**XMLG400D23**	0.095
0…10 V	M12	**XMLG400D73TQ** *(3)*	0.095

(1) For other electrical or fluid connections, or types of output, please consult our Customer Care Centre.
*(2) Sold in lots of 25. Minimum quantity 50. Add TQ to the end of the reference selected. Example: **XMLG001D21** becomes **XMLG001D21TQ**.*
(3) Sold only in lots of 25. Minimum quantity 50.
(4) Phoenix Contact "Quickon" type integrated quick connection.

Electronic pressure sensors

OsiSense XM

XMLG pressure and vacuum switches
Metal body, stainless steel 303 fluid entry.
With solid-state output. Sizes in bar

XMLG●●●D●1TQ

-1 to -0.08 bar (-14.5 to -1.16 psi)

Maximum permissible accidental pressure: 2.7 bar, destruction pressure: 3 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A (male) fluid connection			
NPN	M12	**XMLGM01D31TQ** *(1)*	0.095
PNP	M12	**XMLGM01D41TQ** *(1)*	0.095

0.08 to 1 bar (1.16 to 14.5 psi)

Maximum permissible accidental pressure: 2.7 bar, destruction pressure: 3 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A (male) fluid connection			
NPN	M12	**XMLG001D31TQ** *(1)*	0.095
PNP	M12	**XMLG001D41TQ** *(1)*	0.095

0.8 to 10 bar (11.6 to 145 psi)

Maximum permissible accidental pressure: 22 bar, destruction pressure: 25 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A (male) fluid connection			
NPN	M12	**XMLG010D31TQ** *(1)*	0.095
PNP	M12	**XMLG010D41TQ** *(1)*	0.095

2 to 25 bar (29 to 362.5 psi)

Maximum permissible accidental pressure: 56 bar, destruction pressure: 62.5 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A (male) fluid connection			
NPN	M12	**XMLG025D31TQ** *(1)*	0.095
PNP	M12	**XMLG025D41TQ** *(1)*	0.095

8 to 100 bar (116 to 1450 psi)

Maximum permissible accidental pressure: 225 bar, destruction pressure: 250 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A (male) fluid connection			
NPN	M12	**XMLG100D31TQ** *(1)*	0.095
PNP	M12	**XMLG100D41TQ** *(1)*	0.095

20 to 250 bar (290 to 3625 psi)

Maximum permissible accidental pressure: 560 bar, destruction pressure: 625 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A (male) fluid connection			
NPN	M12	**XMLG250D31TQ** *(1)*	0.095
PNP	M12	**XMLG250D41TQ** *(1)*	0.095

32 to 400 bar (464 to 5800 psi)

Maximum permissible accidental pressure: 800 bar, destruction pressure: 900 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A (male) fluid connection			
NPN	M12	**XMLG400D31TQ** *(1)*	0.095
PNP	M12	**XMLG400D41TQ** *(1)*	0.095

(1) Sold only in lots of 25. Minimum quantity 50.

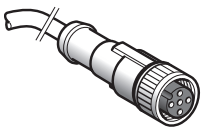
***Note**: Since the product is factory-set, please consult our Customer Care Centre before ordering, to specify the desired switching points.*

Electronic pressure sensors

OsiSense XM

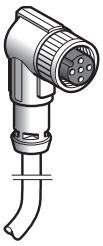
XMLG pressure transmitters, pressure and vacuum switches.
Accessories and replacement parts

563352



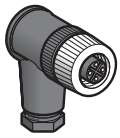
XZCP1141L●

503360



XZCP1241L●

532711



XZCC12FCM40B

532715

XMLGZ001

Connection accessories

Description		Length of cable m	Reference	Weight kg
M12 female connector, metal clamping ring *(1)*	Straight	–	**XZCC12FDM40B**	0.020
	Elbowed	–	**XZCC12FCM40B**	0.020
Pre-wired M12 female connectors	Straight	2	**XZCP1141L2**	0.090
		5	**XZCP1141L5**	0.190
		10	**XZCP1141L10**	0.370
	Elbowed	2	**XZCP1241L2**	0.090
		5	**XZCP1241L5**	0.190
		10	**XZCP1241L10**	0.370

Replacement part

Description	Sold in lots of	Unit reference	Weight kg
Quick connection *(2)*	10	**XMLGZ001**	0.025

(1) Connector with screw terminal connections.
(2) Phoenix Contact "Quickon" type connection.

Electronic pressure sensors

OsiSense XM

XMLP pressure transmitters
Compact metal body, stainless steel fluid entry
With analogue output

"Low pressure" transmitters.
AISI 316L stainless steel casing

"High pressure" transmitters.
AISI 304 stainless steel casing

Presentation

XMLP pressure transmitters rated at less than 9 bar or 100 psi

These transmitters integrate a ceramic pressure measuring cell. Ceramic technology has been used successfully for many years and offers a high level of sensitivity that is particularly suitable for measuring low pressures.

Ceramic also provides good resistance to abrasive fluids.
An internal fluorocarbon rubber gasket provides the seal between the ceramic measuring cell and the AISI 316L stainless steel casing.

Pressure transmitters can be used to measure the following types of pressure:
- air
- fresh water
- the majority of hydraulic oils

It is important, however, to ensure that the gasket is compatible with the fluid being controlled.

These transmitters can control fluids ranging in temperature from -15 to 125 °C.

Their power supply *(1)* depends on the type of analogue output:
- 5 V +/- 10% for the 0.5…4.5 V ratiometric output
- 12 or 24 V (nominal), operating from 7 to 33 V for the 4…20 mA output
- 24 V (nominal), operating from 12 to 33 V for the 0…10 V output

XMLP pressure transmitters rated greater than or equal to 9 bar or 100 psi

These transmitters integrate a "thin film" metal pressure measuring cell.
This measuring cell, which is welded directly onto the AISI 304 stainless steel transmitter body, offers the following advantages:
- An all-metal pressure chamber, with no elastomer gasket in contact with the fluid
- Compatibility with a large number of fluids:
  - air
  - fresh water
  - hydraulic oils
  - refrigeration fluids
  - all fluids or gases compatible with AISI 304 stainless steel

XMLP pressure transmitters can control fluids from -30 to 120 °C.

Their power supply *(1)* depends on the type of analog output:
- 5 V +/- 5% for the 0.5…4.5 V ratiometric output
- 12 or 24 V (nominal), operating from 8 to 30 V for the 4…20 mA output
- 24 V (nominal), operating from 14 to 30 V for the 0…10 V output

General characteristics

Made of stainless steel, XMLP pressure transmitters are compact and rugged.
Their degree of protection varies according to the type of connector:
- IP 65 for EN 175301-803-A connector versions
- IP 65 and IP 67 for Packard Metri-Pack connector versions
- IP 65, IP 67 and IP 69K for M12 connector versions

With typical precision better than 0.5% of the rating, these transmitters are particularly suitable for industrial applications such as:
- machine tools
- moulding presses
- stamping presses
- lifting gear
- HVAC systems (for ratings greater than or equal to 9 bar or 100 psi only)

(1) Use Safety Extra Low Voltage (SELV) or Protected Extra Low Voltage (PELV) power supply.

Electronic pressure sensors

OsiSense XM
XMLP pressure transmitters
Compact metal body, stainless steel fluid entry
With analogue output.

Functions

XMLP pressure transmitters have an analogue output which delivers a signal proportional to the measured pressure.
This output can be one of the following types:
- 4…20 mA
- 0…10 V
- 0.5…4.5 V ratiometric

The pressure ranges available are:
- vacuum measuring
  - -1…0 bar
  - -14.5…0 psi
- pressure measuring
  - 0…600 bar
  - 0…6,000 psi
- combined pressure measuring (vacuum and pressure)
  - -1…25 bar
  - -14.5…60 psi

The XMLP offer is available with three types of electrical connection:
- M12, 4-pin connector
- EN 175301-803-A (ex DIN 43650) connector
- Packard Metri-Pack 150 connector
- 2 m PVC cable

Several types of fluid connection are available:
- G1/4 A male
- 1/4”-18NPT male
- SAE 7/16-20UNF-2A male
- SAE 7/16-20UNF-2B female (with or without Schrader pin depending on the model)

Depending on the model, XMLP transmitters are sold:
- individually
- in lots of 25
- in lots of 40

Electronic pressure sensors

OsiSense XM

XMLP pressure transmitters
Compact metal body, 316L stainless steel fluid entry
With analogue output. Sizes in bar

PF151601

XMLP●●●GD●1F

PF151600

XMLP●●●GC●1F

PF151602

XMLP●●●GL●1F

-1 to 0 bar (-14.5 to 0 psi)

Maximum permissible accidental pressure: 3 bar, destruction pressure: 5 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-E (male) fluid connection			
4…20 mA	M12	**XMLPM00GD21F** *(1)*	0.080
	EN 175301-803-A	**XMLPM00GC21F** *(1)*	0.096
	2 m cable	**XMLPM00GL21F**	0.197
0…10 V	M12	**XMLPM00GD71F** *(1)*	0.080
	EN 175301-803-A	**XMLPM00GC71F** *(1)*	0.096
	2 m cable	**XMLPM00GL71F**	0.197
0.5…4.5 V ratiometric	M12	**XMLPM00GD11F**	0.080
	EN 175301-803-A	**XMLPM00GC11F**	0.096
SAE 7/16-20UNF-2B (female) fluid connection			
4…20 mA	M12	**XMLPM00GD2BF**	0.080
	EN 175301-803-A	**XMLPM00GC2BF**	0.096
0…10 V	M12	**XMLPM00GD7BF**	0.080
	EN 175301-803-A	**XMLPM00GC7BF**	0.096

-1 to 1 bar (-14.5 to 14.5 psi)

Maximum permissible accidental pressure: 3 bar, destruction pressure: 5 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-E (male) fluid connection			
4…20 mA	M12	**XMLPM01GD21F** *(1)*	0.080
	EN 175301-803-A	**XMLPM01GC21F** *(1)*	0.096
0…10 V	M12	**XMLPM01GD71F**	0.080
	EN 175301-803-A	**XMLPM01GC71F**	0.096

-1 to 5 bar (-14.5 to 72.6 psi)

Maximum permissible accidental pressure: 18 bar, destruction pressure: 24 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-E (male) fluid connection			
4…20 mA	M12	**XMLPM05GD21F** *(1)*	0.080
	EN 175301-803-A	**XMLPM05GC21F** *(1)*	0.096
0…10 V	M12	**XMLPM05GD71F**	0.080
	EN 175301-803-A	**XMLPM05GC71F**	0.096

(1) Sold in lots of 25: add the letter Q to the end of the selected reference.
*For example, **XMLPM00GD21F** becomes **XMLPM00GD21FQ**.*

Electronic pressure sensors

OsiSense XM

XMLP pressure transmitters
Compact metal body, 304 stainless steel fluid entry
With analogue output. Sizes in bar

PF120706

XMLP●●●BD●1V

PF120700

XMLP●●●BC●1V

-1 to 9 bar (-14.5 to 130 psi)

Maximum permissible accidental pressure: 20 bar, destruction pressure: 100 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-E (male) fluid connection			
4…20 mA	M12	**XMLPM09BD21V** *(1)*	0.050
	EN 175301-803-A	**XMLPM09BC21V**	0.050
0…10 V	M12	**XMLPM09BD71V** *(1)*	0.050
	EN 175301-803-A	**XMLPM09BC71V**	0.050
0.5…4.5 V ratiometric	M12	**XMLPM09BD11V**	0.050

-1 to 25 bar (-14.5 to 362.5 psi)

Maximum permissible accidental pressure: 50 bar, destruction pressure: 200 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-E (male) fluid connection			
4…20 mA	M12	**XMLPM25BD21V**	0.050

(1) Sold in lots of 40: add the letter Q to the end of the selected reference.
*For example, **XMLPM09BD21V** becomes **XMLPM09BD21VQ**.*

Electronic pressure sensors

OsiSense XM

XMLP pressure transmitters
Compact metal body, 316L stainless steel fluid entry
With analogue output. Sizes in bar

PF151601

XMLP●●●●D●1F

PF151600

XMLP●●●●C●1F

PF151602

*XMLP*001GL●*1F*

PF151603

XMLP001GC●BF

PF151604

XMLP001GD●BF

0 to 0.25 bar (0 to 3.63 psi)

Maximum permissible accidental pressure: 3 bar, destruction pressure: 5 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-E (male) fluid connection			
4…20 mA	M12	**XMLP250MD21F** *(1)*	0.080
	EN 175301-803-A	**XMLP250MC21F** *(1)*	0.096
0…10 V	M12	**XMLP250MD71F** *(1)*	0.080
	EN 175301-803-A	**XMLP250MC71F** *(1)*	0.096
0.5…4.5 V ratiometric	M12	**XMLP250MD11F**	0.080
	EN 175301-803-A	**XMLP250MC11F**	0.096

0 to 0.5 bar (0 to 7.26 psi)

Maximum permissible accidental pressure: 3 bar, destruction pressure: 5 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-E (male) fluid connection			
4…20 mA	M12	**XMLP500MD21F** *(1)*	0.080
	EN 175301-803-A	**XMLP500MC21F** *(1)*	0.096
0…10 V	M12	**XMLP500MD71F** *(1)*	0.080
	EN 175301-803-A	**XMLP500MC71F** *(1)*	0.096
0.5…4.5 V ratiometric	M12	**XMLP500MD11F**	0.080
	EN 175301-803-A	**XMLP500MC11F**	0.096

0 to 1 bar (0 to 14.5 psi)

Maximum permissible accidental pressure: 3 bar, destruction pressure: 5 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-E (male) fluid connection			
4…20 mA	M12	**XMLP001GD21F** *(1)*	0.080
	EN 175301-803-A	**XMLP001GC21F** *(1)*	0.096
	2 m cable	**XMLP001GL21F**	0.197
0…10 V	M12	**XMLP001GD71F** *(1)*	0.080
	EN 175301-803-A	**XMLP001GC71F** *(1)*	0.096
	2 m cable	**XMLP001GL71F**	0.197
0.5…4.5 V ratiometric	M12	**XMLP001GD11F** *(1)*	0.080
	EN 175301-803-A	**XMLP001GC11F**	0.096
SAE 7/16-20UNF-2B (female) fluid connection			
4…20 mA	M12	**XMLP001GD2BF**	0.080
	EN 175301-803-A	**XMLP001GC2BF**	0.096
0…10 V	M12	**XMLP001GD7BF**	0.080
	EN 175301-803-A	**XMLP001GC7BF**	0.096

(1) Sold in lots of 25: add the letter Q to the end of the selected reference.
*For example, **XMLP250MD21F** becomes **XMLP250MD21FQ**.*

Electronic pressure sensors

OsiSense XM

XMLP pressure transmitters
Compact metal body, 316L stainless steel fluid entry
With analogue output. Sizes in bar

PF151601

XMLP●●●●D●1F

PF151600

XMLP●●●●C●1F

PF151602

XMLP●●●GL●1F

0 to 2.5 bar (0 to 36.3 psi)

Maximum permissible accidental pressure: 7.5 bar, destruction pressure: 10 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-E (male) fluid connection			
4…20 mA	M12	**XMLP2D5GD21F** *(1)*	0.080
	EN 175301-803-A	**XMLP2D5GC21F** *(1)*	0.096
	2 m cable	**XMLP2D5GL21F**	0.197
0…10 V	M12	**XMLP2D5GD71F** *(1)*	0.080
	EN 175301-803-A	**XMLP2D5GC71F** *(1)*	0.096
	2 m cable	**XMLP2D5GL71F**	0.197
0.5…4.5 V ratiometric	M12	**XMLP2D5GD11F**	0.080
	EN 175301-803-A	**XMLP2D5GC11F**	0.096

0 to 4 bar (0 to 58 psi)

Maximum permissible accidental pressure: 12 bar, destruction pressure: 16 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-E (male) fluid connection			
4…20 mA	M12	**XMLP004GD21F** *(1)*	0.080
	EN 175301-803-A	**XMLP004GC21F** *(1)*	0.096
0…10 V	M12	**XMLP004GD71F** *(1)*	0.080
	EN 175301-803-A	**XMLP004GC71F** *(1)*	0.096
0.5…4.5 V ratiometric	M12	**XMLP004GD11F**	0.080
	EN 175301-803-A	**XMLP004GC11F**	0.096

0 to 6 bar (0 to 87 psi)

Maximum permissible accidental pressure: 18 bar, destruction pressure: 24 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-E (male) fluid connection			
4…20 mA	M12	**XMLP006GD21F** *(1)*	0.080
	EN 175301-803-A	**XMLP006GC21F** *(1)*	0.096
	2 m cable	**XMLP006GL21F**	0.197
0…10 V	M12	**XMLP006GD71F** *(1)*	0.080
	EN 175301-803-A	**XMLP006GC71F** *(1)*	0.096
	2 m cable	**XMLP006GL71F**	0.197
0.5…4.5 V ratiometric	M12	**XMLP006GD11F** *(1)*	0.080
	EN 175301-803-A	**XMLP006GC11F**	0.096

(1) Sold in lots of 25: add the letter Q to the end of the selected reference.
*For example, **XMLP004GD71F** becomes **XMLP004GD71FQ**.*

Electronic pressure sensors

OsiSense XM

XMLP pressure transmitters
Compact metal body, 304 stainless steel fluid entry
With analogue output. Sizes in bar

PF120706

XMLP●●●BD●1V

PF120700

XMLP●●●BC●1V

PF120708

XMLP●●●BD●7

PF120710

XMLP●●●BC●7

PF120703

XMLP●●●BD●9

PF120709

XMLP●●●BC●9

0 to 10 bar (0 to 145 psi)

Maximum permissible accidental pressure: 20 bar, destruction pressure: 100 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-E (male) fluid connection			
4…20 mA	M12	**XMLP010BD21V** *(1)*	0.050
	EN 175301-803-A	**XMLP010BC21V** *(1)*	0.050
0…10 V	M12	**XMLP010BD71V** *(1)*	0.050
	EN 175301-803-A	**XMLP010BC71V** *(1)*	0.050
0.5…4.5 V ratiometric	M12	**XMLP010BD11V**	0.050
	EN 175301-803-A	**XMLP010BC11V**	0.050
SAE 7/16-20UNF-2A (male) fluid connection			
4…20 mA	M12	**XMLP010BD27**	0.050
	EN 175301-803-A	**XMLP010BC27**	0.050
SAE 7/16-20UNF-2B (female with Schrader pin) fluid connection			
4…20 mA	M12	**XMLP010BD29** *(1)*	0.050
	EN 175301-803-A	**XMLP010BC29**	0.050
0…10 V	M12	**XMLP010BD79**	0.050
	EN 175301-803-A	**XMLP010BC79**	0.050
0.5…4.5 V ratiometric	M12	**XMLP010BD19**	0.050

0 to 16 bar (0 to 232 psi)

Maximum permissible accidental pressure: 32 bar, destruction pressure: 160 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-E (male) fluid connection			
4…20 mA	M12	**XMLP016BD21V** *(1)*	0.050
	EN 175301-803-A	**XMLP016BC21V** *(1)*	0.050
0…10 V	M12	**XMLP016BD71V** *(1)*	0.050
	EN 175301-803-A	**XMLP016BC71V** *(1)*	0.050
0.5…4.5 V ratiometric	M12	**XMLP016BD11V**	0.050
	EN 175301-803-A	**XMLP016BC11V**	0.050
SAE 7/16-20UNF-2A (male) fluid connection			
4…20 mA	M12	**XMLP016BD27**	0.050
	EN 175301-803-A	**XMLP016BC27**	0.050
SAE 7/16-20UNF-2B (female with Schrader pin) fluid connection			
4…20 mA	M12	**XMLP016BD29**	0.050
	EN 175301-803-A	**XMLP016BC29**	0.050
0…10 V	M12	**XMLP016BD79** *(1)*	0.050
0.5…4.5 V ratiometric	M12	**XMLP016BD19**	0.050

(1) Sold in lots of 40: add the letter Q to the end of the selected reference.
*For example, **XMLP016BD21V** becomes **XMLP016BD21VQ**.*

Electronic pressure sensors

OsiSense XM

XMLP pressure transmitters
Compact metal body, 304 stainless steel fluid entry
With analogue output. Sizes in bar

PF120706

XMLP●●●BD●1V

PF120700

XMLP●●●BC●1V

PF120708

XMLP●●●BD●7

PF120710

XMLP●●●BC●7

PF120703

XMLP●●●BD●9

PF120709

XMLP●●●BC●9

0 to 25 bar (0 to 362.5 psi)

Maximum permissible accidental pressure: 50 bar, destruction pressure: 200 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-E (male) fluid connection			
4…20 mA	M12	**XMLP025BD21V**	0.050
	EN 175301-803-A	**XMLP025BC21V** *(1)*	0.050
0…10 V	M12	**XMLP025BD71V** *(1)*	0.050
	EN 175301-803-A	**XMLP025BC71V**	0.050
0.5…4.5 V ratiometric	M12	**XMLP025BD11V**	0.050
	EN 175301-803-A	**XMLP025BC11V**	0.050
SAE 7/16-20UNF-2A (male) fluid connection			
4…20 mA	M12	**XMLP025BD27**	0.050
	EN 175301-803-A	**XMLP025BC27**	0.050
0…10 V	M12	**XMLP025BD77**	0.050
SAE 7/16-20UNF-2B (female with Schrader pin) fluid connection			
4…20 mA	M12	**XMLP025BD29**	0.050
	EN 175301-803-A	**XMLP025BC29**	0.050
0…10 V	M12	**XMLP025BD79**	0.050

0 to 40 bar (0 to 580 psi)

Maximum permissible accidental pressure: 80 bar, destruction pressure: 320 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-E (male) fluid connection			
4…20 mA	M12	**XMLP040BD21V** *(1)*	0.050
	EN 175301-803-A	**XMLP040BC21V** *(1)*	0.050
0…10 V	M12	**XMLP040BD71V**	0.050
	EN 175301-803-A	**XMLP040BC71V**	0.050
0.5…4.5 V ratiometric	M12	**XMLP040BD11V**	0.050
	EN 175301-803-A	**XMLP040BC11V**	0.050
SAE 7/16-20UNF-2A (male) fluid connection			
4…20 mA	M12	**XMLP040BD27**	0.050
	EN 175301-803-A	**XMLP040BC27**	0.050
SAE 7/16-20UNF-2B (female with Schrader pin) fluid connection			
4…20 mA	M12	**XMLP040BD29** *(1)*	0.050
	EN 175301-803-A	**XMLP040BC29**	0.050
0…10 V	M12	**XMLP040BD79**	0.050
0.5…4.5 V ratiometric	M12	**XMLP040BD19**	0.050

(1) Sold in lots of 40: add the letter Q to the end of the selected reference.
*For example, **XMLP040BD21V** becomes **XMLP040BD21VQ**.*

Electronic pressure sensors

OsiSense XM

XMLP pressure transmitters
Compact metal body, 304 stainless steel fluid entry
With analogue output. Sizes in bar

PF120706

XMLP060BD●1V
XMLP100BD●2

PF120700

XMLP060BC●1V
XMLP100BC●2

PF120708

XMLP060BD●7

PF120710

XMLP060BC●7

PF120703

XMLP060BD●9

PF120709

XMLP060BC●9

0 to 60 bar (0 to 870 psi)

Maximum permissible accidental pressure: 120 bar, destruction pressure: 480 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-E (male) fluid connection			
4…20 mA	M12	**XMLP060BD21V** *(1)*	0.050
	EN 175301-803-A	**XMLP060BC21V**	0.050
0…10 V	M12	**XMLP060BD71V**	0.050
	EN 175301-803-A	**XMLP060BC71V** *(1)*	0.050
0.5…4.5 V ratiometric	M12	**XMLP060BD11V**	0.050
	EN 175301-803-A	**XMLP060BC11V**	0.050
SAE 7/16-20UNF-2A (male) fluid connection			
4…20 mA	M12	**XMLP060BD27**	0.050
SAE 7/16-20UNF-2B (female with Schrader pin) fluid connection			
4…20 mA	M12	**XMLP060BD29**	0.050
	EN 175301-803-A	**XMLP060BC29**	0.050
0…10 V	M12	**XMLP060BD79** *(1)*	0.050

0 to 100 bar (0 to 1450 psi)

Maximum permissible accidental pressure: 200 bar, destruction pressure: 600 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-A (male) fluid connection			
4…20 mA	M12	**XMLP100BD22**	0.050
	EN 175301-803-A	**XMLP100BC22**	0.050
0…10 V	M12	**XMLP100BD72** *(1)*	0.050
	EN 175301-803-A	**XMLP100BC72**	0.050
0.5…4.5 V ratiometric	M12	**XMLP100BD12**	0.050
	EN 175301-803-A	**XMLP100BC12**	0.050

(1) Sold in lots of 40: add the letter Q to the end of the selected reference.
*For example, **XMLP060BD21V** becomes **XMLP060BD21VQ**.*

Electronic pressure sensors

OsiSense XM

XMLP pressure transmitters
Compact metal body, 304 stainless steel fluid entry
With analogue output. Sizes in bar

PF120706

XMLP●●0BD●2

PF120700

XMLP●●●BD●2

0 to 160 bar (0 to 2320 psi)

Maximum permissible accidental pressure: 320 bar, destruction pressure: 960 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-A (male) fluid connection			
4…20 mA	M12	**XMLP160BD22**	0.050
	EN 175301-803-A	**XMLP160BC22**	0.050
0…10 V	M12	**XMLP160BD72**	0.050
	EN 175301-803-A	**XMLP160BC72**	0.050
0.5…4.5 V ratiometric	M12	**XMLP160BD12**	0.050

0 to 250 bar (0 to 3625 psi)

Maximum permissible accidental pressure: 500 bar, destruction pressure: 1000 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-A (male) fluid connection			
4…20 mA	M12	**XMLP250BD22** *(1)*	0.050
	EN 175301-803-A	**XMLP250BC22**	0.050
0…10 V	M12	**XMLP250BD72** *(1)*	0.050
	EN 175301-803-A	**XMLP250BC72** *(1)*	0.050
0.5…4.5 V ratiometric	M12	**XMLP250BD12**	0.050
	EN 175301-803-A	**XMLP250BC12**	0.050

0 to 400 bar (0 to 5800 psi)

Maximum permissible accidental pressure: 800 bar, destruction pressure: 1600 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-A (male) fluid connection			
4…20 mA	M12	**XMLP400BD22** *(1)*	0.050
	EN 175301-803-A	**XMLP400BC22** *(1)*	0.050
0…10 V	M12	**XMLP400BD72**	0.050
	EN 175301-803-A	**XMLP400BC72** *(1)*	0.050
0.5…4.5 V ratiometric	M12	**XMLP400BD12**	0.050
	EN 175301-803-A	**XMLP400BC12**	0.050

0 to 600 bar (0 to 8700 psi)

Maximum permissible accidental pressure: 1200 bar, destruction pressure: 2400 bar

Analogue output type	Electrical connection	Reference	Weight kg
G 1/4 A DIN 3852-A (male) fluid connection			
4…20 mA	M12	**XMLP600BD22**	0.050
	EN 175301-803-A	**XMLP600BC22**	0.050
0…10 V	M12	**XMLP600BD72**	0.050
	EN 175301-803-A	**XMLP600BC72** *(1)*	0.050
0.5…4.5 V ratiometric	M12	**XMLP600BD12**	0.050

(1) Sold in lots of 40: add the letter Q to the end of the selected reference.
*For example, **XMLP250BD22** becomes **XMLP250BD22Q**.*

Electronic pressure sensors

OsiSense XM

XMLP pressure transmitters
Compact metal body, 316L stainless steel fluid entry
With analogue output. Sizes in psi

PF151605

*XMLP●●●*RD●3F

PF151606

*XMLP●●●*RC●3F

PF151607

*XMLP●●●*RP●3F

-14.5 to 0 psi (-1 to 0 bar)

Maximum permissible accidental pressure: 44 psi, destruction pressure: 73 psi

Analogue output type	Electrical connection	Reference	Weight kg
1/4" - 18NPT (male) fluid connection			
4…20 mA	M12	**XMLPM00RD23F** *(1)*	0.078
	EN 175301-803-A	**XMLPM00RC23F**	0.094
	Packard Metri-Pack 150	**XMLPM00RP23F**	0.080
0…10 V	M12	**XMLPM00RD73F** *(1)*	0.078
	EN 175301-803-A	**XMLPM00RC73F**	0.094
	Packard Metri-Pack 150	**XMLPM00RP73F**	0.080
0.5…4.5 V ratiometric	M12	**XMLPM00RD13F**	0.078
	EN 175301-803-A	**XMLPM00RC13F**	0.094
	Packard Metri-Pack 150	**XMLPM00RP13F**	0.080

-14.5 to 15 psi (-1 to 1.03 bar)

Maximum permissible accidental pressure: 44 psi, destruction pressure: 73 psi

Analogue output type	Electrical connection	Reference	Weight kg
1/4" - 18NPT (male) fluid connection			
4…20 mA	M12	**XMLPM15RD23F** *(1)*	0.078
	EN 175301-803-A	**XMLPM15RC23F**	0.094
	Packard Metri-Pack 150	**XMLPM15RP23F** *(1)*	0.080
0…10 V	M12	**XMLPM15RD73F** *(1)*	0.078

-14.5 to 60 psi (-1 to 4.14 bar)

Maximum permissible accidental pressure: 260 psi, destruction pressure: 350 psi

Analogue output type	Electrical connection	Reference	Weight kg
1/4" - 18NPT (male) fluid connection			
4…20 mA	M12	**XMLPM60RD23F** *(1)*	0.078
	EN 175301-803-A	**XMLPM60RC23F**	0.094
	Packard Metri-Pack 150	**XMLPM60RP23F**	0.080
0…10 V	M12	**XMLPM60RD73F** *(1)*	0.078

(1) Sold in lots of 25: add the letter Q to the end of the selected reference.
*For example, **XMLPM00RD23F** becomes **XMLPM00RD23FQ**.*

Electronic pressure sensors

OsiSense XM

XMLP pressure transmitters
Compact metal body, 316L stainless steel fluid entry
With analogue output. Sizes in psi

PF151605

XMLP●●●RD●3F

PF151606

XMLP●●●RC●3F

PF151607

XMLP●●●RP●3F

0 to 15 psi (0 to 1.03 bar)

Maximum permissible accidental pressure: 44 psi, destruction pressure: 73 psi

Analogue output type	Electrical connection	Reference	Weight kg
1/4" - 18NPT (male) fluid connection			
4…20 mA	M12	**XMLP015RD23F** *(1)*	0.078
	EN 175301-803-A	**XMLP015RC23F**	0.094
	Packard Metri-Pack 150	**XMLP015RP23F**	0.080
0…10 V	M12	**XMLP015RD73F** *(1)*	0.078
	EN 175301-803-A	**XMLP015RC73F**	0.094
	Packard Metri-Pack 150	**XMLP015RP73F**	0.080

0 to 30 psi (0 to 2.07 bar)

Maximum permissible accidental pressure: 109 psi, destruction pressure: 145 psi

Analogue output type	Electrical connection	Reference	Weight kg
1/4" - 18NPT (male) fluid connection			
4…20 mA	M12	**XMLP030RD23F** *(1)*	0.078
	EN 175301-803-A	**XMLP030RC23F**	0.094
	Packard Metri-Pack 150	**XMLP030RP23F**	0.080
0…10 V	M12	**XMLP030RD73F** *(1)*	0.078
	EN 175301-803-A	**XMLP030RC73F**	0.094
	Packard Metri-Pack 150	**XMLP030RP73F**	0.080

0 to 50 psi (0 to 3.45 bar)

Maximum permissible accidental pressure: 174 psi, destruction pressure: 232 psi

Analogue output type	Electrical connection	Reference	Weight kg
1/4" - 18NPT (male) fluid connection			
4…20 mA	M12	**XMLP050RD23F** *(1)*	0.078
	EN 175301-803-A	**XMLP050RC23F**	0.094
	Packard Metri-Pack 150	**XMLP050RP23F**	0.080
0…10 V	M12	**XMLP050RD73F** *(1)*	0.078

0 to 100 psi (0 to 6.9 bar)

Maximum permissible accidental pressure: 260 psi, destruction pressure: 340 psi

Analogue output type	Electrical connection	Reference	Weight kg
1/4" - 18NPT (male) fluid connection			
4…20 mA	M12	**XMLP100RD23F**	0.078
0…10 V	M12	**XMLP100RD73F**	0.078

(1) Sold in lots of 25: add the letter Q to the end of the selected reference.
*For example, **XMLP030RD73F** becomes **XMLP030RD73FQ**.*

Electronic pressure sensors

OsiSense XM

XMLP pressure transmitters
Compact metal body, 304 stainless steel fluid entry
With analogue output. Sizes in psi

PF121705

XMLP●●●PD●3

PF121704

XMLP●●●PP●3

0 to 100 psi (0 to 6.9 bar)

Maximum permissible accidental pressure: 200 psi, destruction pressure: 1000 psi

Analogue output type	Electrical connection	Reference	Weight kg
1/4" - 18NPT (male) fluid connection			
4…20 mA	M12	**XMLP100PD23** *(1)*	0.050
	Packard Metri-Pack 150	**XMLP100PP23** *(1)*	0.050
0…10 V	M12	**XMLP100PD73**	0.050
	Packard Metri-Pack 150	**XMLP100PP73**	0.050
0.5…4.5 V ratiometric	M12	**XMLP100PD13**	0.050
	Packard Metri-Pack 150	**XMLP100PP13**	0.050

0 to 150 psi (0 to 10.3 bar)

Maximum permissible accidental pressure: 300 psi, destruction pressure: 1500 psi

Analogue output type	Electrical connection	Reference	Weight kg
1/4" - 18NPT (male) fluid connection			
4…20 mA	M12	**XMLP150PD23** *(1)*	0.050
	Packard Metri-Pack 150	**XMLP150PP23**	0.050
0…10 V	M12	**XMLP150PD73**	0.050
	Packard Metri-Pack 150	**XMLP150PP73**	0.050
0.5…4.5 V ratiometric	M12	**XMLP150PD13**	0.050

0 to 200 psi (0 to 13.8 bar)

Maximum permissible accidental pressure: 400 psi, destruction pressure: 2000 psi

Analogue output type	Electrical connection	Reference	Weight kg
1/4" - 18NPT (male) fluid connection			
4…20 mA	M12	**XMLP200PD23** *(1)*	0.050
	Packard Metri-Pack 150	**XMLP200PP23**	0.050
0…10 V	M12	**XMLP200PD73**	0.050
	Packard Metri-Pack 150	**XMLP200PP73**	0.050
0.5…4.5 V ratiometric	M12	**XMLP200PD13**	0.050

(1) Sold in lots of 40: add the letter Q to the end of the selected reference.
*For example, **XMLP150PD23** becomes **XMLP150PD23Q**.*

Electronic pressure sensors

OsiSense XM

XMLP pressure transmitters
Compact metal body, 304 stainless steel fluid entry
With analogue output. Sizes in psi

PF121705

XMLP●●●PD●3

PF121704

XMLP●●●PP●3

0 to 300 psi (0 to 20.7 bar)

Maximum permissible accidental pressure: 600 psi, destruction pressure: 2400 psi

Analogue output type	Electrical connection	Reference	Weight kg
1/4" - 18NPT (male) fluid connection			
4…20 mA	M12	**XMLP300PD23** *(1)*	0.050
	Packard Metri-Pack 150	**XMLP300PP23**	0.050
0…10 V	M12	**XMLP300PD73**	0.050
	Packard Metri-Pack 150	**XMLP300PP73**	0.050
0.5…4.5 V ratiometric	M12	**XMLP300PD13**	0.050
	Packard Metri-Pack 150	**XMLP300PP13**	0.050

0 to 600 psi (0 to 41.4 bar)

Maximum permissible accidental pressure: 1200 psi, destruction pressure: 4800 psi

Analogue output type	Electrical connection	Reference	Weight kg
1/4" - 18NPT (male) fluid connection			
4…20 mA	M12	**XMLP600PD23**	0.050
	Packard Metri-Pack 150	**XMLP600PP23** *(1)*	0.050
0.5…4.5 V ratiometric	M12	**XMLP600PD13**	0.050
	Packard Metri-Pack 150	**XMLP600PP13**	0.050

0 to 1000 psi (0 to 69 bar)

Maximum permissible accidental pressure: 2000 psi, destruction pressure: 6000 psi

Analogue output type	Electrical connection	Reference	Weight kg
1/4" - 18NPT (male) fluid connection			
4…20 mA	M12	**XMLP1K0PD23**	0.050
	Packard Metri-Pack 150	**XMLP1K0PP23**	0.050
0…10 V	M12	**XMLP1K0PD73**	0.050
	Packard Metri-Pack 150	**XMLP1K0PP73**	0.050
0.5…4.5 V ratiometric	M12	**XMLP1K0PD13**	0.050

(1) Sold in lots of 40: add the letter Q to the end of the selected reference.
*For example, **XMLP300PD23** becomes **XMLP300PD23Q**.*

Electronic pressure sensors

OsiSense XM

XMLP pressure transmitters
Compact metal body, 304 stainless steel fluid entry
With analogue output. Sizes in psi

PF121705

XMLP●●●PD●3

PF121704

XMLP●●●PP●3

0 to 2000 psi (0 to 138 bar)

Maximum permissible accidental pressure: 4000 psi, destruction pressure: 12,000 psi

Analogue output type	Electrical connection	Reference	Weight kg
1/4" - 18NPT (male) fluid connection			
4…20 mA	M12	**XMLP2K0PD23**	0.050
0…10 V	M12	**XMLP2K0PD73**	0.050
0.5…4.5 V ratiometric	M12	**XMLP2K0PD13**	0.050

0 to 3000 psi (0 to 207 bar)

Maximum permissible accidental pressure: 6000 psi, destruction pressure: 12,000 psi

Analogue output type	Electrical connection	Reference	Weight kg
1/4" - 18NPT (male) fluid connection			
4…20 mA	M12	**XMLP3K0PD23**	0.050
	Packard Metri-Pack 150	**XMLP3K0PP23**	0.050
0…10 V	M12	**XMLP3K0PD73** *(1)*	0.050
	Packard Metri-Pack 150	**XMLP3K0PP73**	0.050
0.5…4.5 V ratiometric	M12	**XMLP3K0PD13**	0.050

0 to 6000 psi (0 to 414 bar)

Maximum permissible accidental pressure: 11,600 psi, destruction pressure: 24,000 psi

Analogue output type	Electrical connection	Reference	Weight kg
1/4" - 18NPT (male) fluid connection			
4…20 mA	M12	**XMLP6K0PD23**	0.050
0…10 V	M12	**XMLP6K0PD73**	0.050
	Packard Metri-Pack 150	**XMLP6K0PP73**	0.050
0.5…4.5 V ratiometric	M12	**XMLP6K0PD13**	0.050
	Packard Metri-Pack 150	**XMLP6K0PP13** *(1)*	0.050

(1) Sold in lots of 40: add the letter Q to the end of the selected reference.
*For example, **XMLP6K0PP13** becomes **XMLP6K0PP13Q**.*

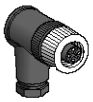
Electronic pressure sensors

OsiSense XM

XMLP pressure transmitters

Separate parts

ZMLPA1●2SH



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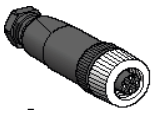

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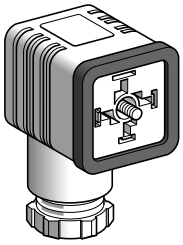

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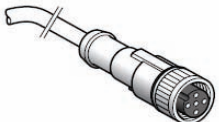

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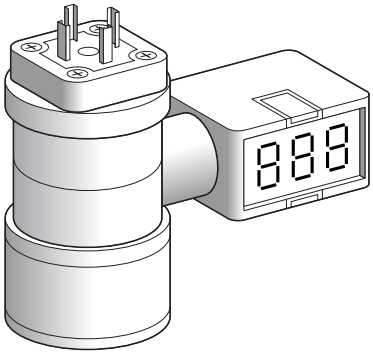
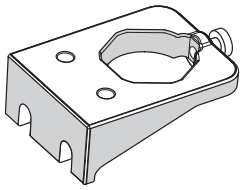


XMLEZ●●●



XMLZL017

Switches with display for XMLP●●●●D2●● pressure transmitters *(1)*

Analogue output type	Solid-state output type	Switching mode	Reference	Weight kg
4…20 mA	1 x PNP	Hysteresis	**ZMLPA1P2SH**	0.104
		Window	**ZMLPA1P2SW**	0.104
	1 x NPN	Hysteresis	**ZMLPA1N2SH**	0.104
		Window	**ZMLPA1N2SW**	0.104
–	2 x PNP	Hysteresis	**ZMLPA2P0SH**	0.104
–	2 x NPN	Hysteresis	**ZMLPA2N0SH**	0.104

Accessories

Description	Type	Reference	Weight kg
Sealing gasket (Pack of 10 gaskets)	–	**XMLZL016**	0.025
M12 female connector metal clamping ring *(2)*	Straight	**XZCC12FDM40B**	0.020
	Elbowed	**XZCC12FCM40B**	0.020
EN 175301-803-A female connector *(2)*	–	**XZCC43FCP40B**	0.035

Description	Cable length	Cable material	Reference	Weight kg
Pre-wired M12, straight, female connectors	2 m	PUR	**XZCP1141L2**	0.090
		PVC	**XZCPV1141L2**	0.110
	5 m	PUR	**XZCP1141L5**	0.190
		PVC	**XZCPV1141L5**	0.210
	10 m	PUR	**XZCP1141L10**	0.370
		PVC	**XZCPV1141L10**	0.390
Pre-wired M12, elbowed, female connectors	2 m	PUR	**XZCP1241L2**	0.090
		PVC	**XZCPV1241L2**	0.110
	5 m	PUR	**XZCP1241L5**	0.190
		PVC	**XZCPV1241L5**	0.210
	10 m	PUR	**XZCP1241L10**	0.370
		PVC	**XZCPV1241L10**	0.390

Description	For use with	Size of transmitter bar	Reference	Weight kg
Digital displays for pressure transmitters	XMLPM00GC2●●	- 1…0	**XMLEZM01**	0.100
	XMLP001GC2●●	0…1	**XMLEZ001**	0.100
	XMLP010BC2●●	0…10	**XMLEZ010**	0.100
	XMLP025BC2●●	0…25	**XMLEZ025**	0.100
	XMLP060BC2●●	0…60	**XMLEZ060**	0.100
	XMLP100BC2●●	0…100	**XMLEZ100**	0.100
	XMLP250BC2●●	0…250	**XMLEZ250**	0.100
	XMLP600BC2●●	0…600	**XMLEZ600**	0.100
Fixing bracket (aluminium)	XMLP●●●M●●● XMLP●●●G●●● XMLP●●●R●●●	–	**XMLZL017**	0.029

(1) ZMLP switches are compatible with pressure transmitters with 4…20 mA analogue output and M12 connector (see pages 2/38 and 2/39).
(2) Connector with screw terminal connections.

***Note**: For other connection accessories, visit our website www.tesensors.com.*

Electronic pressure sensors
OsiSense XM
ZMLP switches with 4-digit display

Example of remote mounting (with jumper cable and fixing bracket).

Example of direct mounting on the pressure transmitter.

Presentation

Combined with a pressure transmitter, the ZMLP switch with display converts an analogue signal into one or two switching outputs with adjustable thresholds.
It can also be used to display the measured pressure. One of 27 display ranges, from -14.5 to 6000, can be selected for this purpose, meaning the switch can adapt to the majority of pressure transmitters, whether calibrated in bar,psi or pascal.

Depending on the model, ZMLP switches with display are available with different output configurations:
- One 4…20 mA analogue output and one switching output, PNP or NPN type, hysteresis or window switching mode.
- Two switching outputs, PNP or NPN type, hysteresis switching mode (fixed hysteresis).

Compact and robust:
Its compact housing made of Valox™ PBT and polyester front face provide it with IP65, IP67 and IP69K degrees of protection, making it suitable for the harshest environments. These products are for a nominal supply voltage of 24 V ⎓ and have a 17 to 33 V ⎓ operating range.

Simplicity of setup:
These products must be connected to an electronic pressure transmitter with 4…20 mA analogue output and 4-pin M12 connector.

They can be mounted:
- Directly on the pressure transmitter. The product body can then pivot through 300°, enabling optimum orientation of the display and settings.
- Or mounted remotely, up to 20 metres from the transmitter, using a simple jumper cable. In this case, clever design accessories allow the product to be fixed in place quickly, horizontally, vertically or even directly on the pressure inlet pipe.

Description

1 4-pin male M12 output connector, for connection to an automation platform.
2 Indicator LEDs displaying the output status (LED lit when the output has been activated).
3 7-segment/4-digit display.
4 Pressure unit indication, bar by default, psi, kPa or Mpa by the addition of an adhesive label supplied with the product.
5 Potentiometer for selecting the display size and adjusting the switching threshold values.
6 4-position rotary switch for selecting the parameter to be configured.
7 4-pin female M12 connector, for connection to the pressure transmitter.

Functions

Configurable functions

For the display:
- Pressure unit (bar, psi, kPa and MPa)
- 27 display ranges can be selected, from -14.5 to 6000

For the solid-state output(s):
- NO or NC contact

Locking/unlocking:
- In order to avoid losing the product settings accidentally, the product can be locked.The settings cannot then be changed

Fast diagnostic function

- Illumination of all the display segments on each power-up, enabling checking of their operation

Electronic pressure sensors
OsiSense XM
ZMLP switches with 4-digit display

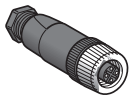
ZMLPA1●2SH

ZMLPA1●2SW

ZMLPA2●0SH

XMLPZLH01

XMLPZLV01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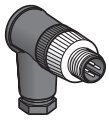
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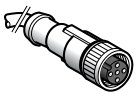
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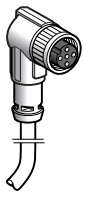
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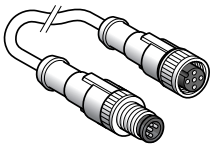
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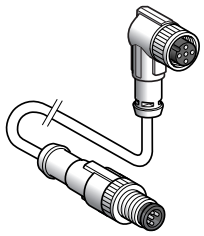
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Switches with a display for OsiSense XMLP pressure sensors *(1)*

Analogue output type	Solid-state output type	Switching mode	Reference	Weight kg
4…20 mA	1 x PNP	Hysteresis	**ZMLPA1P2SH**	0.104
		Window	**ZMLPA1P2SW**	0.104
	1 x NPN	Hysteresis	**ZMLPA1N2SH**	0.104
		Window	**ZMLPA1N2SW**	0.104
–	2 x PNP	Hysteresis	**ZMLPA2P0SH**	0.104
–	2 x NPN	Hysteresis	**ZMLPA2N0SH**	0.104

Fixing brackets for ZMLP switches with display

Description	Reference	Weight kg
Metal bracket for fixing horizontally	**XMLPZLH01**	0.012
Metal bracket for fixing vertically or on an inlet pipe	**XMLPZLV01**	0.024

Cabling accessories

Type	Length of cable	Reference	Weight
	m		kg
4-pin M12 connectors, for connection on screw terminals *(2)*			
Straight female connector	–	**XZCC12FDM40B**	0.020
Elbowed female connector	–	**XZCC12FCM40B**	0.020
Straight male connector	–	**XZCC12MDM40B**	0.025
Elbowed male connector	–	**XZCC12MCM40B**	0.025
Pre-wired M12, 4-pin connectors (PUR cable)			
Straight female connector	2	**XZCP1141L2**	0.090
	5	**XZCP1141L5**	0.190
	10	**XZCP1141L10**	0.370
	15	**XZCP1141L15**	0.500
	20	**XZCP1141L20**	0.750
Elbowed female connector	2	**XZCP1241L2**	0.090
	5	**XZCP1241L5**	0.190
	10	**XZCP1241L10**	0.370
	15	**XZCP1241L15**	0.500
	20	**XZCP1241L20**	0.750
M12-M12, 3-pin jumper cables (PUR cable) *(2)*			
Straight male and female connectors	1	**XZCR1511040A1**	0.065
	2	**XZCR1511040A2**	0.095
Straight male connector, elbowed female connector	1	**XZCR1512040A1**	0.065
	2	**XZCR1512040A2**	0.095

*(1) For **XMLP●●●●D2●** pressure transmitters (see pages 2/24 to 2/29).*
*Switches with display are also compatible with **XMLK●●●●2D2●** and **XMLG●●●D2●** pressure transmitters (see pages 2/12 to 2/21).*
(2) For connecting the pressure transmitter to the switch with display, in the case of remote mounting.

Electronic pressure sensors
OsiSense XM
XMLR pressure sensors with 4-digit display

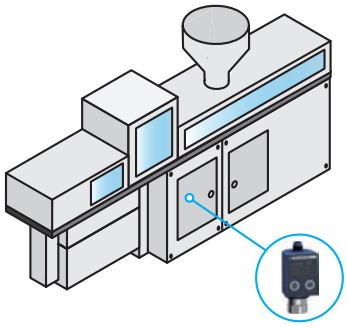
OsiSense XMLR

Electronic pressure sensors are used to control and measure pressure or vacuum levels in hydraulic or pneumatic systems.
They convert the pressure into an electrical signal. They then produce an analogue output which is proportional to the measured pressure and/or one or two switching outputs on which the switching point is adjustable.

The high precision and performance of OsiSense XMLR pressure sensors makes them suitable for numerous industrial applications requiring display, control or regulation of pressure/vacuum levels.

Easy to mount

XMLR pressure sensors minimise installation time and effort. Their compact-sized, rotating body and “flip over display” function make mounting easy and flexible.



With its compact size, the OsiSense XMLR pressure sensor is easily integrated into the machine

Compact format

> With a height of just 88 to 100 mm depending on the pressure range and the fluid entry type, OsiSense XMLR is one of the most compact pressure switches on the market.

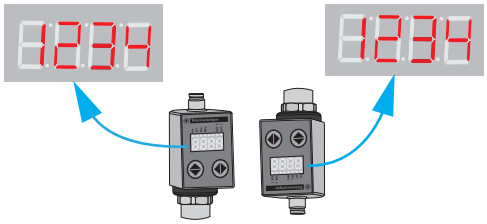
Rotating body

> The body of the OsiSense XMLR pressure sensor can be rotated 300°, thus enabling the user to orientate the front face of the product as required following connection to the pressure inlet pipe.

Electronic pressure sensors
OsiSense XM
XMLR pressure sensors with 4-digit display

Easy to mount *(continued)*

Flip over display function.
> The display can be inverted vertically to adapt to the sensor's installation position.

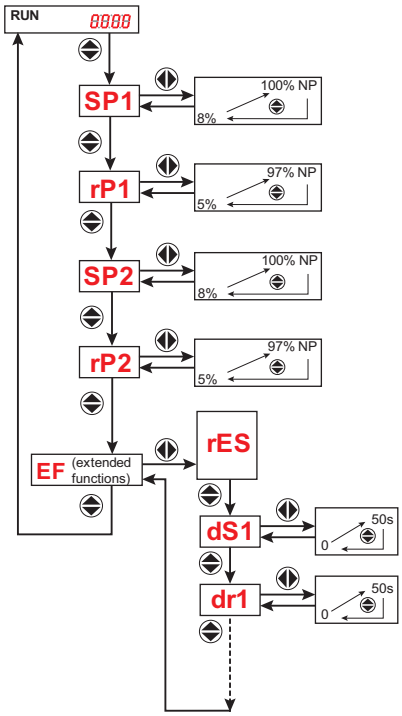


Easy to set up

Menu naming and structure based on the VDMA* standard
> The ergonomic design of OsiSense XMLR sets a new standard for ease of configuration.

Navigation using just two pushbuttons
> Two simple pushbuttons are all that is needed to navigate through an intuitive menu structured according to the VDMA* 24574-1 standard.

1 Pushbutton to display a value or parameter or to save a selected value or parameter and return to the menu.
2 Pushbutton to scroll from one menu to another or to increase a value or change a parameter.



Menu conforming to VDMA standard*

Easy to maintain

At each device start up, all segments of the display light up briefly to confirm that it is operating correctly.

The device can be tested using a diagnostic function which checks the whole electronic signal processing chain. This function is accessible via the "Dia" menu and the result of the test is indicated on the display (DONE or ERR).
For transmitters, this function can also be remotely activated by connecting the Test input to an automation platform, thus enabling automatic verification without the need for intervention by an operator.

In this instance, the self-test also generates an analogue output signal which is equivalent to 50% of the sensor size (12 mA or 5 V) which, in turn, can be verified by the automation platform.
The pressure sensor can be considered as defective if the difference between the signal transmitted and the standard theoretical value is too great.

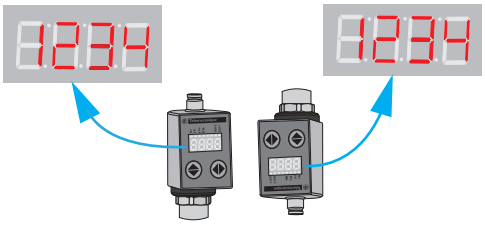
OsiSense XMLR pressure sensors also include a recording of the high and low pressure values measured since the last reset.
These values can be displayed via the Hi and Lo menus.

** VDMA: Verband Deutscher Maschinen und Anlagenbau e.V.*

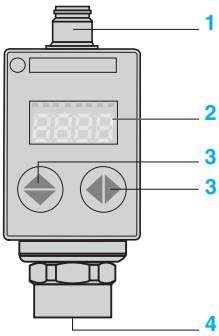
Electronic pressure sensors

OsiSense XM

XMLR pressure sensors with 4-digit display.
Compact plastic body, stainless steel 316L fluid entry.
With analogue and solid-state outputs.



"Flip over display" function.



Presentation

XMLR electronic pressure sensors are used for pressure control of hydraulic oils, fresh water, air and refrigeration fluids, between -1 and 600 bar.
Depending on the model, XMLR sensors are available with different output configurations in order to meet the highest number of requirements:

- One analogue output, 4…20 mA or 0…10 V, proportional to the measuring range
- One analogue output and one switching output, PNP or NPN type
- Two switching outputs, PNP or NPN type
- One 4…20 mA analogue output and two switching outputs, PNP or NPN type

Compact and robust:
The stainless steel 316L fluid entry and fibreglass impregnated polyacrylamide body provide the XMLR pressure sensors with excellent mechanical resistance, improved corrosion resistance and an P65/IP67 degree of protection. Compact in size (88 mm to 100 mm overall, depending on model), these products are for a nominal supply voltage of 24 V ⎓ and have a 17 to 33 V ⎓ operating range.

They are particularly suitable for:

- Moulding and thermoforming presses
- Injection machines
- Pneumatic systems and assembly machinery
- Hydraulic systems of lifting and handling equipment
- Pumping and fresh water treatment

Simplicity of setting-up
The body of the OsiSense XMLR pressure sensor can be turned through 300°, thus enabling the front face of the product to be orientated as required following connection to the pressure inlet pipe.
In addition, the "flip over display" function simplifies reading in the event of upside down mounting (fluid entry from above).

Description

1 M12 male connector, 4 or 5-pin depending on model.
2 4-digit, 7-segment display and LED indicator for pressure and output state (LED lit when the output has been activated).
3 Navigation keys for setting and configuring the menus (conforming to VDMA 24574).
4 Fluid entry: G 1/4 female, 1/4"-18 NPT female or SAE 7/16-20UNF female, depending on model.

Functions

Configurable functions

For the display:

- Pressure unit of measurement (bar, psi, kPa or MPa)
- Display refresh time: fast (50 ms), normal (200 ms), slow (600 ms)
- 180° flip over display
- Display off, power saving mode

For the analogue output (4…20 mA or 0…10 V)**:**

- Compensation offset in the range of ±5% of the units size
- Adjustment of pressure between 75 and 125% of the nominal pressure

For each solid-state output:

- NO or NC contact
- Switching mode of outputs: Hysteresis (pumping) or Window (control)
- Time delay both on trip and on reset (adjustable from 0 to 50 s, in steps of 1 s)

Locking/unlocking:

- In order to avoid losing the product settings accidentally, the product can be locked.The settings cannot then be changed

Fast diagnostic functions

- Illumination of all the display segments on each power-up, enabling checking of their operation
- Diagnostic function for checking correct operation of the sensor
- Saving of min. and max. pressures measured by the sensor, up to 125% of the nominal pressure, and their subsequent display

Electronic pressure sensors

OsiSense XM

XMLR pressure sensors with 4-digit display.
Compact plastic body, stainless steel 316L fluid entry.
With analogue and solid-state outputs.

XMLR●●●G●●●5

XMLR●●●G●●●6

-1 to 0 bar (-14.5 to 0 psi)

Maximum permissible accidental pressure: 3 bar, destruction pressure: 3 bar

Analogue output type	Solid-state output type	Reference	Weight kg
G 1/4 DIN 3852-Y (female) fluid connection			
4…20 mA	–	**XMLRM01G0T25**	0.190
0…10 V	–	**XMLRM01G0T75**	0.190
4…20 mA	1 x PNP	**XMLRM01G1P25**	0.190
4…20 mA	1 x NPN	**XMLRM01G1N25**	0.190
0…10 V	1 x PNP	**XMLRM01G1P75**	0.190
0…10 V	1 x NPN	**XMLRM01G1N75**	0.190
–	2 x PNP	**XMLRM01G2P05**	0.190
–	2 x NPN	**XMLRM01G2N05**	0.190
4…20 mA	2 x PNP	**XMLRM01G2P25**	0.190
4…20 mA	2 x NPN	**XMLRM01G2N25**	0.190
1/4”- 18 NPT (female) fluid connection			
4…20 mA	–	**XMLRM01G0T26**	0.212
4…20 mA	1 x PNP	**XMLRM01G1P26**	0.212
4…20 mA	1 x NPN	**XMLRM01G1N26**	0.212
–	2 x PNP	**XMLRM01G2P06**	0.212
–	2 x NPN	**XMLRM01G2N06**	0.212
4…20 mA	2 x PNP	**XMLRM01G2P26**	0.212
4…20 mA	2 x NPN	**XMLRM01G2N26**	0.212

0 to 1 bar (0 to 14.5 psi)

Maximum permissible accidental pressure: 7 bar, destruction pressure: 7 bar

Analogue output type	Solid-state output type	Reference	Weight kg
G 1/4 DIN 3852-Y (female) fluid connection			
4…20 mA	–	**XMLR001G0T25**	0.190
0…10 V	–	**XMLR001G0T75**	0.190
4…20 mA	1 x PNP	**XMLR001G1P25**	0.190
4…20 mA	1 x NPN	**XMLR001G1N25**	0.190
0…10 V	1 x PNP	**XMLR001G1P75**	0.190
0…10 V	1 x NPN	**XMLR001G1N75**	0.190
–	2 x PNP	**XMLR001G2P05**	0.190
–	2 x NPN	**XMLR001G2N05**	0.190
1/4”- 18 NPT (female) fluid connection			
4…20 mA	–	**XMLR001G0T26**	0.212
0…10 V	–	**XMLR001G0T76**	0.212
4…20 mA	1 x PNP	**XMLR001G1P26**	0.212
4…20 mA	1 x NPN	**XMLR001G1N26**	0.212
–	2 x PNP	**XMLR001G2P06**	0.212
–	2 x NPN	**XMLR001G2N06**	0.212

0 to 2.5 bar (0 to 36.2 psi)

Maximum permissible accidental pressure: 12 bar, destruction pressure: 12 bar

Analogue output type	Solid-state output type	Reference	Weight kg
G 1/4 DIN 3852-Y (female) fluid connection			
4…20 mA	–	**XMLR2D5G0T25**	0.190
0…10 V	–	**XMLR2D5G0T75**	0.190
4…20 mA	1 x PNP	**XMLR2D5G1P25**	0.190
4…20 mA	1 x NPN	**XMLR2D5G1N25**	0.190
0…10 V	1 x PNP	**XMLR2D5G1P75**	0.190
0…10 V	1 x NPN	**XMLR2D5G1N75**	0.190
–	2 x PNP	**XMLR2D5G2P05**	0.190
–	2 x NPN	**XMLR2D5G2N05**	0.190
1/4”- 18 NPT (female) fluid connection			
4…20 mA	1 x PNP	**XMLR2D5G1P26**	0.212
4…20 mA	1 x NPN	**XMLR2D5G1N26**	0.212
–	2 x PNP	**XMLR2D5G2P06**	0.212
–	2 x NPN	**XMLR2D5G2N06**	0.212

Electronic pressure sensors

OsiSense XM

XMLR pressure sensors with 4-digit display.
Compact plastic body, stainless steel 316L fluid entry.
With analogue and solid-state outputs.

XMLR●●●G●●●5

XMLR●●●G●●●6
XMLR●●●G●●●9

0 to 10 bar (0 to 145 psi)

Maximum permissible accidental pressure: 40 bar, destruction pressure: 40 bar

Analogue output type	Solid-state output type	Reference	Weight kg
G 1/4 DIN 3852-Y (female) fluid connection			
4…20 mA	–	**XMLR010G0T25**	0.190
0…10 V	–	**XMLR010G0T75**	0.190
4…20 mA	1 x PNP	**XMLR010G1P25**	0.190
4…20 mA	1 x NPN	**XMLR010G1N25**	0.190
0…10 V	1 x PNP	**XMLR010G1P75**	0.190
0…10 V	1 x NPN	**XMLR010G1N75**	0.190
–	2 x PNP	**XMLR010G2P05**	0.190
–	2 x NPN	**XMLR010G2N05**	0.190
4…20 mA	2 x PNP	**XMLR010G2P25**	0.190
4…20 mA	2 x NPN	**XMLR010G2N25**	0.190
1/4”- 18 NPT (female) fluid connection			
4…20 mA	–	**XMLR010G0T26**	0.212
0…10 V	–	**XMLR010G0T76**	0.212
4…20 mA	1 x PNP	**XMLR010G1P26**	0.212
4…20 mA	1 x NPN	**XMLR010G1N26**	0.212
0…10 V	1 x PNP	**XMLR010G1P76**	0.212
0…10 V	1 x NPN	**XMLR010G1N76**	0.212
–	2 x PNP	**XMLR010G2P06**	0.212
–	2 x NPN	**XMLR010G2N06**	0.212
4…20 mA	2 x PNP	**XMLR010G2P26**	0.212
4…20 mA	2 x NPN	**XMLR010G2N26**	0.212
SAE 7/16-20UNF-2B (female) fluid connection			
–	2 x PNP	**XMLR010G2P09**	0.210
–	2 x NPN	**XMLR010G2N09**	0.210

0 to 16 bar (0 to 232 psi)

Maximum permissible accidental pressure: 62 bar, destruction pressure: 62 bar

Analogue output type	Solid-state output type	Reference	Weight kg
G 1/4 DIN 3852-Y (female) fluid connection			
4…20 mA	–	**XMLR016G0T25**	0.190
0…10 V	–	**XMLR016G0T75**	0.190
4…20 mA	1 x PNP	**XMLR016G1P25**	0.190
4…20 mA	1 x NPN	**XMLR016G1N25**	0.190
0…10 V	1 x PNP	**XMLR016G1P75**	0.190
–	2 x PNP	**XMLR016G2P05**	0.190
4…20 mA	2 x PNP	**XMLR016G2P25**	0.190
1/4”- 18 NPT (female) fluid connection			
4…20 mA	–	**XMLR016G0T26**	0.212
4…20 mA	1 x PNP	**XMLR016G1P26**	0.212
4…20 mA	1 x NPN	**XMLR016G1N26**	0.212
–	2 x PNP	**XMLR016G2P06**	0.212
–	2 x NPN	**XMLR016G2N06**	0.212

0 to 25 bar (0 to 362 psi)

Maximum permissible accidental pressure: 100 bar, destruction pressure: 100 bar

Analogue output type	Solid-state output type	Reference	Weight kg
G 1/4 DIN 3852-Y (female) fluid connection			
4…20 mA	–	**XMLR025G0T25**	0.190
0…10 V	–	**XMLR025G0T75**	0.190
4…20 mA	1 x PNP	**XMLR025G1P25**	0.190
4…20 mA	1 x NPN	**XMLR025G1N25**	0.190
0…10 V	1 x PNP	**XMLR025G1P75**	0.190
0…10 V	1 x NPN	**XMLR025G1N75**	0.190
–	2 x PNP	**XMLR025G2P05**	0.190
–	2 x NPN	**XMLR025G2N05**	0.190
1/4”- 18 NPT (female) fluid connection			
4…20 mA	–	**XMLR025G0T26**	0.212
4…20 mA	1 x PNP	**XMLR025G1P26**	0.212
4…20 mA	1 x NPN	**XMLR025G1N26**	0.212
–	2 x PNP	**XMLR025G2P06**	0.212
–	2 x NPN	**XMLR025G2N06**	0.212

Electronic pressure sensors

OsiSense XM

XMLR pressure sensors with 4-digit display.
Compact plastic body, stainless steel 316L fluid entry.
With analogue and solid-state outputs.

XMLR●●●G●●●5

XMLR●●●G●●●6

XMLR●●●M●●●5
XMLR●●●M●●●6

XMLR●●●M●●●9

0 to 40 bar (0 to 580 psi)

Maximum permissible accidental pressure: 150 bar, destruction pressure: 150 bar

Analogue output type	Solid-state output type	Reference	Weight kg
G 1/4 DIN 3852-Y (female) fluid connection			
4…20 mA	–	**XMLR040G0T25**	0.190
0…10 V	–	**XMLR040G0T75**	0.190
4…20 mA	1 x PNP	**XMLR040G1P25**	0.190
4…20 mA	1 x NPN	**XMLR040G1N25**	0.190
0…10 V	1 x PNP	**XMLR040G1P75**	0.190
0…10 V	1 x NPN	**XMLR040G1N75**	0.190
–	2 x PNP	**XMLR040G2P05**	0.190
–	2 x NPN	**XMLR040G2N05**	0.190
4…20 mA	2 x PNP	**XMLR040G2P25**	0.190
4…20 mA	2 x NPN	**XMLR040G2N25**	0.190
1/4”- 18 NPT (female) fluid connection			
4…20 mA	–	**XMLR040G0T26**	0.212
4…20 mA	1 x PNP	**XMLR040G1P26**	0.212
4…20 mA	1 x NPN	**XMLR040G1N26**	0.212
–	2 x PNP	**XMLR040G2P06**	0.212
–	2 x NPN	**XMLR040G2N06**	0.212

0 to 100 bar (0 to 1450 psi)

Maximum permissible accidental pressure: 300 bar, destruction pressure: 600 bar

Analogue output type	Solid-state output type	Reference	Weight kg
G 1/4 DIN 3852-Y (female) fluid connection			
4…20 mA	–	**XMLR100M0T25**	0.186
0…10 V	–	**XMLR100M0T75**	0.186
4…20 mA	1 x PNP	**XMLR100M1P25**	0.186
4…20 mA	1 x NPN	**XMLR100M1N25**	0.186
0…10 V	1 x PNP	**XMLR100M1P75**	0.186
0…10 V	1 x NPN	**XMLR100M1N75**	0.186
–	2 x PNP	**XMLR100M2P05**	0.186
–	2 x NPN	**XMLR100M2N05**	0.186
1/4”- 18 NPT (female) fluid connection			
4…20 mA	–	**XMLR100M0T26**	0.186
4…20 mA	1 x PNP	**XMLR100M1P26**	0.186
4…20 mA	1 x NPN	**XMLR100M1N26**	0.186
–	2 x PNP	**XMLR100M2P06**	0.186
–	2 x NPN	**XMLR100M2N06**	0.186

0 to 160 bar (0 to 2320 psi)

Maximum permissible accidental pressure: 480 bar, destruction pressure: 960 bar

Analogue output type	Solid-state output type	Reference	Weight kg
G 1/4 DIN 3852-Y (female) fluid connection			
4…20 mA	–	**XMLR160M0T25**	0.186
0…10 V	–	**XMLR160M0T75**	0.186
4…20 mA	1 x PNP	**XMLR160M1P25**	0.186
4…20 mA	1 x NPN	**XMLR160M1N25**	0.186
0…10 V	1 x PNP	**XMLR160M1P75**	0.186
0…10 V	1 x NPN	**XMLR160M1N75**	0.186
–	2 x PNP	**XMLR160M2P05**	0.186
–	2 x NPN	**XMLR160M2N05**	0.186
SAE 7/16-20UNF-2B (female) fluid connection			
–	2 x PNP	**XMLR160M2P09**	0.212
–	2 x NPN	**XMLR160M2N09**	0.212

Electronic pressure sensors

OsiSense XM

XMLR pressure sensors with 4-digit display.
Compact plastic body, stainless steel 316L fluid entry.
With analogue and solid-state outputs.

XMLR●●●M●●●5
XMLR●●●M●●●6

XMLR●●●M●●●9

0 to 250 bar (0 to 3625 psi)

Maximum permissible accidental pressure: 750 bar, destruction pressure: 1500 bar

Analogue output type	Solid-state output type	Reference	Weight kg
G 1/4 DIN 3852-Y (female) fluid connection			
4…20 mA	–	**XMLR250M0T25**	0.186
0…10 V	–	**XMLR250M0T75**	0.186
4…20 mA	1 x PNP	**XMLR250M1P25**	0.186
4…20 mA	1 x NPN	**XMLR250M1N25**	0.186
0…10 V	1 x PNP	**XMLR250M1P75**	0.186
0…10 V	1 x NPN	**XMLR250M1N75**	0.186
–	2 x PNP	**XMLR250M2P05**	0.186
–	2 x NPN	**XMLR250M2N05**	0.186
4…20 mA	2 x PNP	**XMLR250M2P25**	0.186
4…20 mA	2 x NPN	**XMLR250M2N25**	0.186
1/4”- 18 NPT (female) fluid connection			
4…20 mA	–	**XMLR250M0T26**	0.186
4…20 mA	1 x PNP	**XMLR250M1P26**	0.186
4…20 mA	1 x NPN	**XMLR250M1N26**	0.186
0…10 V	1 x PNP	**XMLR250M1P76**	0.186
–	2 x PNP	**XMLR250M2P06**	0.186
–	2 x NPN	**XMLR250M2N06**	0.186
SAE 7/16-20UNF-2B (female) fluid connection			
–	2 x PNP	**XMLR250M2P09**	0.212
–	2 x NPN	**XMLR250M2N09**	0.212

0 to 400 bar (0 to 5800 psi)

Maximum permissible accidental pressure: 1200 bar, destruction pressure: 2400 bar

Analogue output type	Solid-state output type	Reference	Weight kg
G 1/4 DIN 3852-Y (female) fluid connection			
4…20 mA	–	**XMLR400M0T25**	0.186
0…10 V	–	**XMLR400M0T75**	0.186
4…20 mA	1 x PNP	**XMLR400M1P25**	0.186
4…20 mA	1 x NPN	**XMLR400M1N25**	0.186
0…10 V	1 x PNP	**XMLR400M1P75**	0.186
0…10 V	1 x NPN	**XMLR400M1N75**	0.186
–	2 x PNP	**XMLR400M2P05**	0.186
–	2 x NPN	**XMLR400M2N05**	0.186
4…20 mA	2 x PNP	**XMLR400M2P25**	0.186
4…20 mA	2 x NPN	**XMLR400M2N25**	0.186
1/4”- 18 NPT (female) fluid connection			
4…20 mA	–	**XMLR400M0T26**	0.186
4…20 mA	1 x PNP	**XMLR400M1P26**	0.186
4…20 mA	1 x NPN	**XMLR400M1N26**	0.186
–	2 x PNP	**XMLR400M2P06**	0.186
–	2 x NPN	**XMLR400M2N06**	0.186

0 to 600 bar (0 to 8700 psi)

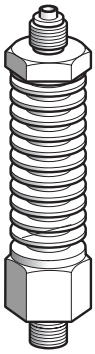
Maximum permissible accidental pressure: 1500 bar, minimum destruction pressure: 2500 bar

Analogue output type	Solid-state output type	Reference	Weight kg
Fluid connection G 1/4 (female)			
4…20 mA	–	**XMLR600M0T25**	0.186
0…10 V	–	**XMLR600M0T75**	0.186
4…20 mA	1 x PNP	**XMLR600M1P25**	0.186
0…10 V	1 x PNP	**XMLR600M1P75**	0.186
–	2 x PNP	**XMLR600M2P05**	0.186

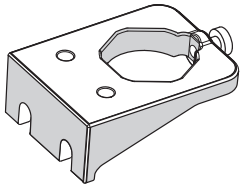
Electronic pressure sensors

OsiSense XM

XMLR pressure sensors with 4-digit display
Accessories



XMLZL009



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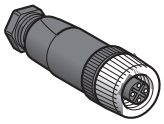

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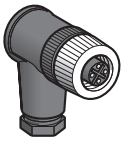

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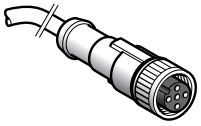
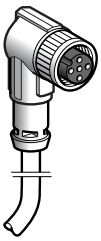


XZCP1141L●



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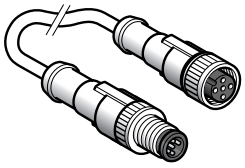
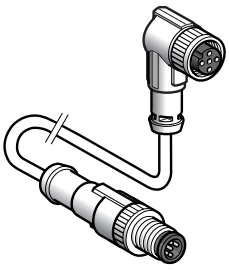


XZCR15110●●●●



XZCR15120●●●●

Accessories

Description	For use with	Reference	Weight kg
Cooler with G 1/4 A (male) connections Usage temperature: 150°C max. for the fluid, 50°C for the ambient air	**XMLR●●●●●●●5**	**XMLZL009**	0.370
Fixing bracket aluminium	**XMLR●●●**	**XMLZL017**	0.029

Connectors

Description	For use with	Type	Reference	Weight kg
M12 female connector, 4-pin Metal clamping ring	**XMLR●●●●0T●●** **XMLR●●●●1P●●** **XMLR●●●●1N●●** **XMLR●●●●2P0●** **XMLR●●●●2N0●**	Straight	**XZCC12FDM40B**	0.020
		Elbowed	**XZCC12FCM40B**	0.020
M12 female connector, 5-pin Metal clamping ring	**XMLR●●●●2P2●** **XMLR●●●●2N2●**	Straight	**XZCC12FDM50B**	0.020
		Elbowed	**XZCC12FCM50B**	0.020

Pre-wired connectors and jumper cables

Description	For use with	Type	Length of cable	Reference	Weight
			m		kg
Pre-wired M12, 4-pin connectors Metal clamping ring PUR cable	**XMLR●●●●0T●●** **XMLR●●●●1●●●** **XMLR●●●●2P0●** **XMLR●●●●2N0●**	Straight	2	**XZCP1141L2**	0.090
			5	**XZCP1141L5**	0.190
			10	**XZCP1141L10**	0.370
		Elbowed	2	**XZCP1241L2**	0.090
			5	**XZCP1241L5**	0.190
			10	**XZCP1241L10**	0.370
Pre-wired M12, 5-pin connectors PVC cable	**XMLR●●●●2P2●** **XMLR●●●●2N2●**	Straight female connector	2	**XZCPV11V12L2**	0.100
			5	**XZCPV11V12L5**	0.200
			10	**XZCPV11V12L10**	0.400
		Elbowed female connector	2	**XZCPV12V12L2**	0.100
			5	**XZCPV12V12L5**	0.200
			10	**XZCPV12V12L10**	0.400
M12-M12 4-pin jumper cables PUR cable	**XMLR●●●●0T●●** **XMLR●●●●1●●●** **XMLR●●●●2P0●** **XMLR●●●●2N0●**	Straight female connector	1	**XZCR1511041C1**	0.100
			2	**XZCR1511041C2**	0.100
		Elbowed female connector	1	**XZCR1512041C1**	0.100
			2	**XZCR1512041C2**	0.100
M12-M12 5-pin jumper cables PUR cable	**XMLR●●●●2P2●** **XMLR●●●●2N2●**	Straight female connector	1	**XZCR1511064D1**	0.100
			2	**XZCR1511064D2**	0.100
		Elbowed female connector	1	**XZCR1512064D1**	0.100
			2	**XZCR1512064D2**	0.100

Electromechanical sensors for pressure control

OsiSense XM

Applications	Type of installation	**Control circuits**		
	Fluids controlled	**Air, water, hydraulic oils, corrosive fluids, viscous products**		
	Type of operation	**Detection of a single threshold (fixed differential)**	**Regulation between 2 thresholds (adjustable differential)**	

Fluid characteristics		Air, fresh water, corrosive fluids, viscous products, up to 160°C Sea water, up to 30 °C, depending on model		
Sizes		- 1 bar…500 bar (- 14.5 psi…7250 psi)		
Dimensions of case (mm)	Width x height x depth	35 x 68 x 75		46 x 68 x 85
Type of contacts		1 CO single-pole, snap action		2 CO single-pole, simultaneous, snap action
Degree of protection		IP 66: switches with terminal connections IP 65: switches with connector		IP 66: switches with terminal connections
Electrical connection		Connector : ■ EN 175301-803-A (ex-DIN 43650A), 4-pin male. Screw terminals: ■ 1 tapped entry M20 x 1.5 mm for ISO cable gland or ■ 1 tapped entry 1/2”-14 NPT for cable gland, depending on model.		
Fluid connection		G 1/4 (female) 1/4” - 18 NPTF (female) G 1¼” (female) for viscous products		
Type reference		**XMLA**	**XMLB**	**XMLC**
Pages		2/64 to 2/116		
Other versions		Electromechanical pressure and vacuum switches with alternative tapped cable entries and/ or fluid entries: NPT etc. Please consult our Customer Care Centre.		

Control circuits		
Air, water, hydraulic oils, corrosive fluids, viscous products	**Air, hydraulic oils, corrosive fluids**	
Dual stage switches **Detection at each threshold (fixed differential)**	**Regulation between 2 thresholds (adjustable differential)**	
Air, fresh water, corrosive fluids, viscous products, up to 160°C Sea water, up to 30 °C, depending on model	Air, oils and other non corrosive fluids (- 73…+ 125°C)	Oils and other fluids (- 25…+ 120 °C) Only oils, including synthetic oils, (- 30…+ 125 °C), depending on model
- 1 bar…500 bar (- 14.5 psi…7250 psi)	0.7 bar…131 bar (10.15 psi…1900 psi)	69 bar…340 bar (1000 psi…4930 psi)
45 x 68 x 85	88 x 88 x 68	
2 CO single-pole, staggered, snap action	1 CO or 2 CO single-pole, snap action	
IIP 66: switches with terminal connections	IP 65	
Connector : ■ EN 175301-803-A (ex-DIN 43650A), 4-pin male. Screw terminals: ■ 1 tapped entry M20 x 1.5 mm for ISO cable gland or ■ 1 tapped entry 1/2”-14 NPT for cable gland, depending on model.	Screw terminals: ■ 1 tapped entry M20 x 1.5 mm for ISO cable gland or ■ 1 tapped entry for n° 13 cable gland, depending on model	
G 1/4 (female) 1/4” - 18 NPTF (female) G 1¼” (female) for viscous products	G 1/4 (femelle)	G 3/8 (female)
XMLD	**ACW**	**ADW**
2/64 to 2/116	2/124 and 2/125	2/126 and 2/127

Electromechanical sensors for pressure control

OsiSense XM

Applications	Type of installation	**Control circuits**
	Fluids controlled	**Air, water**
	Type of operation	**Regulation between 2 thresholds (adjustable differential)**

Fluid characteristics		Air, fresh water, sea water (0…+ 70°C)	
Sizes		6 bar, 12 bar and 25 bar (87 psi, 174 psi and 362.5 psi)	
Dimensions of case (mm)	Width x height x depth	57 x 78 x 97.5	
Setting of switching points		Internal screws	External screws
Type of contacts		1 CO single-pole, snap action	
Degree of protection		IP 54	
Electrical connection		Screw terminals: ■ 2 entries tapped for n° 13 cable gland, ■ one fitted with n° 13 cable gland, ■ one fitted with blanking plug.	
Fluid connection		G 1/4 or 4 x G 1/4 (female), depending on model	
Type reference		**XMX**	**XMA**
Pages		2/132	2/135

Other versions

Electromechanical pressure switches with alternative tapped cable entries and/or fluid entries: ISO, NPT, etc. Please consult our Customer Care Centre.

Power circuits				
Water				Air, water
Detection of a single threshold (fixed differential)	Regulation between 2 thresholds (adjustable differential)			
Fresh water, sea water (0…+ 70°C)				Air, fresh water, sea water (0…+ 70°C)
4.6 bar (66.7 psi)		7 bar (101.5 psi)	10.5 bar (152.3 psi)	6 bar, 12 bar and 25 bar (87 psi, 174 psi and 362.5 psi)
73 x 73 x 102	72 x 77 x 106	72 x 73 x 102		57 x 78 x 97.5
Internal screws				
2 NC snap action				2 NC or 3 NC snap action
IP 20/IP 65				IP 54 or IP 65, depending on model
Screw terminals: ■ 2 cable entries with grommet or ■ 2 cable entries with n° 13 cable gland				Screw terminals: ■ 2 entries incorporating n° 13 cable gland or without cable gland, depending on model
G 1/4 or R 1/4 (female or male)				G 1/4, G 3/8 or 4 x G 1/4 (female), depending on model
FTG●, FTG●NE	**FSG●, FSG●NE**	**FYG22, FYG22NE**	**FYG32, FYG32NE**	**XMP**
2/138 to 2/140				2/144 to 2/152

Electromechanical pressure and vacuum switches
OsiSense XM

Function

The function of pressure and vacuum switches is the control or regulation of pressure or vacuum levels in hydraulic or pneumatic systems.
They transform the pressure change into a digital electrical signal when the preset switching points are reached.

Switches for power circuits

Switches with power electrical contacts, either 2-pole or 3-pole, designed for direct switching of single-phase or 3-phase motors (pumps, compressors, etc.).

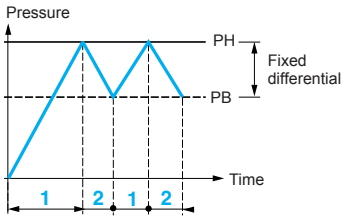
Switches for control circuits

Switches with standard electrical contacts, designed for control of contactors, relays, power valves, PLC inputs, etc.

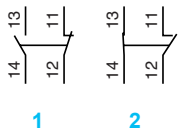
Pressure switch operating principle

Detection of a single threshold

The switches for detection of a single threshold (fixed differential) have a single adjustable setting point (PH). The differential between the high and low points (PH - PB) depends upon the natural characteristics of the switch. It is not adjustable.



Example: contact schematics of XMLA

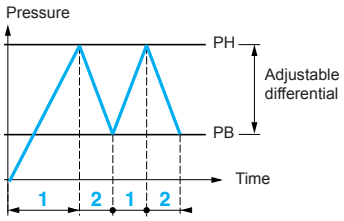


— Adjustable value
--- Non adjustable value

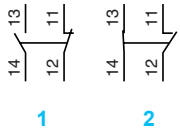
PH = High point
PB = Low point

Regulation between 2 thresholds

The switches for regulation between 2 thresholds (adjustable differential) have both a high point setting (PH) and a low point setting (PB). Both of these points can be independently adjusted.



Example: contact schematics of XMLB

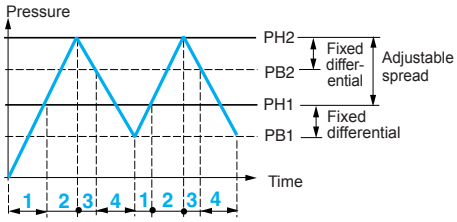


— Adjustable value

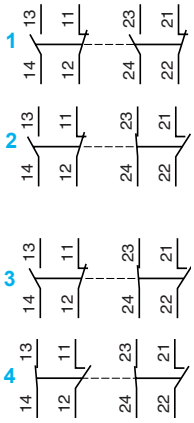
PH = High point
PB = Low point

Detection of 2 thresholds

The dual stage switches, for detection at each threshold, have an adjustable high point setting for each stage (PH1 and PH2). Both of these points can be independently adjusted. For both stages, the differential between the high point and the low point (PH1 - PB1 and PH2 - PB2) depends upon the natural characteristics of the switch. It is not adjustable.



Example: contact schematics of XMLD



— Adjustable value
--- Non adjustable value

PH = High point
PB = Low point

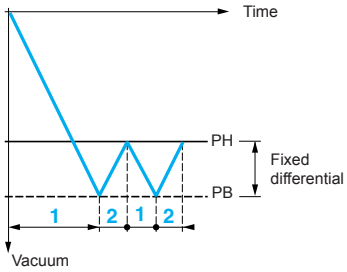
Electromechanical pressure and vacuum switches

OsiSense XM

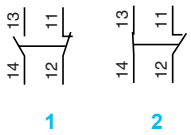
Vacuum switch operating principle

Detection of a single threshold

The switches for detection of a single threshold (fixed differential) have a single adjustable setting point (PH). The differential between the high and low points (PH - PB) depends upon the natural characteristics of the switch. It is not adjustable.



Example: contact schematics of XMLA

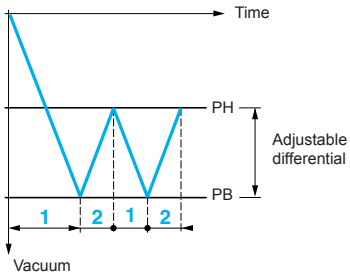


— Adjustable value
--- Non adjustable value

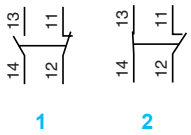
PH = High point
PB = Low point

Regulation between 2 thresholds

The switches for regulation between 2 thresholds (adjustable differential) have both a high point setting (PH) and a low point setting (PB). Both of these points can be independently adjusted.



Example: contact schematics of XMLB

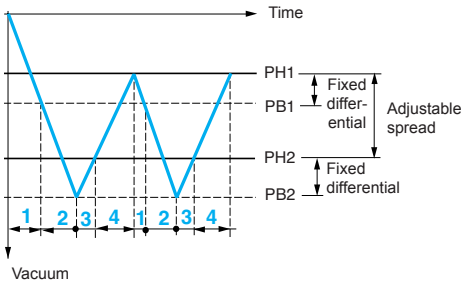


— Adjustable value

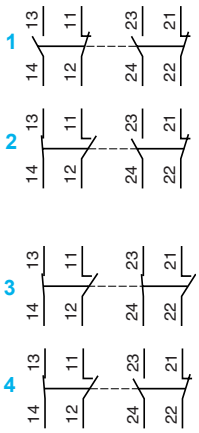
PH = High point
PB = Low point

Detection of 2 thresholds

The dual stage switches, for detection at each threshold, have an adjustable high point setting for each stage (PH1 and PH2). Both of these points can be independently adjusted.
For both stages, the differential between the high point and the low point (PH1 - PB1 and PH2 - PB2) depends upon the natural characteristics of the switch. It is not adjustable.



Example: contact schematics of XMLD



— Adjustable value
--- Non adjustable value

PH = High point
PB = Low point

Electromechanical pressure and vacuum switches
OsiSense XM

Terminology

Operating range
The difference between the minimum low point (PB) and the maximum high point (PH) setting values.

Size
Pressure switches and vacuum-pressure switches (vacu-pressure switches)
Maximum value of the operating range.

Vacuum switches
Minimum value of the operating range.

Switching point on rising pressure (PH)
Pressure switches
The upper pressure setting at which the pressure switch will actuate the contacts on rising pressure.

Vacuum switches
The lower vacuum setting at which the vacuum switch will reset the contacts on rising pressure.

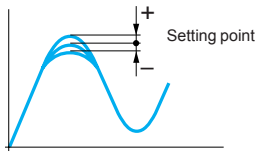
Switching point on falling pressure (PB)
The pressure at which the switch output changes state on falling pressure.

Switches with fixed differential
The lower point (PB) is not adjustable and is entirely dependent on the high point setting (PH) and the natural differential of the switch.

Switches with adjustable differential
The adjustable differential enables the independent setting of the lower point (PB).

Differential
The difference between the switching point on rising pressure (PH) and the switching point on falling pressure (PB).

Spread
For dual stage switches, the spread indicates the difference between the 2 switching points on rising pressure (PH2 and PH1) and, for vacuum switches, the difference between the 2 switching points on falling pressure (PB2 and PB1).

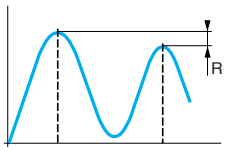
Accuracy (switches with setting scale)


The tolerance between the point at which the switch actuates its contacts and the value indicated on the setting scale. Where very high setting accuracy is required (initial installation of the product), it is recommended to use separate measuring equipment (pressure gauge, etc.).

Electromechanical pressure and vacuum switches
OsiSense XM

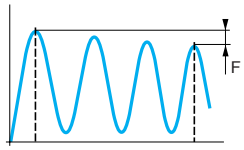
Terminology (continued)

Repeat accuracy (R)



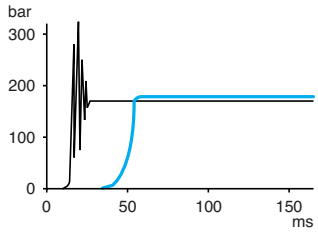
The tolerance between two consecutive switching operations.

Drift (F)

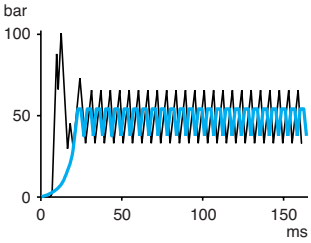


The tolerance of the switching point throughout the entire service life of the switch.

Accidental overpressure



Example 1: with destructive pressure level.



Example 2: with destructive pressure level and destructive pressure oscillations.

—— Without damping device
—— With damping device

This is an accidental pressure surge of very short duration (a few milliseconds).

If accidental overpressures occur and their duration is less than 50 milliseconds, the pressure damping device incorporated in the XML switches (sizes 10 bar and greater) will diminish the effect.

Maximum permissible pressure per cycle (Ps)

A pressure switch can withstand this pressure, without detrimental effect, on each cycle throughout its service life.

Its minimum value is at least equal to 1.25 times the switch size.

Maximum permissible accidental pressure

The maximum accidental pressure is at least equal to 2.25 times the switch size.

Destruction pressure

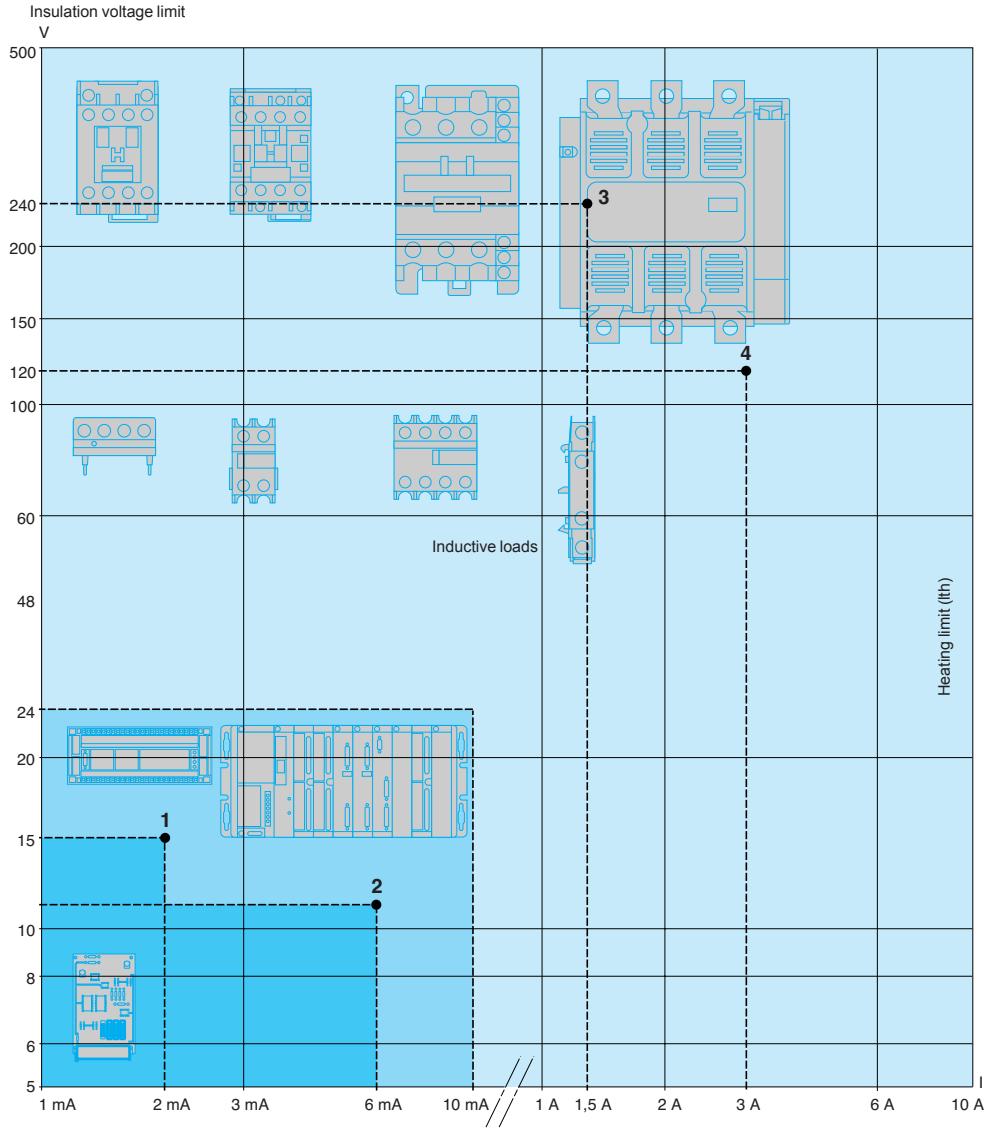
The maximum guaranteed pressure that the switch will withstand before its destruction, i.e. bursting, rupturing, component failure, etc.

Its value is at least equal to 4.5 times the switch size.

Electromechanical pressure and vacuum switches
OsiSense XM

Application range of pressure and vacuum switches XML, XMA and XMX, for control circuits

On standard loads
Continuous duty, frequent switching.



1 Standard PLC input, type 1
2 Standard PLC input, type 2
3 Switching capacity conforming to IEC 60947-5-1, utilisation category AC-15, DC-13

B300	240 V	1.5 A
R300	250 V	0.1 A

4 Switching capacity conforming to IEC 60947-5-1, utilisation category AC-15, DC-13

B300	120 V	3 A
R300	125 V	0.22 A

PLC: Programmable Logic Controller

Pressure switches	Application range		
XMLA XMLB XMLC XMLD XMX, XMA			
XMLG XMLK			

On small loads
The use of electromechanical pressure and vacuum switches with programmable logic controllers is becoming more predominant.
On small loads, the reliability of the switches maintain a failure rate of less than 1 for 100 million operating cycles.

Electromechanical pressure and vacuum switches

OsiSense XM

Selection of switch size

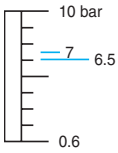
After establishing the type of switch required for the application (single threshold detection or regulation between 2 thresholds), the selection of its size will depend on the following criteria:

- the differential: difference between the high point (PH) and the low point (PB),
- the maximum pressure permissible per cycle,
- repeat accuracy, precision and minimum drift.

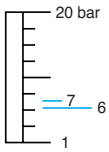
Examples of a fixed differential pressure switch selection, for detection of a single threshold

Main criterion: minimum differential

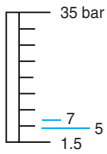
Example: for a selected high point (PH) of 7 bar



XMLA010●●●●●
Differential = 0.5 bar



XMLA020●●●●●
Differential = 1 bar

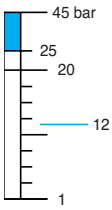


XMLA035●●●●●
Differential = 2 bar

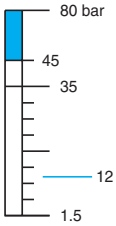
Select an XMLA010●●●●● (the lowest size)

Main criterion: tolerance to overpressures

Example: for a selected high point (PH) of 12 bar



XMLA020●●●●●
Permissible accidental overpressure = 45 bar

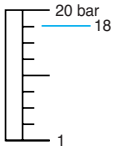


XMLA035●●●●●
Permissible accidental overpressure = 80 bar

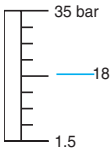
Select an XMLA035●●●●● (the highest size)

Main criterion: repeat accuracy, precision and minimum drift

Example: for a selected high point (PH) of 18 bar



XMLA020●●●●●
Adjustable from 1 to 20 bar



XMLA035●●●●●
Adjustable from 1.5 to 35 bar

Select an XMLA035●●●●●

As a general rule, working at the upper or lower limits of the operating range should be avoided.

Units of pressure conversion table

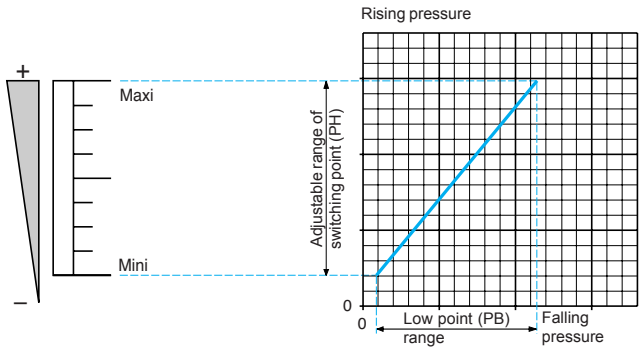
	psi	kg/cm²	bar	atm	mm Hg (Torr)	mm H_2O	Pa
1 psi =	1	0.07031	0.06895	0.06805	51.71	703.7	6895
1 kg/cm² =	14.22	1	0.98066	0.96784	735.55	10 000	98 066
1 bar =	14.50	1.0197	1	0.98695	750.06	10 197	10^5
1 atm =	14.70	1.0333	1.0132	1	760.0	10 333	101 325
1 mm Hg = (Torr)	0.01934	1.360×10^{-3}	1.333×10^{-3}	1.316×10^{-3}	1	13.59	133.3
1 mm H_2O =	1.421×10^{-3}	10^{-4}	$\sim 10^{-4}$	$\sim 10^{-4}$	0.07361	1	~ 9.80
1 Pa =	1.45×10^{-4}	1.0197×10^{-5}	10^{-5}	9.8695×10^{-6}	7.5×10^{-3}	0.10197	1

Example: 1 bar = 14.50 psi = 10^5 Pa

Electromechanical pressure and vacuum switches

Fixed differential switches, for detection of a single threshold

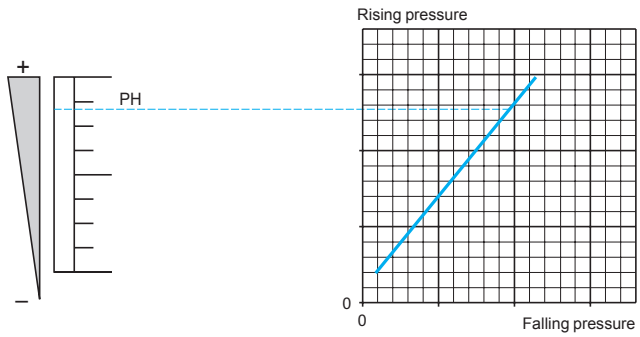
Adjustment range of the high point



Defined by the difference between the minimum and maximum high point (PH) setting values.

For a high set point (PH), the lower point (PB) is fixed and cannot be adjusted.
For a low set point (PB1 or PB2), the higher point (PH1 or PH2) is fixed and cannot be adjusted.

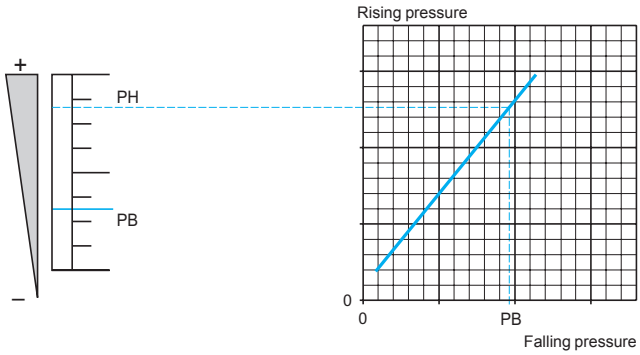
Switching point on rising pressure (PH)



The upper pressure setting at which the pressure or vacuum switch will actuate the contacts on rising pressure.

Adjustable throughout the range on rising pressure.

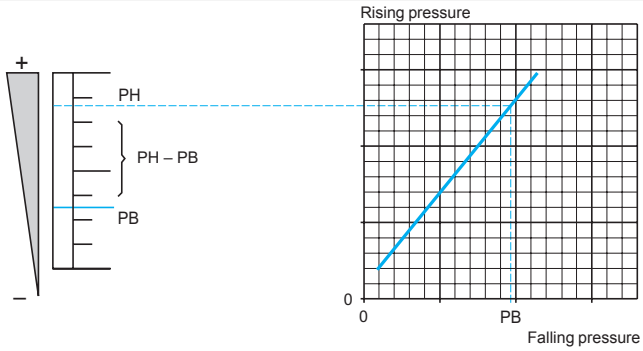
Switching point on falling pressure (PB)



The pressure at which the switch contact changes state on falling pressure.

The lower point (PB) is not adjustable and is entirely dependent on the high point setting (PH) and the natural differential of the switch.

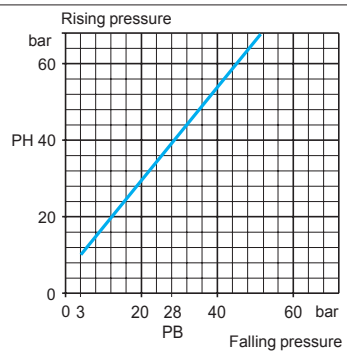
Differential



PH - PB = natural differential
The difference between the switching point on rising pressure (PH) and the switching point on falling pressure (PB).

This point is not adjustable and therefore, the value of the differential is fixed.
It is the natural differential of the switch (contact differential, friction, etc.).

Example

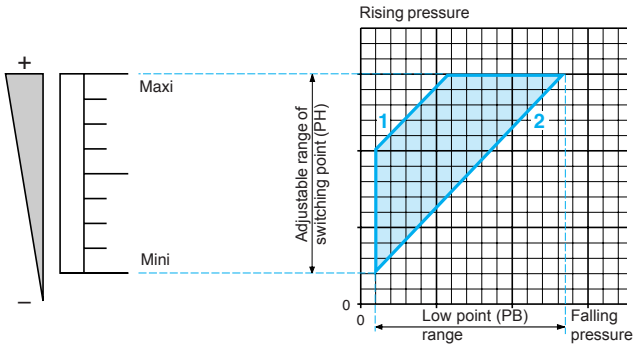


■ Consider a switching point on rising pressure (PH) of 40 bar (set value at which the contact will change state on rising pressure).
■ It can be seen that the switching point on falling pressure (PB) is 28 bar (fixed value at which the contact will return to its original state).
Conclusion:
□ the differential will be 40 - 28 = 12 bar.

Electromechanical pressure and vacuum switches

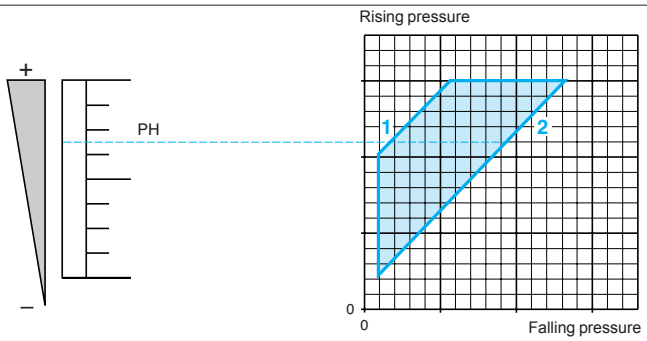
Adjustable differential switches, for regulation between 2 thresholds

Adjustment range of the high point



Defined by the difference between the minimum and maximum high point (PH) setting values.

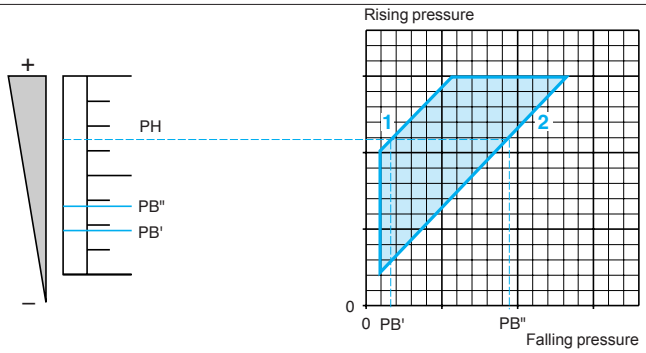
Switching point on rising pressure (PH)



The upper pressure setting at which the pressure or vacuum switch will actuate the contacts on rising pressure.

Adjustable throughout the range on rising pressure.

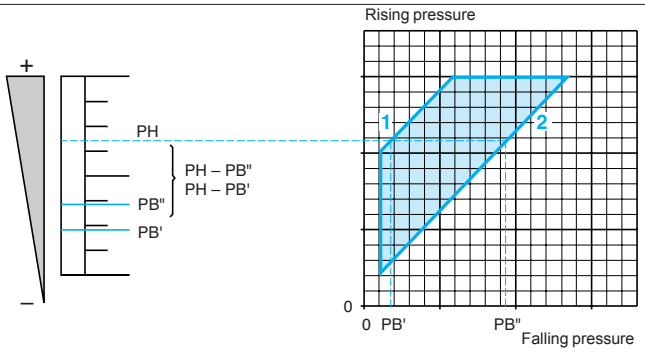
Switching point on falling pressure (PB)



The pressure at which the switch contact changes state on falling pressure.

The adjustable differential enables the independent setting of the lower point (PB).

Differential

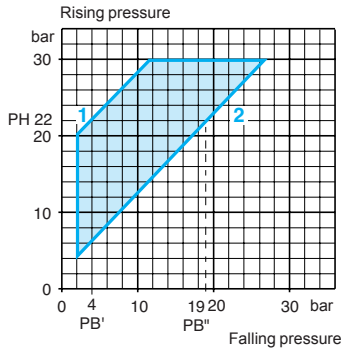


Low point < High point
PH - PB' = natural differential
PH - PB" = minimum differential

The difference between the switching point on rising pressure (PH) and the switching point on falling pressure (PB).

***Note:** the low point can be set at any value between PB' and PB".*

Example



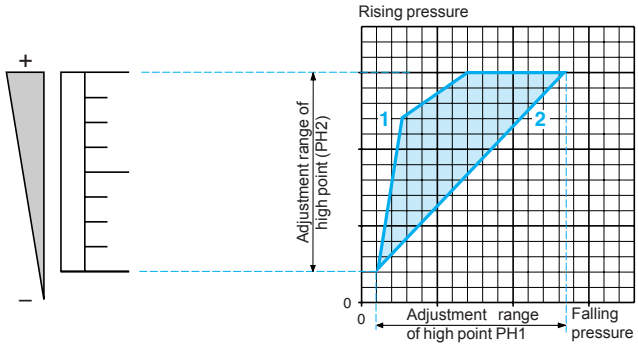
1 Maximum differential
2 Minimum differential

■ Consider a switching point on rising pressure (PH) of 22 bar (set value at which the contact will change state on rising pressure).
■ It can be seen that the switching point on falling pressure (PB) can be between 4 and 19 bar inclusive (set value at which the contact will return to its original state).
Conclusion:
□ the maximum differential will be: 22 - 4 = 18 bar,
□ the minimum differential will be: 22 - 19 = 3 bar.

Electromechanical pressure and vacuum switches

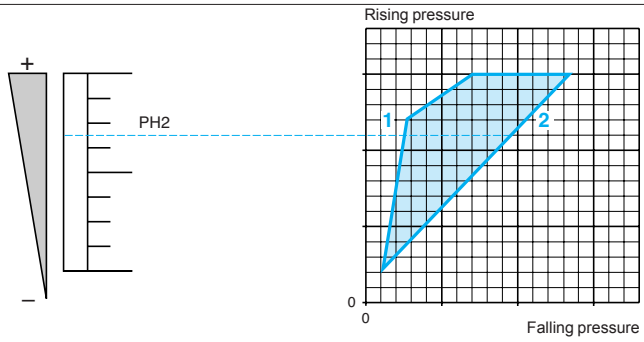
Dual stage, fixed differential switches, for detection at each threshold

Adjustment ranges of the switching points PH1 and PH2 on rising pressure



Defined by the difference between the minimum and maximum high point setting values of each stage (PH1 and PH2).

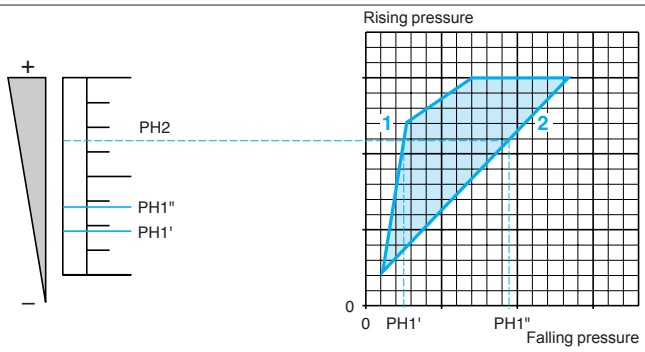
Switching point PH2 on rising pressure



The upper pressure setting at which the pressure or vacuum switch will actuate the contacts on rising pressure.

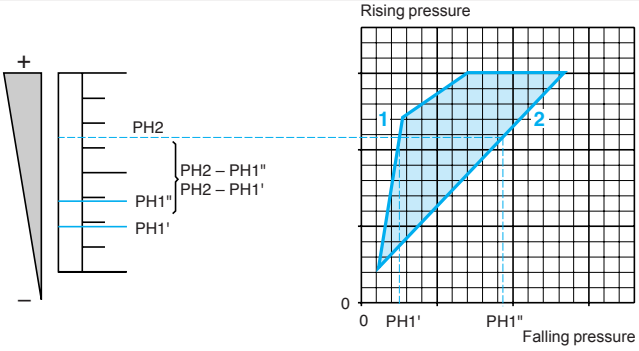
Adjustable throughout the range on rising pressure.

Switching point PH1 on rising pressure



The upper pressure setting at which the pressure or vacuum switch will actuate contact 1 on rising pressure.

Spread

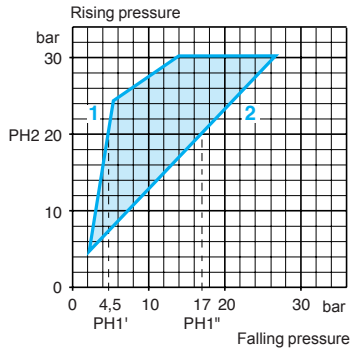


PH1 < PH2
PH2 - PH1' = maximum spread
PH2 - PH1" = minimum spread

The difference between switching points PH2 and PH1 on rising pressure.

Note: *switching point PH1 can be set at any value between PH1' and PH1".*

Example: Determining switching points on rising pressure for the 2 stages



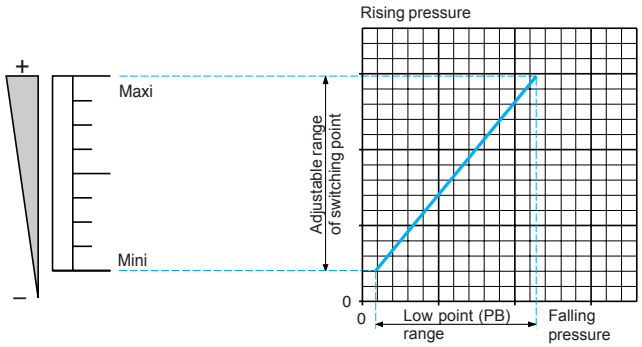
1 Maximum spread
2 Minimum spread

■ Consider a 2nd stage switching point on rising pressure (PH2) of 20 bar (set value at which contact 2 will change state on rising pressure).
■ It can be seen that the 1st stage switching point (PH1) can be set between 4.5 and 17 bar on rising pressure.
Conclusion:
□ the maximum spread will be:
20 - 4.5 = 15.5 bar,
□ the minimum spread will be:
20 - 17 = 3 bar.

Electromechanical pressure and vacuum switches

Dual stage, fixed differential switches, for detection at each threshold

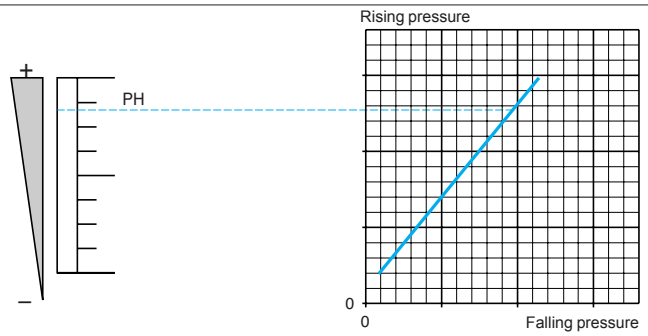
Adjustment range of high point (PH1 or PH2)



Defined by the difference between the minimum and maximum high point (PH1 or PH2) setting values for each stage.

For a high set point (PH), the lower point (PB) is fixed and cannot be adjusted.
For a low set point (PB1 or PB2), the higher point (PH1 or PH2) is fixed and cannot be adjusted.

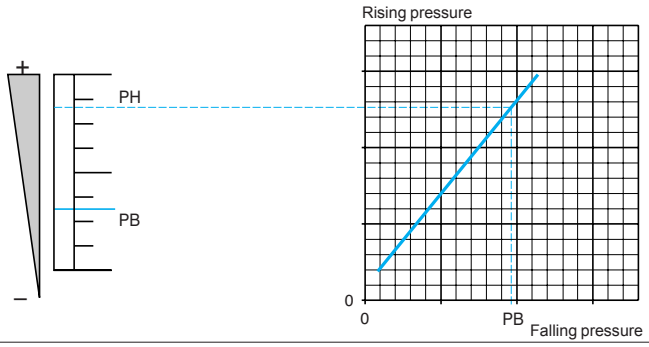
Switching point on rising pressure (PH1 or PH2)



The upper pressure setting at which the pressure or vacuum switch will actuate the contact, for each stage, on rising pressure.

Adjustable throughout the range on rising pressure.

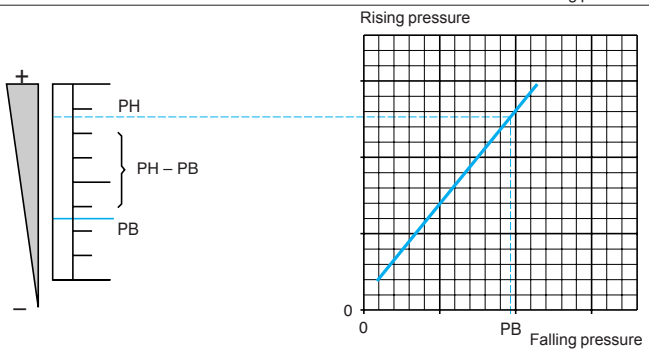
Switching point on falling pressure (PB1 or PB2)



The pressure at which the switch contact changes state, for each stage, on falling pressure.

The lower point (PB) is not adjustable and is entirely dependent on the high point setting (PH) and the natural differential of the switch.

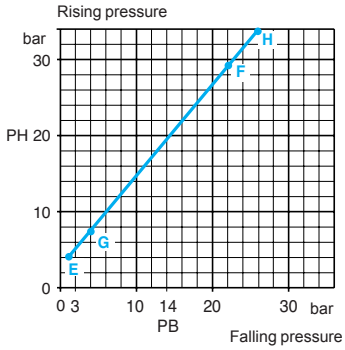
Differential



PH - PB = natural differential
The difference between the switching point on rising pressure (PH) and the switching point on falling pressure (PB), for each stage.

This point is not adjustable and therefore, the value of the differential is fixed.
It is the natural differential of the switch (contact differential, friction, etc.), for each of its 2 stages.

Example: stage 1 = segment EF stage 2 = segment GH



1 Maximum spread
2 Minimum spread

For stage 2 (segment GH):
■ Consider a switching point on rising pressure (PH2) of 20 bar (set value at which contact 2 will change state on rising pressure).
■ It can be seen that the switching point on falling pressure (PB2) is 14 bar (fixed value at which contact 2 will return to its original state).
Conclusion:
for stage 2, the differential will be:
20 - 14 = 6 bar.
Repeat the same procedure for stage 1 (segment EF).

Electromechanical pressure and vacuum switches

OsiSense XM

OsiSense XML for control circuits

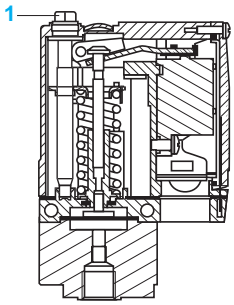
Presentation

OsiSense **XML** pressure and vacuum switches are designed for use in control circuits.
They are used to control the pressure of hydraulic oils, fresh water, sea water, air, steam, corrosive fluids or viscous products, up to 500 bar.

OsiSense **XMLA** pressure and vacuum switches have a fixed differential and are used for detection of a single threshold. They incorporate 1 CO single-pole contact.
OsiSense **XMLB** pressure and vacuum switches have an adjustable differential and are used for regulation between 2 thresholds. They incorporate 1 CO single-pole contact.
OsiSense **XMLC** pressure and vacuum switches have an adjustable differential and are used for regulation between 2 thresholds. They incorporate 2 CO single-pole contacts.
OsiSense **XMLD** pressure and vacuum switches are dual stage switches, each stage with a fixed differential, and are used for detection at each threshold. They incorporate 2 CO single-pole contacts (one per stage).

Setting

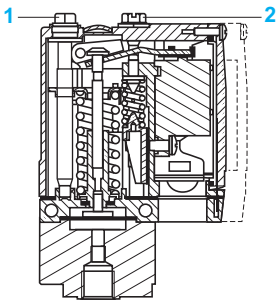
When setting OsiSense XML pressure and vacuum switches, adjust the switching point on rising pressure (PH) first and then the switching point on falling pressure (PB).



OsiSense XMLA pressure and vacuum switches with fixed differential

Switching point on rising pressure
The switching point on rising pressure (PH) is set by adjusting the red screw 1.

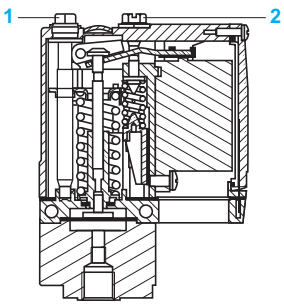
Switching point on falling pressure
The switching point on falling pressure (PB) is not adjustable.
The difference between the tripping and resetting points of the contact is the natural differential of the switch (contact differential, friction, etc.).



OsiSense XMLB and XMLC pressure and vacuum switches with adjustable differential

Switching point on rising pressure
The switching point on rising pressure (PH) is set by adjusting the red screw 1.

Switching point on falling pressure
The switching point on falling pressure (PB) is set by adjusting the green screw 2.



OsiSense XMLD dual stage pressure and vacuum switches with fixed differential for each threshold

Switching point on rising pressure of stage 1 and stage 2
The first stage switching point on rising pressure (PH1) is set by adjusting the red screw 1.
The second stage switching point on rising pressure (PH2) is set by adjusting the blue screw 2.

Switching point on falling pressure
The switching points on falling pressure (PB1 and PB2) are not adjustable.
The difference between the tripping and resetting points of each contact is the natural differential of the switch (contact differential, friction, etc.).

Electromechanical pressure and vacuum switches

OsiSense XM

OsiSense XML for control circuits

Environment characteristics

Conformity to standards		CE, IEC/EN 60947-5-1, UL 508, CSA C22-2 no. 14
Product certifications		All products: UL, CSA, EAC XMLA and XMLB: CCC, BV, LROS
Protective treatment		Standard version "TC". Special version "TH"
Ambient air temperature	**°C**	For operation: -25…+70. For storage: -40…+70
Fluids or products controlled		Hydraulic oils, air, fresh water, sea water Steam, corrosive fluids, viscous products, depending on model
Materials		Case: zinc alloy Component materials in contact with fluid: see pages 2/120 and 2/121
Operating position		All positions
Vibration resistance		4 gn (30...500 Hz) conforming to IEC 60068-2-6 except **XML●L35●●●●●**, **XML●001●●●●●** and **XMLBM03●●●●●**: 2 gn
Shock resistance		50 gn conforming to IEC 60068-2-27 except **XML●L35●●●●●**, **XML●001●●●●●** and **XMLBM03●●●●●**: 30 gn
Electric shock protection		Class I conforming to IEC 1140, IEC 536 and NF C 20-030
Degree of protection		Screw terminal models: IP 66 conforming to IEC/EN 60529 Connector models: IP 65 conforming to IEC/EN 60529
Operating rate	**Op. cycles/ min**	Piston version switches: ⩽ 60 (for temperatures > 0 °C) Diaphragm version switches: ⩽ 120 (for temperatures > 0 °C)
Repeat accuracy		< 2%
Fluid connection		G 1/4 (BSP female) conforming to NF E 03-005, ISO 228 or 1/4"-18 NPTF For sizes ⩾ 300 bar, use the gasket supplied with the product. This gasket is also available as a separate part, reference **XMLZL010**.
Electrical connection		Screw terminal models: ISO M20 x 1.5 or 1/2" NPT tapped entry For an entry tapped for no.13 (DIN Pg 13.5) cable gland, replace the last number of the reference with 1 (for example, **XMLA010A2S12** becomes **XMLA010A2S11**) Connector models: EN 175301-803-A (ex-DIN 43650) connector

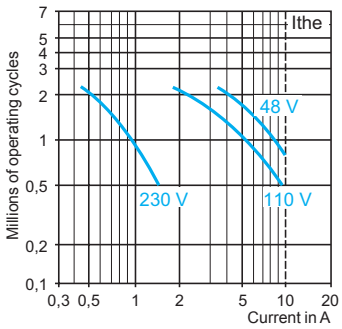
Contact block characteristics

Rated operational characteristics		∼ AC-15, B300 (Ue = 240 V, Ie = 1.5 A; Ue = 120 V, Ie = 3 A) ⎓ DC-13; R300 (Ue = 250 V, Ie = 0.1 A), conforming to IEC 60947-5-1 Appendix A, EN 60947-5-1
Rated insulation voltage		Ui = 500 V conforming to IEC/EN 60947-1 Ui = 300 V conforming to UL 508, CSA C22-2 no. 14
Rated impulse withstand voltage		U imp = 6 kV conforming to IEC/EN 60947-1
Type of contacts		Silver tipped contacts **XMLA** and **XMLB**: 1 CO single-pole contact (4 terminals), snap action **XMLC**: 2 CO single-pole contacts (8 terminals), simultaneous, snap action **XMLD**: 2 CO single-pole contacts (8 terminals), staggered, snap action
Resistance across terminals	**mΩ**	< 25 conforming to NF C 93-050 method A or IEC 255-7 category 3
Terminal referencing		Conforming to CENELEC EN 50013
Short-circuit protection		10 A cartridge fuse type gG (gI)
Connection		Screw clamp terminals. Minimum clamping capacity: 1 x 0.5 mm²/ AWG 20 Maximum clamping capacity: 2 x 2.5 mm²/AWG 14

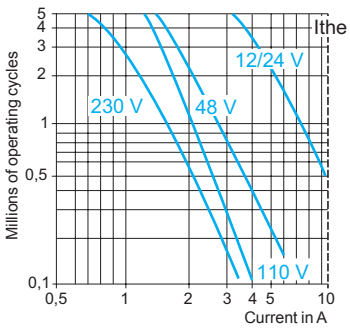
Electrical durability
Conforming to IEC/EN 60947-5-1 Appendix C
Utilisation categories AC-15 and DC-13

Operating rate: 3600 operating cycles/hour
Load factor: 0.5

XMLA and **XMLB**
AC supply ∼ 50/60 Hz
Inductive circuit, Ithe = 10 A



XMLC and **XMLD**
AC supply ∼ 50/60 Hz
Inductive circuit, Ithe = 10 A



DC supply ⎓
Power broken in W
for 1 million operating cycles

Voltage	V	**24**	**48**	**120**
	W	31	29	26

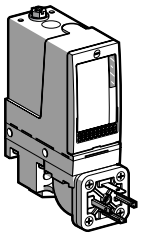
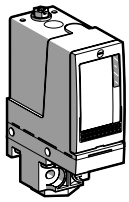
DC supply ⎓
Power broken in W for 5 million operating cycles

Voltage	V	**24**	**48**	**120**
	W	10	7	4

Electromechanical vacuum switches

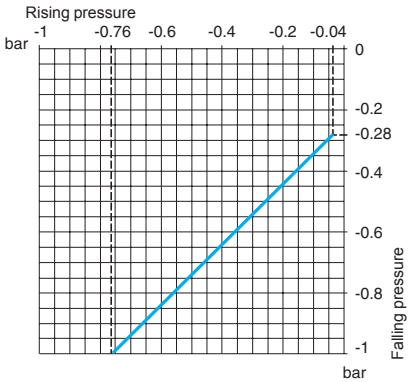
OsiSense XML

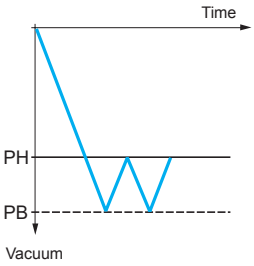
Size - 1 bar (- 14.5 psi)
Fixed differential, for detection of a single threshold
Switches with 1 CO single-pole contact

OsiSense XMLA vacuum switches		With setting scale		
				
Adjustable range of switching point (PB) (Falling pressure)		**- 0.28…- 1 bar (- 4.06…- 14.5 psi)**		
Electrical connection		DIN connector	Terminals	
Fluid connection		G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)
References *(1)*				
Fluids controlled *(2)*	Hydraulic oils, fresh water, air, up to + 70 °C	**XMLAM01V2C11**	**XMLAM01V2S12**	**XMLAM01V2S13**
	Hydraulic oils, fresh water, air, corrosive fluids, up to + 160 °C Sea water, up to + 30 °C	**XMLAM01T2C11**	**XMLAM01T2S12**	**–**
Weight (kg)		0.685	0.715	0.715
Complementary characteristics not shown under general characteristics (page 2/63)				
Natural differential (add to PB to give PH)	At low setting *(3)*	0.24 bar (3.48 psi)		
	At high setting *(3)*	0.24 bar (3.48 psi)		
Maximum permissible pressure	Per cycle	5 bar (72.5 psi)		
	Accidental	9 bar (130.5 psi)		
Destruction pressure		18 bar (261 psi)		
Mechanical life		3 x 10^6 operating cycles		
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Vacuum switch type		Diaphragm		

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLAM01V2S12** becomes **XMLAM01V2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low and high setting points for switches of the same size: ± 0.05 bar (± 0.72 psi).

Operating curves





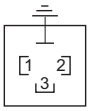
— Adjustable value
--- Non adjustable value

Connection

Terminal model

Connector model

Vacuum switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

Other versions For vacuum switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

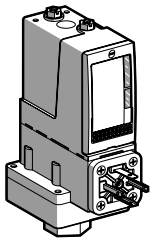
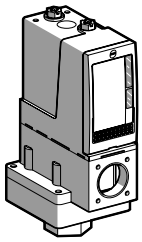
Accessories: page 2/116
Dimensions: pages 2/117 to 2/119

Telemecanique Sensors

Electromechanical vacuum switches

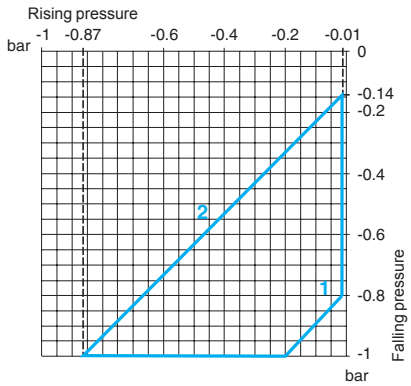
OsiSense XM, OsiSense XML

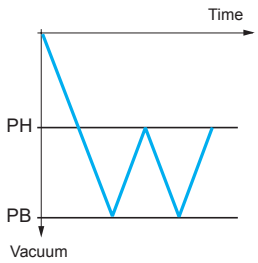
Size - 1 bar (- 14.5 psi)
Adjustable differential, for regulation between 2 thresholds
Switches with 1 CO single-pole contact

OsiSense XMLB vacuum switches		With setting scale		
				
Adjustable range of switching point (PB) (Falling pressure)		**- 0.14…- 1 bar (- 2.03…- 14.5 psi)**		
Electrical connection		DIN connector	Terminals	
Fluid connection		G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)
References *(1)*				
Fluids controlled *(2)*	Hydraulic oils, fresh water, air, up to + 70 °C	**XMLBM02V2C11**	**XMLBM02V2S12**	**XMLBM02V2S13**
	Hydraulic oils, fresh water, air, corrosive fluids, up to + 160 °C Sea water, up to + 30 °C	**XMLBM02T2C11**	**XMLBM02T2S12**	**XMLBM02T2S13**
Weight (kg)		1.015	1.030	1.030
Complementary characteristics not shown under general characteristics (page 2/63)				
Possible differential (add to PB to give PH)	Min. at low setting *(3)*	0.13 bar (1.88 psi)		
	Min. at high setting *(3)*	0.13 bar (1.88 psi)		
	Max. at high setting	0.8 bar (11.6 psi)		
Maximum permissible pressure	Per cycle	5 bar (72.5 psi)		
	Accidental	9 bar (130.5 psi)		
Destruction pressure		18 bar (261 psi)		
Mechanical life		3 x 10^6 operating cycles		
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/62	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Vacuum switch type		Diaphragm		

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLBM02V2S12** becomes **XMLBM02V2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low and high setting points for switches of the same size: ± 0.02 bar (± 0.29 psi).

Operating curves



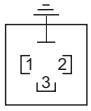


Connection

Terminal model

Connector model

Vacuum switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

1 Maximum differential
2 Minimum differential

— Adjustable value

Other versions

For vacuum switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical vacuum switches

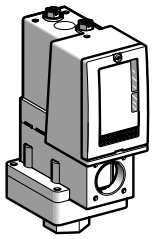
OsiSense XML

Size - 1 bar (- 14.5 psi)

Adjustable differential, for regulation between 2 thresholds

Switches with 2 CO single-pole contacts

OsiSense XMLC vacuum switches	With setting scale



Adjustable range of switching point (PB) (Falling pressure)	**- 0.14…- 1 bar (- 2.03…- 14.5 psi)**
Electrical connection	Terminals
Fluid connection	G 1/4 (female)

References *(1)*

Fluids controlled *(2)*	Hydraulic oils, fresh water, air, up to + 70 °C	**XMLCM02V2S12**
	Hydraulic oils, fresh water, air, corrosive fluids, up to + 160 °C Sea water, up to + 30 °C	**XMLCM02T2S12**
Weight (kg)		1.015

Complementary characteristics not shown under general characteristics (page 2/63)

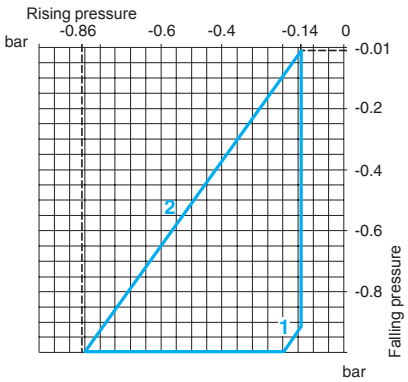
Possible differential (add to PB to give PH)	Min. at low setting *(3)*	0.13 bar (1.89 psi)
	Min. at high setting *(3)*	0.14 bar (2.03 psi)
	Max. at high setting	0.8 bar (11.6 psi)
Maximum permissible pressure	Per cycle	5 bar (72.5 psi)
	Accidental	9 bar (130.5 psi)
Destruction pressure		18 bar (261 psi)
Mechanical life		3 x 10^6 operating cycles
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm
Vacuum switch type		Diaphragm

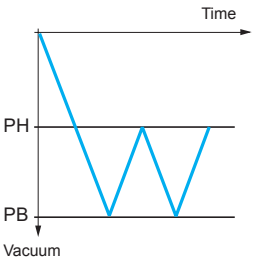
*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLCM02V2S12** becomes **XMLCM02V2S11**).*

(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.

(3) Deviation of the differential at low and high setting points for switches of the same size: ± 0.02 bar (± 0.29 psi).

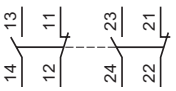
Operating curves





Connection

Terminal model



1 Maximum differential

2 Minimum differential

— Adjustable value

Other versions

For vacuum switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Accessories: page 2/116

Dimensions: pages 2/117 to 2/119

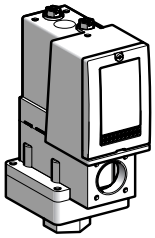
Telemecanique Sensors

Electromechanical vacuum switches

OsiSense XML

Size - 1 bar (- 14.5 psi)
Dual stage, fixed differential, for detection at each threshold
Switches with 2 CO single-pole contacts

OsiSense XMLD vacuum switches		Without setting scale



Adjustable range of each switching point (Falling pressure)	2nd stage switching point (PB2)	**- 0.12…- 1 bar (- 1.74…- 14.5 psi)**
	1st stage switching point (PB1)	**- 0.10…- 0.98 bar (- 1.45…- 14.21 psi)**
Spread between 2 stages (PB2 - PB1)		**0.02…0.88 bar (0.29…12.76 psi)**
Electrical connection		Terminals
Fluid connection		G 1/4 (female)

References *(1)*

Fluids controlled *(2)*	Hydraulic oils, fresh water, air, up to + 70 °C	**XMLDM02V1S12**
	Hydraulic oils, fresh water, air, corrosive fluids, up to + 160 °C Sea water, up to + 30 °C	**XMLDM02T1S12**
Weight (kg)		1.015

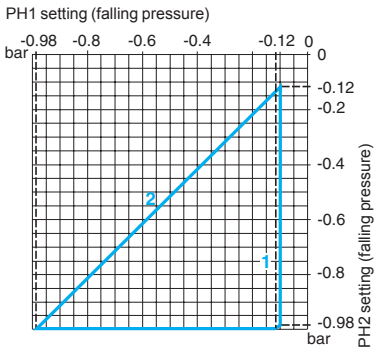
Complementary characteristics not shown under general characteristics (page 2/63)

Natural differential (add to PB1/PB2 to give PH1/PH2)	At low setting *(3)*	0.1 bar (1.45 psi)
	At high setting *(4)*	0.1 bar (1.45 psi)
Maximum permissible pressure	Per cycle	5 bar (72.5 psi)
	Accidental	9 bar (130.5 psi)
Destruction pressure		18 bar (261 psi)
Mechanical life		3 x 10^6 operating cycles
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm
Vacuum switch type		Diaphragm

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLDM02V1S12** becomes **XMLDM02V1S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low setting point for switches of the same size: ± 0.035 bar (± 0.51 psi)
(4) Deviation of the differential at high setting point for switches of the same size: ± 0.02 bar (± 0.29 psi).

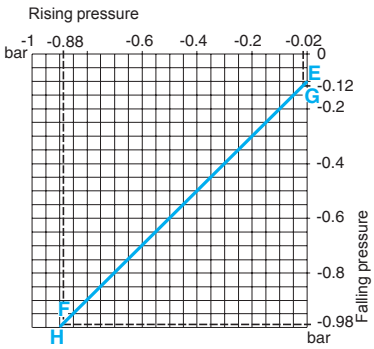
Operating curves

High setting tripping points of contacts 1 and 2

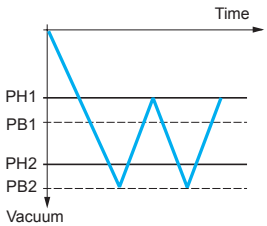


1 Maximum differential
2 Minimum differential

Natural differential of contacts 1 and 2



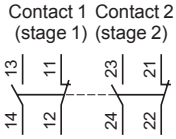
EF Contact 1 (stage 1)
GH Contact 2 (stage 2)



— Adjustable value
--- Non adjustable value

Connection

Terminal model



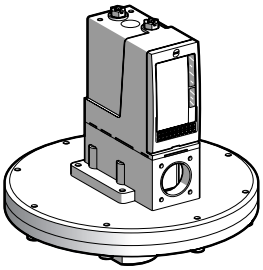
Other versions	For vacuum switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical vacuum switches

OsiSense XML

Size - 200 mbar (- 2.9 psi)
Adjustable differential, for regulation between 2 thresholds
Switches with 1 CO single-pole contact

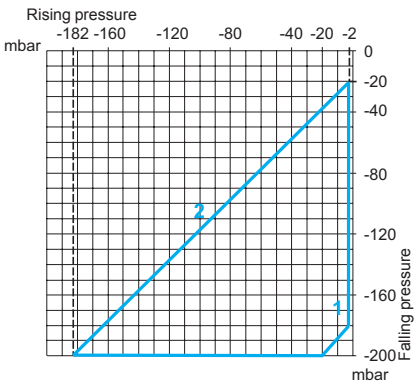
OsiSense XMLB vacuum switches	With setting scale	

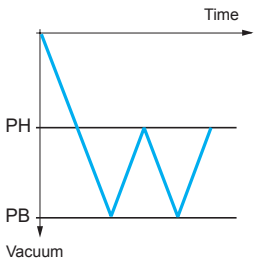


Adjustable range of switching point (PB) (Falling pressure)		**- 20…- 200 mbar (- 0.29…- 2.9 psi)**	
Electrical connection		Terminals	
Fluid connection		G 1/4 (female)	1/4"-18 NPTF (female)
References *(1)*			
Fluids controlled *(2)*	Hydraulic oils, air, up to + 160 °C	**XMLBM03R2S12**	**XMLBM03R2S13**
Weight (kg)		3.310	3.310
Complementary characteristics not shown under general characteristics (page 2/63)			
Possible differential (add to PB to give PH)	Min. at low setting *(3)*	18 mbar (0.26 psi)	
	Min. at high setting *(3)*	18 mbar (0.26 psi)	
	Max. at high setting	180 mbar (2.6 psi)	
Maximum permissible pressure	Per cycle	1 bar (14.5 psi)	
	Accidental	2 bar (29 psi)	
Destruction pressure		3.5 bar (50.75 psi)	
Mechanical life		3 x 10^6 operating cycles	
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Vacuum switch type		Diaphragm	

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLBM03R2S12** becomes **XMLBM03R2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low and high setting points for switches of the same size: ± 2 mbar (± 0.29 psi).

Operating curves





Connection

Terminal model

1 Maximum differential
2 Minimum differential

— Adjustable value

Other versions

For vacuum switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Accessories:
page 2/116

Dimensions:
pages 2/117 to 2/119

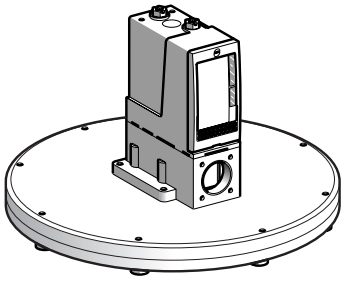
Telemecanique
Sensors

Electromechanical pressure switches

OsiSense XML

Size 50 mbar (0.72 psi)
Adjustable differential, for regulation between 2 thresholds
Switches with 1 CO single-pole contact

OsiSense XMLB pressure switches	With setting scale



Adjustable range of switching point (PH) (Rising pressure)	**2.6…50 mbar (0.038…0,72 psi)**
Electrical connection	Terminals
Fluid connection	G 1/4 (female)

References *(1)*

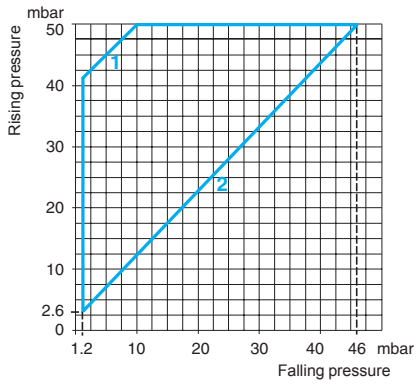
Fluids controlled *(2)*	Hydraulic oils, air, up to + 160 °C	**XMLBL05R2S12**
	Fresh water, corrosive fluids, up to + 160 °C	**XMLBL05S2S12**
Weight (kg)		2.420

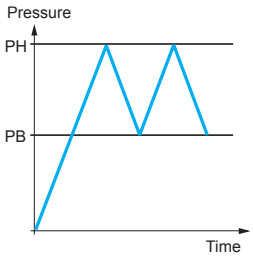
Complementary characteristics not shown under general characteristics (page 2/63)

Possible differential (subtract from PH to give PB)	Min. at low setting *(3)*	1.4 mbar (0.02 psi)
	Min. at high setting *(4)*	4 mbar (0.06 psi)
	Max. at high setting	40 mbar (0.58 psi)
Maximum permissible pressure	Per cycle	62.5 mbar (0.90 psi)
	Accidental	112.5 mbar (1.63 psi)
Destruction pressure		225 mbar (3.26 psi)
Mechanical life		6 x 10^6 operating cycles
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLBL05R2S12** becomes **XMLBL05R2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low setting point for switches of the same size: - 0.8 mbar, + 1.1 mbar (- 0.01 psi, + 0.02 psi).
(4) Deviation of the differential at high setting point for switches of the same size: ± 1.4 mbar, (+ 0.02 psi).

Operating curves





1 Maximum differential
2 Minimum differential

— Adjustable value

Connection

Terminal model

Other versions

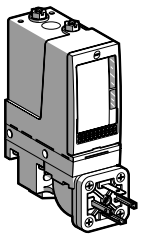
For pressure switches with EN 175301-803-A (ex-DIN 43650A) connector or with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

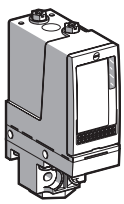
Electromechanical vacu-pressure switches

OsiSense XML. Size 5 bar (72.5 psi)

Adjustable differential, for regulation between 2 thresholds
Switches with 1 CO single-pole contact

OsiSense XMLB vacu-pressure switches | **With setting scale**

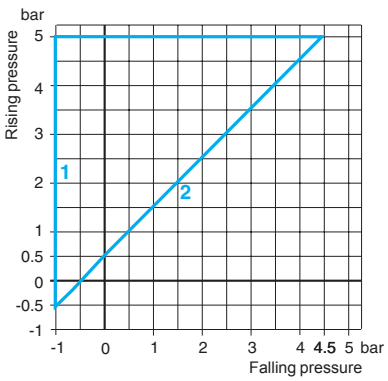


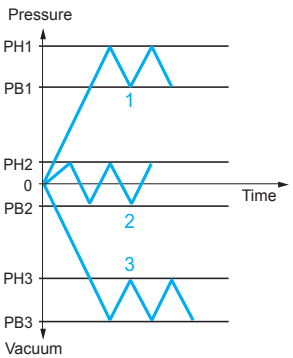


Adjustable range of switching point (PH) (Rising pressure)		**- 0.5…5 bar (- 7.25…72.5 psi)**		
Electrical connection		DIN connector	Terminals	
Fluid connection		G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)
References *(1)*				
Fluids controlled *(2)*	Hydraulic oils, fresh water, air, up to + 70 °C	**XMLBM05A2C11**	**XMLBM05A2S12**	**XMLBM05A2S13**
	Hydraulic oils, fresh water, air, up to + 160 °C	**XMLBM05B2C11**	**XMLBM05B2S12**	–
	Corrosive fluids, up to + 160 °C	**XMLBM05C2C11**	**XMLBM05C2S12**	–
	Viscous products, up to + 160 °C (G 1¼" fluid connection)	**XMLBM05P2C11**	**XMLBM05P2S12**	–
Weight (kg)		0.715	0.685	0.685
Complementary characteristics not shown under general characteristics (page 2/63)				
Possible differential (subtract from PH to give PB)	Min. at low setting *(3)*	0.5 bar (7.25 psi)		
	Min. at high setting *(3)*	0.5 bar (7.25 psi)		
	Max. at high setting	6 bar (87 psi)		
Maximum permissible pressure	Per cycle	6.25 bar (90.62 psi)		
	Accidental	11.25 bar (163.12 psi)		
Destruction pressure		23 bar (333.5 psi)		
Mechanical life		3 x 10^6 operating cycles		
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Vacu-pressure switch type		Diaphragm		

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLBM05A2S12** becomes **XMLBM05A2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low and high setting points for switches of the same size: ± 0.05 bar (± 0.72 psi).

Operating curves





1 Maximum differential
2 Minimum differential

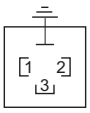
— Adjustable value

Connection

Terminal model

Connector model

Vacu-pressure switch pin view



1 → 11 and 13
2 → 12
3 → 14

Other versions For vacu-pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Accessories: page 2/116
Dimensions: pages 2/117 to 2/119

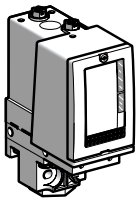
Telemecanique Sensors

Electromechanical vacu-pressure switches

OsiSense XML. Size 5 bar (72.5 psi)

Adjustable differential, for regulation between 2 thresholds
Switches with 2 CO single-pole contacts

OsiSense XMLC vacu-pressure switches	With setting scale



Adjustable range of switching point (PH) (Rising pressure)		**- 0.55…5 bar (- 7.97…72.5 psi)**
Electrical connection		Terminals
Fluid connection		G 1/4 (female)

References *(1)*

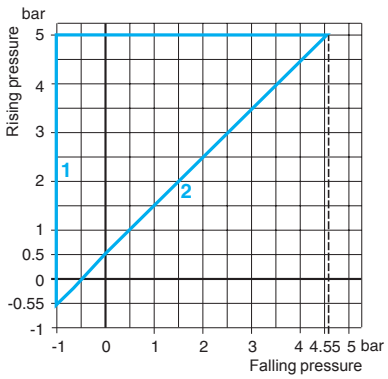
Fluids controlled *(2)*	Hydraulic oils, fresh water, air, up to + 160 °C	**XMLCM05B2S12**
	Corrosive fluids, up to + 160 °C	**XMLCM05C2S12**
Weight (kg)		0.685

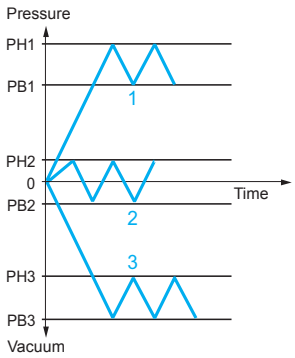
Complementary characteristics not shown under general characteristics (page 2/63)

Possible differential (subtract from PH to give PB)	Min. at low setting *(3)*	0.45 bar (6.52 psi)
	Min. at high setting *(3)*	0.45 bar (6.52 psi)
	Max. at high setting	6 bar (87 psi)
Maximum permissible pressure	Per cycle	6.25 bar (90.62 psi)
	Accidental	11.25 bar (163.12 psi)
Destruction pressure		23 bar (333.5 psi)
Mechanical life		3 x 10^6 operating cycles
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm
Vacu-pressure switch type		Diaphragm

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLCM05B2S12** becomes **XMLCM05B2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low and high setting points for switches of the same size: ± 0.1 bar (± 1.45 psi).

Operating curves



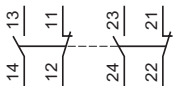


1 Maximum differential
2 Minimum differential

— Adjustable value

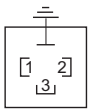
Connection

Terminal model



Connector model

Vacu-pressure switch pin view



1 → 11 and 13
2 → 12
3 → 14

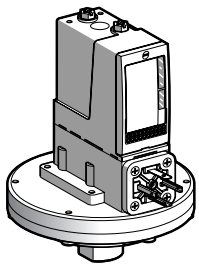
Other versions	For vacu-pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

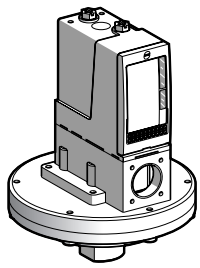
Electromechanical pressure switches

OsiSense XML

Size 350 mbar (5.07 psi)
Adjustable differential, for regulation between 2 thresholds
Switches with 1 CO single-pole contact

OsiSense XMLB pressure switches — **With setting scale**





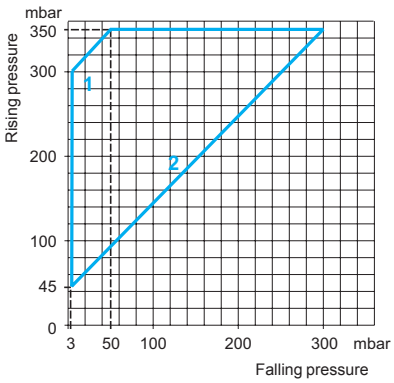
Adjustable range of switching point (PH) (Rising pressure)		**45…350 mbar (0.65…5.07 psi)**		
Electrical connection		DIN connector	Terminals	
Fluid connection		G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)
References *(1)*				
Fluids controlled *(2)*	Hydraulic oils, air, up to + 160 °C	**XMLBL35R2C11**	**XMLBL35R2S12**	**XMLBL35R2S13**
	Fresh water, corrosive fluids, up to + 160 °C	**XMLBL35S2C11**	**XMLBL35S2S12**	–
	Viscous products, up to + 160 °C (G 1¼" fluid connection)	**XMLBL35P2C11**	**XMLBL35P2S12**	–
Weight (kg)		2.590	2.575	2.575

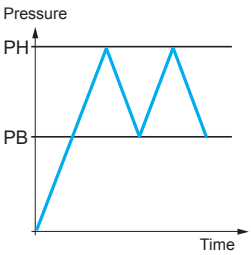
Complementary characteristics not shown under general characteristics (page 2/63)

Possible differential (subtract from PH to give PB)	Min. at low setting *(3)*	42 mbar (0.60 psi)		
	Min. at high setting *(4)*	50 mbar (0.72 psi)		
	Max. at high setting	300 mbar (4.35 psi)		
Maximum permissible pressure	Per cycle	1.25 bar (18.12 psi)		
	Accidental	2.25 bar (32.62 psi)		
Destruction pressure		4.5 bar (65.25 psi)		
Mechanical life		4 million operating cycles		
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm		

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLBL35R2S12** becomes **XMLBL35R2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low setting point for switches of the same size: - 8 mbar, + 3 mbar (- 0.12 psi, + 0.04 psi).
(4) Deviation of the differential at high setting point for switches of the same size: ± 8 mbar (± 0.11 psi).

Operating curves





— Adjustable value

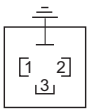
1 Maximum differential
2 Minimum differential

Connection

Terminal model

Connector model

Pressure switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

Other versions — For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Accessories: page 2/116
Dimensions: pages 2/117 to 2/119

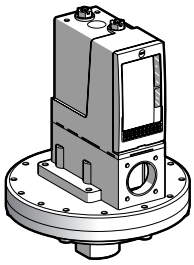
Telemecanique Sensors

Electromechanical pressure switches

OsiSense XML

Size 350 mbar (5.07 psi)
Adjustable differential, for regulation between 2 thresholds
Switches with 1 CO single-pole contact

OsiSense XMLB pressure switches	**30 bar (435 psi) overpressure** **With setting scale**



Adjustable range of switching point (PH) (Rising pressure)	**42…330 mbar (0.61…4.78 psi)**
Electrical connection	Terminals
Fluid connection	G 1/4 (female)

References *(1)*

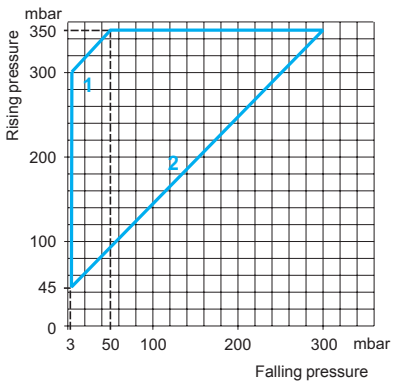
Fluids controlled *(2)*	Hydraulic oils, air, up to + 160 °C	**XMLBS35R2S12**
Weight (kg)		3.500

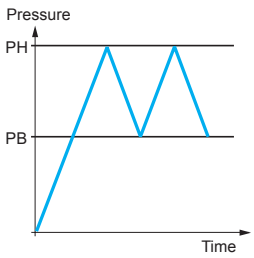
Complementary characteristics not shown under general characteristics (page 2/63)

Possible differential (subtract from PH to give PB)	Min. at low setting *(3)*	33 mbar (0.48 psi)
	Min. at high setting *(4)*	58 mbar (0.84 psi)
	Max. at high setting	250 mbar (3.62 psi)
Maximum permissible pressure	Per cycle	30 bar (435 psi)
	Accidental	37.5 bar (543.75 psi)
Destruction pressure		67.5 bar (978.75 psi)
Mechanical life		2 million operating cycles
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm
Connector type for connector models		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116
Pressure switch type		Diaphragm

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLBS35R1S12** becomes **XMLBS35R1S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low setting point for switches of the same size: - 8 mbar, + 3 mbar (- 0.12 psi, + 0.04 psi).
(4) Deviation of the differential at high setting point for switches of the same size: ± 8 mbar (± 0.11 psi).

Operating curves





1 Maximum differential
2 Minimum differential

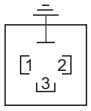
— Adjustable value

Connection

Terminal model

Connector model

Pressure switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

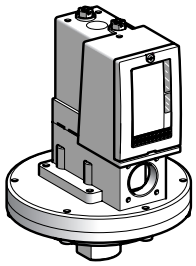
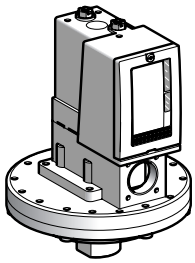
Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

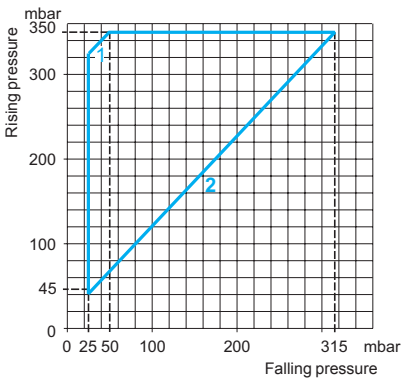
OsiSense XML

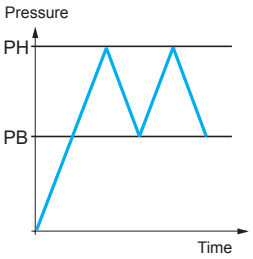
Size 350 mbar (5.07 psi)
Adjustable differential, for regulation between 2 thresholds
Switches with 2 CO single-pole contacts

OsiSense XMLC pressure switches		**With setting scale**		**30 bar (435 psi) overpressure With setting scale**	
					
Adjustable range of switching point (PH) (Rising pressure)		**45…350 mbar (0.65…5.07 psi)**		**42…330 mbar (0.61…4.78 psi)**	
Electrical connection		Terminals		Terminals	
Fluid connection		G 1/4 (female)	1/4"-18 NPTF (female)	G 1/4 (female)	1/4"-18 NPTF (female)
References *(1)*					
Fluids controlled *(2)*	Hydraulic oils, air, up to + 160 °C	**XMLCL35R2S12**	**–**	**XMLCS35R2S12**	**XMLCS35R2S13**
	Fresh water, corrosive fluids, up to + 160 °C	**XMLCL35S2S12**	**XMLCL35S2S13**	**–**	**–**
Weight (kg)		2.575	2.575	3.500	3.500
Complementary characteristics not shown under general characteristics (page 2/63)					
Possible differential (subtract from PH to give PB)	Min. at low setting *(3)*	20 mbar (0.29 psi)		40 mbar (0.58 psi)	
	Min. at high setting *(3)*	35 mbar (0.51 psi)		88 mbar (1.27 psi)	
	Max. at high setting	300 mbar (4.35 psi)		230 mbar (3.33 psi)	
Maximum permissible pressure	Per cycle	1.25 bar (18.12 psi)		30 bar (435 psi)	
	Accidental	2.25 bar (32.62 psi)		37.5 bar (543.75 psi)	
Destruction pressure		4.5 bar (65.25 psi)		67.5 bar (978.75 psi)	
Mechanical life		4 million operating cycles		2 million operating cycles	
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm			

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLCL35R2S12** becomes **XMLCL35R2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low setting point for switches of the same size: ± 20 mbar (± 0.29 psi).

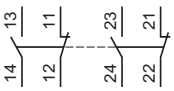
Operating curves





Connection

Terminal model



1 Maximum differential
2 Minimum differential

— Adjustable value

Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Accessories: page 2/116
Dimensions: pages 2/117 to 2/119

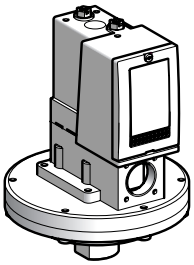
Telemecanique Sensors

Electromechanical pressure switches

OsiSense XML

Size 350 mbar (5.07 psi)
Dual stage, fixed differential, for detection at each threshold
Switches with 2 CO single-pole contacts

OsiSense XMLD pressure switches | **Without setting scale**



Adjustable range of each switching point (Rising pressure)	2nd stage switching point (PH2)	**58…350 mbar (0.84…5.07 psi)**
	1st stage switching point (PH1)	**33…325 mbar (0.48…4.71 psi)**
Spread between 2 stages (PH2 - PH1)		**25…310 mbar (0.36…4.50 psi)**
Electrical connection		Terminals
Fluid connection		G 1/4 (female)

References *(1)*

Fluids controlled *(2)*	Hydraulic oils, air, up to + 160 °C	**XMLDL35R1S12**
Weight (kg)		2.575

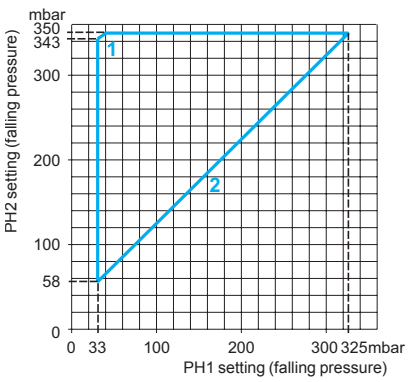
Complementary characteristics not shown under general characteristics (page 2/63)

Natural differential (subtract from PH1/PH2 to give PB1/PB2)	At low setting *(3)*	30 mbar (0.44 psi)
	At high setting *(4)*	30 mbar (0.44 psi)
Maximum permissible pressure	Per cycle	1.25 bar (18.12 psi)
	Accidental	2.25 bar (32.62 psi)
Destruction pressure		4.5 bar (65.25 psi)
Mechanical life		4 million operating cycles
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLDL35R1S12** becomes **XMLDL35R1S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low setting point for switches of the same size: ± 10 mbar (± 0.15 psi).
(4) Deviation of the differential at high setting point for switches of the same size: ± 8 mbar (± 0.11 psi).

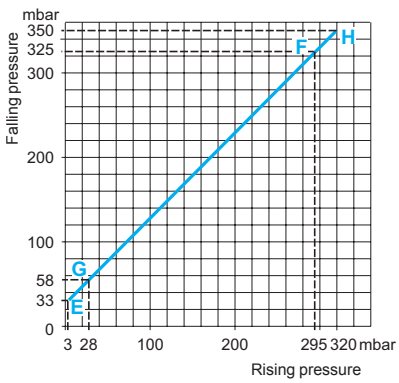
Operating curves

High setting tripping points of contacts 1 and 2

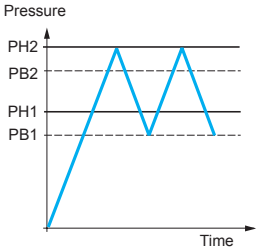


1 Maximum differential
2 Minimum differential

Natural differential of contacts 1 and 2



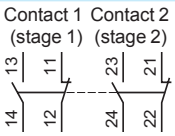
EF Contact 1 (stage 1)
GH Contact 2 (stage 2)



— Adjustable value
--- Non adjustable value

Connection

Terminal model



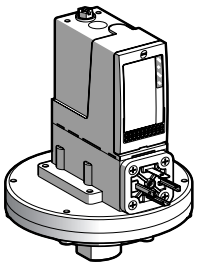
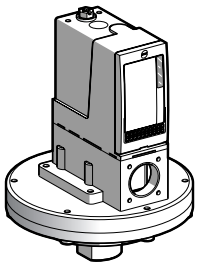
Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

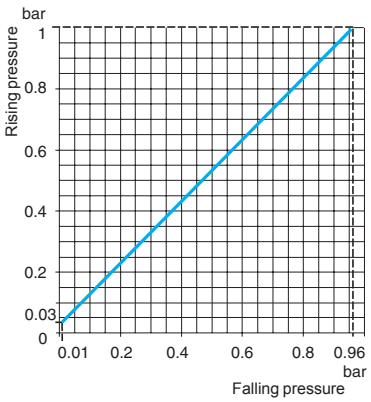
OsiSense XML

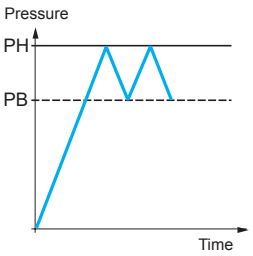
Size 1 bar (14.5 psi)
Fixed differential, for detection of a single threshold
Switches with 1 CO single-pole contact

OsiSense XMLA pressure switches		With setting scale		
				
Adjustable range of switching point (PH) (Rising pressure)		**0.03…1 bar (0.435…14.5 psi)**		
Electrical connection		DIN connector	Terminals	
Fluid connection		G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)
References *(1)*				
Fluids controlled *(2)*	Hydraulic oils, air, up to + 160 °C	**XMLA001R2C11**	**XMLA001R2S12**	–
	Fresh water, corrosive fluids, up to + 160 °C	**XMLA001S2C11**	**XMLA001S2S12**	**XMLA001S2S13**
Weight (kg)		2.570	2.555	2.555
Complementary characteristics not shown under general characteristics (page 2/63)				
Natural differential (subtract from PH to give PB)	At low setting *(3)*	0.02 bar (0.29 psi)		
	At high setting *(3)*	0.04 bar (0.58 psi)		
Maximum permissible pressure	Per cycle	1.25 bar (18.12 psi)		
	Accidental	2.25 bar (32.62 psi)		
Destruction pressure		4.5 bar (65.25 psi)		
Mechanical life		4 x 10^6 operating cycles		
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm		

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLA001R2S12** becomes **XMLA001R2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low and high setting points for switches of the same size: ± 0.01 bar (± 0.14 psi)

Operating curves





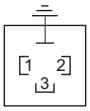
— Adjustable value
--- Non adjustable value

Connection

Terminal model

Connector model

Pressure switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

Other versions For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

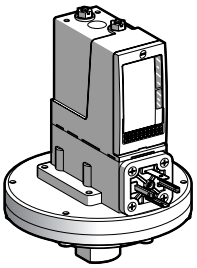
Accessories: page 2/116
Dimensions: pages 2/117 to 2/119

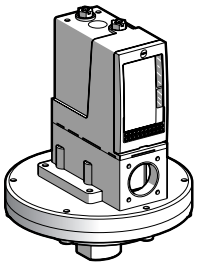
Electromechanical pressure switches

OsiSense XML

Size 1 bar (14.5 psi)
Adjustable differential, for regulation between 2 thresholds
Switches with 1 CO single-pole contact

OsiSense XMLB pressure switches — **With setting scale**

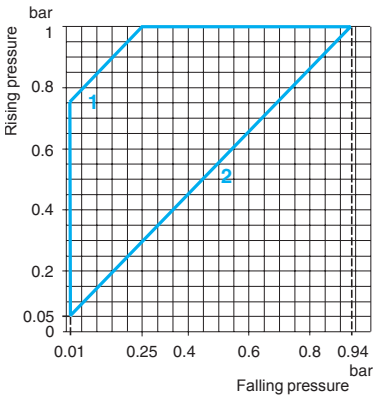


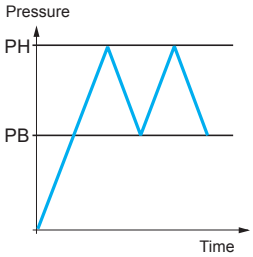


Adjustable range of switching point (PH) (Rising pressure)		**0.05…1 bar (0.72…14.5 psi)**		
Electrical connection		DIN connector	Terminals	
Fluid connection		G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)
References *(1)*				
Fluids controlled *(2)*	Hydraulic oils, air, up to + 160 °C	**XMLB001R2C11**	**XMLB001R2S12**	**XMLB001R2S13**
	Fresh water, corrosive fluids, up to + 160 °C	**XMLB001S2C11**	**XMLB001S2S12**	**XMLB001S2S13**
	Viscous products, up to + 160 °C (G 1¼" fluid connection)	**–**	**XMLB001P2S12**	**–**
Weight (kg)		2.590	2.575	2.575
Complementary characteristics not shown under general characteristics (page 2/63)				
Possible differential (subtract from PH to give PB)	Min. at low setting *(3)*	0.04 bar (0.58 psi)		
	Min. at high setting *(4)*	0.06 bar (0.87 psi)		
	Max. at high setting	0.75 bar (10.87 psi)		
Maximum permissible pressure	Per cycle	1.25 bar (18.12 psi)		
	Accidental	2.25 bar (32.62 psi)		
Destruction pressure		4.5 bar (65.25 psi)		
Mechanical life		4 x 10^6 operating cycles		
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm		

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLB001R2S12** becomes **XMLB001R2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low setting point for switches of the same size: ± 10 mbar (± 0.14 psi).
(4) Deviation of the differential at high setting point for switches of the same size: ± 20 mbar (± 0.29 psi).

Operating curves





1 Maximum differential
2 Minimum differential

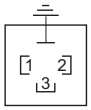
— Adjustable value

Connection

Terminal model

Connector model

Pressure switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

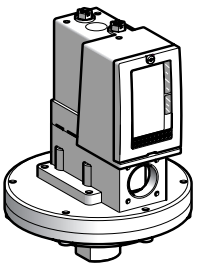
Other versions — For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

OsiSense XML

Size 1 bar (14.5 psi)
Adjustable differential, for regulation between 2 thresholds
Switches with 2 CO single-pole contacts

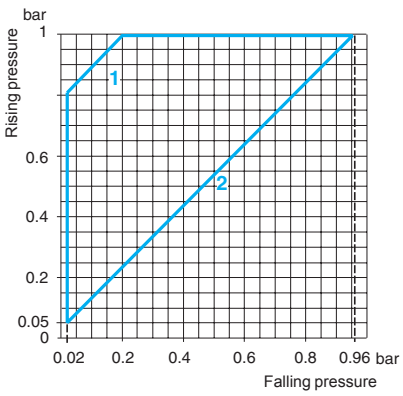
OsiSense XMLC pressure switches		With setting scale	

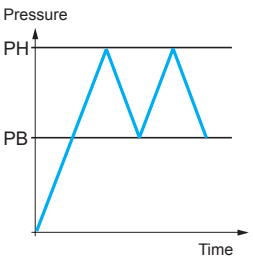


Adjustable range of switching point (PH) (Rising pressure)		**0.05…1 bar (0.725…14.5 psi)**	
Electrical connection		Terminals	
Fluid connection		G 1/4 (female)	1/4”-18 NPTF (female)
References *(1)*			
Fluids controlled *(2)*	Hydraulic oils, air, up to + 160 °C	**XMLC001R2S12**	**XMLC001R2S13**
	Fresh water, corrosive fluids, up to + 160 °C	**XMLC001S2S12**	**XMLC001S2S13**
Weight (kg)		2.555	2.555
Complementary characteristics not shown under general characteristics (page 2/63)			
Possible differential (subtract from PH to give PB)	Min. at low setting *(3)*	0.03 bar (0.43 psi)	
	Min. at high setting *(4)*	0.04 bar (0.58 psi)	
	Max. at high setting	0.8 bar (11.6 psi)	
Maximum permissible pressure	Per cycle	1.25 bar (18.12 psi)	
	Accidental	2.25 bar (32.62 psi)	
Destruction pressure		4.5 bar (65.25 psi)	
Mechanical life		4 x 10^6 operating cycles	
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2”-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm	

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLC001R2S12** becomes **XMLC001R2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low setting point for switches of the same size: ± 0.01 bar (± 0.14 psi)
(4) Deviation of the differential at high setting point for switches of the same size: ± 0.03 bar (± 0.43 psi)

Operating curves



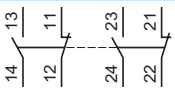


1 Maximum differential
2 Minimum differential

— Adjustable value

Connection

Terminal model



Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Accessories: page 2/116
Dimensions: pages 2/117 to 2/119

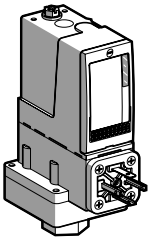
Telemecanique Sensors

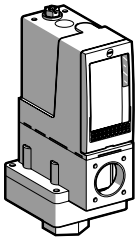
Electromechanical pressure switches

OsiSense XML

Size 2.5 bar (36.25 psi)
Fixed differential, for detection of a single threshold
Switches with 1 CO single-pole contact

OsiSense XMLA pressure switches — **With setting scale**

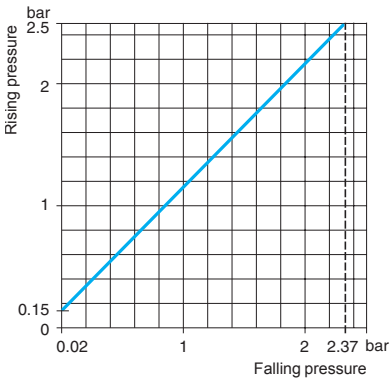


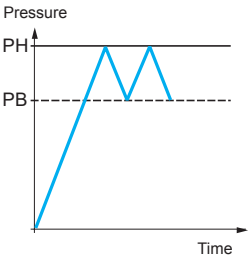


Adjustable range of switching point (PH) (Rising pressure)		**0.15…2.5 bar (2.17…36.25 psi)**		
Electrical connection		DIN connector	Terminals	
Fluid connection		G 1/4 (female)	G 1/4 (female)	1/4”-18 NPTF (female)
References *(1)*				
Fluids controlled *(2)*	Hydraulic oils, fresh water, air, up to + 70 °C	**XMLA002A2C11**	**XMLA002A2S12**	**XMLA002A2S13**
	Hydraulic oils, fresh water, air, up to + 160 °C	**XMLA002B2C11**	**XMLA002B2S12**	**–**
	Corrosive fluids, up to + 160 °C	**XMLA002C2C11**	**XMLA002C2S12**	**–**
Weight (kg)		1.010	0.995	0.995
Complementary characteristics not shown under general characteristics (page 2/63)				
Natural differential (subtract from PH to give PB)	At low setting *(3)*	0.13 bar (1.88 psi)		
	At high setting *(3)*	0.13 bar (1.88 psi)		
Maximum permissible pressure	Per cycle	5 bar (72.5 psi)		
	Accidental	9 bar (130.5 psi)		
Destruction pressure		18 bar (261 psi)		
Mechanical life		8 x 10^6 operating cycles		
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2”-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm		

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLA002A2S12** becomes **XMLA002A2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low and high setting points for switches of the same size: ± 0.03 bar (± 0.43 psi).

Operating curves





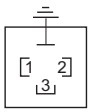
— Adjustable value
--- Non adjustable value

Connection

Terminal model

Connector model

Pressure switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

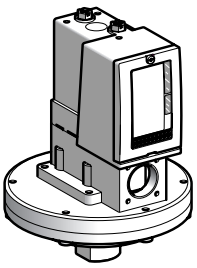
Other versions — For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

OsiSense XML

Size 1 bar (14.5 psi)
Adjustable differential, for regulation between 2 thresholds
Switches with 2 CO single-pole contacts

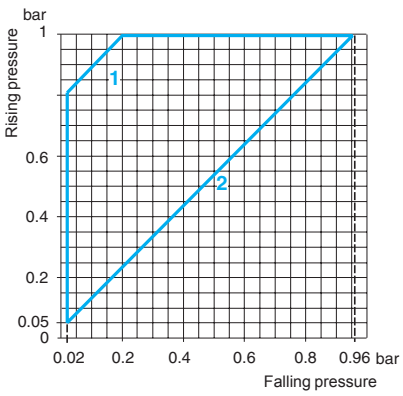
OsiSense XMLC pressure switches		With setting scale	

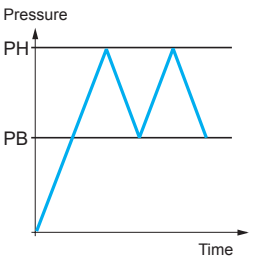


Adjustable range of switching point (PH) (Rising pressure)		**0.05…1 bar (0.725…14.5 psi)**	
Electrical connection		Terminals	
Fluid connection		G 1/4 (female)	1/4”-18 NPTF (female)
References *(1)*			
Fluids controlled *(2)*	Hydraulic oils, air, up to + 160 °C	**XMLC001R2S12**	**XMLC001R2S13**
	Fresh water, corrosive fluids, up to + 160 °C	**XMLC001S2S12**	**XMLC001S2S13**
Weight (kg)		2.555	2.555
Complementary characteristics not shown under general characteristics (page 2/63)			
Possible differential (subtract from PH to give PB)	Min. at low setting *(3)*	0.03 bar (0.43 psi)	
	Min. at high setting *(4)*	0.04 bar (0.58 psi)	
	Max. at high setting	0.8 bar (11.6 psi)	
Maximum permissible pressure	Per cycle	1.25 bar (18.12 psi)	
	Accidental	2.25 bar (32.62 psi)	
Destruction pressure		4.5 bar (65.25 psi)	
Mechanical life		4 x 10^6 operating cycles	
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2”-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm	

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLC001R2S12** becomes **XMLC001R2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low setting point for switches of the same size: ± 0.01 bar (± 0.14 psi)
(4) Deviation of the differential at high setting point for switches of the same size: ± 0.03 bar (± 0.43 psi)

Operating curves



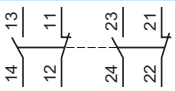


1 Maximum differential
2 Minimum differential

— Adjustable value

Connection

Terminal model



Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Accessories: page 2/116
Dimensions: pages 2/117 to 2/119

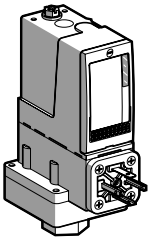
Telemecanique Sensors

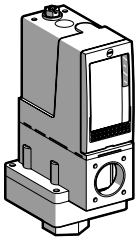
Electromechanical pressure switches

OsiSense XML

Size 2.5 bar (36.25 psi)
Fixed differential, for detection of a single threshold
Switches with 1 CO single-pole contact

OsiSense XMLA pressure switches — **With setting scale**

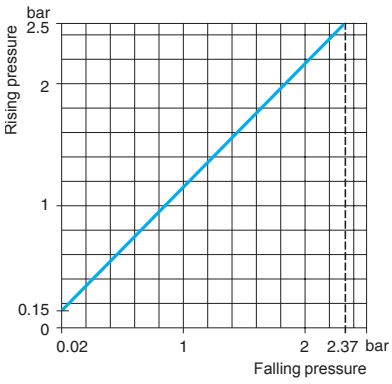


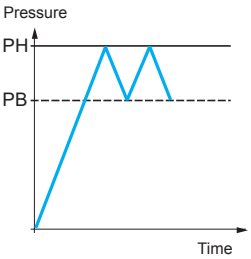


Adjustable range of switching point (PH) (Rising pressure)		**0.15…2.5 bar (2.17…36.25 psi)**		
Electrical connection		DIN connector	Terminals	
Fluid connection		G 1/4 (female)	G 1/4 (female)	1/4”-18 NPTF (female)
References *(1)*				
Fluids controlled *(2)*	Hydraulic oils, fresh water, air, up to + 70 °C	**XMLA002A2C11**	**XMLA002A2S12**	**XMLA002A2S13**
	Hydraulic oils, fresh water, air, up to + 160 °C	**XMLA002B2C11**	**XMLA002B2S12**	**–**
	Corrosive fluids, up to + 160 °C	**XMLA002C2C11**	**XMLA002C2S12**	**–**
Weight (kg)		1.010	0.995	0.995
Complementary characteristics not shown under general characteristics (page 2/63)				
Natural differential (subtract from PH to give PB)	At low setting *(3)*	0.13 bar (1.88 psi)		
	At high setting *(3)*	0.13 bar (1.88 psi)		
Maximum permissible pressure	Per cycle	5 bar (72.5 psi)		
	Accidental	9 bar (130.5 psi)		
Destruction pressure		18 bar (261 psi)		
Mechanical life		8 x 10^6 operating cycles		
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2”-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm		

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLA002A2S12** becomes **XMLA002A2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low and high setting points for switches of the same size: ± 0.03 bar (± 0.43 psi).

Operating curves





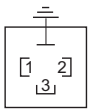
— Adjustable value
--- Non adjustable value

Connection

Terminal model

Connector model

Pressure switch connector pin view



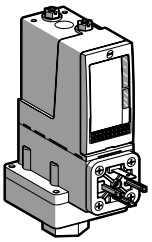
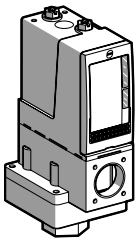
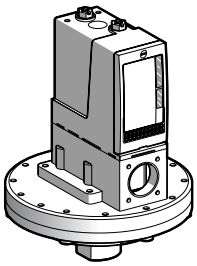
1 → 11 and 13
2 → 12
3 → 14

Other versions — For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

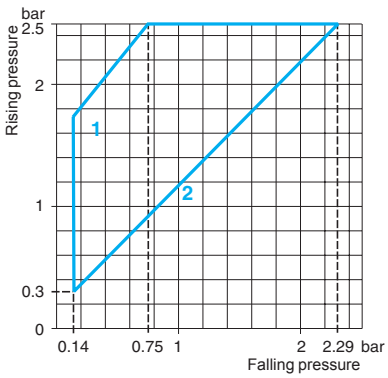
OsiSense XML

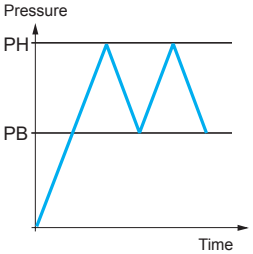
Size 2.5 bar (36.25 psi)
Adjustable differential, for regulation between 2 thresholds
Switches with 1 CO single-pole contact

OsiSense XMLB pressure switches	With setting scale			30 bar (435 psi) overpressure With setting scale
				
Adjustable range of switching point (PH) (Rising pressure)	**0.3…2.5 bar (4.35…36.25 psi)**			
Electrical connection	DIN connector	Terminals		
Fluid connection	G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)	G 1/4 (female)
References *(1)*				
Fluids controlled *(2)* — Hydraulic oils, fresh water, air, up to + 70 °C	**XMLB002A2C11**	**XMLB002A2S12**	**XMLB002A2S13**	**–**
Hydraulic oils, fresh water, air, up to + 160 °C	**XMLB002B2C11**	**XMLB002B2S12**	**–**	**XMLBS02B2S12**
Corrosive fluids, up to + 160 °C	**XMLB002C2C11**	**XMLB002C2S12**	**–**	**–**
Weight (kg)	1.030	1.015	1.015	3.500
Complementary characteristics not shown under general characteristics (page 2/63)				
Possible differential (subtract from PH to give PB) — Min. at low setting *(3)*	0.16 bar (2.32 psi)			0.1 bar (1.45 psi)
Min. at high setting *(3)*	0.21 bar (3.04 psi)			0.22 bar (3.19 psi)
Max. at high setting	1.75 bar (25.37 psi)			1.45 bar (21 psi)
Maximum permissible pressure — Per cycle	5 bar (72.5 psi)			30 bar (435 psi)
Accidental	9 bar (130.5 psi)			37.5 bar (543.75 psi)
Destruction pressure	18 bar (261 psi)			67.5 bar (978.75 psi)
Mechanical life	8 x 10^6 operating cycles			2 x 10^6 operating cycles
Connection	EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm
Pressure switch type	Diaphragm			

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLB002A2S12** becomes **XMLB002A2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low and high setting points for switches of the same size: - 0.03 bar, + 0.05 bar (- 0.43 psi, + 0.72 psi).

Operating curves





1 Maximum differential
2 Minimum differential

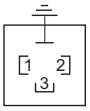
— Adjustable value

Connection

Terminal model

Connector model

Pressure switch connector pin view



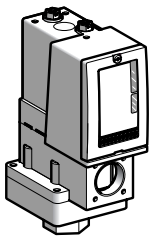
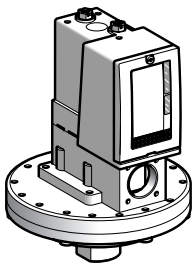
1 → 11 and 13
2 → 12
3 → 14

Other versions — For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

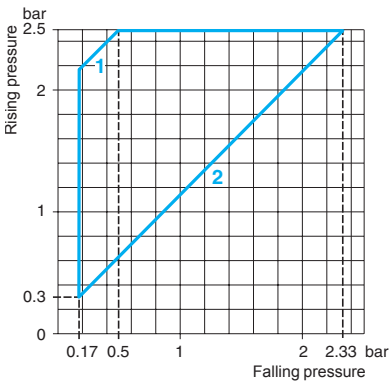
OsiSense XML

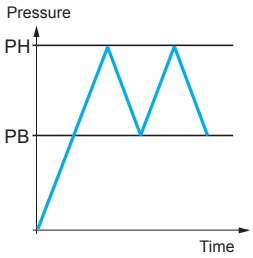
Size 2.5 bar (36.25 psi)
Adjustable differential, for regulation between 2 thresholds
Switches with 2 CO single-pole contacts

OsiSense XMLC pressure switches	With setting scale		30 bar (435 psi) overpressure With setting scale	
				
Adjustable range of switching point (PH) (Rising pressure)	**0.3…2.5 bar (4.35…36.25 psi)**			
Electrical connection	Terminals			
Fluid connection	G 1/4 (female)	1/4"-18 NPTF (female)	G 1/4 (female)	1/4"-18 NPTF (female)
References *(1)*				
Fluids controlled *(2)* — Hydraulic oils, fresh water, air, up to + 160 °C	**XMLC002B2S12**	**XMLC002B2S13**	**XMLCS02B2S12**	**XMLCS02B2S13**
Weight (kg)	0.995	0.995	3.500	3.500
Complementary characteristics not shown under general characteristics (page 2/63)				
Possible differential (subtract from PH to give PB) — Min. at low setting *(3)*	0.13 bar (1.89 psi)		0.1 bar (1.45 psi)	
Min. at high setting *(4)*	0.17 bar (2.47 psi)		0.18 bar (2.61 psi)	
Max. at high setting	2 bar (29 psi)		1.25 bar (18.12 psi)	
Maximum permissible pressure — Per cycle	5 bar (72.5 psi)		30 bar (435 psi)	
Accidental	9 bar (130.5 psi)		37.5 bar (543.75 psi)	
Destruction pressure	18 bar (261 psi)		67.5 bar (978.75 psi)	
Mechanical life	8 x 10^6 operating cycles		2 x 10^6 operating cycles	
Cable entry for terminal models	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type	Diaphragm			

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLC002B2S12** becomes **XMLC002B2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low setting point for switches of the same size: ± 0.02 bar (± 0.29 psi)
(4) Deviation of the differential at high setting point for switches of the same size: ± 0.03 bar (± 0.43 psi)

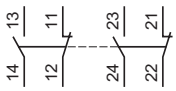
Operating curves





Connection

Terminal model



1 Maximum differential
2 Minimum differential

— Adjustable value

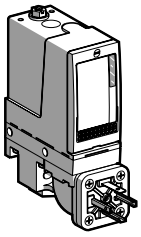
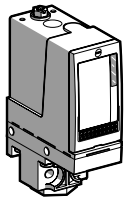
Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

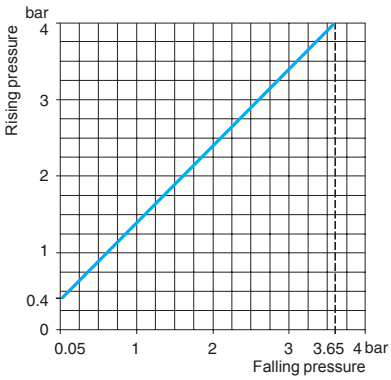
OsiSense XML

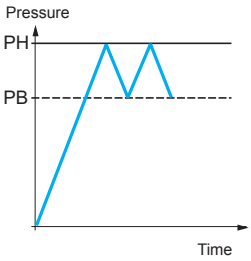
Size 4 bar (58 psi)
Fixed differential, for detection of a single threshold
Switches with 1 CO single-pole contact

OsiSense XMLA pressure switches		With setting scale		
				
Adjustable range of switching point (PH) (Rising pressure)		**0.4…4 bar (5.8…58 psi)**		
Electrical connection		DIN connector	Terminals	
Fluid connection		G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)
References *(1)*				
Fluids controlled *(2)*	Hydraulic oils, fresh water, air, up to + 70 °C	**XMLA004A2C11**	**XMLA004A2S12**	**XMLA004A2S13**
	Hydraulic oils, fresh water, air, up to + 160 °C	**XMLA004B2C11**	**XMLA004B2S12**	**–**
	Corrosive fluids, up to + 160 °C Sea water, up to + 30 °C	**XMLA004C2C11**	**XMLA004C2S12**	**–**
	Viscous products, up to + 160 °C (G 1¼" fluid connection)	**XMLA004P2C11**	**XMLA004P2S12**	**–**
Weight (kg)		0.715	0.685	0.685
Complementary characteristics not shown under general characteristics (page 2/63)				
Natural differential (subtract from PH to give PB)	At low setting *(3)*	0.35 bar (5.07 psi)		
	At high setting *(3)*	0.35 bar (5.07 psi)		
Maximum permissible pressure	Per cycle	5 bar (72.5 psi)		
	Accidental	9 bar (130.5 psi)		
Destruction pressure		18 bar (261 psi)		
Mechanical life		8 x 10^6 operating cycles		
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm		

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLA004A2S12** becomes **XMLA004A2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low and high setting points for switches of the same size: ± 0.03 bar (± 0.43 psi)

Operating curves





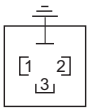
— Adjustable value
--- Non adjustable value

Connection

Terminal model

Connector model

Pressure switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

Other versions For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

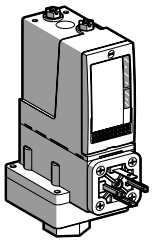
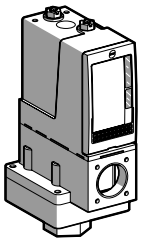
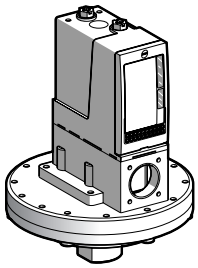
Accessories: page 2/116
Dimensions: pages 2/117 to 2/119

Telemecanique Sensors

Electromechanical pressure switches

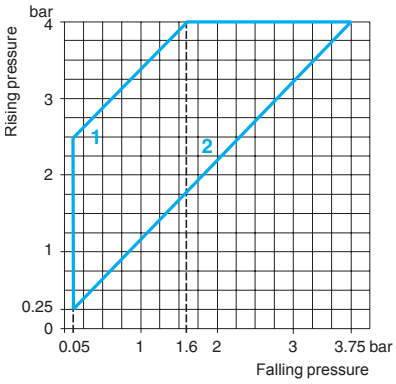
OsiSense XML

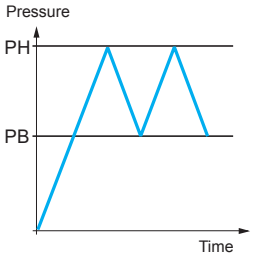
Size 4 bar (58 psi)
Adjustable differential, for regulation between 2 thresholds
Switches with 1 CO single-pole contact

OsiSense XMLB pressure switches	With setting scale			30 bar (435 psi) overpressure With setting scale
				
Adjustable range of switching point (PH) (Rising pressure)	**0.25…4 bar (3.62…58 psi)**			
Electrical connection	DIN connector	Terminals		
Fluid connection	G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)	G 1/4 (female)
References *(1)*				
Fluids controlled *(2)* — Hydraulic oils, fresh water, air, up to + 70 °C	**XMLB004A2C11**	**XMLB004A2S12**	**XMLB004A2S13**	**–**
Hydraulic oils, fresh water, air, up to + 160 °C	**XMLB004B2C11**	**XMLB004B2S12**	**–**	**XMLBS04B2S12**
Corrosive fluids, up to + 160 °C	**XMLB004C2C11**	**XMLB004C2S12**	**–**	**–**
Weight (kg)	1.030	1.015	1.015	3.500
Complementary characteristics not shown under general characteristics (page 2/63)				
Possible differential (subtract from PH to give PB) — Min. at low setting *(3)*	0.2 bar (2.9 psi)			0.15 bar (2.18 psi)
Min. at high setting *(4)*	0.25 bar (3.62 psi)			0.34 bar (4.93 psi)
Max. at high setting	2.4 bar (34.8 psi)			2.46 bar (35.67 psi)
Maximum permissible pressure — Per cycle	5 bar (72.5 psi)			30 bar (435 psi)
Accidental	9 bar (130.5 psi)			37.5 bar (543.75 psi)
Destruction pressure	18 bar (261 psi)			67.5 bar (978.75 psi)
Mechanical life	8 x 10^6 operating cycles			2 x 10^6 operating cycles
Connection	EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm
Pressure switch type	Diaphragm			

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLB004A2S12** becomes **XMLB004A2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low setting point for switches of the same size: ± 0.01 bar (± 0.14 psi).
(4) Deviation of the differential at high setting point for switches of the same size: - 0.03 bar, + 0.05 bar (- 0.43 psi, + 0.72 psi).

Operating curves





1 Maximum differential
2 Minimum differential

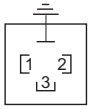
— Adjustable value

Connection

Terminal model

Connector model

Pressure switch connector pin view



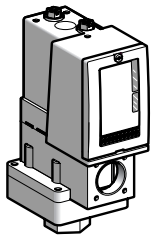
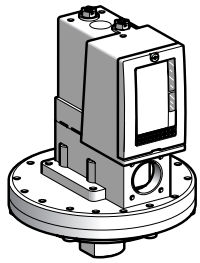
1 → 11 and 13
2 → 12
3 → 14

Other versions — For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

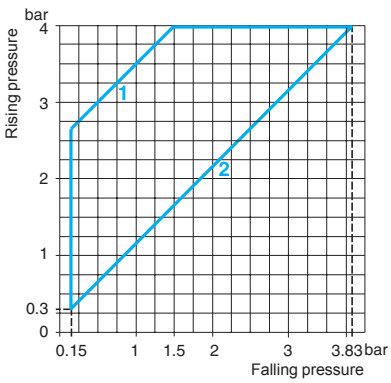
OsiSense XML

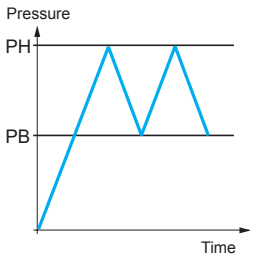
Size 4 bar (58 psi)
Adjustable differential, for regulation between 2 thresholds
Switches with 2 CO single-pole contacts

OsiSense XMLC pressure switches	With setting scale		30 bar (435 psi) overpressure With setting scale
			
Adjustable range of switching point (PH) (Rising pressure)	**0.3…4 bar (4.35…58 psi)**		
Electrical connection	Terminals		
Fluid connection	G 1/4 (female)	1/4"-18 NPTF (female)	G 1/4 (female)
References *(1)*			
Fluids controlled *(2)* — Hydraulic oils, fresh water, air, up to + 160 °C	**XMLC004B2S12**	**XMLC004B2S13**	**XMLCS04B2S12**
Corrosive fluids, up to + 160 °C	**XMLC004C2S12**	**XMLC004C2S13**	**–**
Weight (kg)	0.685	0.685	3.500
Complementary characteristics not shown under general characteristics (page 2/63)			
Possible differential (subtract from PH to give PB) — Min. at low setting *(3)*	0.15 bar (2.18 psi)		0.1 bar (1.45 psi)
Min. at high setting *(3)*	0.17 bar (2.47 psi)		0.25 bar (3.62 psi)
Max. at high setting	2.5 bar (36.25 psi)		2.20 bar (31.9 psi)
Maximum permissible pressure — Per cycle	5 bar (72.5 psi)		30 bar (435 psi)
Accidental	9 bar (130.5 psi)		37.5 bar (543.75 psi)
Destruction pressure	18 bar (261 psi)		67.5 bar (978.75 psi)
Mechanical life	8 x 10^6 operating cycles		2 x 10^6 operating cycles
Cable entry for terminal models	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm
Pressure switch type	Diaphragm		

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLC004B2S12** becomes **XMLC004B2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low and high setting points for switches of the same size: ± 0.02 bar (± 0.29 psi).

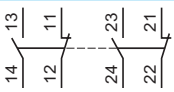
Operating curves





Connection

Terminal model



1 Maximum differential
2 Minimum differential

— Adjustable value

Other versions For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Accessories: page 2/116
Dimensions: pages 2/117 to 2/119

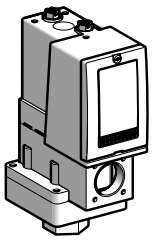
Telemecanique Sensors

Electromechanical pressure switches

OsiSense XML

Size 4 bar (58 psi)
Dual stage, fixed differential, for detection at each threshold
Switches with 2 CO single-pole contacts

OsiSense XMLD pressure switches | **Without setting scale**



Adjustable range of each switching point (Rising pressure)	2nd stage switching point (PH2)	**0.40…4 bar (5.8…58 psi)**
	1st stage switching point (PH1)	**0.19…3.79 bar (2.76…54.96 psi)**
Spread between 2 stages (PH2 - PH1)		**0.21…2.18 bar (3.05…31.61 psi)**
Electrical connection		Terminals
Fluid connection		G 1/4 (female)

References *(1)*

Fluids controlled *(2)*	Hydraulic oils, fresh water, air, up to + 160 °C	**XMLD004B1S12**
Weight (kg)		1.015

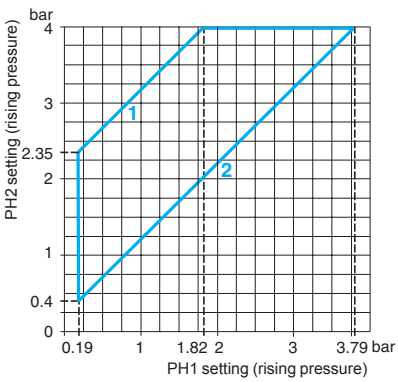
Complementary characteristics not shown under general characteristics (page 2/63)

Natural differential (subtract from PH1/PH2 to give PB1/PB2)	At low setting *(3)*	0.15 bar (2.18 psi)
	At high setting *(3)*	0.19 bar (2.76 psi)
Maximum permissible pressure	Per cycle	5 bar (72.5 psi)
	Accidental	9 bar (130.5 psi)
Destruction pressure		18 bar (261 psi)
Mechanical life		8 x 10^6 operating cycles
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLD004B1S12** becomes **XMLD004B1S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low and high setting points for switches of the same size: ± 0.03 bar (± 0.43 psi).

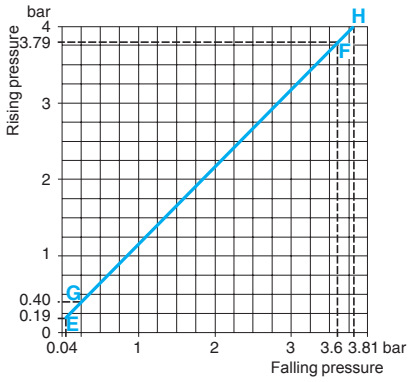
Operating curves

High setting tripping points of contacts 1 and 2

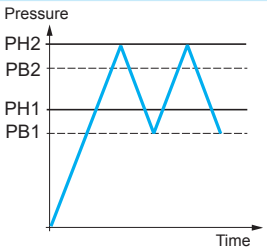


1 Maximum differential
2 Minimum differential

Natural differential of contacts 1 and 2



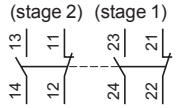
EF Contact 1 (stage 1)
GH Contact 2 (stage 2)



— Adjustable value
--- Non adjustable value

Connection

Terminal model



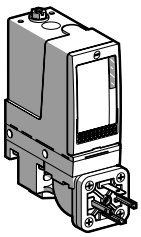
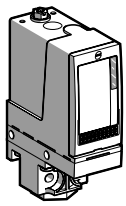
Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

OsiSense XML

Size 10 bar (145 psi)
Fixed differential, for detection of a single threshold
Switches with 1 CO single-pole contact

OsiSense XMLA pressure switches	With setting scale		
			
Adjustable range of switching point (PH) (Rising pressure)	**0.6…10 bar (8.7…145 psi)**		
Electrical connection	DIN connector	Terminals	Terminals
Fluid connection	G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)

References *(1)*

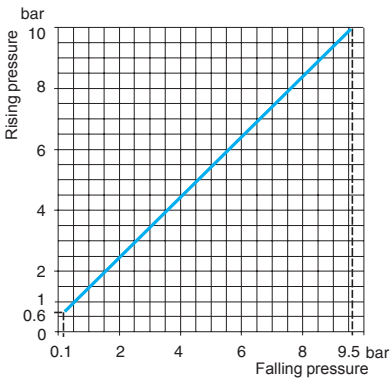
Fluids controlled *(2)*	Hydraulic oils, fresh water, air, up to + 70 °C	**XMLA010A2C11**	**XMLA010A2S12**	**XMLA010A2S13**
	Hydraulic oils, fresh water, air, up to + 160 °C	**XMLA010B2C11**	**XMLA010B2S12**	**–**
	Corrosive fluids, up to + 160 °C Sea water, up to + 30 °C	**XMLA010C2C11**	**XMLA010C2S12**	**XMLA010C2S13**
	Viscous products, up to + 160 °C (G 1¼" fluid connection)	**XMLA010P2C11**	**XMLA010P2S12**	**–**
Weight (kg)		0.715	0.685	0.685

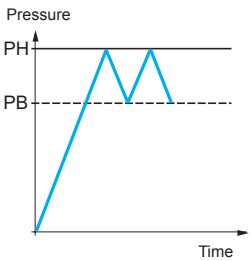
Complementary characteristics not shown under general characteristics (page 2/63)

Natural differential (subtract from PH to give PB)	At low setting *(3)*	0.5 bar (7.25 psi)		
	At high setting *(3)*	0.5 bar (7.25 psi)		
Maximum permissible pressure	Per cycle	12.5 bar (181.25 psi)		
	Accidental	22.5 bar (326.25 psi)		
Destruction pressure		45 bar (652.5 psi)		
Mechanical life		5 x 10^6 operating cycles		
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm		

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLA010A2S12** becomes **XMLA010A2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low and high setting points for switches of the same size: ± 0.05 bar (± 0.72 psi)

Operating curves





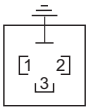
— Adjustable value
--- Non adjustable value

Connection

Terminal model

Connector model

Pressure switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

Other versions For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

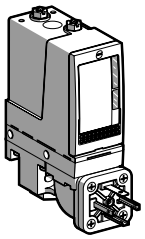
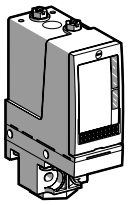
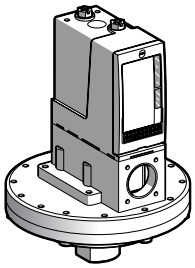
Accessories: page 2/116
Dimensions: pages 2/117 to 2/119

Telemecanique Sensors

Electromechanical pressure switches

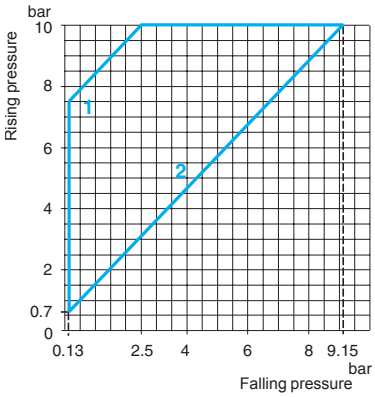
OsiSense XML

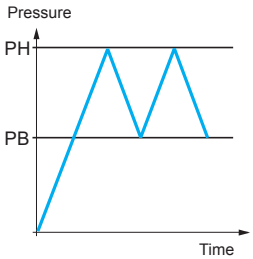
Size 10 bar (145 psi)
Adjustable differential, for regulation between 2 thresholds
Switches with 1 CO single-pole contact

OsiSense XMLB pressure switches		With setting scale			30 bar (435 psi) overpressure With setting scale
					
Adjustable range of switching point (PH) (Rising pressure)		**0.7…10 bar (10.15…145 psi)**			
Electrical connection		DIN connector	Terminals	Terminals	Terminals
Fluid connection		G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)	G 1/4 (female)
References *(1)*					
Fluids controlled *(2)*	Hydraulic oils, fresh water, air, up to + 70 °C	**XMLB010A2C11**	**XMLB010A2S12**	**XMLB010A2S13**	**XMLBS10A2S12**
	Hydraulic oils, fresh water, air, up to + 160 °C	**XMLB010B2C11**	**XMLB010B2S12**	**XMLB010B2S13**	**–**
	Corrosive fluids, up to + 160 °C Sea water, up to + 30 °C	**XMLB010C2C11**	**XMLB010C2S12**	**XMLB010C2S13**	**–**
	Viscous products, up to + 160 °C (G 1¼" fluid connection)	**XMLB010P2C11**	**XMLB010P2S12**	**–**	**–**
Weight (kg)		0.735	0.705	0.705	3.500
Complementary characteristics not shown under general characteristics (page 2/63)					
Possible differential (subtract from PH to give PB)	Min. at low setting *(3)*	0.57 bar (8.26 psi)			0.45 bar (6.52 psi)
	Min. at high setting *(4)*	0.85 bar (12.32 psi)			0.85 bar (12.32 psi)
	Max. at high setting	7.5 bar (108.75 psi)			6.25 bar (90.62 psi)
Maximum permissible pressure	Per cycle	12.5 bar (181.25 psi)			30 bar (435 psi)
	Accidental	22.5 bar (326.25 psi)			37.5 bar (543.75 psi)
Destruction pressure		45 bar (652.5 psi)			67.5 bar (978.75 psi)
Mechanical life		5 x 10^6 operating cycles			2 x 10^6 operating cycles
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm			

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLB010A2S12** becomes **XMLB010A2S11**.*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low setting point for switches of the same size: ± 0.05 bar (± 0.72 psi).
(4) Deviation of the differential at high setting point for switches of the same size: - 0.1 bar, + 0.15 bar (- 1.45 psi, + 2.17 psi).

Operating curves





1 Maximum differential
2 Minimum differential

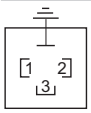
— Adjustable value

Connection

Terminal model

Connector model

Pressure switch connector pin view

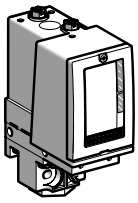
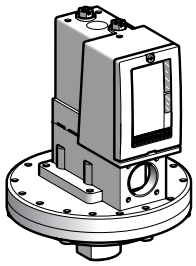


1 → 11 and 13
2 → 12
3 → 14

Electromechanical pressure switches

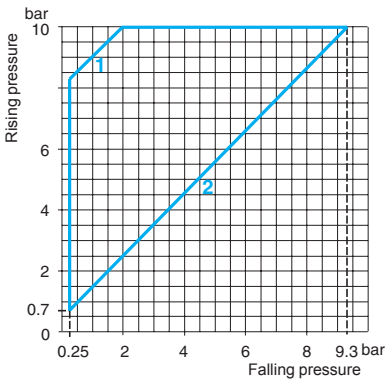
OsiSense XML

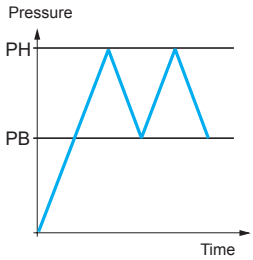
Size 10 bar (145 psi)
Adjustable differential, for regulation between 2 thresholds
Switches with 2 CO single-pole contacts

OsiSense XMLC pressure switches		With setting scale		30 bar (435 psi) overpressure With setting scale
				
Adjustable range of switching point (PH) (Rising pressure)		**0.7…10 bar (10.15…145 psi)**		
Electrical connection		Terminals		
Fluid connection		G 1/4 (female)	1/4"-18 NPTF (female)	G 1/4 (female)
References *(1)*				
Fluids controlled *(2)*	Hydraulic oils, fresh water, air, up to + 70 °C	–	–	**XMLCS10A2S12**
	Hydraulic oils, fresh water, air, up to + 160 °C	**XMLC010B2S12**	**XMLC010B2S13**	–
	Corrosive fluids, up to + 160 °C Sea water, up to + 30 °C	**XMLC010C2S12**	**XMLC010C2S13**	–
Weight (kg)		0.685	0.685	3.500
Complementary characteristics not shown under general characteristics (page 2/63)				
Possible differential (subtract from PH to give PB)	Min. at low setting *(3)*	0.45 bar (6.53 psi)		0.25 bar (3.62 psi)
	Min. at high setting *(4)*	0.70 bar (10.15 psi)		0.65 bar (9.42 psi)
	Max. at high setting	8 bar (116 psi)		5.6 bar (81.2 psi)
Maximum permissible pressure	Per cycle	12.5 bar (181.25 psi)		30 bar (435 psi)
	Accidental	22.5 bar (326.25 psi)		37.5 bar (543.75 psi)
Destruction pressure		45 bar (652.5 psi)		67.5 bar (978.75 psi)
Mechanical life		5 x 10^6 operating cycles		2 x 10^6 operating cycles
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm		

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLC010B2S12** becomes **XMLC010B2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low setting point for switches of the same size: ± 0.05 bar (± 0.72 psi)
(4) Deviation of the differential at high setting point for switches of the same size: ± 0.01 bar (± 1.45 psi)

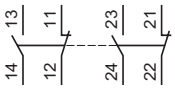
Operating curves





Connection

Terminal model



1 Maximum differential
2 Minimum differential

— Adjustable value

Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

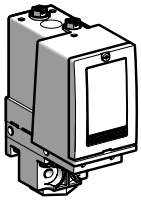
Accessories: page 2/116
Dimensions: pages 2/117 to 2/119

Electromechanical pressure switches

OsiSense XML

Size 10 bar (145 psi)
Dual stage, fixed differential, for detection at each threshold
Switches with 2 CO single-pole contacts

OsiSense XMLD pressure switches | **Without setting scale**



Adjustable range of each switching point (Rising pressure)	2nd stage switching point (PH2)	**1.2…10 bar (17.4…145 psi)**
	1st stage switching point (PH1)	**0.52…9.32 bar (7.54…135.14 psi)**
Spread between 2 stages (PH2 - PH1)		**0.68…5.8 bar (9.86…84.1 psi)**
Fluid connection		G 1/4 (female)
Electrical connection		Terminals

References

Fluids controlled *(1)*	Hydraulic oils, fresh water, air, up to + 160 °C	**XMLD010B1S11**	**XMLD010B1S12**
	Corrosive fluids, up to + 160 °C Sea water, up to + 30 °C	**XMLD010C1S11**	–
Weight (kg)		0.705	0.705

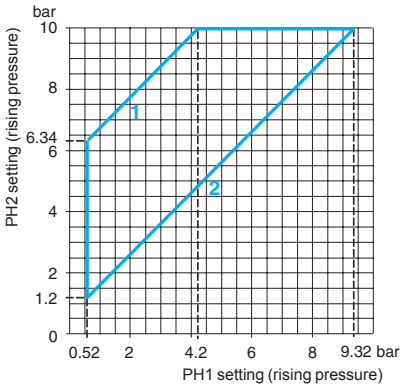
Complementary characteristics not shown under general characteristics (page 2/63)

Natural differential (subtract from PH1/PH2 to give PB1/PB2)	At low setting *(2)*	0.45 bar (6.53 psi)	
	At high setting *(3)*	0.6 bar (8.7 psi)	
Maximum permissible pressure	Per cycle	12.5 bar (181.25 psi)	
	Accidental	22.5 bar (326.25 psi)	
Destruction pressure		45 bar (652.5 psi)	
Mechanical life		5 x 10^6 operating cycles	
Cable entry for terminal models		1 entry tapped for no. 13 cable gland	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm	

(1) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(2) Deviation of the differential at low setting point for switches of the same size: ± 0.05 bar (± 0.72 psi)
(3) Deviation of the differential at high setting point for switches of the same size: ± 0.1 bar (± 1.45 psi)

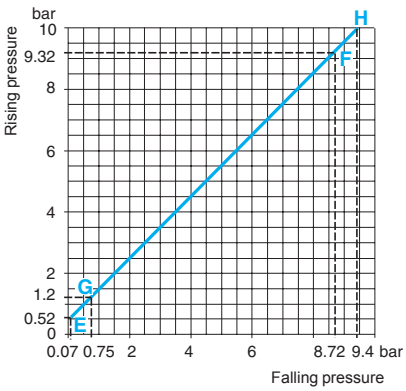
Operating curves

High setting tripping points of contacts 1 and 2

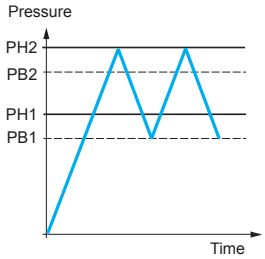


1 Maximum differential
2 Minimum differential

Natural differential of contacts 1 and 2



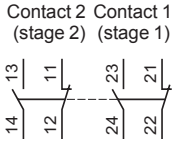
EF Contact 1 (stage 1)
GH Contact 2 (stage 2)



— Adjustable value
--- Non adjustable value

Connection

Terminal model



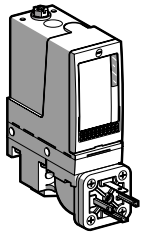
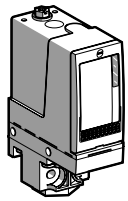
Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

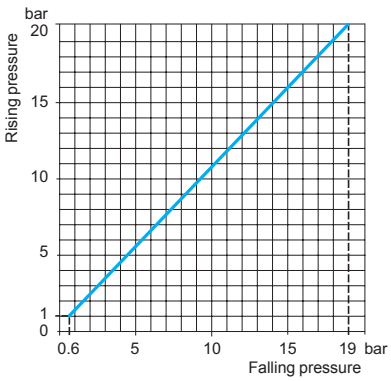
OsiSense XML

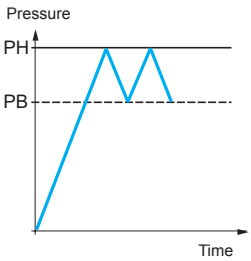
Size 20 bar (290 psi)
Fixed differential, for detection of a single threshold
Switches with 1 CO single-pole contact

OsiSense XMLA pressure switches		With setting scale		
				
Adjustable range of switching point (PH) (Rising pressure)		**1…20 bar (14.5…290 psi)**		
Electrical connection		DIN connector	Terminals	
Fluid connection		G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)
References *(1)*				
Fluids controlled *(2)*	Hydraulic oils, fresh water, air, up to + 70 °C	**XMLA020A2C11**	**XMLA020A2S12**	**XMLA020A2S13**
	Hydraulic oils, fresh water, air, up to + 160 °C	**XMLA020B2C11**	**XMLA020B2S12**	**–**
	Corrosive fluids, up to + 160 °C Sea water, up to + 30 °C	**XMLA020C2C11**	**XMLA020C2S12**	**–**
	Viscous products, up to + 160 °C (G 1¼" fluid connection)	**XMLA020P2C11**	**XMLA020P2S12**	**–**
Weight (kg)		0.715	0.685	0.685
Complementary characteristics not shown under general characteristics (page 2/63)				
Natural differential (subtract from PH to give PB)	At low setting *(3)*	0.4 bar (5.8 psi)		
	At high setting *(3)*	1 bar (14.5 psi)		
Maximum permissible pressure	Per cycle	25 bar (362.5 psi)		
	Accidental	45 bar (652.5 psi)		
Destruction pressure		90 bar (1305 psi)		
Mechanical life		5 x 10^6 operating cycles		
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm		

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLA020A2S12** becomes **XMLA020A2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at high setting point for switches of the same size: ± 0.1 bar (± 1.45 psi)
Deviation of the differential at low setting point: ± 0.2 bar (± 2.9 psi)

Operating curves





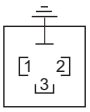
— Adjustable value
--- Non adjustable value

Connection

Terminal model

Connector model

Pressure switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

Other versions For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Accessories: page 2/116
Dimensions: pages 2/117 to 2/119

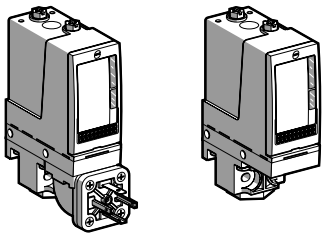
Telemecanique Sensors

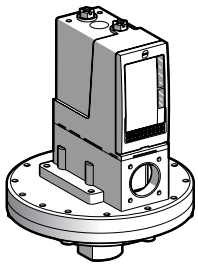
Electromechanical pressure switches

OsiSense XML

Size 20 bar (290 psi)
Adjustable differential, for regulation between 2 thresholds
Switches with 1 CO single-pole contact

OsiSense XMLB pressure switches	With setting scale			30 bar (435 psi) overpressure With setting scale

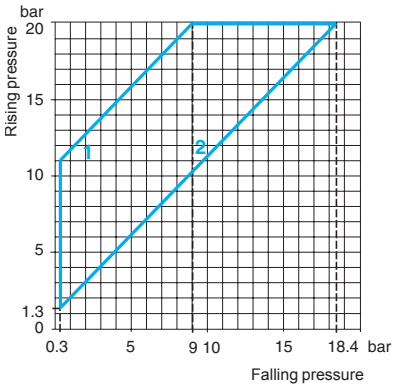


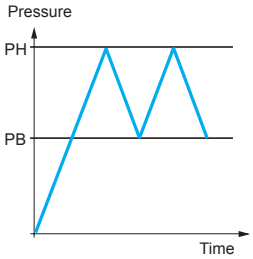


Adjustable range of switching point (PH) (Rising pressure)		**1.3…20 bar (18.9…290 psi)**			
Electrical connection		DIN connector	Terminals		
Fluid connection		G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)	G 1/4 (female)
References *(1)*					
Fluids controlled *(2)*	Hydraulic oils, fresh water, air, up to + 70 °C	**XMLB020A2C11**	**XMLB020A2S12**	**XMLB020A2S13**	**XMLBS20A2S12**
	Hydraulic oils, fresh water, air, up to + 160 °C	**XMLB020B2C11**	**XMLB020B2S12**	**XMLB020B2S13**	**–**
	Corrosive fluids, up to + 160 °C Sea water, up to + 30 °C	**XMLB020C2C11**	**XMLB020C2S12**	**–**	**–**
	Viscous products, up to + 160 °C (G 1¼" fluid connection)	**XMLB020P2C11**	**XMLB020P2S12**	**–**	**–**
Weight (kg)		0.735	0.705	0.705	3.500
Complementary characteristics not shown under general characteristics (page 2/63)					
Possible differential (subtract from PH to give PB)	Min. at low setting *(3)*	1 bar (14.5 psi)			0.95 bar (13.78 psi)
	Min. at high setting *(3)*	1.6 bar (23.20 psi)			1.45 bar (21.03 psi)
	Max. at high setting	11 bar (159.5 psi)			12.6 bar (182.7 psi)
Maximum permissible pressure	Per cycle	25 bar (362.5 psi)			30 bar (435 psi)
	Accidental	45 bar (652.5 psi)			37.5 bar (543.75 psi)
Destruction pressure		90 bar (1305 psi)			67.5 bar (978.75 psi)
Mechanical life		5 x 10^6 operating cycles			2 x 10^6 operating cycles
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm			

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLB020A2S12** becomes **XMLB020A2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low and high setting points for switches of the same size: ± 0.25 bar (± 3.63 psi)

Operating curves





1 Maximum differential
2 Minimum differential

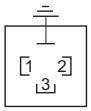
— Adjustable value

Connection

Terminal model

Connector model

Pressure switch connector pin view



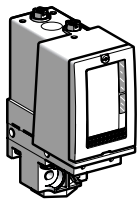
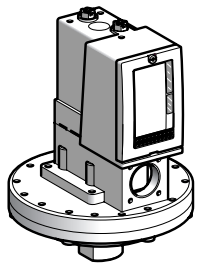
1 → 11 and 13
2 → 12
3 → 14

Other versions	For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

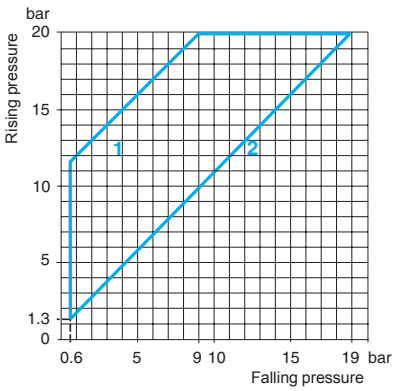
OsiSense XML

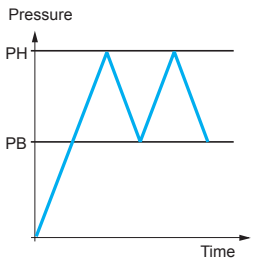
Size 20 bar (290 psi)
Adjustable differential, for regulation between 2 thresholds
Switches with 2 CO single-pole contacts

OsiSense XMLC pressure switches		With setting scale		30 bar (435 psi) overpressure With setting scale
				
Adjustable range of switching point (PH) (Rising pressure)		**1.3…20 bar (18.85…290 psi)**		
Electrical connection		Terminals		
Fluid connection		G 1/4 (female)	1/4"-18 NPTF (female)	G 1/4 (female)
References *(1)*				
Fluids controlled *(2)*	Hydraulic oils, fresh water, air, up to + 70 °C	–	–	**XMLCS20A2S12**
	Hydraulic oils, fresh water, air, up to + 160 °C	**XMLC020B2S12**	**XMLC020B2S13**	–
	Corrosive fluids, up to + 160 °C Sea water, up to + 30 °C	**XMLC020C2S12**	**XMLC020C2S13**	–
Weight (kg)		0.685	0.685	3.500
Complementary characteristics not shown under general characteristics (page 2/63)				
Possible differential (subtract from PH to give PB)	Min. at low setting *(3)*	0.7 bar (10.15 psi)		0.7 bar (10.15 psi)
	Min. at high setting *(3)*	1 bar (14.5 psi)		1.15 bar (16.67 psi)
	Max. at high setting	11 bar (159.5 psi)		11.70 bar (169.6 psi)
Maximum permissible pressure	Per cycle	25 bar (362.5 psi)		30 bar (435 psi)
	Accidental	45 bar (652.5 psi)		37.5 bar (543.75 psi)
Destruction pressure		90 bar (1305 psi)		67.5 bar (978.75 psi)
Mechanical life		5 x 10^6 operating cycles		2 x 10^6 operating cycles
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm		

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLC020B2S12** becomes **XMLC020B2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low and high setting points for switches of the same size: ± 0.2 bar (± 2.9 psi)

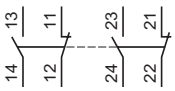
Operating curves





Connection

Terminal model



1 Maximum differential
2 Minimum differential

— Adjustable value

Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

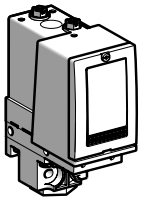
Accessories: page 2/116
Dimensions: pages 2/117 to 2/119

Telemecanique Sensors

Electromechanical pressure switches

OsiSense XML

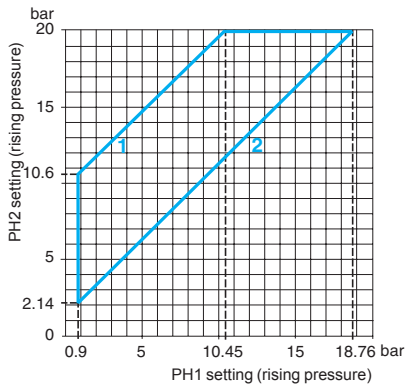
Size 20 bar (290 psi)
Dual stage, fixed differential, for detection at each threshold
Switches with 2 CO single-pole contacts

OsiSense XMLD pressure switches		Without setting scale	
			
Adjustable range of each switching point (Rising pressure)	2nd stage switching point (PH2)	**2.14…20 bar (31.03…290 psi)**	
	1st stage switching point (PH1)	**0.9…18.76 bar (13.05…272.02 psi)**	
Spread between 2 stages (PH2 - PH1)		**1.24…9.55 bar (17.98…138.48 psi)**	
Electrical connection		Terminals	
Fluid connection		G 1/4 (female)	1/4"-18 NPTF (female)
References *(1)*			
Fluids controlled *(2)*	Hydraulic oils, fresh water, air, up to + 160 °C	**XMLD020B1S12**	**XMLD020B1S13**
	Corrosive fluids, up to + 160 °C Sea water, up to + 30 °C	**XMLD020C1S12**	**–**
Weight (kg)		0.705	0.705
Complementary characteristics not shown under general characteristics (page 2/63)			
Natural differential (subtract from PH1/PH2 to give PB1/PB2)	At low setting *(3)*	0.7 bar (10.15 psi)	
	At high setting *(4)*	1.3 bar (18.85 psi)	
Maximum permissible pressure	Per cycle	25 bar (362.5 psi)	
	Accidental	45 bar (652.5 psi)	
Destruction pressure		90 bar (1305 psi)	
Mechanical life		5 x 10^6 operating cycles	
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm	

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLD020B1S12** becomes **XMLD020B1S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low setting point for switches of the same size: ± 0.15 bar (± 2.18 psi)
(4) Deviation of the differential at high setting point for switches of the same size: ± 0.3 bar (± 4.35 psi)

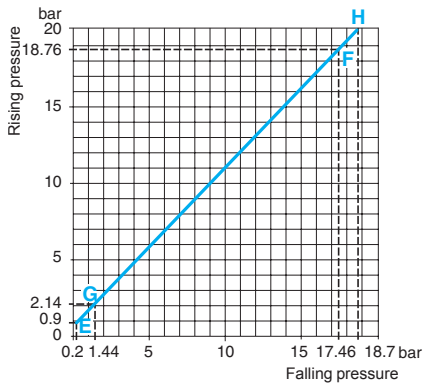
Operating curves

High setting tripping points of contacts 1 and 2

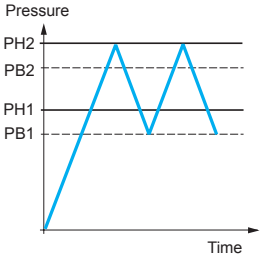


1 Maximum differential
2 Minimum differential

Natural differential of contacts 1 and 2



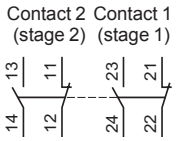
EF Contact 1 (stage 1)
GH Contact 2 (stage 2)



— Adjustable value
--- Non adjustable value

Connection model

Terminal model



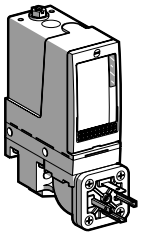
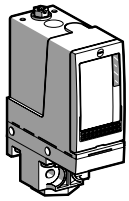
Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

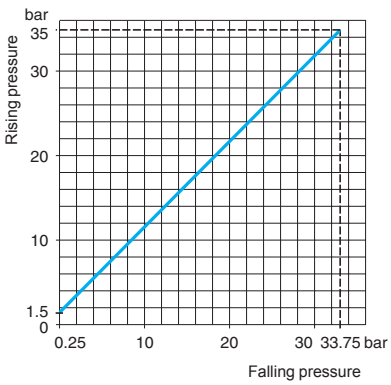
OsiSense XML

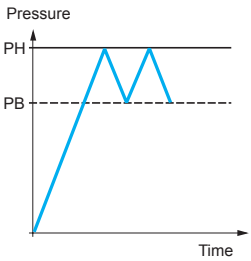
Size 35 bar (507.5 psi)
Fixed differential, for detection of a single threshold
Switches with 1 CO single-pole contact

OsiSense XMLA pressure switches		With setting scale		
				
Adjustable range of switching point (PH) (Rising pressure)		**1.5…35 bar (21.75…507.5 psi)**		
Electrical connection		DIN connector	Terminals	
Fluid connection		G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)
References *(1)*				
Fluids controlled *(2)*	Hydraulic oils, fresh water, air, up to + 70 °C	**XMLA035A2C11**	**XMLA035A2S12**	**XMLA035A2S13**
	Hydraulic oils, fresh water, air, up to + 160 °C	**XMLA035B2C11**	**XMLA035B2S12**	**–**
	Corrosive fluids, up to + 160 °C Sea water, up to + 30 °C	**XMLA035C2C11**	**XMLA035C2S12**	**–**
	Viscous products, up to + 160 °C (G 1¼" fluid connection)	**XMLA035P2C11**	**XMLA035P2S12**	**–**
Weight (kg)		0.725	0.695	0.695
Complementary characteristics not shown under general characteristics (page 2/63)				
Natural differential (subtract from PH to give PB)	At low setting *(3)*	1.25 bar (18.12 psi)		
	At high setting *(3)*	1.25 bar (18.12 psi)		
Maximum permissible pressure	Per cycle	45 bar (652.5 psi)		
	Accidental	80 bar (1160 psi)		
Destruction pressure		160 bar (2320 psi)		
Mechanical life		5 x 10^6 operating cycles		
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm		

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLA035A2S12** becomes **XMLA035A2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low and high setting points for switches of the same size: ± 0.25 bar (± 3.62 psi)

Operating curves





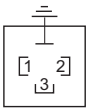
— Adjustable value
--- Non adjustable value

Connection

Terminal model

Connector model

Pressure switch connector pin view



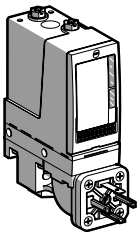
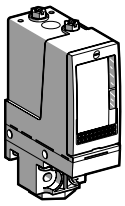
1 → 11 and 13
2 → 12
3 → 14

Other versions For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

OsiSense XML

Size 35 bar (507.5 psi)
Adjustable differential, for regulation between 2 thresholds
Switches with 1 CO single-pole contact

OsiSense XMLB pressure switches	With setting scale		
			
Adjustable range of switching point (PH) (Rising pressure)	**3.5…35 bar (50.75…507.5 psi)**		
Electrical connection	DIN connector	Terminals	
Fluid connection	G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)

References *(1)*

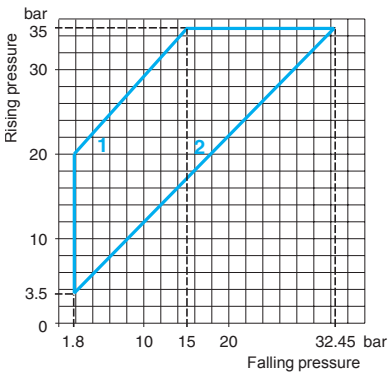
Fluids controlled *(2)*	Hydraulic oils, fresh water, air, up to + 70 °C	**XMLB035A2C11**	**XMLB035A2S12**	**XMLB035A2S13**
	Hydraulic oils, fresh water, air, up to + 160 °C	**XMLB035B2C11**	**XMLB035B2S12**	**–**
	Corrosive fluids, up to + 160 °C Sea water, up to + 30 °C	**XMLB035C2C11**	**XMLB035C2S12**	**–**
	Viscous products, up to + 160 °C (G 1¼" fluid connection)	**–**	**XMLB035P2S12**	**–**
Weight (kg)		0.745	0.715	0.715

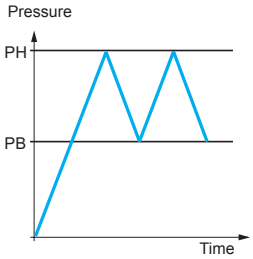
Complementary characteristics not shown under general characteristics (page 2/63)

Possible differential (subtract from PH to give PB)	Min. at low setting *(3)*	1.7 bar (24.65 psi)		
	Min. at high setting *(3)*	2.55 bar (36.97 psi)		
	Max. at high setting	20 bar (290 psi)		
Maximum permissible pressure	Per cycle	45 bar (652.5 psi)		
	Accidental	80 bar (1160 psi)		
Destruction pressure		160 bar (2320 psi)		
Mechanical life		5 x 10^6 operating cycles		
Connection		EN 175301-803-A connector (ex-DIN 43650A), 4-pin male. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm		

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLB035A2S12** becomes **XMLB035A2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low and high setting points for switches of the same size: - 0.5 bar, + 0.7 bar (- 7.25 psi, + 10.15 psi).

Operating curves



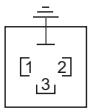


Connection

Terminal model

Connector model

Pressure switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

1 Maximum differential
2 Minimum differential

— Adjustable value

Other versions

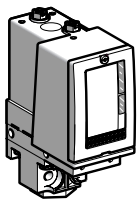
For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

OsiSense XML

Size 35 bar (507.5 psi)
Adjustable differential, for regulation between 2 thresholds
Switches with 2 CO single-pole contacts

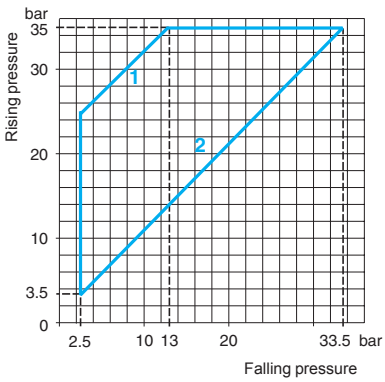
OsiSense XMLC pressure switches	With setting scale	

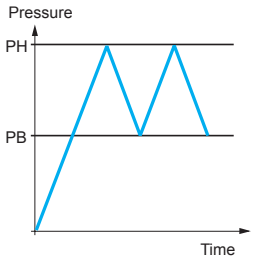


Adjustable range of switching point (PH) (Rising pressure)		**3.5…35 bar (50.75…507.5 psi)**	
Electrical connection		Terminals	
Fluid connection		G 1/4 (female)	1/4"-18 NPTF (female)
References *(1)*			
Fluids controlled *(2)*	Hydraulic oils, fresh water, air, up to + 160 °C	**XMLC035B2S12**	**XMLC035B2S13**
	Corrosive fluids, up to + 160 °C Sea water, up to + 30 °C	**XMLC035C2S12**	**XMLC035C2S13**
Weight (kg)		0.695	0.695
Complementary characteristics not shown under general characteristics (page 2/63)			
Possible differential (subtract from PH to give PB)	Min. at low setting *(3)*	1 bar (14.5 psi)	
	Min. at high setting *(4)*	1.5 bar (21.75 psi)	
	Max. at high setting	22 bar (319 psi)	
Maximum permissible pressure	Per cycle	45 bar (652.5 psi)	
	Accidental	80 bar (1160 psi)	
Destruction pressure		160 bar (2320 psi)	
Mechanical life		5 x 10^6 operating cycles	
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm	

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLC035B2S12** becomes **XMLC035B2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low setting point for switches of the same size: ± 0.2 bar (± 2.9 psi)
(4) Deviation of the differential at high setting point for switches of the same size: ± 0.5 bar (± 7.25 psi)

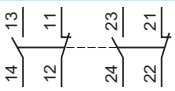
Operating curves





Connection

Terminal model



1 Maximum differential
2 Minimum differential

— Adjustable value

Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Accessories: page 2/116
Dimensions: pages 2/117 to 2/119

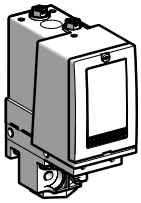
Telemecanique Sensors

Electromechanical pressure switches

OsiSense XML

Size 35 bar (507.5 psi)
Dual stage, fixed differential, for detection at each threshold
Switches with 2 CO single-pole contacts

OsiSense XMLD pressure switches | **Without setting scale**



Adjustable range of each switching point (Rising pressure)	2nd stage switching point (PH2)	**4.4…35 bar (63.8…507.5 psi)**
	1st stage switching point (PH1)	**1.9…32.5 bar (27.55…471.25 psi)**
Spread between 2 stages (PH2 - PH1)		**2.5…20.4 bar (36.25…295.8 psi)**
Electrical connection		Terminals
Fluid connection		G 1/4 (female)

References *(1)*

Fluids controlled *(2)*	Hydraulic oils, fresh water, air, up to + 160 °C	**XMLD035B1S12**
Weight (kg)		0.715

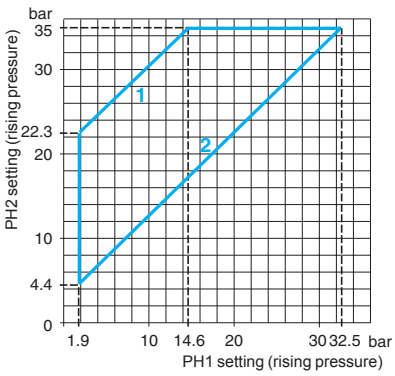
Complementary characteristics not shown under general characteristics (page 2/63)

Natural differential (subtract from PH1/PH2 to give PB1/PB2)	At low setting *(3)*	1.5 bar (21.75 psi)
	At high setting *(4)*	2.6 bar (37.7 psi)
Maximum permissible pressure	Per cycle	45 bar (652.5 psi)
	Accidental	80 bar (1160 psi)
Destruction pressure		160 bar (2320 psi)
Mechanical life		5 x 10^6 operating cycles
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Diaphragm

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLD035B1S12** becomes **XMLD035B1S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low setting point for switches of the same size: ± 0.3 bar (± 4.35 psi)
(4) Deviation of the differential at high setting point for switches of the same size: ± 0.7 bar (± 10.15 psi)

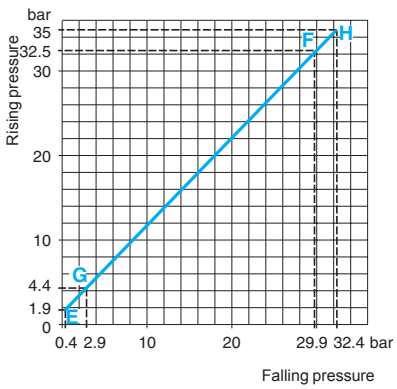
Operating curves

High setting tripping points of contacts 1 and 2

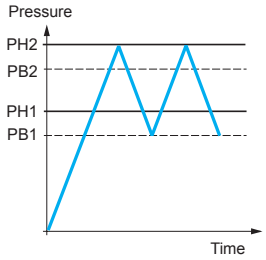


1 Maximum differential
2 Minimum differential

Natural differential of contacts 1 and 2



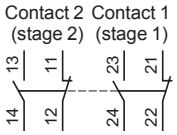
EF Contact 1 (stage 1)
GH Contact 2 (stage 2)



— Adjustable value
--- Non adjustable value

Connection

Terminal model



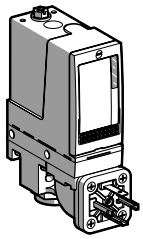
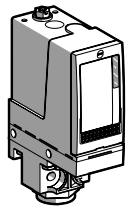
Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

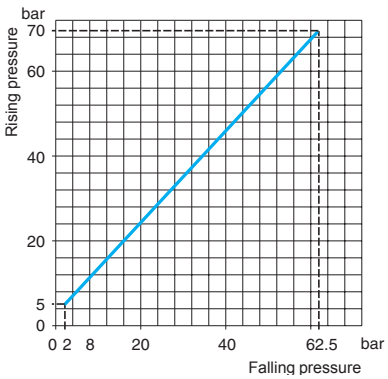
OsiSense XML

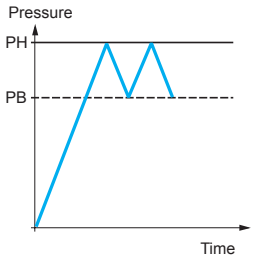
Size 70 bar (1015 psi)
Fixed differential, for detection of a single threshold
Switches with 1 CO single-pole contact

OsiSense XMLA pressure switches		With setting scale		
				
Adjustable range of switching point (PH) (Rising pressure)		**5…70 bar (72.5…1015 psi)**		
Electrical connection		DIN connector	Terminals	
Fluid connection		G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)
References *(1)*				
Fluids controlled *(2)*	Hydraulic oils, up to + 160 °C	**XMLA070D2C11**	**XMLA070D2S12**	**XMLA070D2S13**
	Fresh water, up to + 160 °C	**XMLA070E2C11**	**XMLA070E2S12**	**XMLA070E2S13**
	Corrosive fluids, air, up to + 160 °C	**XMLA070N2C11**	**XMLA070N2S12**	**–**
Weight (kg)		0.725	0.695	0.695
Complementary characteristics not shown under general characteristics (page 2/63)				
Natural differential (subtract from PH to give PB)	At low setting *(3)*	3 bar (43.5 psi)		
	At high setting *(3)*	9.5 bar (137.75 psi)		
Maximum permissible pressure	Per cycle	90 bar (1035 psi)		
	Accidental	160 bar (2320 psi)		
Destruction pressure		320 bar (4640 psi)		
Mechanical life		6 x 10^6 operating cycles		
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Piston		

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLA070D2S12** becomes **XMLA070D2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low and high setting points for switches of the same size: ± 1 bar (± 14.5 psi)

Operating curves





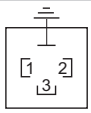
— Adjustable value
--- Non adjustable value

Connection

Terminal model

Connector model

Pressure switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

Other versions For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

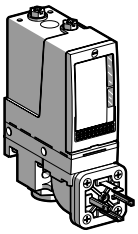
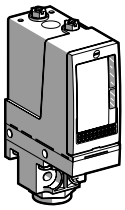
Accessories: page 2/116
Dimensions: pages 2/117 to 2/119

Telemecanique Sensors

Electromechanical pressure switches

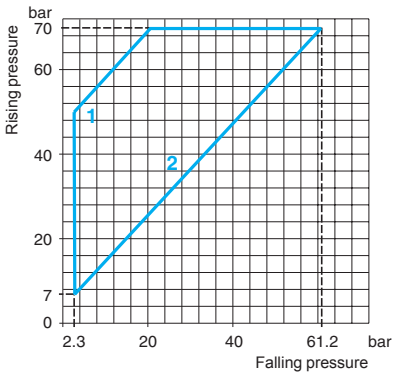
OsiSense XML

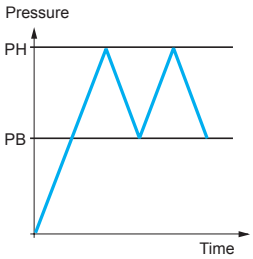
Size 70 bar (1015 psi)
Adjustable differential, for regulation between 2 thresholds
Switches with 1 CO single-pole contact

OsiSense XMLB pressure switches		With setting scale		
				
Adjustable range of switching point (PH) (Rising pressure)		**7…70 bar (101.5…1015 psi)**		
Electrical connection		DIN connector	Terminals	
Fluid connection		G 1/4 (female)	G 1/4 (female)	1/4”-18 NPTF (female)
References *(1)*				
Fluids controlled *(2)*	Hydraulic oils, up to + 160 °C	**XMLB070D2C11**	**XMLB070D2S12**	**XMLB070D2S13**
	Fresh water, up to + 160 °C	**XMLB070E2C11**	**XMLB070E2S12**	–
	Corrosive fluids, air, up to + 160 °C	**XMLB070N2C11**	**XMLB070N2S12**	–
Weight (kg)		0.745	0.715	0.715
Complementary characteristics not shown under general characteristics (page 2/63)				
Possible differential (subtract from PH to give PB)	Min. at low setting *(3)*	4.7 bar (68.15 psi)		
	Min. at high setting *(4)*	9.5 bar (137.75 psi)		
	Max. at high setting	50 bar (725 psi)		
Maximum permissible pressure	Per cycle	90 bar (1035 psi)		
	Accidental	160 bar (2320 psi)		
Destruction pressure		320 bar (4640 psi)		
Mechanical life		6 x 10^6 operating cycles		
Connection		EN 175301-803-A connector (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2”-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Piston		

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLB070D2S12** becomes **XMLB070D2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low setting point for switches of the same size: - 0.4 bar, + 0.7 bar (- 5.8 psi, + 10.15 psi).
(4) Deviation of the differential at high setting point for switches of the same size: - 0.6 bar, + 0.8 bar (- 8.7 psi, + 11.6 psi).

Operating curves



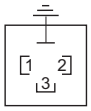


Connection

Terminal model

Connector model

Pressure switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

1 Maximum differential
2 Minimum differential

— Adjustable value

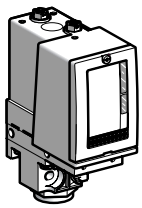
Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

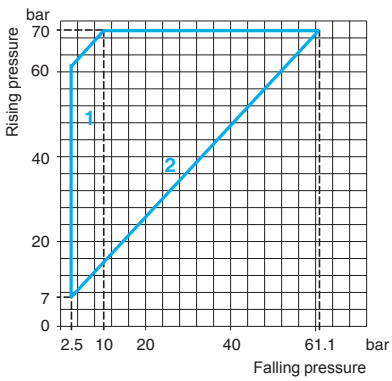
OsiSense XML

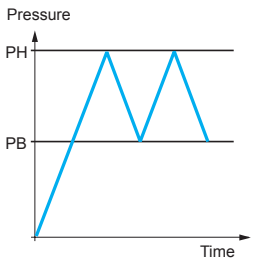
Size 70 bar (1015 psi)
Adjustable differential, for regulation between 2 thresholds
Switches with 2 CO single-pole contacts

OsiSense XMLC pressure switches		With setting scale	
			
Adjustable range of switching point (PH) (Rising pressure)		**7…70 bar (101.5…1015 psi)**	
Electrical connection		Terminals	
Fluid connection		G 1/4 (female)	1/4”-18 NPTF (female)
References *(1)*			
Fluids controlled *(2)*	Hydraulic oils, up to + 160 °C	**XMLC070D2S12**	**XMLC070D2S13**
	Fresh water, up to + 160 °C	**XMLC070E2S12**	**–**
	Corrosive fluids, air, up to + 160 °C	**XMLC070N2S12**	**–**
Weight (kg)		0.695	0.695
Complementary characteristics not shown under general characteristics (page 2/63)			
Possible differential (subtract from PH to give PB)	Min. at low setting *(3)*	4.5 bar (65.25 psi)	
	Min. at high setting *(3)*	9.5 bar (137.75 psi)	
	Max. at high setting	60 bar (870 psi)	
Maximum permissible pressure	Per cycle	90 bar (1035 psi)	
	Accidental	160 bar (2320 psi)	
Destruction pressure		320 bar (4640 psi)	
Mechanical life		6 x 10^6 operating cycles	
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2”-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Piston	

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLC070D2S12** becomes **XMLC070D2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low and high setting points for switches of the same size: ± 0.8 bar (± 11.6 psi)

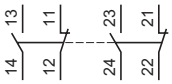
Operating curves





Connection

Terminal model



1 Maximum differential
2 Minimum differential

— Adjustable value

Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

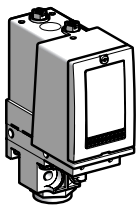
Accessories: page 2/116
Dimensions: pages 2/117 to 2/119

Electromechanical pressure switches

OsiSense XML

Size 70 bar (1015 psi)
Dual stage, fixed differential, for detection at each threshold
Switches with 2 CO single-pole contacts

OsiSense XMLD pressure switches		Without setting scale	
Adjustable range of each switching point (Rising pressure)	2nd stage switching point (PH2)	**9.4…70 bar (136.3…1015 psi)**	
	1st stage switching point (PH1)	**6.6…67.2 bar (95.7…974.4 psi)**	
Spread between 2 stages (PH2 - PH1)		**2.8…46 bar (40.6…667 psi)**	
Electrical connection		Terminals	
Fluid connection		G 1/4 (female)	1/4"-18 NPTF (female)



References *(1)*

Fluids controlled *(2)*	Hydraulic oils, up to + 160 °C	**XMLD070D1S12**	**XMLD070D1S13**
	Corrosive fluids, air, up to + 160 °C	**XMLD070N1S12**	**–**
Weight (kg)		0.715	0.715

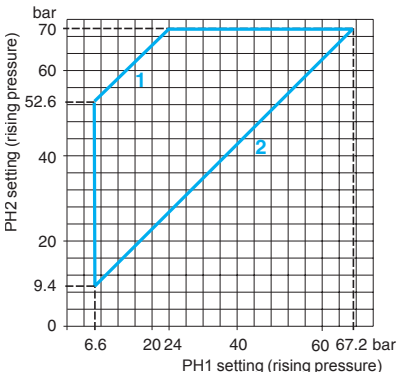
Complementary characteristics not shown under general characteristics (page 2/63)

Natural differential (subtract from PH1/PH2 to give PB1/PB2)	At low setting *(3)*	5 bar (72.5 psi)	
	At high setting *(4)*	9.5 bar (137.75 psi)	
Maximum permissible pressure	Per cycle	90 bar (1035 psi)	
	Accidental	160 bar (2320 psi)	
Destruction pressure		320 bar (4640 psi)	
Mechanical life		6 x 10^6 operating cycles	
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Piston	

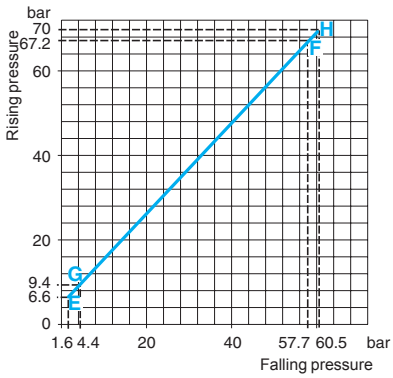
*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLD070D1S12** becomes **XMLD070D1S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low setting point for switches of the same size: ± 1.5 bar (± 21.75 psi)
(4) Deviation of the differential at high setting point for switches of the same size: ± 2 bar *(± 29 psi)*

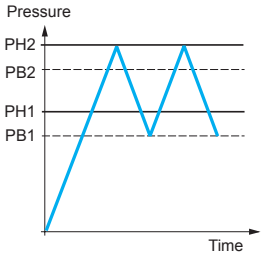
Operating curves

High setting tripping points of contacts 1 and 2



Natural differential of contacts 1 and 2





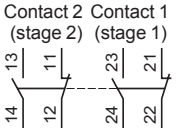
— Adjustable value
--- Non adjustable value

1 Maximum differential
2 Minimum differential

EF Contact 1 (stage 1)
GH Contact 2 (stage 2)

Connection

Terminal model



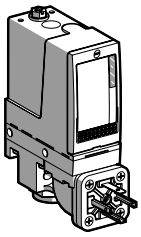
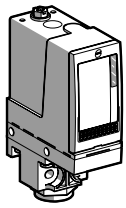
Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

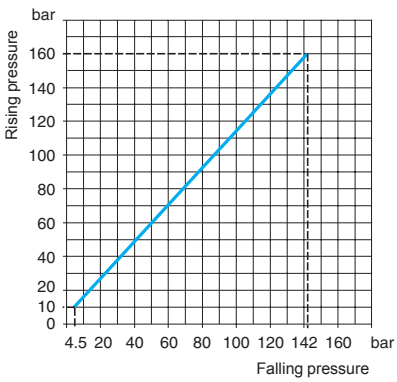
OsiSense XML

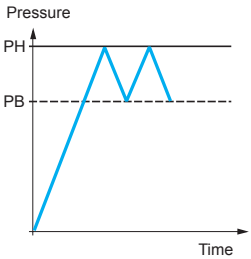
Size 160 bar (2320 psi)
Fixed differential, for detection of a single threshold
Switches with 1 CO single-pole contact

OsiSense XMLA pressure switches		With setting scale		
				
Adjustable range of switching point (PH) (Rising pressure)		**10…160 bar (145…2320 psi)**		
Electrical connection		DIN connector	Terminals	
Fluid connection		G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)
References *(1)*				
Fluids controlled *(2)*	Hydraulic oils, up to + 160 °C	**XMLA160D2C11**	**XMLA160D2S12**	**XMLA160D2S13**
	Fresh water, up to + 160 °C	**XMLA160E2C11**	**XMLA160E2S12**	**XMLA160E2S13**
	Corrosive fluids, air, up to + 160 °C	**XMLA160N2C11**	**XMLA160N2S12**	**–**
Weight (kg)		0.780	0.750	0.750
Complementary characteristics not shown under general characteristics (page 2/63)				
Natural differential (subtract from PH to give PB)	At low setting *(3)*	5.5 bar (79.75 psi)		
	At high setting *(4)*	18 bar (261 psi)		
Maximum permissible pressure	Per cycle	200 bar (2900 psi)		
	Accidental	360 bar (5220 psi)		
Destruction pressure		720 bar (10,440 psi)		
Mechanical life		6 x 10^6 operating cycles		
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Piston		

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLA160D2S12** becomes **XMLA160D2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low setting point for switches of the same size: ± 1 bar (± 14.5 psi)
(4) Deviation of the differential at high setting point for switches of the same size: ± 3 bar (± 43.5 psi)

Operating curves





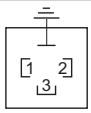
— Adjustable value
--- Non adjustable value

Connection

Terminal model

Connector model

Pressure switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

Other versions For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

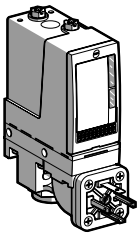
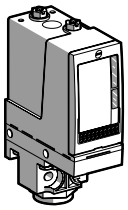
Accessories: page 2/116
Dimensions: pages 2/117 to 2/119

Telemecanique Sensors

Electromechanical pressure switches

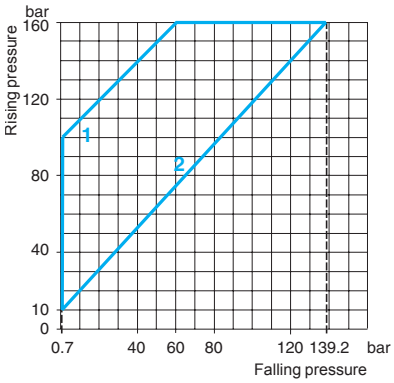
OsiSense XML

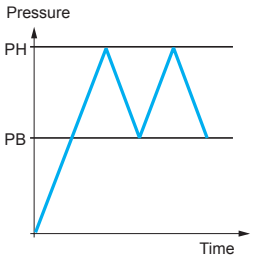
Size 160 bar (2320 psi)
Adjustable differential, for regulation between 2 thresholds
Switches with 1 CO single-pole contact

OsiSense XMLB pressure switches		With setting scale		
				
Adjustable range of switching point (PH) (Rising pressure)		**10…160 bar (145…2320 psi)**		
Electrical connection		DIN connector	Terminals	
Fluid connection		G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)
References *(1)*				
Fluids controlled *(2)*	Hydraulic oils, up to + 160 °C	**XMLB160D2C11**	**XMLB160D2S12**	**XMLB160D2S13**
	Fresh water, up to + 160 °C	**XMLB160E2C11**	**XMLB160E2S12**	**–**
	Corrosive fluids, air, up to + 160 °C	**XMLB160N2C11**	**XMLB160N2S12**	**–**
Weight (kg)		0.780	0.750	0.750
Complementary characteristics not shown under general characteristics (page 2/63)				
Possible differential (subtract from PH to give PB)	Min. at low setting *(3)*	9.3 bar (134.85 psi)		
	Min. at high setting *(4)*	20.8 bar (301.6 psi)		
	Max. at high setting	100 bar (1450 psi)		
Maximum permissible pressure	Per cycle	200 bar (2900 psi)		
	Accidental	360 bar (5220 psi)		
Destruction pressure		720 bar (10,440 psi)		
Mechanical life		6 x 10^6 operating cycles		
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Piston		

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLB160D2S12** becomes **XMLB160D2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low setting point for switches of the same size: - 1.8 bar, + 1.5 bar (- 26.1 psi, + 21.75 psi).
(4) Deviation of the differential at high setting point for switches of the same size: - 1.9 bar, + 1.6 bar (- 27.55 psi, + 23.2 psi).

Operating curves



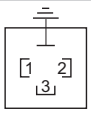


Connection

Terminal model

Connector model

Pressure switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

1 Maximum differential
2 Minimum differential

— Adjustable value

Other versions

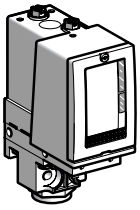
For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

OsiSense XML

Size 160 bar (2320 psi)
Adjustable differential, for regulation between 2 thresholds
Switches with 2 CO single-pole contacts

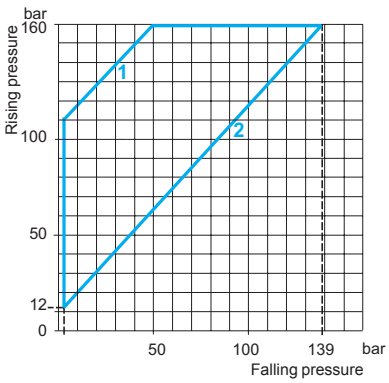
OsiSense XMLC pressure switches		With setting scale	

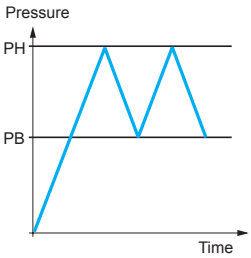


Adjustable range of switching point (PH) (Rising pressure)		**12…160 bar (174…2320 psi)**	
Electrical connection		Terminals	
Fluid connection		G 1/4 (female)	1/4"-18 NPTF (female)
References *(1)*			
Fluids controlled *(2)*	Hydraulic oils, up to + 160 °C	**XMLC160D2S12**	**XMLC160D2S13**
	Fresh water, up to + 160 °C	**XMLC160E2S12**	–
	Corrosive fluids, air, up to + 160 °C	**XMLC160N2S12**	–
Weight (kg)		0.750	0.750
Complementary characteristics not shown under general characteristics (page 2/63)			
Possible differential (subtract from PH to give PB)	Min. at low setting *(3)*	9 bar (130.5 psi)	
	Min. at high setting *(3)*	21 bar (304.5 psi)	
	Max. at high setting	110 bar (1590 psi)	
Maximum permissible pressure	Per cycle	200 bar (2900 psi)	
	Accidental	360 bar (5220 psi)	
Destruction pressure		720 bar (10 440 psi)	
Mechanical life		6 x 10^6 operating cycles	
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Piston	

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLC160D2S12** becomes **XMLC160D2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low and high setting points for switches of the same size: ± 0.9 bar (± 13.05 psi)

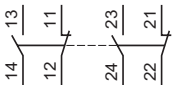
Operating curves





Connection

Terminal model



1 Maximum differential
2 Minimum differential

— Adjustable value

Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

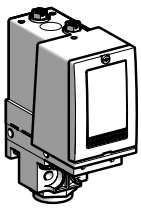
Accessories: page 2/116
Dimensions: pages 2/117 to 2/119

Telemecanique Sensors

Electromechanical pressure switches

OsiSense XML

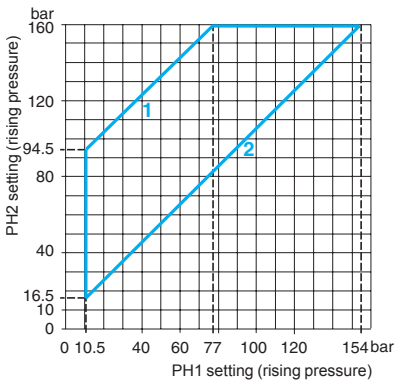
Size 160 bar (2320 psi)
Dual stage, fixed differential, for detection at each threshold
Switches with 2 CO single-pole contacts

OsiSense XMLD pressure switches		Without setting scale	
			
Adjustable range of each switching point (Rising pressure)	2nd stage switching point (PH2)	**16.5…160 bar (239.25…2320 psi)**	
	1st stage switching point (PH1)	**10.5…154 bar (152.25…2233 psi)**	
Spread between 2 stages (PH2 - PH1)		**6…83 bar (87…1203.5 psi)**	
Electrical connection		Terminals	
Fluid connection		G 1/4 (female)	1/4"-18 NPTF (female)
References *(1)*			
Fluids controlled *(2)*	Hydraulic oils, up to + 160 °C	**XMLD160D1S12**	**XMLD160D1S13**
	Fresh water, up to + 160 °C	**XMLD160E1S12**	**–**
Weight (kg)		0.750	0.750
Complementary characteristics not shown under general characteristics (page 2/63)			
Natural differential (subtract from PH1/PH2 to give PB1/PB2)	At low setting *(3)*	8.8 bar (127.6 psi)	
	At high setting *(4)*	20 bar (290 psi)	
Maximum permissible pressure	Per cycle	200 bar (2900 psi)	
	Accidental	360 bar (5220 psi)	
Destruction pressure		720 bar (10,440 psi)	
Mechanical life		6 x 10^6 operating cycles	
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Piston	

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLD160D1S12** becomes **XMLD160D1S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low setting point for switches of the same size: ± 1.5 bar (± 21.75 psi)
(4) Deviation of the differential at high setting point for switches of the same size: ± 7 bar (± 101.5 psi)

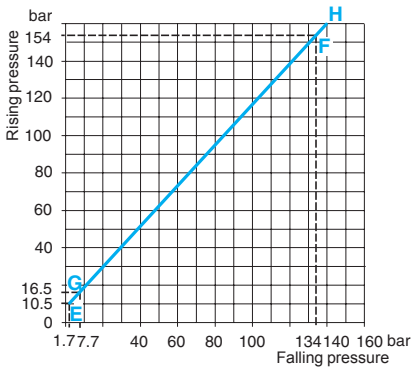
Operating curves

High setting tripping points of contacts 1 and 2

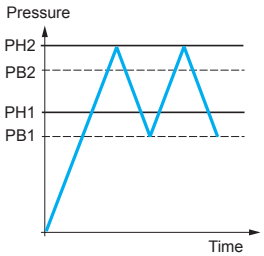


1 Maximum differential
2 Minimum differential

Natural differential of contacts 1 and 2



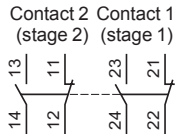
EF Contact 1 (stage 1)
GH Contact 2 (stage 2)



— Adjustable value
--- Non adjustable value

Connection

Terminal model



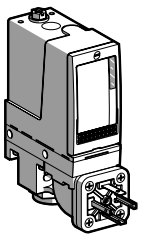
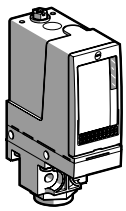
Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

OsiSense XML

Size 300 bar (4350 psi)
Fixed differential, for detection of a single threshold
Switches with 1 CO single-pole contact

OsiSense XMLA pressure switches	With setting scale		
			
Adjustable range of switching point (PH) (Rising pressure)	**20…300 bar (290…4350 psi)**		
Electrical connection	DIN connector	Terminals	
Fluid connection	G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)

References *(1)*

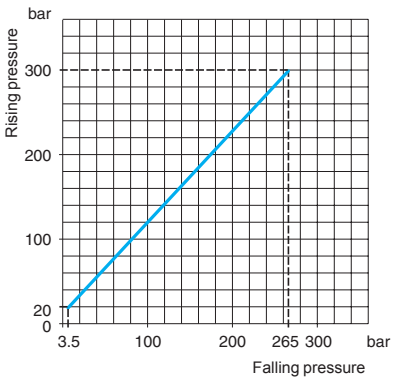
Fluids controlled *(2) (5)*	Hydraulic oils, up to + 160 °C	**XMLA300D2C11**	**XMLA300D2S12**	**XMLA300D2S13**
	Fresh water, up to + 160 °C	**XMLA300E2C11**	**XMLA300E2S12**	**XMLA300E2S13**
	Corrosive fluids, air, up to + 160 °C	**XMLA300N2C11**	**XMLA300N2S12**	**–**
Weight (kg)		0.780	0.750	0.750

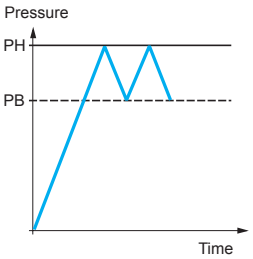
Complementary characteristics not shown under general characteristics (page 2/63)

Natural differential (subtract from PH to give PB)	At low setting *(3)*	16.5 bar (239.25 psi)		
	At high setting *(4)*	35 bar (507.5 psi)		
Maximum permissible pressure	Per cycle	375 bar (5437.5 psi)		
	Accidental	675 bar (9787.5 psi)		
Destruction pressure		1350 bar (19 575 psi)		
Mechanical life		3 x 10^6 operating cycles		
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Piston		

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLA300D2S12** becomes **XMLA300D2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low setting point for switches of the same size: ± 3 bar (± 43.5 psi)
(4) Deviation of the differential at high setting point for switches of the same size: ± 6 bar (± 87 psi)
(5) Only for control of group 2 fluids, in accordance with directive 97/23/EEC.

Operating curves





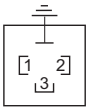
— Adjustable value
--- Non adjustable value

Connection

Terminal model

Connector model

Pressure switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

Other versions For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

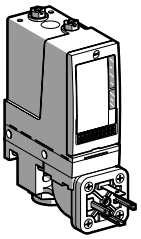
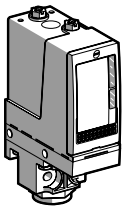
Accessories: page 2/116
Dimensions: pages 2/117 to 2/119

Telemecanique Sensors

Electromechanical pressure switches

OsiSense XML

Size 300 bar (4350 psi)
Adjustable differential, for regulation between 2 thresholds
Switches with 1 CO single-pole contact

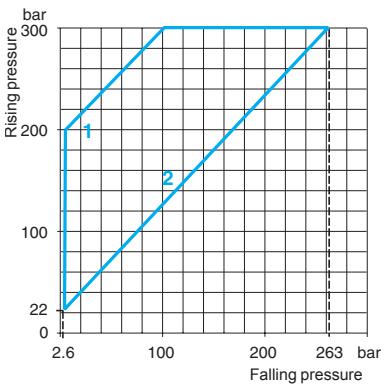
OsiSense XMLB pressure switches		With setting scale		
				
Adjustable range of switching point (PH) (Rising pressure)		**22…300 bar (319…4350 psi)**		
Electrical connection		DIN connector	Terminals	
Fluid connection		G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)
References *(1)*				
Fluids controlled *(2)(5)*	Hydraulic oils, up to + 160 °C	**XMLB300D2C11**	**XMLB300D2S12**	**XMLB300D2S13**
	Fresh water, up to + 160 °C	**XMLB300E2C11**	**XMLB300E2S12**	**–**
	Corrosive fluids, air, up to + 160 °C	**XMLB300N2C11**	**XMLB300N2S12**	**–**
Weight (kg)		0.780	0.750	0.750

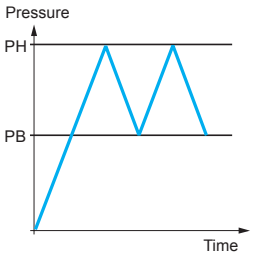
Complementary characteristics not shown under general characteristics (page 2/63)

Possible differential (subtract from PH to give PB)	Min. at low setting *(3)*	19.4 bar (281.3 psi)
	Min. at high setting *(4)*	37 bar (536.5 psi)
	Max. at high setting	200 bar (2900 psi)
Maximum permissible pressure	Per cycle	375 bar (5437.5 psi)
	Accidental	675 bar (9787.5 psi)
Destruction pressure		1350 bar (19,575 psi)
Mechanical life		3 x 10^6 operating cycles
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116 / 1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm / 1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Piston

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLB300D2S12** becomes **XMLB300D2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low setting point for switches of the same size: - 1.5 bar, + 1.7 bar (- 21.75 psi, + 24.65 psi).
(4) Deviation of the differential at high setting point for switches of the same size: - 1 bar, + 4 bar (- 14.5 psi, + 58 psi).
(5) Only for control of group 2 fluids, in accordance with directive 97/23/EEC.

Operating curves





1 Maximum differential
2 Minimum differential

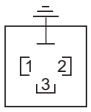
— Adjustable value

Connection

Terminal model

Connector model

Pressure switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

Other versions

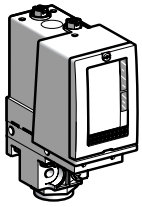
For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

OsiSense XML

Size 300 bar (4350 psi)
Adjustable differential, for regulation between 2 thresholds
Switches with 2 CO single-pole contacts

OsiSense XMLC pressure switches	With setting scale



Adjustable range of switching point (PH) (Rising pressure)	**22…300 bar (319…4350 psi)**
Electrical connection	Terminals
Fluid connection	G 1/4 (female)

References *(1)*

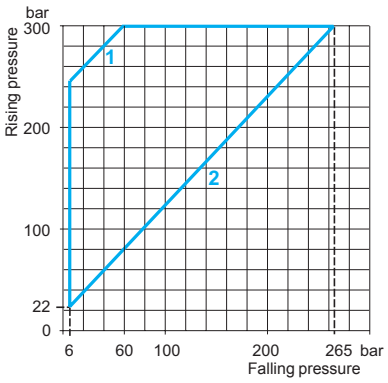
Fluids controlled *(2) (4)*	Hydraulic oils, up to + 160 °C	**XMLC300D2S12**
	Fresh water, up to + 160 °C	**XMLC300E2S12**
	Corrosive fluids, air, up to + 160 °C	**XMLC300N2S12**
Weight (kg)		0.750

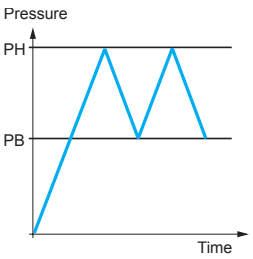
Complementary characteristics not shown under general characteristics (page 2/63)

Possible differential (subtract from PH to give PB)	Min. at low setting *(3)*	16 bar (232 psi)
	Min. at high setting *(3)*	35 bar (507.5 psi)
	Max. at high setting	240 bar (3480 psi)
Maximum permissible pressure	Per cycle	375 bar (5437.5 psi)
	Accidental	675 bar (9787.5 psi)
Destruction pressure		1350 bar (19 575 psi)
Mechanical life		3 x 10^6 operating cycles
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Piston

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLC300D2S12** becomes **XMLC300D2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low and high setting points for switches of the same size: ± 0.9 bar (± 13.05 psi)
(4) Only for control of group 2 fluids, in accordance with directive 97/23/EEC.

Operating curves



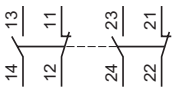


1 Maximum differential
2 Minimum differential

— Adjustable value

Connection

Terminal model



Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Accessories:
page 2/116

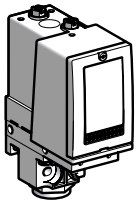
Dimensions:
pages 2/117 to 2/119

Telemecanique
Sensors

Electromechanical pressure switches

OsiSense XML

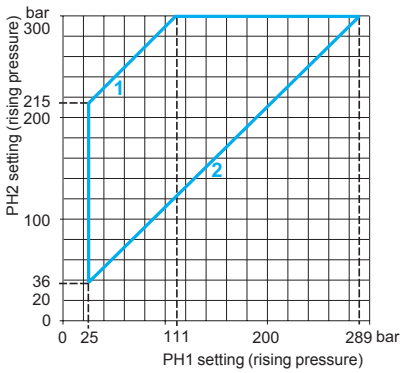
Size 300 bar (4350 psi)
Dual stage, fixed differential, for detection at each threshold
Switches with 2 CO single-pole contacts

OsiSense XMLD pressure switches		Without setting scale	
			
Adjustable range of each switching point (Rising pressure)	2nd stage switching point (PH2)	**36…300 bar (522…4350 psi)**	
	1st stage switching point (PH1)	**25…289 bar (362.5…4190.5 psi)**	
Spread between 2 stages (PH2 - PH1)		**11…189 bar (159.5…2740.5 psi)**	
Electrical connection		Terminals	
Fluid connection		G 1/4 (female)	1/4"-18 NPTF (female)
References *(1)*			
Fluids controlled *(2) (5)*	Hydraulic oils, up to + 160 °C	**XMLD300D1S12**	**XMLD300D1S13**
	Fresh water, up to + 160 °C	**XMLD300E1S12**	**–**
	Corrosive fluids, air, up to + 160 °C	**XMLD300N1S12**	**–**
Weight (kg)		0.750	0.750
Complementary characteristics not shown under general characteristics (page 2/63)			
Natural differential (subtract from PH1/PH2 to give PB1/PB2)	At low setting *(3)*	17 bar (246.5 psi)	
	At high setting *(4)*	42 bar (609 psi)	
Maximum permissible pressure	Per cycle	375 bar (5437.5 psi)	
	Accidental	675 bar (9787.5 psi)	
Destruction pressure		1350 bar (19,575 psi)	
Mechanical life		3 x 10^6 operating cycles	
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Piston	

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLD300D1S12** beomes **XMLD300D1S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low setting point for switches of the same size: ± 2.5 bar (± 36.25 psi)
(4) Deviation of the differential at high setting point for switches of the same size: ± 9 bar (± 130.5 psi)
(5) Only for control of group 2 fluids, in accordance with directive 97/23/EEC.

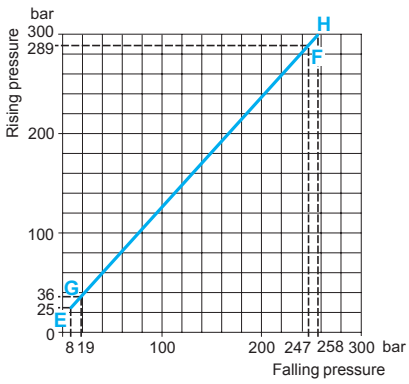
Operating curves

High setting tripping points of contacts 1 and 2

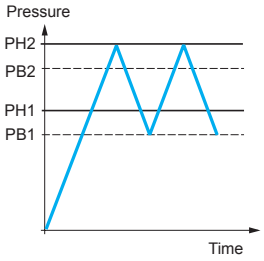


1 Maximum differential
2 Minimum differential

Natural differential of contacts 1 and 2



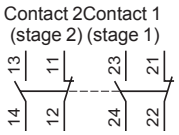
EF Contact 1 (stage 1)
GH Contact 2 (stage 2)



— Adjustable value
--- Non adjustable value

Connection

Terminal model



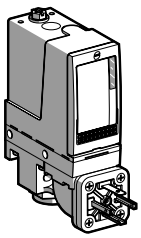
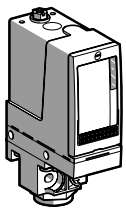
Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

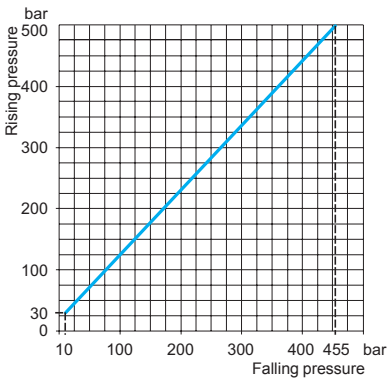
OsiSense XML

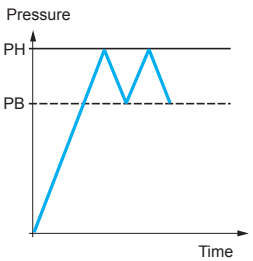
Size 500 bar (7250 psi)
Fixed differential, for detection of a single threshold
Switches with 1 CO single-pole contact

OsiSense XMLA pressure switches	With setting scale		
			
Adjustable range of switching point (PH) (Rising pressure)	**30…500 bar (435…7250 psi)**		
Electrical connection	DIN connector	Terminals	
Fluid connection	G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)
References *(1)*			
Fluids controlled *(2) (5)* — Hydraulic oils, up to + 160 °C	**XMLA500D2C11**	**XMLA500D2S12**	**XMLA500D2S13**
Fresh water, up to + 160 °C	**XMLA500E2C11**	**XMLA500E2S12**	**XMLA500E2S13**
Corrosive fluids, air, up to + 160 °C	**XMLA500N2C11**	**XMLA500N2S12**	**–**
Weight (kg)	0.780	0.750	0.750
Complementary characteristics not shown under general characteristics (page 2/63)			
Natural differential (subtract from PH to give PB) — At low setting *(3)*	20 bar (290 psi)		
At high setting *(4)*	45 bar (652.5 psi)		
Maximum permissible pressure — Per cycle	625 bar (9062.5 psi)		
Accidental	1125 bar (16,312.5 psi)		
Destruction pressure	2250 bar (32,625 psi)		
Mechanical life	3 x 10^6 operating cycles		
Connection	EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type	Piston		

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLA500D2S12** becomes **XMLA500D2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low setting point for switches of the same size: ± 6 bar (± 87 psi)
(4) Deviation of the differential at high setting point for switches of the same size: ± 10 bar (± 145 psi)
(5) Only for control of group 2 fluids, in accordance with directive 97/23/EEC.

Operating curves





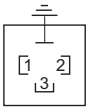
— Adjustable value
--- Non adjustable value

Connection

Terminal model

Connector model

Pressure switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

Other versions — For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

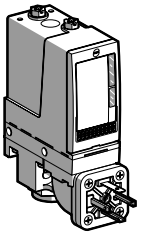
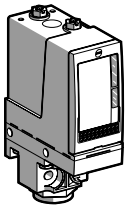
Accessories: page 2/116
Dimensions: pages 2/117 to 2/119

Telemecanique Sensors

Electromechanical pressure switches

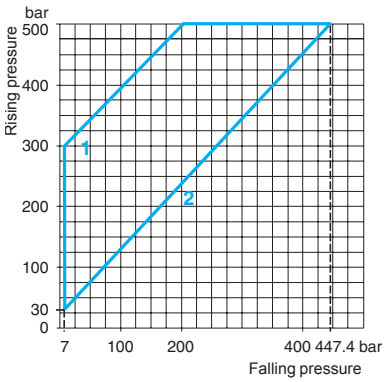
OsiSense XML

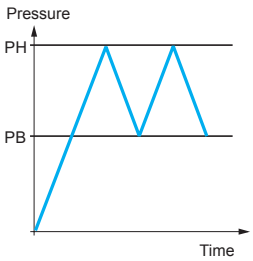
Size 500 bar (7250 psi)
Adjustable differential, for regulation between 2 thresholds
Switches with 1 CO single-pole contact

OsiSense XMLB pressure switches		With setting scale		
				
Adjustable range of switching point (PH) (Rising pressure)		**30…500 bar (435…7250 psi)**		
Electrical connection		DIN connector	Terminals	
Fluid connection		G 1/4 (female)	G 1/4 (female)	1/4"-18 NPTF (female)
References *(1)*				
Fluids controlled *(2) (5)*	Hydraulic oils, up to + 160 °C	**XMLB500D2C11**	**XMLB500D2S12**	**XMLB500D2S13**
	Fresh water, up to + 160 °C	**XMLB500E2C11**	**XMLB500E2S12**	**–**
	Corrosive fluids, air, up to + 160 °C	**XMLB500N2C11**	**XMLB500N2S12**	**–**
Weight (kg)		0.780	0.750	0.750
Complementary characteristics not shown under general characteristics (page 2/63)				
Possible differential (subtract from PH to give PB)	Min. at low setting *(3)*	23 bar (333.5 psi)		
	Min. at high setting *(4)*	52.6 bar (762.7 psi)		
	Max. at high setting	300 bar (4350 psi)		
Maximum permissible pressure	Per cycle	625 bar (9062.5 psi)		
	Accidental	1125 bar (16,312.5 psi)		
Destruction pressure		2250 bar (32,625 psi)		
Mechanical life		3 x 10^6 operating cycles		
Connection		EN 175301-803-A (ex-DIN 43650A), 4-pin male connector. For suitable female connector, see page 2/116	1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm	1 entry tapped 1/2"-14 NPT for cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Piston		

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLB500D2S12** becomes **XMLB500D2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low setting point for switches of the same size: - 2.6 bar, + 3.8 bar (- 37.7 psi, + 55.1 psi).
(4) Deviation of the differential at high setting point for switches of the same size: - 14.8 bar, + 11.2 bar (- 214.6 psi, + 162.4 psi).
(5) Only for control of group 2 fluids, in accordance with directive 97/23/EEC.

Operating curves



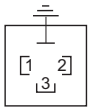


Connection

Terminal model

Connector model

Pressure switch connector pin view



1 → 11 and 13
2 → 12
3 → 14

1 Maximum differential
2 Minimum differential

— Adjustable value

Other versions

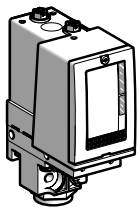
For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Electromechanical pressure switches

OsiSense XML

Size 500 bar (7250 psi)
Adjustable differential, for regulation between 2 thresholds
Switches with 2 CO single-pole contacts

OsiSense XMLC pressure switches		With setting scale



Adjustable range of switching point (PH) (Rising pressure)		**30…500 bar (435…7250 psi)**
Electrical connection		Terminals
Fluid connection		G 1/4 (female)

References *(1)*

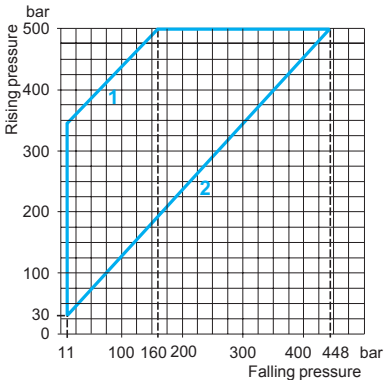
Fluids controlled *(2) (4)*	Hydraulic oils, up to + 160 °C	**XMLC500D2S12**
	Corrosive fluids, air, up to + 160 °C	**XMLC500N2S12**
Weight (kg)		0.750

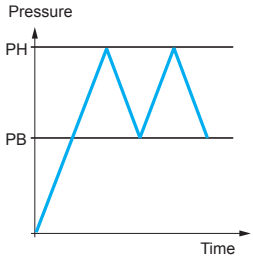
Complementary characteristics not shown under general characteristics (page 2/63)

Possible differential (subtract from PH to give PB)	Min. at low setting *(3)*	19 bar (275.5 psi)
	Min. at high setting *(3)*	52 bar (754 psi)
	Max. at high setting	340 bar (4930 psi)
Maximum permissible pressure	Per cycle	625 bar (9062.5 psi)
	Accidental	1125 bar (16 312.5 psi)
Destruction pressure		2250 bar (32 625 psi)
Mechanical life		3 x 10^6 operating cycles
Cable entry for terminal models		1 entry tappedJe préfère acheter des.5 mm for ISO cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Piston

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLC500D2S12** becomes **XMLC500D2S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low and high setting points for switches of the same size: ± 0.9 bar (± 13.05 psi)
(4) Only for control of group 2 fluids, in accordance with directive 97/23/EEC.

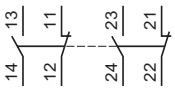
Operating curves





Connection

Terminal model



1 Maximum differential
2 Minimum differential

— Adjustable value

Other versions For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

Accessories:
page 2/116

Dimensions:
pages 2/117 to 2/119

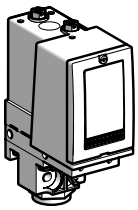
Telemecanique
Sensors

Electromechanical pressure switches

OsiSense XML

Size 500 bar (7250 psi)
Dual stage, fixed differential, for detection at each threshold
Switches with 2 CO single-pole contacts

OsiSense XMLD pressure switches		Without setting scale



Adjustable range of each switching point (Rising pressure)	2nd stage switching point (PH2)	**41…500 bar (594.5…7250 psi)**
	1st stage switching point (PH1)	**25…484 bar (362.5…7018 psi)**
Spread between 2 stages (PH2 - PH1)		**16…244 bar (232…3538 psi)**
Electrical connection		Terminals
Fluid connection		G 1/4 (female)

References *(1)*

Fluids controlled *(2) (5)*	Hydraulic oils, up to + 160 °C	**XMLD500D1S12**
Weight (kg)		0.750

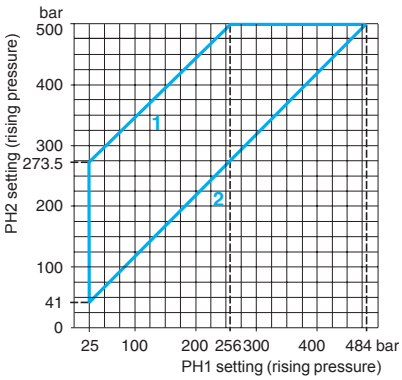
Complementary characteristics not shown under general characteristics (page 2/63)

Natural differential (subtract from PH1/PH2 to give PB1/PB2)	At low setting *(3)*	21 bar (304.5 psi)
	At high setting *(4)*	65 bar (942.5 psi)
Maximum permissible pressure	Per cycle	625 bar (9062.5 psi)
	Accidental	1125 bar (16,312.5 psi)
Destruction pressure		2250 bar (32,625 psi)
Mechanical life		3 x 10^6 operating cycles
Cable entry for terminal models		1 entry tapped M20 x 1.5 mm for ISO cable gland, clamping capacity 7 to 13 mm
Pressure switch type		Piston

*(1) For 1 entry tapped for no. 13 cable gland, replace **S12** with **S11** (for example, **XMLD500D1S12** becomes **XMLD500D1S11**).*
(2) For component materials of units in contact with the fluid, see pages 2/120 and 2/121.
(3) Deviation of the differential at low setting point for switches of the same size: ± 3 bar (± 43.5 psi)
(4) Deviation of the differential at high setting point for switches of the same size: ± 10 bar (± 145 psi)
(5) Only for control of group 2 fluids, in accordance with directive 97/23/EEC.

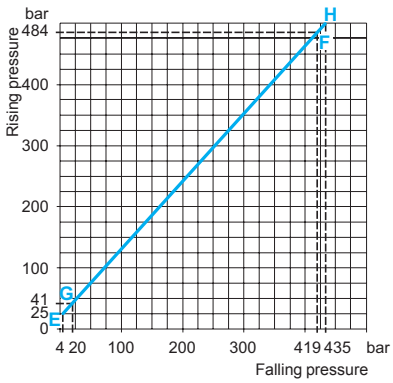
Operating curves

High setting tripping points of contacts 1 and 2

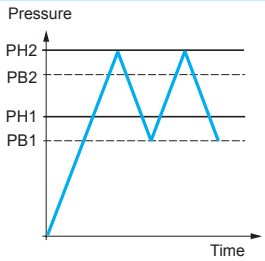


1 Maximum differential
2 Minimum differential

Natural differential of contacts 1 and 2



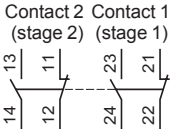
EF Contact 1 (stage 1)
GH Contact 2 (stage 2)



— Adjustable value
--- Non adjustable value

Connection

Terminal model



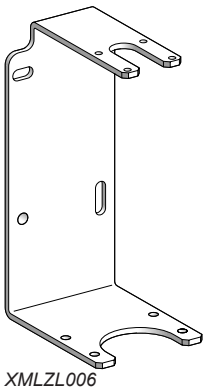
Other versions

For pressure switches with alternative tapped cable entries, such as NPT, etc. please consult our Customer Care Centre.

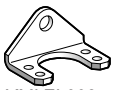
Electromechanical pressure and vacuum switches

OsiSense XMLA, XMLB, XMLC and XMLD

Accessories and replacement parts

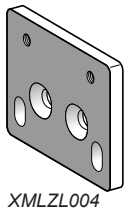


XMLZL006

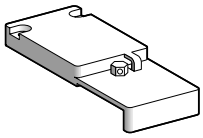


XMLZL002

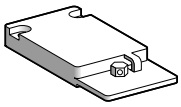
XMLZL003



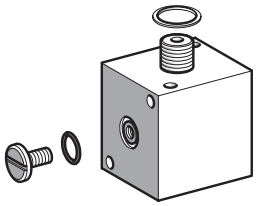
XMLZL004



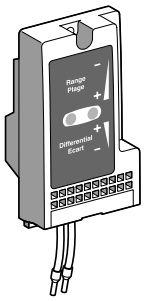
XMLZL001



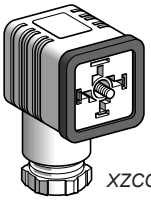
XMLZL011



XMLZL005



XMLZA●●●,
XMLZB●●●



XZCC43FCP40B

XMLZL010

Accessories for pressure switches and vacuum switches

Description		Specific characteristics	For use with switches	Unit reference	Weight kg
Rear fixing bracket for vibrations > 2 gn		–	XML●L35 XML●001	**XMLZL006**	0.230
Additional top support bracket for vibrations > 4 gn		–	XMLAM01 XML●M05 XMLA004 XML●010… XML●500	**XMLZL002**	0.020
Knurled adjustment knob, Ø 36 mm fits over adjustment screws to facilitate setting		–	All models	**XMLZL003**	0.010
Fixing plate for replacing an XMJA or XMGB switch with an XML switch		–	XMLAM01 XML●M05 XMLA004 XML●010… XML●500	**XMLZL004**	0.110
Lead sealable protective cover to prevent unauthorised access to adjustment screws and fixing screw of switch cover		–	XMLA XMLB	**XMLZL001**	0.035
Lead sealable protective cover to prevent unauthorised access to adjustment screws		–	All types	**XMLZL011**	0.030
Indicator modules and associated covers, 2 LEDs (orange and green)	Without setting scale	∿ or ⎓ 24/48 V	XMLA/B	**XMLZZ024**	0.090
		∿ 110/240 V	XMLA/B	**XMLZZ120**	0.090
	With setting scale	∿ or ⎓ 24/48 V	XMLA	**XMLZA024**	0.090
			XMLB	**XMLZB024**	0.090
		∿ 110/240 V	XMLA	**XMLZA120**	0.090
			XMLB	**XMLZB120**	0.090
Hydraulic block for base mounting directly onto fluid manifold		–	All types	**XMLZL005**	0.240
Female EN 175301-803-A connector (ex-DIN 43650A)		–	XML●●●●●●C11	**XZCC43FCP40B**	0.035
Adaptor, G 1/4"/G 3/8" male/female		–	All types	**XMLZL012**	0.130

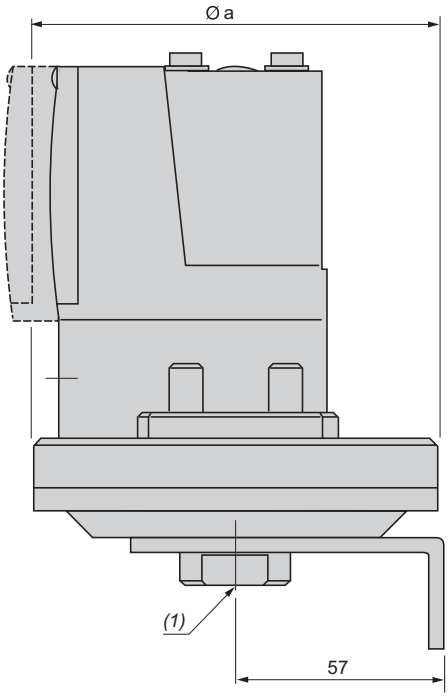
Replacement parts

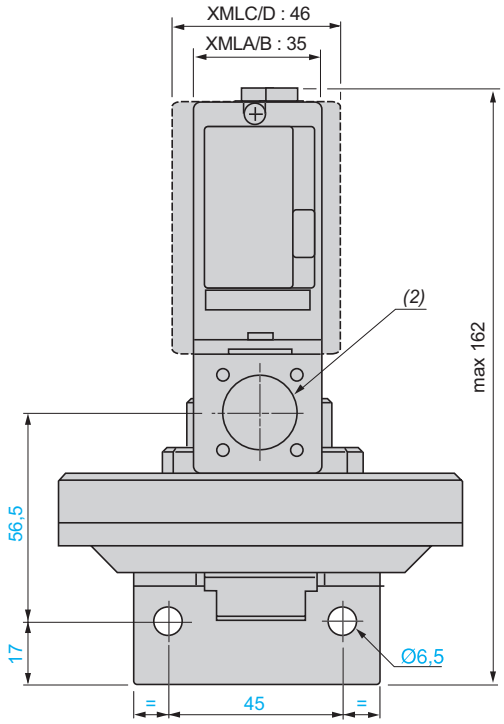
Sealing gasket (pack of 10 gaskets)	For sizes ⩾ 300 bar (XMLA/B/C/D)		**XMLZL010**	0.015
Diaphragms	–	XML●S35	**XMLZL013**	0.060
		XML●S02	**XMLZL014**	0.040
		XML●S04	**XMLZL015**	0.030

Electromechanical pressure and vacuum switches

OsiSense XMLA, XMLB, XMLC and XMLD

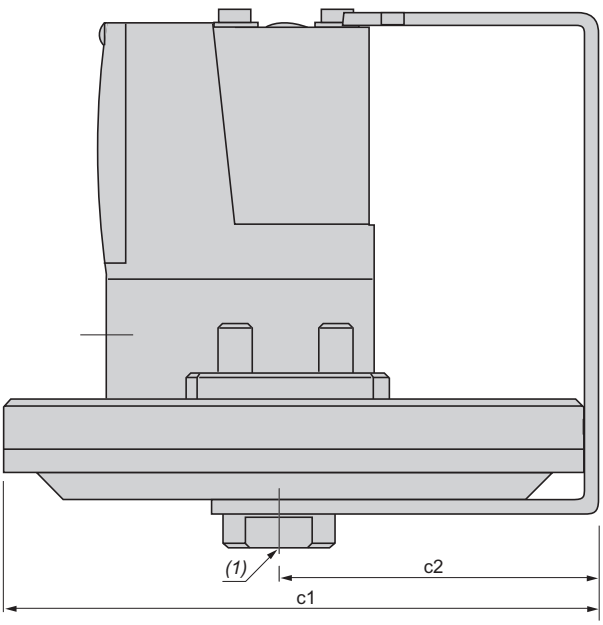
XML●L35, XML●001, XML●S

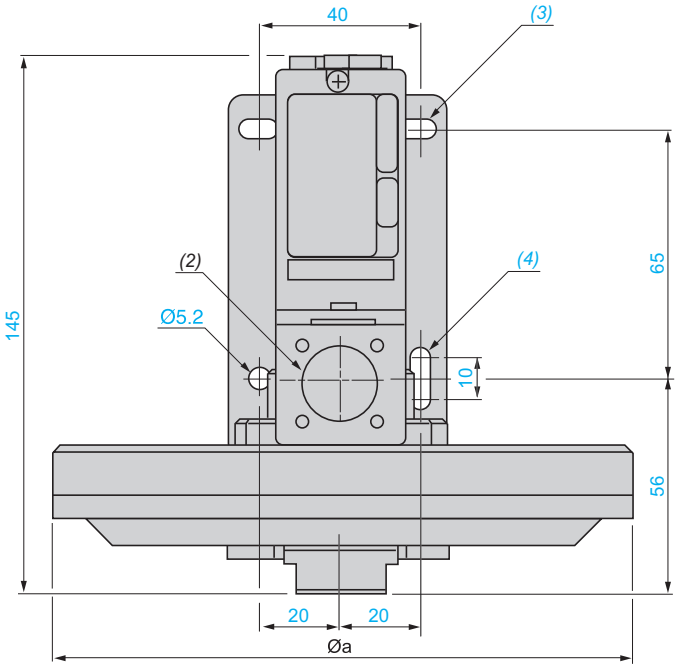




(1) 1 fluid entry, tapped G 1/4 (female) or 1/4"-18 NPTF (female)
(2) 1 electrical connections entry, tapped M20 x 1.5 mm or Pg 13.5 or 1/2"-14 NPT

XMLBM03, XMLBL05



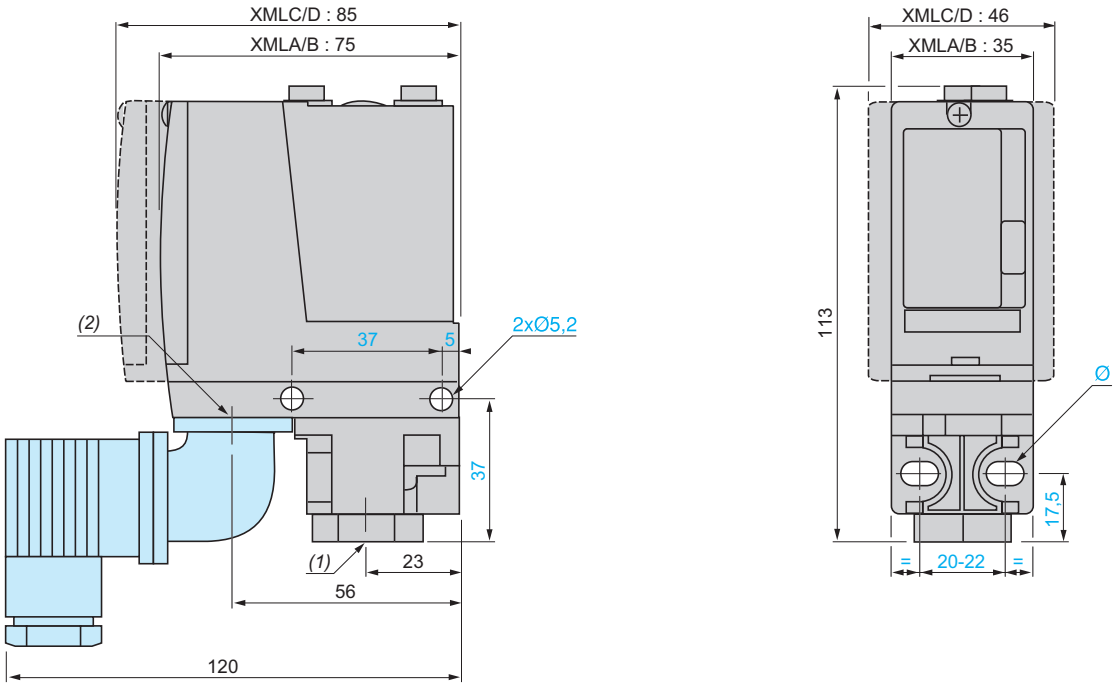


(1) 1 fluid entry, tapped G 1/4 (female) or 1/4"-18 NPTF (female)
(2) 1 electrical connections entry, tapped M20 x 1.5 mm or Pg 13.5 or 1/2"-14 NPT
(3) 2 elongated holes Ø 10.2 x 5.2
(4) 1 elongated hole Ø 15.2 x 5.2

XML	Øa	c1	c2
BM03	150	155.5	80.5
BL05	200	204	104
●L35, ●001	110	–	–
●S35, ●S02, ●S04	110	–	–
●S10, ●S20	86	–	–

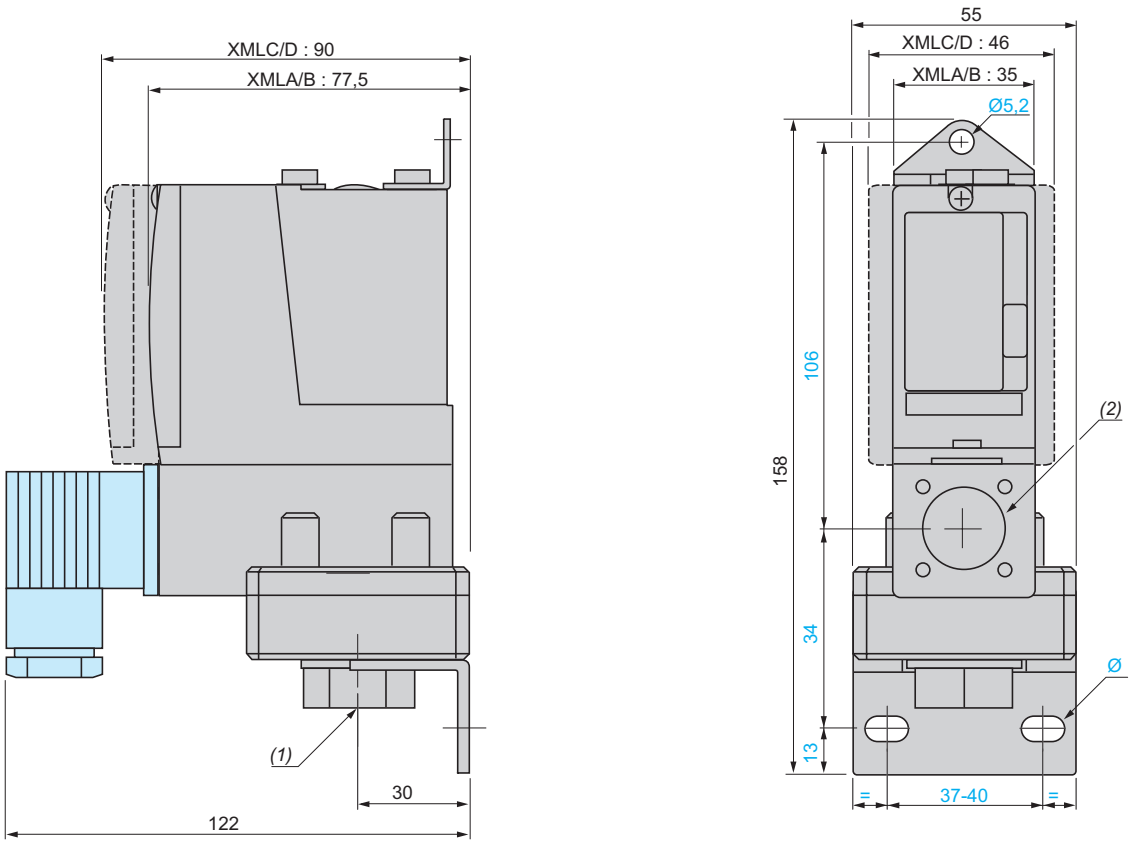
2

XMLAM01, XMLBM05, XMLCM05, XMLA004, XML●010…500



(1) 1 fluid entry, tapped G 1/4 (female) or 1/4"-18 NPTF (female)
(2) 1 electrical connections entry, tapped M20 x 1.5 mm or Pg 13.5 or 1/2"-14 NPT
Ø: 2 elongated holes Ø 5.2 x 6.7

XML●M02, XML●002, XMLB004, XMLC004, XMLD004

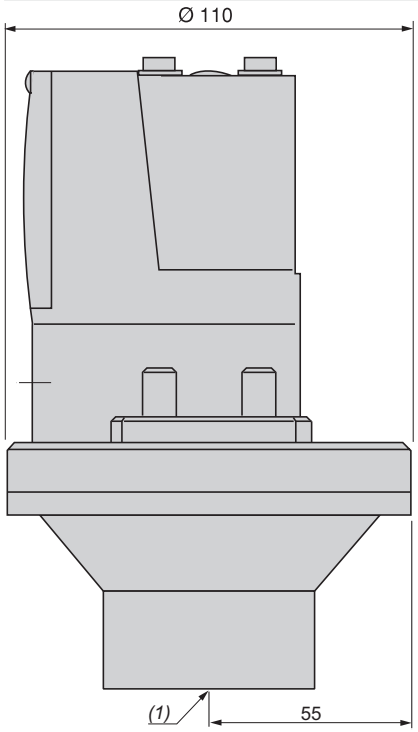


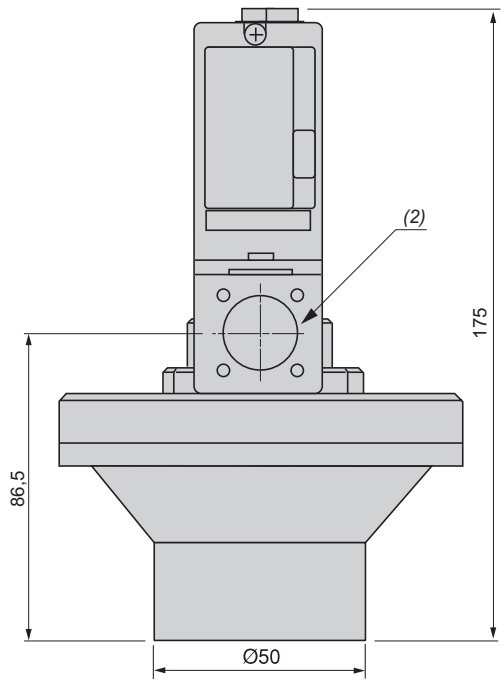
(1) 1 fluid entry, tapped G 1/4 (female) or 1/4"-18 NPTF (female)
(2) 1 electrical connections entry, tapped M20 x 1.5 mm or Pg 13.5 or 1/2"-14 NPT
Ø: 2 elongated holes Ø 10.2 x 5.2

Characteristics:
pages 2/63 to 2/115

References:
pages 2/64 to 2/115

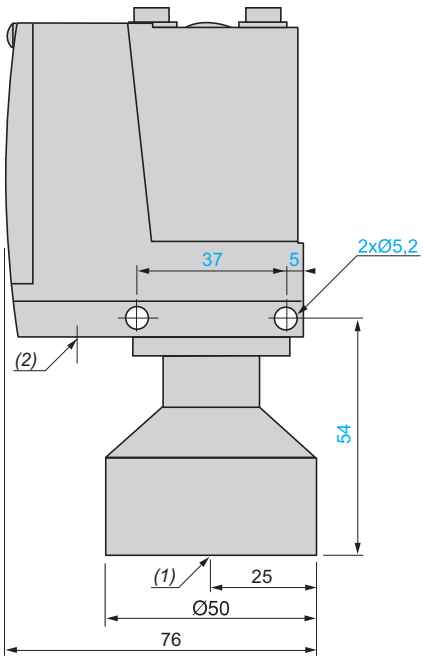
XMLBL35P, XMLB001P

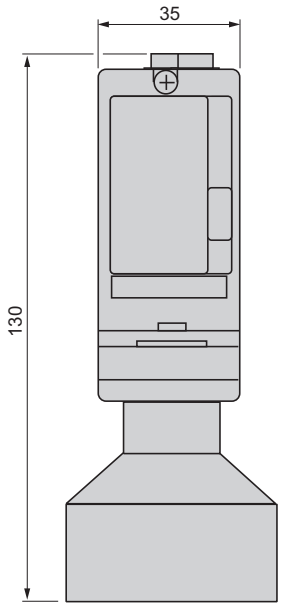




(1) 1 fluid entry, tapped G 1¼ (female)
(2) 1 electrical connections entry, tapped M20 x 1.5 mm or Pg 13.5

XMLBM05P, XMLA004P, XML●010P, XML●020P, XML●035P





(1) 1 fluid entry, tapped G 1¼ (female)
(2) 1 electrical connections entry, tapped M20 x 1.5 mm or Pg 13.5

Component materials of units in contact with fluid

This information will assist in checking the corrosion resistance of the pressure or vacuum switches in relation to the fluids controlled

Electromechanical pressure and vacuum switches

OsiSense XML

Pressure or vacuum switch reference	Component materials in contact with fluid							
	Zinc alloy	Stainless steel	Brass	Steel	Nitrile	PTFE	FPM, FKM	Aluminium
XMLAM01V●●●●, XML●M02V●●●●	■	*(1)*			■			
XMLAM01T●●●●, XML●M02T●●●●		*(2)*				■		
XMLBM03R●●●●				■			■	■
XMLBM03S●●●●		*(3)*				■		■
XML●M05A●●●●	■	*(1)*			■			
XML●M05B●●●●		*(1)*	■				■	
XML●M05C●●●●		*(1)*				■		
XMLBM05P●●●●		*(1)*		■			■	
XMLBL05R●●●●							■	■
XMLBL05S●●●●		*(3)*				■		
XML●L35R●●●●, XML●S35R●●●●		*(1)*		■			■	
XML●L35S●●●●		*(3)*				■		
XMLBL35P●●●●		*(1)*		■			■	
XML●001R●●●●		*(1)*		■			■	
XML●001S●●●●		*(3)*				■		
XMLB001P●●●●		*(1)*		■			■	
XML●002A●●●●	■				■			
XML●002B●●●●, XML●S02B●●●●				■			■	
XML●002C●●●●		*(3)*				■		
XMLA004A●●●●	■						■	
XMLA004B●●●●			■				■	
XMLA004C●●●●		*(2)*				■		
XMLA004P●●●●				■			■	

■ Component materials in contact with fluid

(1) 1.4307 (AISI 304L)
(2) 1.4404 (AISI 316L)
(3) 1.4305 (AISI 303)

Component materials of units in contact with fluid

This information will assist in checking the corrosion resistance of the pressure or vacuum switches in relation to the fluids controlled

Electromechanical pressure and vacuum switches

OsiSense XML

Pressure switch reference	Component materials in contact with fluid							
	Zinc alloy	Stainless steel	Brass	Steel	Nitrile	PTFE	FPM, FKM	Aluminium
XMLB004A●●●●	■				■			
XML●004B●●●●, XML●S04B●●●●				■			■	
XML●004C●●●●		*(3)* ■				■		
XML●010A●●●●	■						■	
XML●010B●●●●			■				■	
XML●010C●●●●		*(2)* ■				■		
XML●010P●●●●, XML●S10A●●●●				■			■	
XML●020A●●●●, XML●035A●●●●	■		■		■			■
XML●020B●●●●, XML●035B●●●●			■				■	
XML●020C●●●●, XML●035C●●●●		*(2)* ■				■		
XML●020P●●●●, XML●035P●●●●, XML●S20A●●●●				■			■	
XML●070D●●●●, XML●160D●●●●			■	■		■	■	
XML●070E●●●●, XML●160E●●●●		*(4)* ■	■			■	■	
XML●070N●●●●, XML●160N●●●●		*(5)* ■				■	■	
XML●300D●●●●			■	■		■	■	
XML●300E●●●●		*(4)* ■	■			■	■	
XML●300N●●●●		*(5)* ■				■	■	
XML●500D●●●●		■	■	■		■	■	
XML●500E●●●●		■	■			■	■	
XML●500N●●●●4		*(5)* ■				■	■	

■ Component materials in contact with fluid

(2) 1.4404 (AISI 316L)
(3) 1.4305 (AISI 303)
(4) 1.4404 (AISI 316L) + 1.4462
(5) 1.4404 (AISI 316L) + 1.4305 (AISI 303)

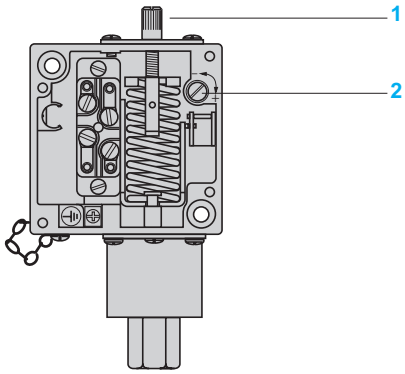
Electromechanical pressure switches
OsiSense XM
For control circuits, OsiSense ACW and ADW

Presentation

Pressure switches OsiSense ACW and ADW are switches for control circuits, with an adjustable differential.
Pressure switches OsiSense ACW are used to control the pressure of air, oils and other non corrosive fluids, up to 131 bar.
Pressure switches OsiSense ADW are used to control the pressure of oils (including synthetic), up to 340 bar.

Setting, operating principle

Pressure switches OsiSense ACW

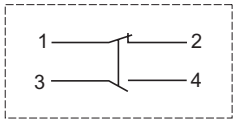


The switching point on falling pressure (low point - PB) is adjusted using screw 1.

The switching point on rising pressure (high point - PH) is made by adjusting screw 2. This sets the differential between the low and high points, giving a switching point on rising pressure of the displayed low point setting plus the differential setting.

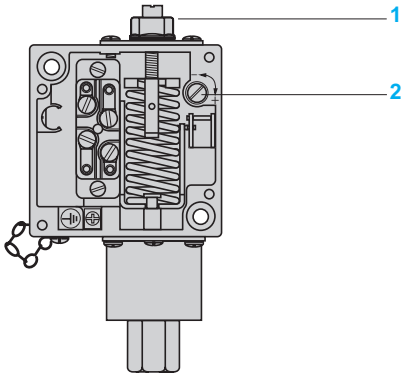
The two adjustments are completely independent.

Contact block operation



When the rising pressure reaches the high point setting (low point setting + differential setting), contact B (1-2) opens and contact A (3-4) closes. The contacts remain actuated until the pressure falls back to the low point setting.

Pressure switches OsiSense ADW

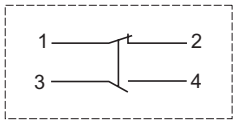


The switching point on rising pressure (high point - PH) is adjusted using screw 1.

The switching point on falling pressure (low point - PB) is made by adjusting screw 2. This sets the differential between the high and low points, giving a switching point on falling pressure of the displayed high point setting minus the differential setting.

The two adjustments are completely independent.

Contact block operation



When the rising pressure reaches the high point setting, contact B (1-2) opens and contact A (3-4) closes. The contacts remain actuated until the pressure falls back to the low point setting (high point setting - differential setting).

Electromechanical pressure switches

OsiSense XM

For control circuits, OsiSense ACW and ADW

Environment characteristics

Pressure switch type		ACW (bellows operated)	ADW (piston operated)
Conformity to standards		CE, IEC/EN 60947-5-1	
Product certifications		CSA, UL (Recognized), EAC	
Protective treatment		"TC"	
Materials		Zinc alloy case Phosphor bronze bellows	Zinc alloy case Pressure switches with drainage hole: Buna N diaphragm, steel piston, cast iron cylinder Pressure switches with Quad-Ring piston seal: Buna N diaphragm, Teflon and Viton seal, stainless steel piston and cylinder
Ambient air temperature (for operation)	**°C**	- 56…+ 85	- 30…+ 85
Fluids controlled		Air, oils and other non corrosive fluids, from - 73 to + 125°C	Oils and other fluids, from - 25 to + 120°C (for **ADW5, ADW6, ADW7S1, ADW25** and **ADW26**) Oils (including synthetic) only, from - 30 to + 125°C (for **ADW3, ADW4, ADW7, ADW23, ADW24** and **ADW27**)
Degree of protection		IP 65 conforming to IEC/EN 60529	
Fluid connection		G 1/4 (BSP female) conforming to NF E 03-005, ISO 228	G 3/8 (BSP female) conforming to NF E 03-005, ISO 228
Electrical connection Terminals		1 tapped entry M20 x 1.5 mm for ISO cable gland. (for **ACW●M119012, ACW●●M119012, ADW●M119012** and **ADW●●M119012).** 1 tapped entry for n° 13 (DIN Pg 13.5) cable gland (for **ACW●M129012, ACW●●M129012, ADW●M129012** and **ADW●●M129012).**	

Contact block characteristics

Rated operational current			**1 CO single-pole pressure switches**	**2 CO single-pole pressure switches**
	Category AC-15	Ue 24 V 110 V 220 V 500 V	Ie 5 A 5 A 3 A 1.4 A	Ie 3 A 3 A 1.5 A 0.7 A
	Category DC-13	Ue 24 V 110 V 220 V 500 V 600 V	Ie 5 A 0.5 A 0.25 A 0.10 A 0.06 A	Ie 1.5 A 0.25 A – – –
Short-circuit protection		10 A cartridge fuse type gG		
Connection		Screw terminals Minimum clamping capacity: 1 x 1 mm² Maximum clamping capacity: 2 x 2.5 mm²		

References:
pages 2/124 to 2/127

Dimensions:
pages 2/128 and 2/129

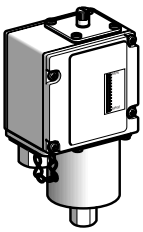
Electromechanical pressure switches

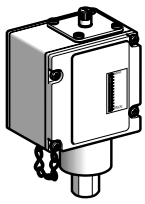
OsiSense XM

For control circuits, OsiSense ACW
Sizes 0.70 to 131 bar (10.15 to 1900 psi)
Adjustable differential, for regulation between 2 thresholds

Fluid connection G 1/4 (female)

Pressure switches OsiSense ACW — **Bellows operated**

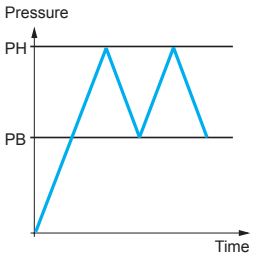




Adjustable range of switching point (PB) (Falling pressure)		**0.07…0.70 bar (1.01…10.15 psi)**	**0.07…1.4 bar (1.01…20.3 psi)**	**0.07…5.2 bar (1.01…75.4 psi)**	**0.07…7.6 bar (1.01…110.2 psi)**
References					
Switches with 1 CO single-pole contact					
Electrical connection	With one tapped entry M20 x 1.5 mm for ISO cable gland	**ACW3M119012**	**ACW4M119012**	**ACW5M119012**	**ACW1M119012**
	With one tapped entry for n° 13 cable gland	**ACW3M129012**	**ACW4M129012**	**ACW5M129012**	**ACW1M129012**
Weight (kg)		1.750		1.550	
Switches with 2 CO single-pole contacts					
Electrical connection	With one tapped entry M20 x 1.5 mm for ISO cable gland	**ACW23M119012**	**ACW24M119012**	**ACW25M119012**	**ACW21M119012**
	With one tapped entry for n° 13 cable gland	**ACW23M129012**	**ACW24M129012**	**ACW25M129012**	**ACW21M129012**
Weight (kg)		1.750		1.550	
Complementary characteristics not shown under general characteristics (page 2/123)					
Possible differential (add to PB to give PH)	1 CO switches Min.	0.04 bar (0.58 psi)	0.10 bar (1.45 psi)	0.30 bar (4.35 psi)	0.50 bar (7.25 psi)
	1 CO switches Max.	0.34 bar (4.93 psi)	0.40 bar (5.8 psi)	1 bar (14.5 psi)	2 bar (29 psi)
	2 CO switches Min.	0.05 bar (0.73 psi)	0.14 bar (2.03 psi)	0.41 bar (5.95 psi)	0.9 bar (13.05 psi)
	2 CO switches Max.	0.48 bar (6.96 psi)	0.70 bar (10.15 psi)	1.4 bar (20.3 psi)	2.8 bar (40.6 psi)
Maximum permissible pressure		2 bar (29 psi)		7 bar (101.5 psi)	17 bar (246.5 psi)
Fluids controlled		Air, oils and other non corrosive fluids, from - 73 to + 125°C *(1)*			
Mechanical life		1 x 10^6 operating cycles (average value, depending on application)			
Cable entry, screw terminals	ACW●M119012, ACW2●M119012	1 tapped entry M20 x 1.5 mm for ISO cable gland. Clamping capacity 7 to 13 mm			
	ACW●M129012, ACW2●M129012	1 tapped entry for n° 13 cable gland, conforming to NF C 68-300 (DIN Pg 13.5). Clamping capacity 9 to 13 mm			

(1) See "Component materials of units in contact with the fluid", page 2/123.

Operating curve



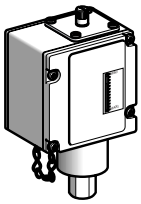
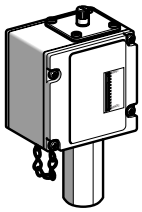
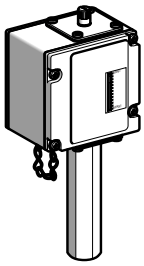
— Adjustable value

Contact block connections

Other versions — Pressure switches with alternative tapped cable entries: NPT, etc. Please consult our Customer Care Centre.

Dimensions: page 2/128

Bellows operated

1.4…12 bar (20.3…174 psi)	**0.7…18 bar (10.15…261 psi)**	**0.7…21 bar (10.15…304.5 psi)**	**5.2…34 bar (75.4…493 psi)**	**10…69 bar (145…1000 psi)**	**24…131 bar (348…1900 psi)**
References					
Switches with 1 CO single-pole contact					
ACW8M119012	**ACW9M119012**	**ACW2M119012**	**ACW6M119012**	**ACW7M119012**	**ACW10M119012**
ACW8M129012	**ACW9M129012**	**ACW2M129012**	**ACW6M129012**	**ACW7M129012**	**ACW10M129012**
1.550		2.100			
Switches with 2 CO single-pole contacts					
ACW28M119012	**–**	**ACW22M119012**	**ACW26M119012**	**–**	**ACW20M119012**
ACW28M129012	**ACW29M129012**	**ACW22M129012**	**ACW26M129012**	**ACW27M129012**	**ACW20M129012**
1.550		2.100			
Complementary characteristics not shown under general characteristics (page 2/123)					
0.70 bar (10.15 psi)	1 bar (14.5 psi)	1.7 bar (24.7 psi)	3.4 bar (49.3 psi)	5.9 bar (85.6 psi)	11 bar (159.5 psi)
2 bar (29 psi)	1.7 bar (24.7 psi)	8.6 bar (124.7 psi)	8.3 bar (120.4 psi)	10 bar (145 psi)	21 bar (304.5 psi)
1 bar (14.5 psi)	1.6 bar (23.2 psi)	2.4 bar (34.8 psi)	5.9 bar (85.6 psi)	9.3 bar (134.9 psi)	17 bar (246.5 psi)
2.8 bar (40.6 psi)	2.4 bar (34.8 psi)	10 bar (145 psi)	11 bar (159.5 psi)	14 bar (203 psi)	24 bar (348 psi)
17 bar (246.5 psi)	20 bar (290 psi)	41 bar (549.5 psi)	140 bar (2030 psi)	140 bar (2030 psi)	175 bar (2538 psi)
Air, oils and other non corrosive fluids, from - 73 to + 125°C *(1)*					
1 x 10^6 operating cycles (average value, depending on application)					
1 tapped entry M20 x 1.5 mm for ISO cable gland. Clamping capacity 7 to 13 mm					
1 tapped entry for n° 13 cable gland, conforming to NF C 68-300 (DIN Pg 13.5). Clamping capacity 9 to 13 mm					

Other versions Pressure switches with alternative tapped cable entries: NPT, etc. Please consult our Customer Care Centre.

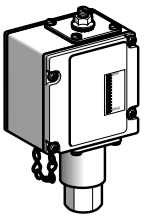
Dimensions:
page 2/128

Electromechanical pressure switches

OsiSense XM

For control circuits, OsiSense ADW
Sizes 69 to 340 bar (1000 to 4930 psi)
Adjustable differential, for regulation between 2 thresholds
Fluid connection G 3/8 (female)

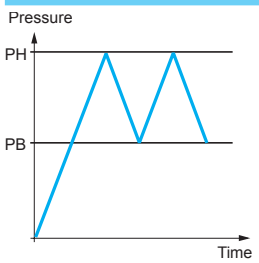
Pressure switches OsiSense ADW — **Piston operated, with drainage hole** *(1)*



Adjustable range of switching point (PH) (Rising pressure)		**9.3…69 bar (135…1000 psi)**	**28…210 bar (406…3045 psi)**	**38…340 bar (551…4930 psi)**
References				
Switches with 1 CO single-pole contact				
Electrical connection	With one tapped entry M20 x 1.5 mm for ISO cable gland	**ADW3M119012**	**ADW4M119012**	**ADW7M119012**
	With one tapped entry for n° 13 cable gland	**ADW3M129012**	**ADW4M129012**	**ADW7M129012**
Weight (kg)		1.880		
Switches with 2 CO single-pole contacts				
Electrical connection	With one tapped entry for n° 13 cable gland	**ADW23M129012**	**ADW24M129012**	**ADW27M129012**
Weight (kg)		1.880		
Complementary characteristics not shown under general characteristics (page 2/123)				
Possible differential (subtract from PH to give PB)	1 CO switches — Min.	2.4 bar (34.8 psi)	6.9 bar (100 psi)	8.6 bar (124.7 psi)
	1 CO switches — Max.	9.3 bar (135 psi)	28 bar (406 psi)	38 bar (551 psi)
	2 CO switches — Min.	3.1 bar (45 psi)	8.6 bar (124.7 psi)	14 bar (203 psi)
	2 CO switches — Max.	14 bar (203 psi)	34 bar (493 psi)	41 bar (594.5 psi)
Maximum permissible pressure		690 bar (10,000 psi)		
Fluids controlled		Oils (including synthetic) only, from - 30°C to + 125°C *(2) (3)*		
Mechanical life		1 x 10^6 operating cycles (average value, depending on application)		
Cable entry, screw terminals	ADW●M119012	1 tapped entry M20 x 1.5 mm for ISO cable gland. Clamping capacity 7 to 13 mm		
	ADW●M129012, ADW2●●M129012	1 tapped entry for n° 13 cable gland, conforming to NF C 68-300 (DIN Pg 13.5). Clamping capacity 9 to 13 mm		

(1) Since it is normal for piston type pressure switches (not incorporating a piston seal) to have a slight oil leakage past the piston, a drain hole through the cylinder wall is incorporated. To avoid back pressure, this hole should never be plugged. If for any reason this oil leakage is undesirable, use pressure switches incorporating a Quad-Ring piston seal.
(2) See "Component materials of units in contact with the fluid", page 2/123.
(3) Only for control of group 2 fluids, in accordance with directive 97/23/EEC.

Operating curve



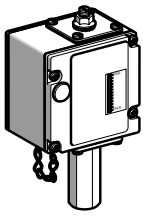
— Adjustable value

Contact block connections

Other versions — Pressure switches with alternative tapped cable entries: NPT, etc. Please consult our Customer Care Centre.

Dimensions: page 2/129

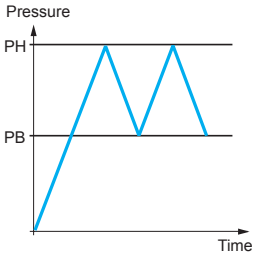
Pressure switches OsiSense ADW	Piston operated, with Quad-Ring piston seal		



Adjustable range of switching point (PH) (Falling pressure)		**9.3…69 bar (135…1000 psi)**	**28…210 bar (406…3045 psi)**	**38…340 bar (551…4930 psi)**
References				
Switches with 1 CO single-pole contact				
Electrical connection	With one tapped entry M20 x 1.5 mm for ISO cable gland	**ADW5M119012**	**ADW6M119012**	**–**
	With one tapped entry for n° 13 cable gland	**ADW5M129012**	**ADW6M129012**	**ADW7S1M129012**
Weight (kg)		1.880		
Switches with 2 CO single-pole contacts				
Electrical connection	With one tapped entry for n° 13 cable gland	**ADW25M129012**	**ADW26M129012**	**–**
Weight (kg)		1.880		
Complementary characteristics not shown under general characteristics (page 2/123)				
Possible differential (subtract from PH to give PB)	1 CO switches, Min./max. at low setting	4.8/6.9 bar (69.6/100 psi)	14/21 bar (203/304.5 psi)	19/25 bar (275.5/362.5 psi)
	1 CO switches, Min./max. at low setting	8.6/10 bar (124.7/145 psi)	28/34 bar (406/493 psi)	38/45 bar (551/652.5 psi)
	2 CO switches, Min./max. at low setting	6.2/7.9 bar (89.9/114.6 psi)	17/24 bar (246.5/348 psi)	22/28 bar (319/406 psi)
	2 CO switches, Min./max. at high setting	10/12 bar (145/174 psi)	34/39 bar (493/565.5 psi)	44/50 bar (638/725 psi)
Maximum permissible pressure		690 bar (10,000 psi)		
Fluids controlled		Oils and other fluids, from - 25°C to + 120°C *(1) (2)*		
Mechanical life		1 x 10^6 operating cycles (average value, depending on application)		
Cable entry, screw terminals	ADW●M119012	1 tapped entry M20 x 1.5 mm for ISO cable gland. Clamping capacity 7 to 13 mm		
	ADW●M129012, ADW2●●M129012	1 tapped entry for n° 13 cable gland, conforming to NF C 68-300 (DIN Pg 13.5). Clamping capacity 9 to 13 mm		

(1) See "Component materials of units in contact with the fluid", page 2/123.
(2) Only for control of group 2 fluids, in accordance with directive 97/23/EEC.

Operating curve



— Adjustable value

Contact block connections

Other versions Pressure switches with alternative tapped cable entries: NPT, etc. Please consult our Customer Care Centre.

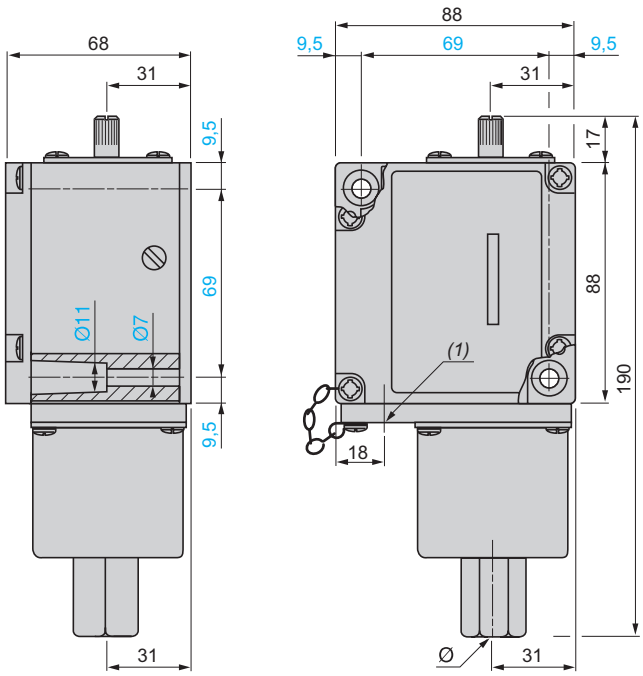
Dimensions:
page 2/129

Electromechanical pressure switches

OsiSense XM

For control circuits, OsiSense ACW

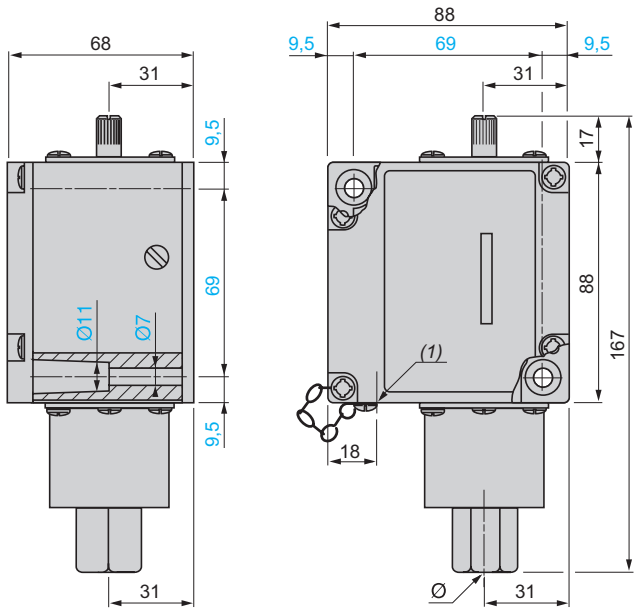
ACW3, ACW4, ACW23 and **ACW24**



(1) Tapped entry for n° 13 or ISO M20 cable gland, depending on model

Ø: G 1/4 (female)

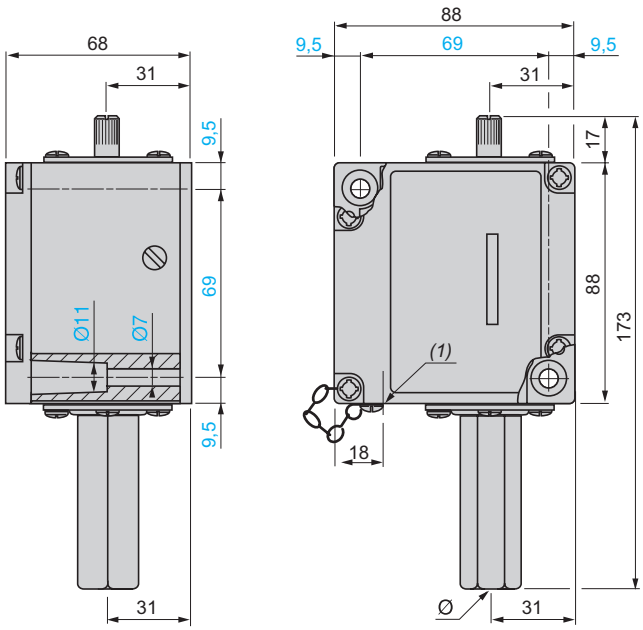
ACW1, ACW5, ACW8, ACW9, ACW21, ACW25, ACW28 and **ACW29**



(1) Tapped entry for n° 13 or ISO M20 cable gland, depending on model

Ø: G 1/4 (female)

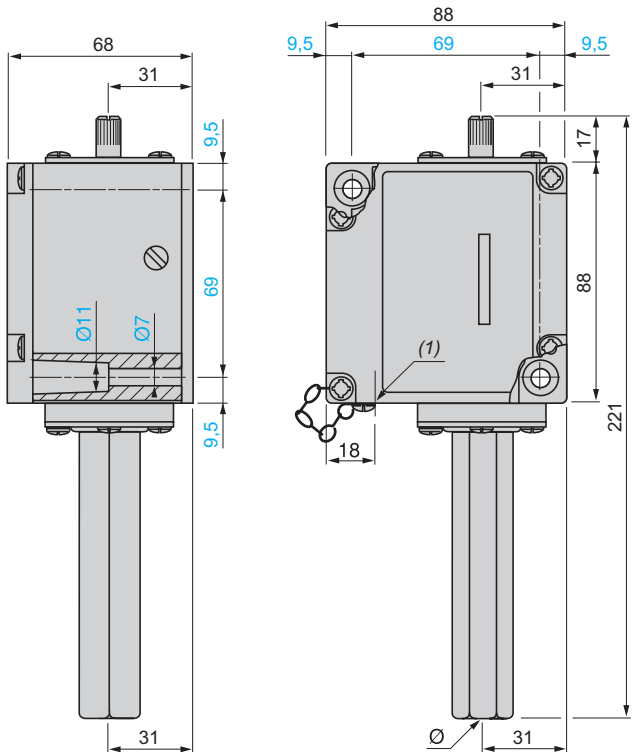
ACW2 and **ACW22**



(1) Tapped entry for n° 13 or ISO M20 cable gland, depending on model

Ø: G 1/4 (female)

ACW6, ACW7, ACW10, ACW26, ACW27 and **ACW20**



(1) Tapped entry for n° 13 or ISO M20 cable gland, depending on model

Ø: G 1/4 (female)

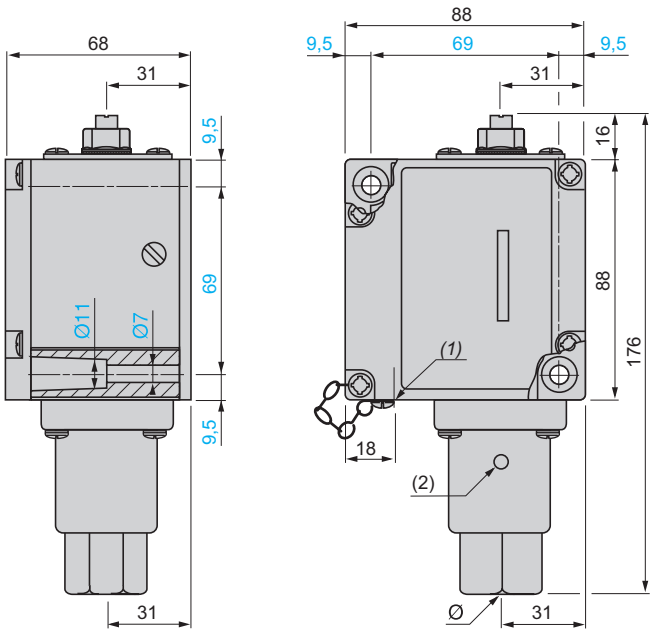
References:
pages 2/124 and 2/125

Electromechanical pressure switches

OsiSense XM

For control circuits, OsiSense ADW

ADW3, ADW4, ADW7, ADW23, ADW24 and **ADW27**

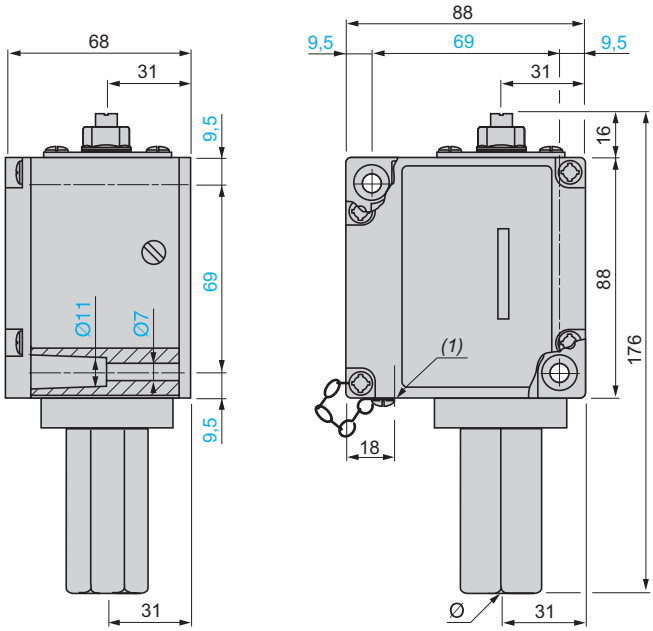


(1) Tapped entry for n° 13 or ISO M20 cable gland, depending on model

(2) Drainage hole, tapped G 1/8 (female)

Ø: G 3/8 (female)

ADW5, ADW6, ADW7S1, ADW25 and **ADW26**



(1) Tapped entry for n° 13 or ISO M20 cable gland, depending on model

Ø: G 3/8 (female)

References:
pages 2/124 and 2/125

Electromechanical pressure switches

OsiSense XM

For control circuits, OsiSense XMX and XMA

Presentation

Pressure switches OsiSense XMX and XMA are switches for control circuits, with an adjustable differential.
They are used to control the pressure of water and air, up to 25 bar.

Equipment fitted to the various models

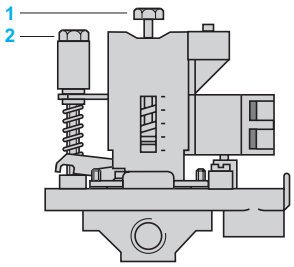
Location of setting screw

Pressure switches OsiSense XMX have an internal setting screw that is only accessible after removing the cover.
Pressure switches OsiSense XMA have an external setting screw that is accessible without removing the cover.

Case

Pressure switches OsiSense XMX have a black opaque case.
Pressure switches OsiSense XMA can have a transparent case or a black opaque case.

Setting



When setting pressure switches XMX or XMA, adjust the switching point on rising pressure (PH) first and then the switching point on falling pressure (PB).

Switching point on rising pressure
The switching point on rising pressure (PH) is set by adjusting screw-nut 1.

Switching point on falling pressure
The switching point on falling pressure (PB) is set by adjusting screw-nut 2.

References:
page 2/132

Dimensions:
page 2/135

Electromechanical pressure switches

OsiSense XM

For control circuits, OsiSense XMX and XMA

Environment characteristics

Conformity to standards			CE, IEC/EN 60947-5-1
Product certifications			UL, CSA, CCC, EAC
Protective treatment			"TC"
Ambient air temperature	For operation	**°C**	- 25…+ 70 for 6 and 25 bar versions - 25…+ 55 for 12 bar version
	For storage		- 40…+ 70
Fluids controlled		**°C**	Air, fresh water, sea water: 0…+ 70°C for 6 and 25 bar versions 0…+ 55°C for 12 bar version
Materials			Case: polycarbonate impregnated with Lexan 500R fibreglass (black opaque cover) or polycarbonate impregnated with Lexan 123 fibreglass (transparent cover) Component materials in contact with fluid: chromated zinc alloy (fluid entry), canvas covered nitrile (diaphragm)
Operating position			All positions
Electric shock protection			Class I conforming to IEC 536
Degree of protection			IP 54 conforming to IEC/EN 60529
Operating rate		**Op. cycles/h**	600
Repeat accuracy			< 3.5%
Fluid connection			G 1/4 or 4 x G 1/4 (BSP female) conforming to NF E 03-005, ISO 228
Electrical connection			Terminals 2 tapped entries for n° 13 (DIN Pg 13.5) cable gland

Contact block characteristics

Rated operational characteristics		∿ AC-15, B300 (Ue = 240 V, Ie = 1.5 A; Ue = 120 V, Ie = 3 A) ⎓ DC-13, R300 (Ue = 250 V, Ie = 0.1 A)
Rated insulation voltage	**V**	Ui = 500 conforming to IEC/EN 60947-1
Rated impulse withstand voltage	**kV**	U imp = 6 conforming to IEC/EN 60947-1
Type of contacts		1 CO single-pole contact, snap action
Terminal referencing		Conforming to CENELEC EN 50013
Short-circuit protection		10 A cartridge fuse type gG (gI)
Connection		Screw clamp terminals Minimum clamping capacity: 1 x 1 mm^2 Maximum clamping capacity: 2 x 2.5 mm^2
Electrical durability		AC supply 50/60Hz, Ith = 10 A Inductive circuit, utilisation category AC-15, 3 A/240 V: 1 million operating cycles

References:
page 2/132

Dimensions:
page 2/135

Electromechanical pressure switches

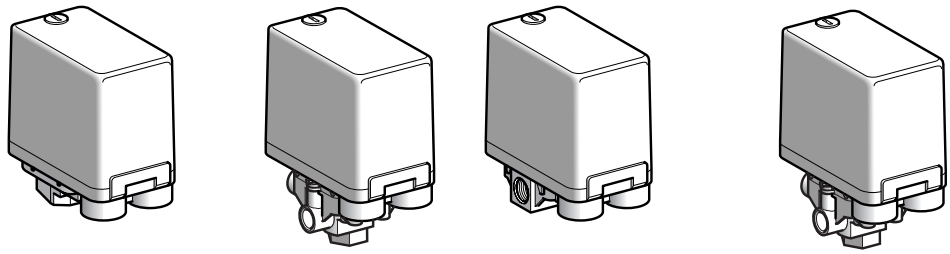
OsiSense XMX for control circuits

Sizes 6 to 25 bar (87 to 362.5 psi)

Adjustable differential, for regulation between 2 thresholds

Switches with 1 CO single-pole contact

Pressure switches OsiSense XMX (internal setting screw)

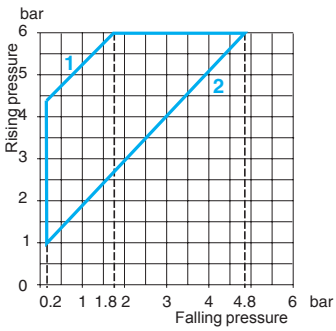


Adjustable range of switching point (PH) (Rising pressure)		**1…6 bar (14.5…87 psi)**	**1.3…12 bar (18.85…174 psi)**	**3.5…25 bar (50.75…362.5 psi)**	**1…6 bar (14.5…87 psi)**	**1.3…12 bar (18.85…174 psi)**	**3.5…25 bar (50.75…362.5 psi)**
Fluid connection		G 1/4 (female)			4 x G 1/4 (female)		
References							
Switches with black opaque cover							
Fluids controlled	Air, fresh water, sea water *(1)*	**XMXA06L2135**	**XMXA12L2135**	**XMXA25L2135**	**XMXA06L2435**	**XMXA12L2435**	**XMXA25L2435**
Weight (kg)		0.430		0.650	0.430		0.650
Complementary characteristics not shown under general characteristics (page 2/132)							
Possible differential (subtract from PH to give PB)	Min. at low setting	0.8 bar (11.6 psi)	1 bar (14.5 psi)	3.4 bar (49.3 psi)	0.8 bar (11.6 psi)	1 bar (14.5 psi)	3.4 bar (49.3 psi)
	Min. at high setting	1.2 bar (17.4 psi)	1.7 bar (24.6 psi)	4.5 bar (65.2 psi)	1.2 bar (17.4 psi)	1.7 bar (24.6 psi)	4.5 bar (65.2 psi)
	Max. at high setting	4.2 bar (60.9 psi)	8.4 bar (121.8 psi)	20 bar (290 psi)	4.2 bar (60.9 psi)	8.4 bar (121.8 psi)	20 bar (290 psi)
Maximum permissible pressure	Per cycle	7.5 bar (108.7 psi)	15 bar (217.5 psi)	31.25 bar (453.1 psi)	7.5 bar (108.7 psi)	15 bar (217.5 psi)	31.25 bar (453.1 psi)
	Accidental	13.5 bar (195.7 psi)	27 bar (391.5 psi)	56.25 bar (815.6 psi)	13.5 bar (195.7 psi)	27 bar (391.5 psi)	56.25 bar (815.6 psi)
Destruction pressure		30 bar (435 psi)		100 bar (1450 psi)	30 bar (435 psi)		100 bar (1450 psi)
Mechanical life		1 x 10^6 operating cycles					
Cable entry		2 entries tapped for n° 13 cable gland, conforming to NF C 68-300 (DIN Pg 13.5)					
Pressure switch type		Diaphragm					

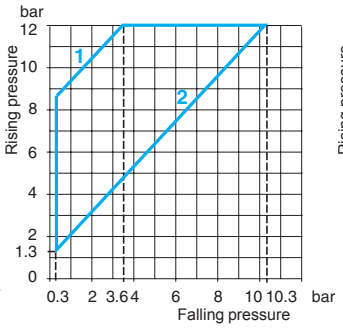
(1) Component materials of units in contact with the fluid, see page 2/132.

Operating curves

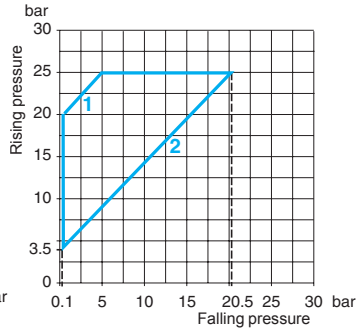
XMXA06●●●●●

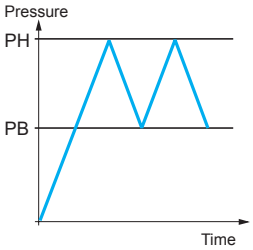


XMXA12●●●●●



XMXA25●●●●●





1 Maximum differential
2 Minimum differential

1 Maximum differential
2 Minimum differential

1 Maximum differential
2 Minimum differential

Connections

Other versions

Pressure switches with alternative tapped cable entries: ISO, NPT, etc. Please consult our Customer Care Centre.

Accessories: page 30383/6

Dimensions: page 2/135

Telemecanique Sensors

Electromechanical pressure switches

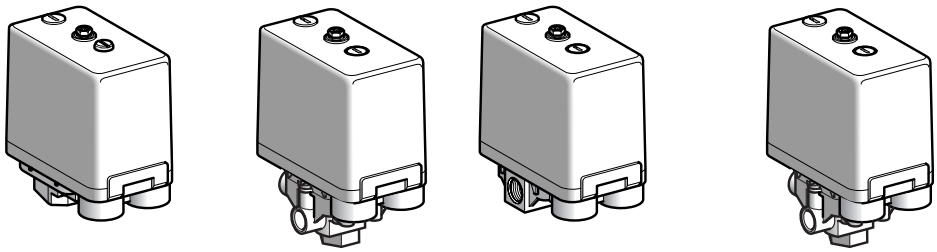
OsiSense XMA for control circuits

Sizes 6 to 25 bar (87 to 362.5 psi)

Adjustable differential, for regulation between 2 thresholds

Switches with 1 CO single-pole contact

Pressure switches OsiSense XMA (external setting screw)

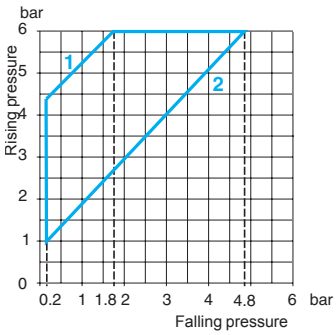


Adjustable range of switching point (PH) (Rising pressure)		**1…6 bar (14.5…87 psi)**	**1.3…12 bar (18.85…174 psi)**	**3.5…25 bar (50.75…362.5 psi)**	**1…6 bar (14.5…87 psi)**	**1.3…12 bar (18.85…174 psi)**	**3.5…25 bar (50.75…362.5 psi)**
Fluid connection		G 1/4 (female)			4 x G 1/4 (female)		
References							
Switches with black opaque cover							
Fluids controlled	Air, fresh water, sea water *(1)*	**XMAH06L2135**	**XMAH12L2135**	**XMAH25L2135**	**XMAH06L2435**	**XMAH12L2435**	**XMAH25L2435**
Switches with transparent cover							
Fluids controlled	Air, fresh water, sea water *(1)*	**XMAV06L2135**	**XMAV12L2135**	**XMAV25L2135**	**XMAV06L2435**	**XMAV12L2435**	**XMAV25L2435**
Weight (kg)		0.430		0.650	0.430		0.650
Complementary characteristics not shown under general characteristics (page 2/132)							
Possible differential (subtract from PH to give PB)	Min. at low setting	0.8 bar (11.6 psi)	1 bar (14.5 psi)	3.4 bar (49.3 psi)	0.8 bar (11.6 psi)	1 bar (14.5 psi)	3.4 bar (49.3 psi)
	Min. at high setting	1.2 bar (17.4 psi)	1.7 bar (24.6 psi)	4.5 bar (65.2 psi)	1.2 bar (17.4 psi)	1.7 bar (24.6 psi)	4.5 bar (65.2 psi)
	Max. at high setting	4.2 bar (60.9 psi)	8.4 bar (121.8 psi)	20 bar (290 psi)	4.2 bar (60.9 psi)	8.4 bar (121.8 psi)	20 bar (290 psi)
Maximum permissible pressure	Per cycle	7.5 bar (108.7 psi)	15 bar (217.5 psi)	31.25 bar (453.1 psi)	7.5 bar (108.7 psi)	15 bar (217.5 psi)	31.25 bar (453.1 psi)
	Accidental	13.5 bar (195.7 psi)	27 bar (391.5 psi)	56.25 bar (815.6 psi)	13.5 bar (195.7 psi)	27 bar (391.5 psi)	56.25 bar (815.6 psi)
Destruction pressure		30 bar (435 psi)		100 bar (1450 psi)	30 bar (435 psi)		100 bar (1450 psi)
Mechanical life		1 x 10^6 operating cycles					
Cable entry		2 entries tapped for n° 13 cable gland, conforming to NF C 68-300 (DIN Pg 13.5)					
Pressure switch type		Diaphragm					

(1) Component materials of units in contact with the fluid, see page 2/132.

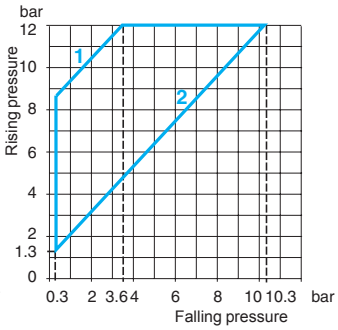
Operating curves

XMA●06●●●●●



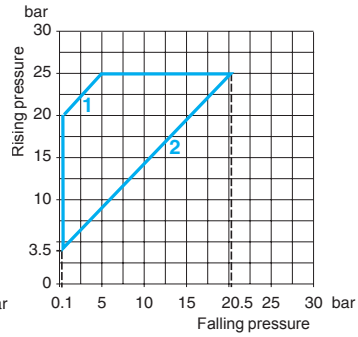
1 Maximum differential
2 Minimum differential

XMA●12●●●●●

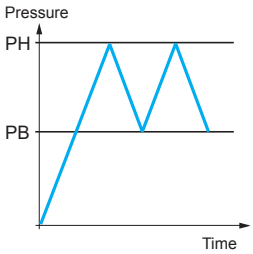


1 Maximum differential
2 Minimum differential

XMA●25●●●●●



1 Maximum differential
2 Minimum differential



— Adjustable value

Connections

Other versions

Pressure switches with alternative tapped cable entries: ISO, NPT, etc. Please consult our Customer Care Centre.

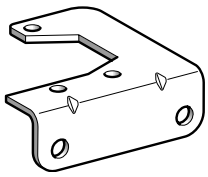
Accessories:
page 30383/6

Dimensions:
page 2/135

Electromechanical pressure switches

OsiSense XMX and XMA for control circuits

Accessories and replacement parts

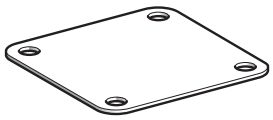


XMAZL001

XMLZL003

DE9PM1201

DE9PM1202



XMPZ3●

Description		Reference	Weight kg
Fixing bracket		**XMAZL001**	0.035
Knurled adjustment knob, Ø 36 mm fits over adjustment screws to facilitate setting		**XMLZL003**	0.010
13P cable gland	With anti pull-out ring (for cable Ø 6…9 mm)	**DE9PM1201**	0.005
	Without anti pull-out ring (for cable Ø 6…9 mm)	**DE9PM1202**	0.005
	With anti pull-out ring (for cable Ø 9…12.5 mm)	**DE9PM1203**	0.005

Description	For pressure switch	Reference	Weight kg
Diaphragms	Size 6 bar	**XMPZ31**	0.005
	Size 25 bar	**XMPZ33**	0.005

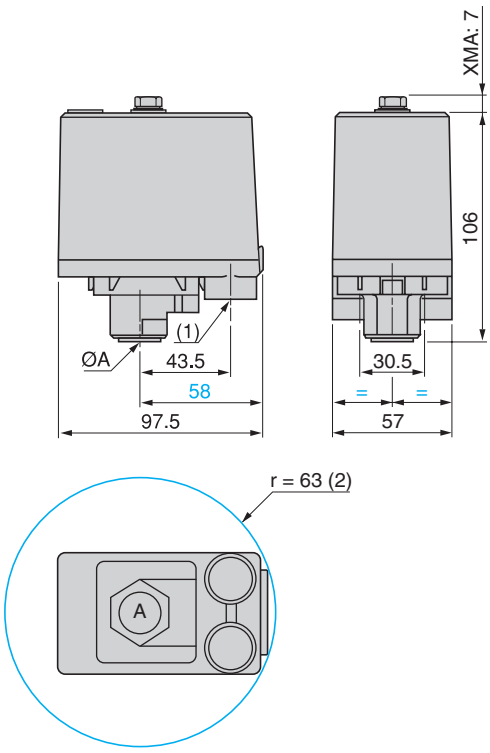
Dimensions:
page 2/135

Electromechanical pressure switches

OsiSense XM

For control circuits, OsiSense XMX and XMA
Accessories and replacement parts

XMXA06L2135, XMXA12L2135
XMA●06L2135, XMA●12L2135

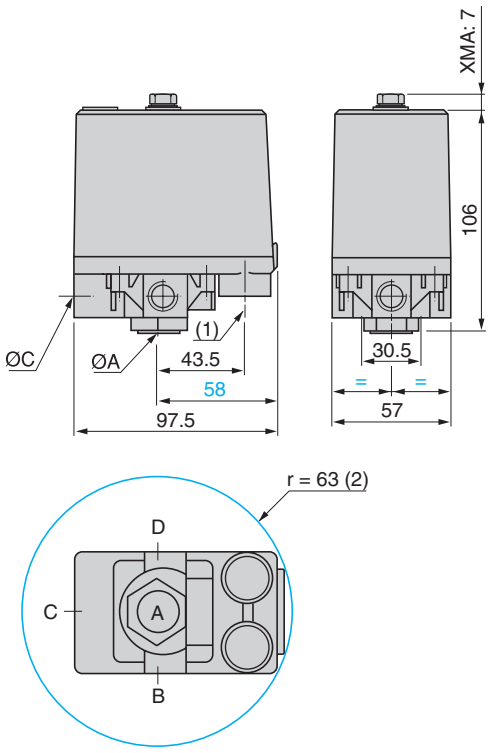


ØA = G 1/4 (female)

(1) 2 tapped entries for n° 13 cable gland

(2) Minimum clearance zone for screwing-on pressure switch at point A

XMXA06L2435, XMXA12L2435
XMA●06L2435, XMA●12L2435

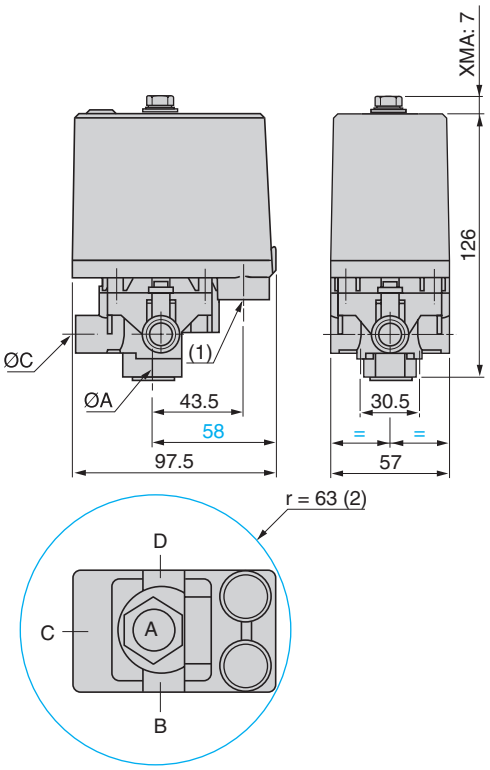


ØA = ØB = ØC = ØD = G 1/4 (female)

(1) 2 tapped entries for n° 13 cable gland

(2) Minimum clearance zone for screwing-on pressure switch at point A

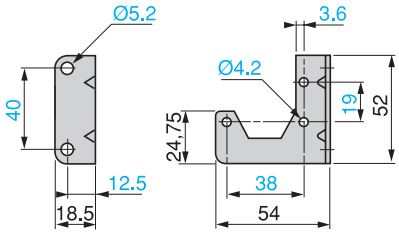
XMXA25L2135, XMXA25L2435
XMA●25L2135, XMA●25L2435



XM●●25L2135: ØA only = G 1/4 (female)

XM●●25L2435: ØA = ØB = ØC = ØD = G 1/4 (female)

Fixing bracket
XMAZL001



(1) 2 tapped entries for n° 13 cable gland

(2) Minimum clearance zone for screwing-on pressure switch at point A

Characteristics:
page 2/132

References:
page 2/132

Electromechanical pressure switches

OsiSense XM

For power circuits, OsiSense FTG, FSG and FYG

Presentation

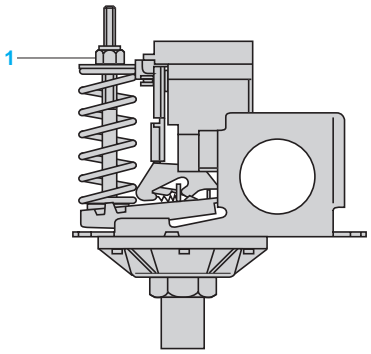
Pressure switches OsiSense FTG, FSG and FYG are switches for power circuits. They are used to control the pressure of water, up to 10.5 bar.

2 types of product are available:
- pressure switches OsiSense FTG with fixed differential, for detection of a single threshold,
- pressure switches OsiSense FSG and FYG with an adjustable differential, for regulation between 2 thresholds.

For specific needs, these 2 types of product can be supplied in IP 65 versions, thus ensuring a higher degree of protection. They feature 2 cable entries, fitted with cable gland, and are referenced **F•G•NE**.

Setting

Pressure switches with fixed differential (FTG)

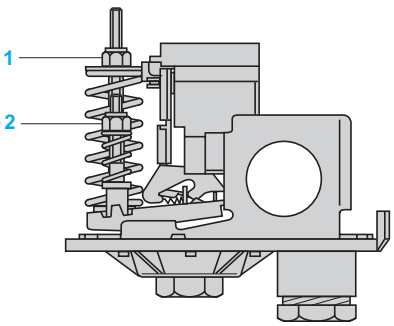


Only the switching point on rising pressure is adjustable.

Switching point on rising pressure
The switching point on rising pressure (PH) is set by adjusting screw-nut 1.

Switching point on falling pressure
The switching point on falling pressure (PB) is not adjustable.
The difference between the tripping and resetting points of the contact is the natural differential of the switch (contact differential, friction, etc.).

Pressure switches with adjustable differential (FSG and FYG)



When setting the pressure switch, adjust the switching point on rising pressure (PH) first and then the switching point on falling pressure (PB).

Switching point on rising pressure
The switching point on rising pressure (PH) is set by adjusting screw-nut 1.

Switching point on falling pressure
The switching point on falling pressure (PB) is set by adjusting screw-nut 2.

Electromechanical pressure switches

OsiSense XM

For power circuits, OsiSense FTG, FSG and FYG

Environment characteristics

Pressure switch type			FTG● FTG●NE	FSG● and FYG● FSG●NE and FYG●NE
Conformity to standards			CE, IEC/EN 60730	
Protective treatment			Standard version: "TC"	
Ambient air temperature		**°C**	For operation: 0...+ 45. For storage: - 30...+ 80	
Fluids controlled			Fresh water, sea water (0…+ 70°C)	
Materials			Case: polystyrene, resistant to mechanical impact Component materials in contact with fluid: nylon 6/6, zinc plated steel, nitrile	
Operating position			All positions	
Electric shock protection			Class I conforming to IEC 536	
Degree of protection conforming to IEC/EN 60529	**FTG●, FSG● and FYG●**		IP 20	
	FTG●NE, FSG●NE and FYG●NE		IP 65	
Operating rate		**Op. cycles/h**	600	
Repeat accuracy			< 2%	
Fluid connection	**F●G 2, FYG●2**		G 1/4 (BSP female) conforming to NF E 03-005, ISO 228	
	F●G 9		R 1/4 (BSP male) conforming to NF E 03-004, ISO 7	
Electrical connection	**FTG●, FSG● and FYG●**		Terminals. 2 cable entries, with grommet	
	FTG●NE, FSG●NE and FYG●NE		Terminals. 2 entries incorporating 13P cable gland (DIN Pg 13.5)	

Contact block characteristics

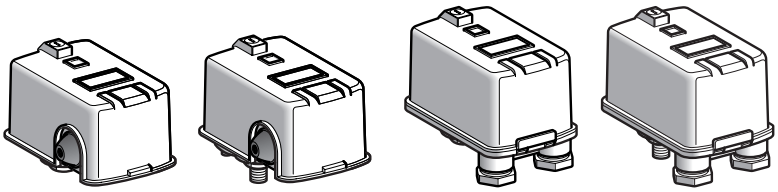
Rated operational characteristics			Ie = 10 A, Ue = ∿ 250 V conforming to EN 60730-1			
Power ratings of controlled motors	Voltage		∿ 2-pole 1-phase	∿ 2-pole 3-phase	∿ 2-pole 1-phase	∿ 2-pole 3-phase
	110 V		0.75 kW (1 HP)	1.1 kW (1.5 HP)	0.75 kW (1 HP)	1.1 kW (1.5 HP)
	230 V		1.1 kW (1.5 HP)	1.5 kW (2 HP)	1.5 kW (2 HP)	2.2 kW (3 HP)
	400 V		1.5 kW (2 HP)	1.5 kW (2 HP)	1.5 kW (2 HP)	2.2 kW (3 HP)
Rated insulation voltage conforming to IEC/EN 60947-1		**V**	Ui = 500			
Rated impulse withstand voltage conforming to IEC/EN 60947-1		**kV**	U imp = 6			
Type of contacts			1 2-pole 2 NC (4 terminal) contact, snap action			
Short-circuit protection			20 A cartridge fuse type gG			
Connection			Screw clamp terminals. Minimum clamping capacity: 1 x 1 mm², max: 2 x 2 mm²			
Electrical durability at an operating rate of 600 operating cycles/hour		**Op. cycles**	40 000		100 000	

References: page 2/138
Dimensions: page 2/141

Electromechanical pressure switches

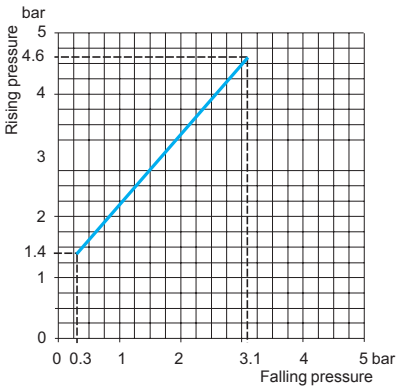
OsiSense XM

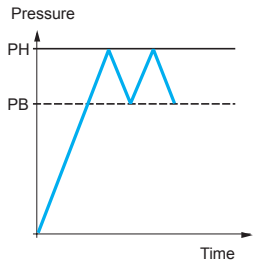
For power circuits, OsiSense FTG
Size 4.6 bar (66.7 psi), fixed differential, for detection of a single threshold. Switches with 2-pole 2 NC contact.
Degree of protection IP 20 or IP 65

Fluid connection		G 1/4 (female)	R 1/4 (male)	G 1/4 (female)	R 1/4 (male)
					
Adjustable range of switching point (PH) (Rising pressure)		**1.4…4.6 bar (20.3…66.7 psi)**			
Degree of protection conforming to IEC/EN 60529		**IP 20**		**IP 65**	
References					
Fluids controlled	Fresh water, sea water, from 0°C to + 70°C *(1)*	**FTG2**	**FTG9**	**FTG2NE**	**FTG9NE**
Weight (kg)		0.340			
Complementary characteristics not shown under general characteristics (page 2/137)					
Natural differential (subtract from PH to give PB)	At low setting	1.1 bar (15.95 psi)			
	At middle setting	1.3 bar (18.85 psi)			
	At high setting	1.5 bar (21.75 psi)			
Maximum permissible pressure	Per cycle	5.75 bar (83.38 psi)			
	Accidental	8 bar (116 psi)			
Destruction pressure		20 bar (290 psi)			
Mechanical life		4 x 10^5 operating cycles			
Cable entry		2 cable entries, with grommet		2 entries with 13P cable gland (DIN Pg 13.5)	
Clamping capacity		–		9 to 13 mm	
Pressure switch type		Diaphragm			

(1) Component materials of units in contact with the fluid, see page 2/137.

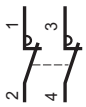
Operating curves





— Adjustable value
---- Non adjustable value

Connections



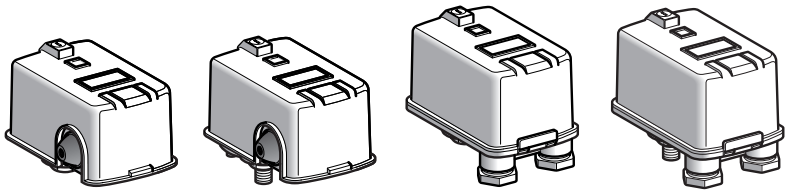
Dimensions:
page 2/135

Telemecanique Sensors

Electromechanical pressure switches

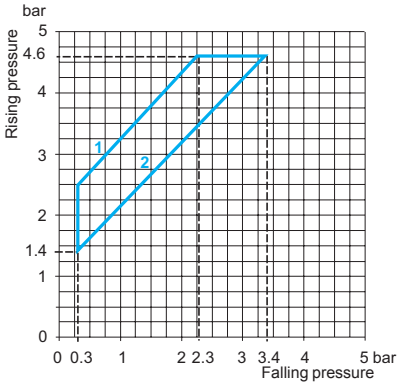
OsiSense XM

For power circuits, OsiSense FSG
Size 4.6 bar (66.7 psi), adjustable differential, for regulation between 2 thresholds. Switches with 2-pole 2 NC contact.
Degree protection IP 20 or IP 65

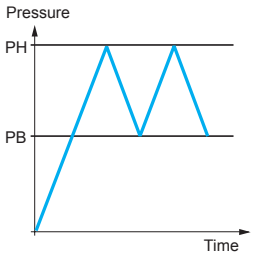
Fluid connection		G 1/4 (female)	R 1/4 (male)	G 1/4 (female)	R 1/4 (male)
					
Adjustable range of switching point (PH) (Rising pressure)		**1.4…4.6 bar (20.3…66.7 psi)**			
Degree of protection conforming to IEC/EN 60529		**IP 20**		**IP 65**	
References					
Fluids controlled	Fresh water, sea water, from 0°C to + 70°C *(1)*	**FSG2**	**FSG9**	**FSG2NE** *(2)*	**FSG9NE**
Weight (kg)		0.340			
Complementary characteristics not shown under general characteristics (page 2/137)					
Possible differential (subtract from PH to give PB)	Max. at low setting	2.1 bar (30.45 psi)			
	Max. at middle setting	2.2 bar (31.9 psi)			
	Max. at high setting	2.3 bar (33.35 psi)			
	Min. at low setting	1 bar (14.5 psi)			
	Min. at middle setting	1.1 bar (15.95 psi)			
	Min. at high setting	1.2 bar (17.4 psi)			
Maximum permissible pressure	Per cycle	5.75 bar (83.38 psi)			
	Accidental	8 bar (116 psi)			
Destruction pressure		20 bar (290 psi)			
Mechanical life		1 x 10^6 operating cycles			
Cable entry		2 cable entries, with grommet		2 entries with 13P cable gland (DIN Pg 13.5)	
Clamping capacity		–		9 to 13 mm	
Pressure switch type		Diaphragm			

(1) Component materials of units in contact with the fluid, see page 2/137.
*(2) Variant: for a G 3/8 female fluid entry that pivots throughout 360°, select the **FSG2NEG**.*

Operating curves

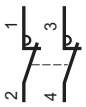


1 Maximum differential
2 Minimum differential



— Adjustable value

Connections

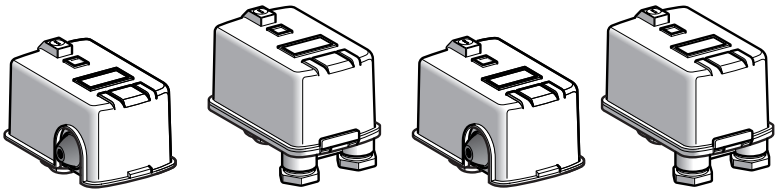


Dimensions:
page 2/135

Electromechanical pressure switches

OsiSense XM

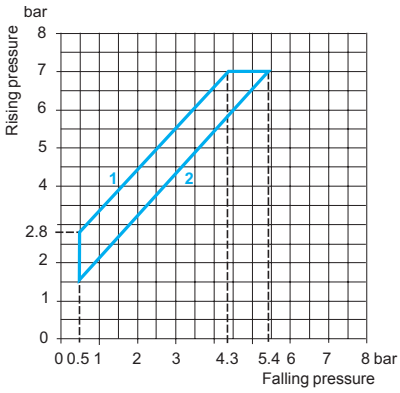
For power circuits, OsiSense FYG
Sizes 7 and 10.5 bar (101.5 and 152.3 psi), adjustable differential, for regulation between 2 thresholds. Switches with 2-pole 2 NC contact. Degree of protection IP 20 or IP 65

Fluid connection		**G 1/4 (female)**			
					
Adjustable range of switching point (PH) (Rising pressure)		**2.8…7 bar (40.6…101.5 psi)**		**5.6…10.5 bar (81.2…152.3 psi)**	
Degree of protection conforming to EN/IEC 60529		**IP 20**	**IP 65**	**IP 20**	**IP 65**
References					
Fluids controlled	Fresh water, sea water, from 0°C to + 70°C *(1)*	**FYG22** *(2)*	**FYG22NE**	**FYG32** *(3)*	**FYG32NE**
Weight (kg)		0.340			
Complementary characteristics not shown under general characteristics (page 2/137)					
Possible differential (subtract from PH to give PB)	Max. at low setting	2.3 bar (33.35 psi)		3 bar (43.5 psi)	
	Max. at middle setting	2.5 bar (36.25 psi)		3.2 bar (46.4 psi)	
	Max. at high setting	2.7 bar (39.15 psi)		3.4 bar (49.3 psi)	
	Min. at low setting	1.2 bar (17.4 psi)		1.9 bar (27.55 psi)	
	Min. at middle setting	1.4 bar (20.3 psi)		2.1 bar (30.45 psi)	
	Min. at high setting	1.6 bar (23.2 psi)		2.3 bar (33.35 psi)	
Maximum permissible pressure	Per cycle	8.75 bar (126.9 psi)		13 bar (188.5 psi)	
	Accidental	15 bar (217.5 psi)		15 bar (217.5 psi)	
Destruction pressure		20 bar (290 psi)		20 bar (290 psi)	
Mechanical life		1 x 10^6 operating cycles			
Cable entry		2 cable entries, with grommet			
Pressure switch type		Diaphragm			

(1) Component materials of units in contact with the fluid, see page 2/137.
*(2) Variant: for a 2.8 to 7 bar, IP 20, pressure switch with R 1/4 (male) fluid entry, select the **FYG29.***
*(3) Variant: for a 5.6 to 10.5 bar, IP 20, pressure switch with R 1/4 (male) fluid entry, select the **FYG39.***

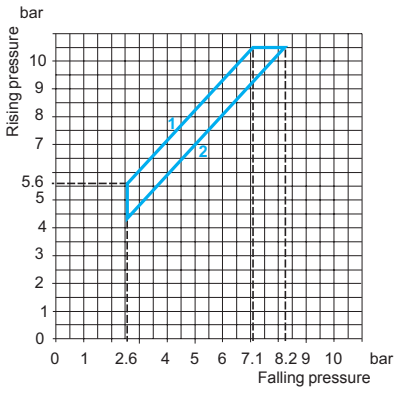
Operating curves

FYG22



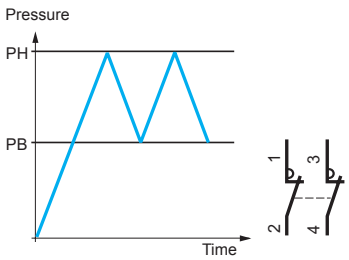
1 Maximum differential
2 Minimum differential

FYG32



1 Maximum differential
2 Minimum differential

Connections



— Adjustable value

Dimensions:
page 2/141

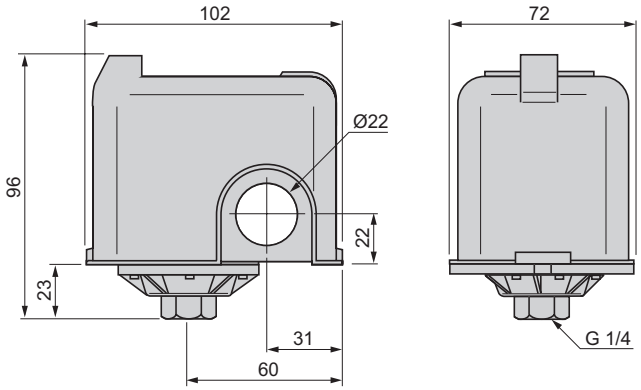
Electromechanical pressure switches

OsiSense XM

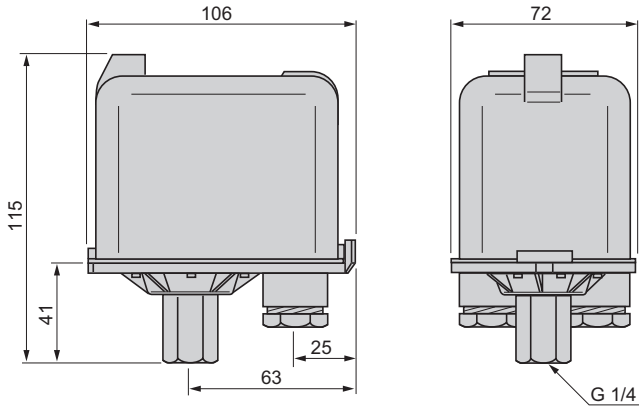
For power circuits, OsiSense FTG, FSG and FYG

Dimensions

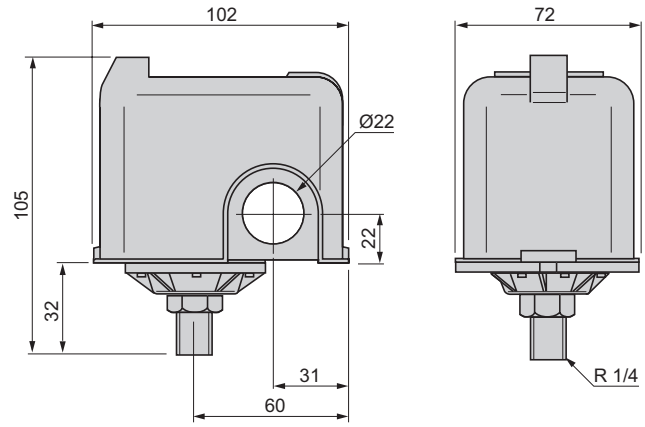
FTG2, FSG2



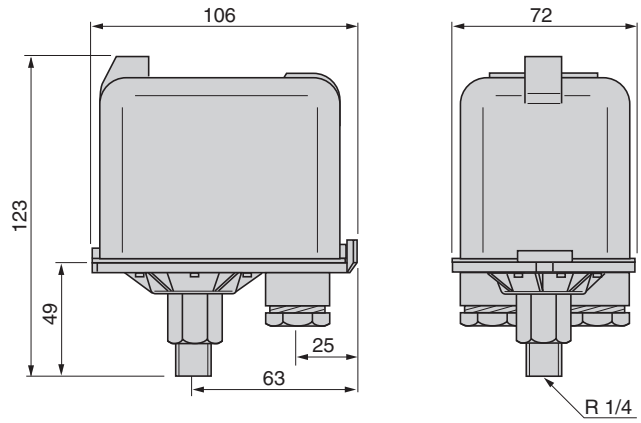
FTG2NE, FSG2NE



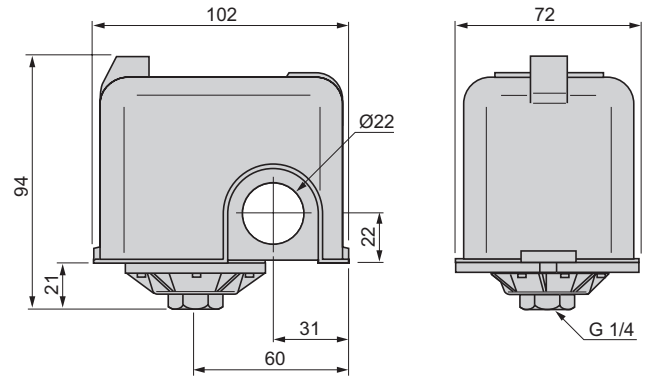
FTG9, FSG9



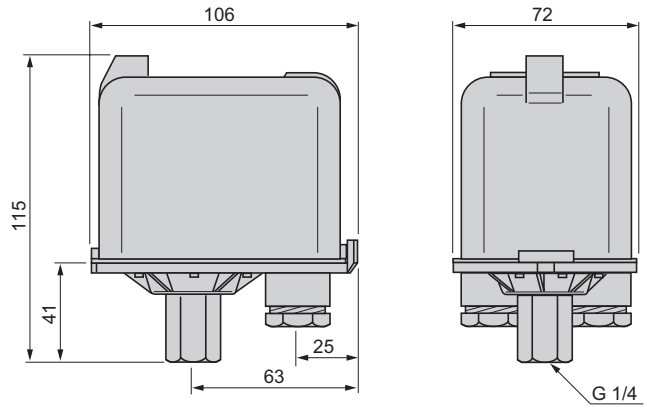
FTG9NE, FSG9NE



FYG22, FYG32



FYG22NE, FYG32NE



Characteristics:
page 2/137

References:
page 2/138

Electromechanical pressure switches

OsiSense XM

For power circuits, OsiSense XMP

Presentation

Pressure switches OsiSense XMP are switches for power circuits (direct switching), with an adjustable differential.
They are used to control the pressure of water and air, up to 25 bar.

Equipment fitted to the various models

Case

Pressure switches OsiSense XMP, depending on the model, include:

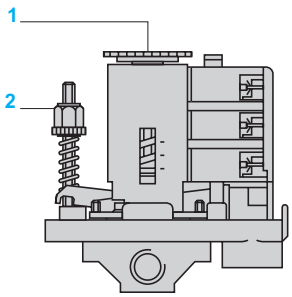
- 3 types of case:
  - bare case,
  - case with On/Off knob (black): used as a switch for starting and stopping the installation,
  - case with reset knob (yellow): necessary when the safety requirements of the system include tripping in the event of overpressure. Resetting is not automatic on return to normal pressure, and it can only be achieved by manually turning the "Reset" knob.

- 2 degrees of protection:
  - IP 54,
  - IP 65.

Decompression valve

Depending on the model, 2 types of decompression valve can be fitted to pressure switches OsiSense XMP:
- Straight, instant connection, decompression valve (connection by Ø 6 mm plastic tube).
- Straight, olive connection, decompression valve (connection by Ø 6 mm plastic or metal tube).

Setting



When setting XMP pressure switches, adjust the switching point on rising pressure (PH) first and then the switching point on falling pressure (PB).

Switching point on rising pressure
The switching point on rising pressure (PH) is set by adjusting the screw-nut or knurled knob 1.
Tighten either the nut or knurled knob 1 to increase the high point switching value.

Switching point on falling pressure
The switching point on falling pressure is set by adjusting screw-nut 2.
Tighten nut 2 to reduce the low point switching value (increase in differential).

References:
pages 2/144 to 2/152

Dimensions:
page 2/153

Electromechanical pressure switches

OsiSense XM

For power circuits, OsiSense XMP

Environment characteristics

Conformity to standards		CE, IEC/EN 60947-4-1
Product certifications		EAC
Ambient air temperature	**°C**	For operation: - 25...+ 70 For storage: - 40...+ 70
Fluids controlled		Air, fresh water, sea water (0…+ 70°C)
Materials		Case: polyamide impregnated with fibreglass Component materials in contact with fluid: chromated zinc alloy (fluid entry), canvas covered nitrile (diaphragm)
Operating position		All positions
Vibration resistance		3 gn (10…500 Hz) conforming to IEC 60068-2-6
Shock resistance		50 gn, conforming to IEC 60068-2-27
Electric shock protection		Class I conforming to IEC 60536
Degree of protection		IP 54 conforming to IEC/EN 60529 or IP 65 for universal model
Operating rate	**Op. cycles/h**	≤ 600
Repeat accuracy		< 3.5%
Fluid connection		G 1/4, 4 x G 1/4 or G 3/8 (BSP female) conforming to NF E 03-005, ISO 228
Electrical connection		2 tapped entries for n° 13 (DIN Pg 13.5) cable gland

Contact block characteristics

Rated insulation voltage	**V**	Ui = 500 conforming to IEC/EN 60947-1
Rated impulse withstand voltage	**V**	U imp = 6 kV conforming to IEC/EN 60947-1
Type of contacts		One 2-pole 2 NC or 3-pole 3 NC contact, snap action
Resistance across terminals	**mΩ**	≤ 25 conforming to NF C 93-050 method A or IEC 255-7 category 3
Terminal referencing		Conforming to CENELEC EN 50013
Short-circuit protection		Cartridge fuse type Am
Connection		Screw clamp terminals. Minimum clamping capacity: 2 x 4 mm²

Electrical durability
Operating rate: 600 operating cycles/hour
Load factor: 0.4

Power	Number of operating cycles	
kW	∼ 400 V, 3-phase	∼ 230 V, 3-phase
1.5	1 000 000	600 000
2.2	700 000	–
3	500 000	–

References:
pages 2/144 to 2/152

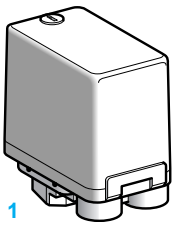
Dimensions:
page 2/153

Electromechanical pressure switches

OsiSense XMP, IP 54

Size 6 bar (87 psi)
Adjustable differential, for regulation between 2 thresholds
Switches with 2-pole 2 NC or 3-pole 3 NC contact

Fluid connection	**G 1/4 (female)**	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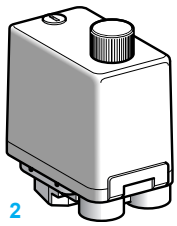

2

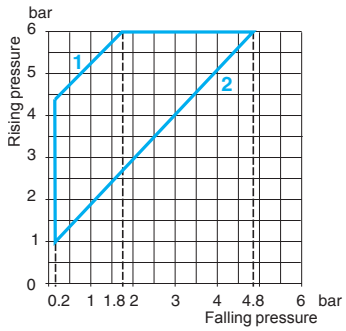
Adjustable range of switching point (PH) (Rising pressure)	**1…6 bar (14.5…87 psi)**	
Type of contact	2-pole 2 NC	3-pole 3 NC
References *(1)*		
Switches without decompression valve		
Bare case 1	**XMPA06B2131**	**XMPA06C2131**
Case with reset knob 2	**XMPB06B2131**	**–**
Case with On/Off knob 2	**XMPC06B2131**	**XMPC06C2131**
Weight (kg)	0.430	
Switches with straight decompression valve, instant connection		
Bare case 1	**XMPD06B2131**	**XMPD06C2131**
Case with On/Off knob 2	**XMPE06B2131**	**XMPE06C2131**
Weight (kg)	0.450	

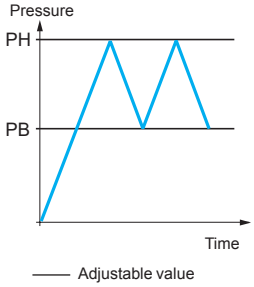
Complementary characteristics not shown under general characteristics (page 2/144)

Possible differential (subtract from PH to give PB)	Min. at low setting	0.8 bar (11.6 psi)
	Min. at high setting	1.2 bar (17.4 psi)
	Max. at high setting	4.2 bar (60.9 psi)
Destruction pressure		30 bar (435 psi)
Mechanical life		1 million operating cycles
Cable entry		2 entries tapped for n° 13 cable gland, conforming to NF C 68-300 (DIN Pg 13.5)
Pressure switch type		Diaphragm

*(1) References for individually packaged switches. Also available packaged in lots of 10. To order, add the letter **C** to the reference selected from above. Example: reference for lot of 10 pressure switches **XMPA06B2131** in one package becomes **XMPA06B2131C**.*

Operating curves



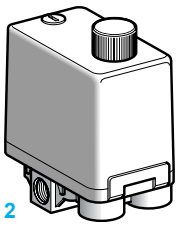
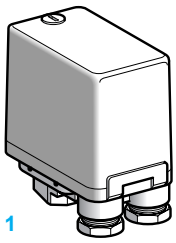
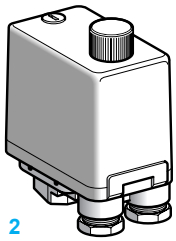


1 Maximum differential
2 Minimum differential

Accessories:
page 2/152

Dimensions:
page 2/153

Telemecanique
Sensors

4 x G 1/4 (female)	G 3/8 (female)	
 2	 1	 2
1…6 bar (14.5…87 psi)		
3-pole 3 NC	2-pole 2 NC	3-pole 3 NC

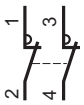
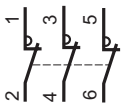
References

Switches without decompression valve		
–	**XMPA06B2242**	**XMPA06C2242**
–	**XMPB06B2242**	–
–	**XMPC06B2242**	**XMPC06C2242**
–	0.430	
Switches with straight decompression valve, instant connection		
–	**XMPD06B2242**	**XMPD06C2242**
XMPE06C2431	–	**XMPE06C2242**
0.450		

Complementary characteristics not shown under general characteristics (page 2/144)

0.8 bar (11.6 psi)	
1.2 bar (17.4 psi)	
4.2 bar (60.9 psi)	
30 bar (435 psi)	
1 million operating cycles	
2 entries tapped for n° 13 cable gland, conforming to NF C 68-300 (DIN Pg 13.5)	2 entries incorporating n° 13 plastic cable gland (DIN Pg 13.5) Clamping capacity 9 to 13 mm
Diaphragm	
Other versions	Pressure switches not listed above, comprising the equipment proposed for the choice of reference. Please consult our Customer Care Centre.

Terminal connections

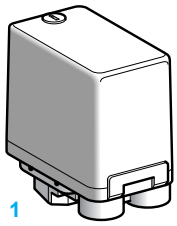
XMP●●●B●●●●	**XMP●●●C●●●●**
	

Accessories: page 2/152
Dimensions: page 2/153

Electromechanical pressure switches

OsiSense XMP, IP 54
Size 12 bar (174 psi)
Adjustable differential, for regulation between 2 thresholds
Switches with 2-pole 2 NC or 3-pole 3 NC contact

Fluid connection	G 1/4 (female)	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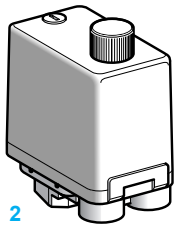

2

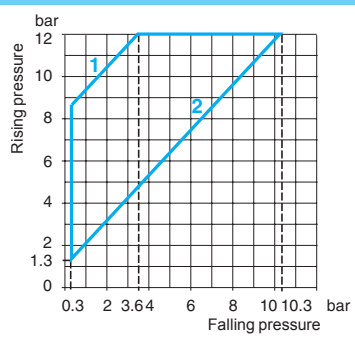
Adjustable range of switching point (PH) (Rising pressure)	**1.3…12 bar (18.85…174 psi)**	
Type of contact	2-pole 2 NC	3-pole 3 NC
References *(1)*		
Switches without decompression valve		
Bare case 1	**XMPA12B2131**	**XMPA12C2131**
Case with reset knob 2	**XMPB12B2131**	**–**
Case with On/Off knob 2	**XMPC12B2131**	**XMPC12C2131**
Weight (kg)	0.430	
Switches with straight decompression valve, instant connection		
Bare case 1	**XMPD12B2131**	**XMPD12C2131**
Case with On/Off knob 2	**XMPE12B2131**	**XMPE12C2131**
Weight (kg)	0.450	
Switches with straight decompression valve, olive connection		
Case with On/Off knob 2	**XMPR12B2131**	**XMPR12C2131**
Weight (kg)	0.450	

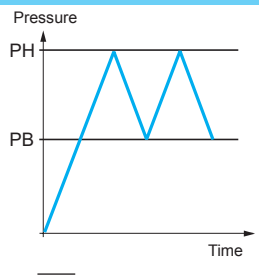
Complementary characteristics not shown under general characteristics (page 2/144)

Possible differential (subtract from PH to give PB)	Min. at low setting	1 bar (14.5 psi)
	Min. at high setting	1.7 bar (24.6 psi)
	Max. at high setting	8.4 bar (121.8 psi)
Destruction pressure		30 bar (435 psi)
Mechanical life		1 million operating cycles
Cable entry		2 entries tapped for n° 13 cable gland, conforming to NF C 68-300 (DIN Pg 13.5)
Pressure switch type		Diaphragm

*(1) References for individually packaged switches. Also available packaged in lots of 10. To order, add the letter **C** to the reference selected from above. Example: reference for lot of 10 pressure switches **XMPA12B2131** in one package becomes **XMPA12B2131C**.*

Operating curves

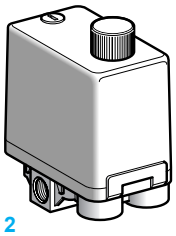
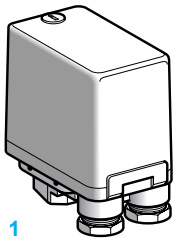
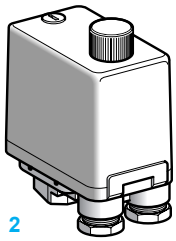




1 Maximum differential
2 Minimum differential

Accessories: page 2/152
Dimensions: page 2/153

Telemecanique Sensors

4 x G 1/4 (female)		G 3/8 (female)	
 2		 1	 2
1.3…12 bar (18.85…174 psi)			
2-pole 2 NC	3-pole 3 NC	2-pole 2 NC	3-pole 3 NC

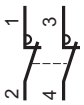
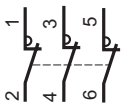
References

Switches without decompression valve			
–		**XMPA12B2242**	**XMPA12C2242**
–		**XMPB12B2242**	–
XMPC12B2431	–	**XMPC12B2242**	**XMPC12C2242**
0.430			
Switches with straight decompression valve, instant connection			
–	**XMPD12C2431**	**XMPD12B2242**	**XMPD12C2242**
XMPE12B2431	**XMPE12C2431**	**XMPE12B2242**	**XMPE12C2242**
0.450			
Switches with straight decompression valve, olive connection			
–			
–			

Complementary characteristics not shown under general characteristics (page 2/144)

1 bar (14.5 psi)	
1.7 bar (24.6 psi)	
8.4 bar (121.8 psi)	
30 bar (435 psi)	
1 million operating cycles	
2 entries tapped for n° 13 cable gland, conforming to NF C 68-300 (DIN Pg 13.5)	2 entries incorporating n° 13 plastic cable gland (DIN Pg 13.5) Clamping capacity 9 to 13 mm
Diaphragm	
Other versions	Pressure switches not listed above, comprising the equipment proposed for the choice of reference. Please consult our Customer Care Centre.

Terminal connections

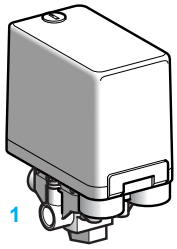
XMP●●●B●●●●	XMP●●●C●●●●
	

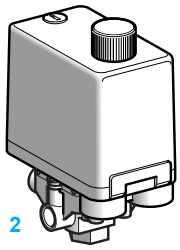
Accessories: page 2/152
Dimensions: page 2/153

Electromechanical pressure switches

OsiSense XMP, IP 54
Size 25 bar (362.5 psi)
Adjustable differential, for regulation between 2 thresholds
Switches with 2-pole 2 NC or 3-pole 3 NC contact

Fluid connection	**G 1/4 (female)**


1


2

Adjustable range of switching point (PH) (Rising pressure)	**3.5…25 bar (50.75…362.5 psi)**
Type of contact	2-pole 2 NC

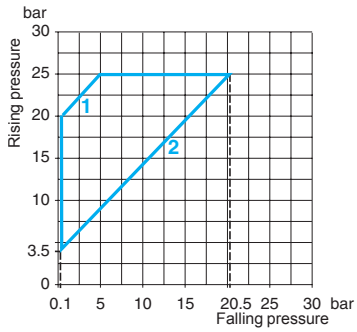
References

Switches without decompression valve	
Bare case 1	**XMPA25B2131**
Case with reset knob 2	**XMPB25B2131**
Case with On/Off knob 2	**XMPC25B2131**
Weight (kg)	0.650
Switches with straight decompression valve, olive connection	
Case with On/Off knob 2	**XMPR25B2131**
Weight (kg)	0.670

Complementary characteristics not shown under general characteristics (page 2/144)

Possible differential (subtract from PH to give PB)	Min. at low setting	3.4 bar (49.3 psi)
	Min. at high setting	4.5 bar (65.2 psi)
	Max. at high setting	20 bar (290 psi)
Destruction pressure		100 bar (1450 psi)
Mechanical life		1 million operating cycles
Cable entry		2 entries tapped for n° 13 cable gland, conforming to NF C 68-300 (DIN Pg 13.5)
Pressure switch type		Diaphragm

Operating curves

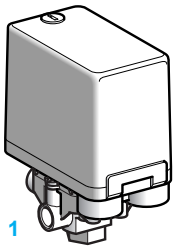


1 Maximum differential
2 Minimum differential

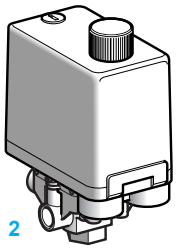
Accessories: page 2/152
Dimensions: page 2/153

Telemecanique Sensors

G 1/4 (female)



1



2

3.5…25 bar (50.75…362.5 psi)

3-pole 3 NC

References

Switches without decompression valve

XMPA25C2131

–

XMPC25C2131

0.650

Switches with straight decompression valve, olive connection

XMPR25C2131

0.670

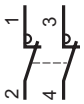
Complementary characteristics not shown under general characteristics (page 2/144)

3.4 bar (49.3 psi)
4.5 bar (65.2 psi)
20 bar (290 psi)
100 bar (1450 psi)
1 million operating cycles
2 entries tapped for n° 13 cable gland, conforming to NF C 68-300 (DIN Pg 13.5)
Diaphragm

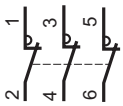
Other versions Pressure switches not listed above, comprising the equipment proposed for the choice of reference. Please consult our Customer Care Centre.

Terminal connections

XMP●●●B●●●●



XMP●●●C●●●●



Accessories:
page 2/152

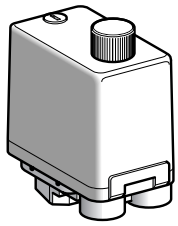
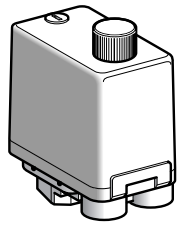
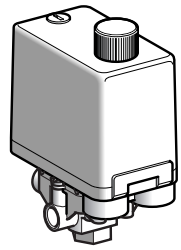
Dimensions:
page 2/153

Electromechanical pressure switches

OsiSense XMP, IP 65

Sizes 6 to 25 bar (87 to 362.5 psi)
Adjustable differential, for regulation between 2 thresholds
Switches with 2-pole 2 NC or 3-pole 3 NC contact

Fluid connection	G 1/4 (female)					

Adjustable range of switching point (PH) (Rising pressure)	**1…6 bar (14.5…87 psi)**		**1.3…12 bar (18.85…174 psi)**		**3.5…25 bar (50.75…362.5 psi)**	
Type of contact	2-pole 2 NC	3-pole 3 NC	2-pole 2 NC	3-pole 3 NC	2-pole 2 NC	3-pole 3 NC

References

Switches with straight decompression valve, olive connection

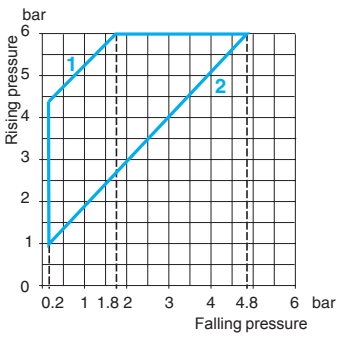
Case with On/Off knob	**XMPR06B2133**	**XMPR06C2133**	**XMPR12B2133**	**XMPR12C2133**	**XMPR25B2133**	**XMPR25C2133**
Weight (kg)	0.450				0.670	

Complementary characteristics not shown under general characteristics (page 2/144)

Possible differential (subtract from PH to give PB)	Min. at low setting	0.8 bar (11.6 psi)	1 bar (14.5 psi)	3.4 bar (49.3 psi)
	Min. at high setting	1.2 bar (17.4 psi)	1.7 bar (24.6 psi)	4.5 bar (65.2 psi)
	Max. at high setting	4.2 bar (60.9 psi)	8.4 bar (121.8 psi)	20 bar (290 psi)
Destruction pressure		30 bar (435 psi)		100 bar (1450 psi)
Mechanical life		1 million operating cycles		
Cable entry		2 entries tapped for n° 13 cable gland, conforming to NF C 68-300 (DIN Pg 13.5)		
Adjustment of high setting point (PH)		By screw-nut		
Pressure switch type		Diaphragm		

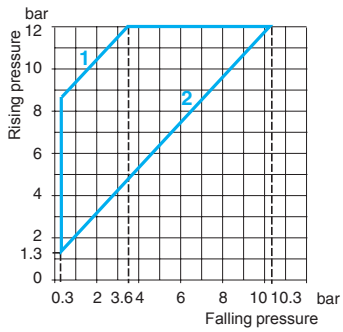
Operating curves

XMPR06●●●●●



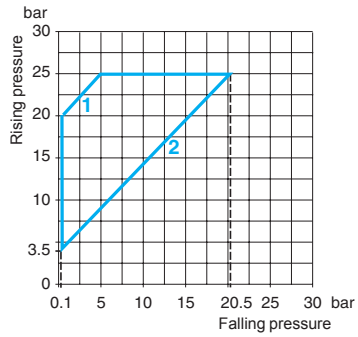
1 Maximum differential
2 Minimum differential

XMPR12●●●●●

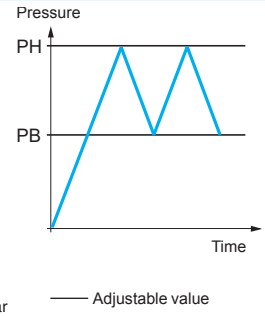


1 Maximum differential
2 Minimum differential

XMPR25●●●●●



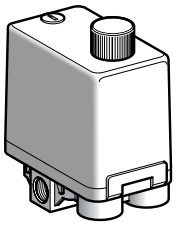
1 Maximum differential
2 Minimum differential

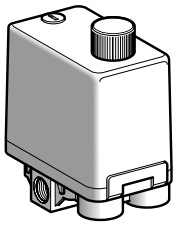


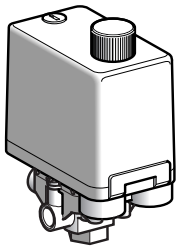
Accessories: page 2/152
Dimensions: page 2/153

Telemecanique Sensors

4 x G 1/4 (female)







1…6 bar (14.5…87 psi)		1.3…12 bar (18.85…174 psi)		3.5…25 bar (50.75…362.5 psi)	
2-pole 2 NC	3-pole 3 NC	2-pole 2 NC	3-pole 3 NC	2-pole 2 NC	3-pole 3 NC

References

Switches with straight decompression valve, olive connection

XMPR06B2433	XMPR06C2433	XMPR12B2433	XMPR12C2433	XMPR25B2433	XMPR25C2433
0.450				0.670	

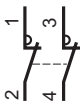
Complementary characteristics not shown under general characteristics (page 2/144)

0.8 bar (11.6 psi)	1 bar (14.5 psi)	3.4 bar (49.3 psi)
1.2 bar (17.4 psi)	1.7 bar (24.6 psi)	4.5 bar (65.2 psi)
4.2 bar (60.9 psi)	8.4 bar (121.8 psi)	20 bar (290 psi)
30 bar (435 psi)		100 bar (1450 psi)
1 million operating cycles		
2 entries tapped for n° 13 cable gland, conforming to NF C 68-300 (DIN Pg 13.5)		
By screw-nut		
Diaphragm		

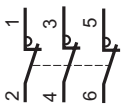
Other versions Pressure switches not listed above, comprising the equipment proposed for the choice of reference. Please consult our Customer Care Centre.

Terminal connections

XMP●●●B●●●●



XMP●●●C●●●●



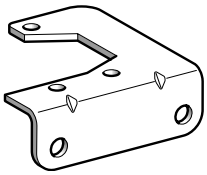
Accessories:
page 2/152

Dimensions:
page 2/153

Electromechanical pressure switches

OsiSense XM

For power circuits, OsiSense XMP
Accessories and replacement parts

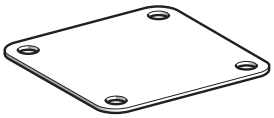


XMAZL001

XMPMDR01

DE9PM1201

DE9PM1202



XMPZ3●

References

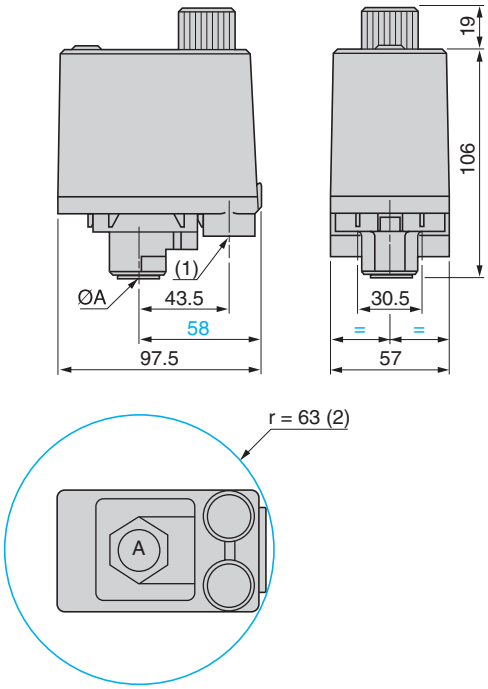
Description		Reference	Weight kg
Fixing bracket		**XMAZL001**	0.035
Knurled adjustment knob, Ø 36 mm fits over adjustment screws to facilitate setting		**XMPMDR01**	0.010
13P cable gland	With anti pull-out ring (for cable Ø 6…9 mm)	**DE9PM1201**	0.005
	Without anti pull-out ring (for cable Ø 6…9 mm)	**DE9PM1202**	0.005
	With anti pull-out ring (for cable Ø 9…12.5 mm)	**DE9PM1203**	0.005

Description	For pressure switch	Sold in lots of	Unit reference	Weight kg
Diaphragms	Size 6 bar	50	**XMPZ31**	0.005
	Size 25 bar	50	**XMPZ33**	0.005

Dimensions

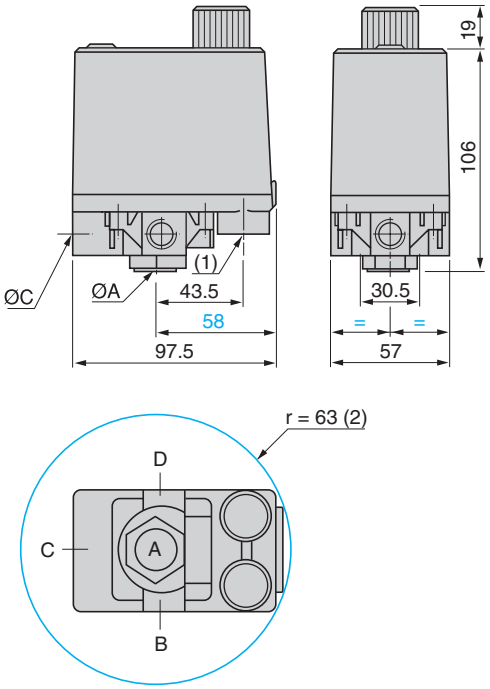
XMP●06●●●●● and XMP●12●●●●●

Fluid connection G 1/4 or G 3/8 (female)
Without decompression valve



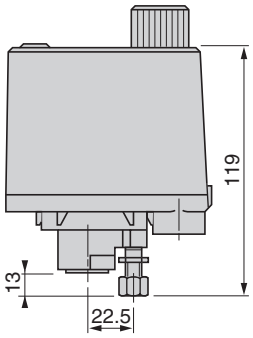
ØA = G 1/4 or G 3/8 (female)

Fluid connection 4 x G 1/4 (female)
Without decompression valve

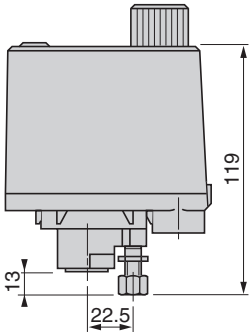


ØA = ØB = ØC = ØD = G 1/4 (female)

With straight, instant connection, decompression valve



With straight, olive connection, decompression valve

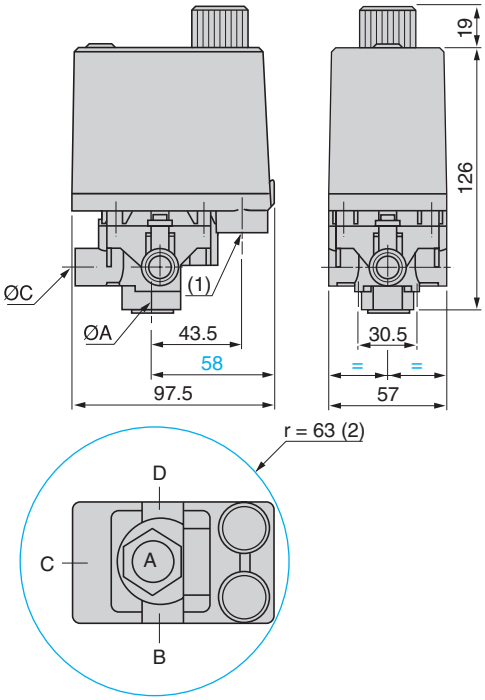


(1) 2 tapped entries for n° 13 cable gland

(2) Minimum clearance zone for screwing-on pressure switch at point A

XMP●25●●●●●

Fluid connection G 1/4 or 4 x G 1/4 (female)
Without decompression valve



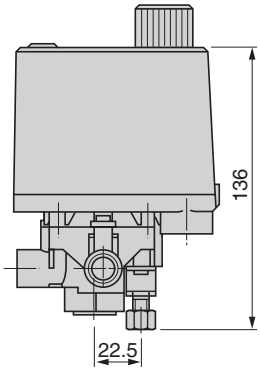
XMP●25●21●●: ØA only = G 1/4 (female)

XMP●25●24●●: ØA = ØB = ØC = ØD = G 1/4 (female)

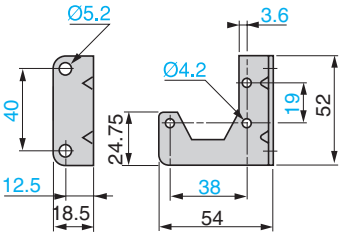
(1) 2 tapped entries for n° 13 cable gland

(2) Minimum clearance zone for screwing-on pressure switch at point A

With straight, olive connection, decompression valve



Fixing bracket XMAZL001



Contents

3 - Inductive proximity sensors OsiSense XS

Selection guide . . . . . page 3/2

- General . . . . . *page 3/12*
- Flush mountability using teach mode:
  Simplicity through innovation . . . . . *page 3/22*

OsiSense XS, general purpose

- Cylindrical type
  - Standard range, flush mountable . . . . . *page 3/24*
  - Increased range, flush mountable . . . . . *page 3/34*
  - Increased range, non flush mountable . . . . . *page 3/42*
- Flat format . . . . . *pages 3/44 to 3/72*
- Cubic type . . . . . *page 3/48*
- Plastic type. . . . . *pages 3/50 to 3/60*
- Multivoltage sensor, cylindrical with short-circuit protection . . . . . *page 3/52*
  - Solid-state PNP or NPN, NO + NC outputs. . . . . *page 3/56*
  - Solid-state PNP + NPN, NO or NC programmable outputs. . . . . *page 3/58*
- Basic sensors, flush and non flush mountable . . . . . *page 3/62*
- Quasi flush mountable sensors, increased range . . . . . *page 3/66*
- Miniature sensors. . . . . *page 3/68*

OsiSense XS Application

- Adjustable range sensors. . . . . *page 3/70*
- Sensors for rotation monitoring . . . . . *page 3/76*
- Sensors with analogue output . . . . . *page 3/78*
- Sensors for food/beverage and pharmaceutical applications
  - Cylindrical, stainless steel . . . . . *page 3/88*
  - Cylindrical, plastic . . . . . *page 3/92*
  - Cylindrical, stainless steel, for harsh industrial environments. . . . . *page 3/96*
- Sensors for assembly, packaging and light material handling applications
  - 12 x 26 x 40 mm format. . . . . *page 3/98*
  - 80 x 80 x 40 mm format. . . . . *page 3/104*
- Sensors for welding machine applications . . . . . *page 3/106*
- Selective detection of ferrous and non ferrous materials . . . . . *page 3/108*

OsiSense XS

- Accessories . . . . . *page 3/112*
- Detection curves . . . . . *page 3/120*
- Substitution table . . . . . *page 3/120*

Inductive proximity sensors
OsiSense XS
General purpose

Cylindrical type

Standard range

Flush mountable

Sensing distance Sn (mm)		**1.5**	**2**	**5**	**10**
Diameter		Ø 6.5 plain and M8	M12	M18	M30
Short case	Supply				
	3-wire ⎓ (PNP/NPN)	Page 3/24			
	2-wire ⎓	Page 3/28			
Long case	Supply				
	3-wire ⎓ (PNP/NPN)	Page 3/25			
	2-wire ⎓	Page 3/29			
	2-wire ∿	–	Page 3/32		
Function	NO	●	●	●	●
	NC	●	●	●	●
Connection	Pre-cabled (L = 2 m) *(1)*	●	●	●	●
	M8 connector, 3-pin (3-wire ⎓)	●	–	–	–
	M12 connector	●	●	●	●
	1/2”-20UNF connector	–	●	●	●
	Remote connector	Remote connectors available: M8, M12, M18, screw terminal, 7/8”, DIN: please consult our Customer Care Centre			
Degree of protection		IP 65 and IP 67, IP 68 for pre-cabled version, IP 69K for diameters 12 to 30			
Special temperatures	**- 40 °C, + 70 °C**	Add the suffix TF to the end of the reference *(2)*			
	- 25 °C, + 85° C	Add the suffix TT to the end of the reference *(2)*			
Type reference		**XS506**	**XS508**	**XS512**	**XS518**	**XS530**
Pages		3/24 to 3/33			

(1) Also available in lengths of 5 and 10 m, depending on model
(2) Product availability depending on model: please consult our Customer Care Centre.

Increased range

Flush mountable					Non flush mountable					
2.5	**4**	**8**	**15**		**7**	**8**	**12**	**16**	**22**	**30**
Ø 6.5 plain and M8	M12	M18	M30		M12		M18		M30	
Pages 3/34 and 3/35					–	Page 3/34	–	Page 3/34	–	–
Page 3/38					–	–	–	–	–	–
Page 3/36					Page 3/40	–	Page 3/40	–	–	Page 3/40
Page 3/38					–	–	–	–	–	–
–	Page 3/40				–	–	Page 3/42	–	Page 3/42	–
●	●	●	●		●	●	●	●	●	●
●	●	●	●		●	●	●	●	●	●
●	●	●	●		●	●	●	●	●	●
●	–	–	–		–	–	–	–	–	–
●	●	●	●		●	●	●	●	●	●
–	●	●	●		–	–	●	–	●	–
Remote connectors available: M8, M12, M18, screw terminal, 7/8", DIN: please consult our Customer Care Centre										
IP 65 and IP 67, IP 68 for pre-cabled version, IP 69K for diameters 12 to 30					IP 65 and IP 67, IP 68 for pre-cabled version, IP 69K					
Add the suffix TF to the end of the reference *(2)*										
Add the suffix TT to the end of the reference *(2)*										
XS106 XS606	**XS108 XS608**	**XS112, XS612**	**XS118, XS618**	**XS130, XS630**	**XS612**	**XS212**	**XS618**	**XS218**	**XS630**	
3/34 to 3/41					3/40 to 3/43					

Inductive proximity sensors
OsiSense XS
General purpose

Block type		Standard range				
		Flush mountable				

Sensing distance Sn (mm)		2.5	5	10	15	40
Dimensions (W x H x D)		**8 x 22 x 8**	**15 x 32 x 8**	**26 x 26 x 13**	**40 x 40 x 15**	**80 x 80 x 26**
Supply	3-wire ⎓ (PNP/NPN)	3/44	3/44	3/46	3/46	3/46
	2-wire ⎓	3/44	3/44	3/46	3/46	3/46
	∿	–	–	–	–	–
Function	NO	●	●	●	●	●
	NC	●	●	●	●	●
	NO + NC	–	–	–	–	–
	NO/NC	–	–	–	–	–
Connection	Pre-cabled (L = 2 m) *(1)*	●	●	●	●	●
	M8 connector, 3-pin (3-wire ⎓)	–	–	●	●	–
	M12 connector	–	–	–	–	●
	1/2”-20UNF connector	–	–	–	–	–
	Screw terminals	–	–	–	–	–
	Remote connector M8	●	●	–	–	–
	Remote connector M12	–	–	●	●	–
	Remote connector 1/2”-20 UNF	–	–	–	–	–
	Other remote connectors available	M18, screw terminal, 7/8”, DIN: please consult our Customer Care Centre				
Degree of protection		IP 67	IP 67, double insulation ⧈ or IP 68, double insulation ⧈, depending on model			
Special temperatures	**- 40 °C, + 70 °C**	Add the suffix TF to the end of the reference *(2)*				
	- 25 °C, + 85 °C	Add the suffix TT to the end of the reference *(2)*				
Type reference		**XS7J**	**XS7F**	**XS7E**	**XS7C**	**XS7D**
Pages		3/44		3/46		

(1) Also available in lengths of 5 and 10 m, depending on model.
(2) Product availability depending on model: please consult our Customer Care Centre.

Standard and increased ranges		
Flush mountable		Non flush mountable
15	**20**	**40**
40 x 40 x 70 and **40 x 40 x 117**		
Pages 3/48 and 3/50		
Pages 3/48 and 3/50		
Pages 3/48 and 3/50		
●	●	●
●	●	●
–	●	●
●	●	●
–	–	–
–	–	–
●	●	●
●	●	●
●	●	●
–	–	–
–	–	–
–	–	–
–		
IP 65, IP 67 and IP 69K		
Add the suffix TF to the end of the reference *(2)*		
Add the suffix TT to the end of the reference *(2)*		
XS7C2, XS7C4, XS8C2 and XS8C4		
3/48 and 3/50		

3

Inductive proximity sensors
OsiSense XS
General purpose

Sensor type: flush and non flush mountable		Multivoltage sensors	Sensors with 2 complementary outputs	
		With short-circuit protection	Solid-state PNP or NPN NO + NC outputs	Solid-state PNP + NPN, NO or NC programmable outputs
Sensing distance Sn (mm)	Flush mountable	**2 ... 10**	**1.5 ... 15**	**2 ... 10**
	Non flush mountable	**4 ... 15**	**2.5 ...15**	**4 ... 15**
Diameter		Threaded: M12, M18, M30	Plain: Ø 6.5 Threaded: M8, M12, M18, M30	Threaded: M12, M18, M30
Case material		Nickel plated brass	Nickel plated brass or stainless steel or plastic	Nickel plated brass or plastic
Supply	⎓	–	●	●
	∼	–	–	–
	≂	●	–	–
Function	NO	●	–	–
	NC	●	–	–
	NO + NC	–	●	–
	NO/NC	–	–	● programmable
Connection	Pre-cabled (L = 2 m) *(1)*	●	●	●
	M8 connector, 3-pin (3-wire ⎓)	–	–	–
	M12 connector	–	●	●
	1/2"-20UNF connector	●	–	–
	Remote connector	Remote connectors available: M8, M12, M18, screw terminal, 7/8", DIN: please consult our Customer Care Centre		
Degree of protection		IP 67, IP 68 or IP 69K depending on model		
Special temperatures	**- 40 °C, + 70 °C**	Add the suffix TF to the end of the reference *(2)*		
	- 25 °C, + 85 °C	Add the suffix TT to the end of the reference *(2)*		
Type reference		**XS1M** **XS2M**	**XS1●●●●C410** **XS4P●●●C410** **XS1●●B3PC●**	**XS1M●●KP340** **XS2M●●KP340** **XS4P●●KP340**
Pages		2/52	3/54	3/58

(1) Also available in lengths of 5 and 10 m, depending on model.
(2) Product availability depending on model: please consult our Customer Care Centre.
(3) Packed and sold in lots of 20

Plastic case sensors	Basic sensors		Almost flush mountable sensors	Miniature sensors
For chemical processing, marine applications	For repetitive machines			For robotic, transfer machine, assembly line applications
–	1.5 ... 10	2.5 ... 15	–	1
2.5 ... 15	2.5 ... 15	–	2.5 ... 20	–
Threaded: M8, M12, M18, M30	Threaded: M8, M12, M18, M30	Plain: Ø 6.5 Threaded: M8, M12, M18, M30		Plain: Ø 4 Threaded: M5
Plastic	Nickel plated brass or plastic	Nickel plated brass		Nickel plated brass or stainless steel
●	●	●	●	●
–	–	–	–	–
●	–	–	–	–
–	●	●	●	●
●	●	●	●	●
–	–	–	–	–
–	–	–	–	–
●	●	●	●	●
–	●	●	●	●
–	●	●	●	●
●	–	–	–	–
Remote connectors available: M8, M12, M18, screw terminal, 7/8", DIN: please consult our Customer Care Centre				
IP 67 or IP 68 depending on model	IP 67		IP 67 or IP 68	IP 67
Add the suffix TF to the end of the reference *(2)*				
Add the suffix TT to the end of the reference *(2)*				
XS4P	**XS1●●BL●** **XS2●●BL●**	**XS1●●B3●●●●TQ** *(3)*	**XS1N●●349**	**XS1L** **XS2L** **XS1N**
3/60	3/62 and 3/63	3/34 and 3/35	3/66	3/68

Inductive proximity sensors
OsiSense XS
Applications

Conveying

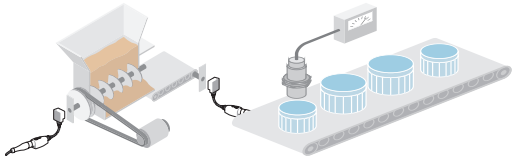
Sensor type: flush and non flush mountable

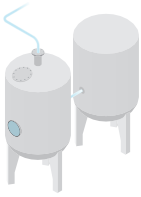
Adjustable range sensors

Developed in accordance with the needs expressed by our customers, these sensors provide a complete solution for specific application functions: rotation monitoring, selective detection, analogue control, etc.

Sensing dist. Sn (mm)	Flush mountable	**3...11** *(1)*	**15**	**25**	**60**
	Non flush mountable	**5...18** *(1)*	–	–	–
Form	**Cylindrical**	M12 x 54 M18 x 67 M30 x 71	–	–	–
	Block (W x H x D) dimensions in mm	–	26 x 26 x 13	40 x 40 x15	80 x 80 x 26
Case material		Nickel plated brass	PBT	PBT	PBT
Supply	⎓	●	●	●	●
	∼	–	–	–	–
	⎓/∼	–	●	●	●
Function	NO	●	●	●	●
	NC	●	●	●	●
	NO + NC	–	–	–	–
	NO/NC	–	–	–	–
Connection	Pre-cabled (L = 2 m) *(2)*	–	●	●	●
	M8 connector, 3-pin (⎓ 3-wire)	–	●	●	–
	M12 connector	–	–	–	●
	1/2"-20UNF connector	–	–	–	●
	Remote connector	●	●	●	●
	Screw terminals	–	–	–	–
Degree of protection		IP 67, double insulation ⧈	IP 67, double insulation ⧈ or IP 68, double insulation ⧈, depending on model.		
Special temperatures	**- 40 °C, + 70 °C**	Add the suffix TF to the end of the reference *(3)*			
	- 25 °C, + 85 °C	Add the suffix TT to the end of the reference *(3)*			
Type reference		**XS612B2** **XS618 B2** **XS630 B2**	**XS8E**	**XS8C**	**XS8D**
Pages		3/70	3/72		

(1) Depending on model.
(2) Also available in lengths of 5 and 10 m, depending on model.
(3) Product availability depending on model: please consult our Customer Care Centre.

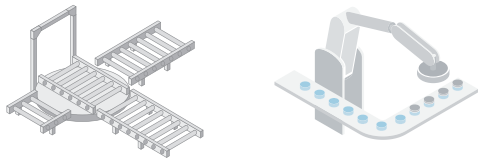




Detection of underspeed, shaft overload	*Position, displacement and deformation control/monitoring*					*Machine with stainless steel housing*		
Sensors for rotation monitoring	**Sensors with analogue output 0 ... 10 V or 4 ... 20 mA**					**Sensors for food/beverage and pharmaceutical applications**		
						Cylindrical, stainless steel 316 L		**Cylindrical, plastic**
10	**10…15** *(1)*	**0.2…10** *(1)*	**5…40** *(1)*	–	–	**6,10 or 20** *(1)*	–	–
10	**10…15** *(1)*	**0.4…15** *(1)*	**5…40** *(1)*	**2…25**	**2…25**	**10, 20 or 40** *(1)*	**7...22** *(1)*	**7...22** *(1)*
M30 x 81	–	Threaded: M12, M18, M30	–	–	–	Threaded: M12, M18, M30	Plain: Ø 18 Threaded: M12, M18, M30	Threaded: M12, M18, M30
–	26 x 26 x 13 40 x 40 x 15	–	32 x 15 x 8 26 x 26 x 13 40 x 40 x 15 80 x 80 x 26	40 x 40 x 70	40 x 40 x 117	–	–	–
Metal	PBT	Metal or plastic	PBT	PBT	PBT	Stainless steel, 316 L	Stainless steel, 316 L	Plastic, PPS
●	●	●	●	●	●	●	●	●
–	–	–	–	–	–	–	–	–
●	●	–	–	–	–	–	●	●
–	–	–	–	–	–	●	●	●
●	●	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–
●	–	●	●	–	–	–	●	●
–	–	–	–	–	–	–	–	–
–	–	–	●	●	–	●	●	●
–	–	–	–	–	–	–	●	●
–	●	–	●	–	–	–	–	–
–	–	–	–	–	●	–	–	–
IP 67	IP 67, double insulation ⧈	IP 67	IP 67 or IP 68 (pre-cabled version)	IP 65, IP 67 IP 69K	IP 65, IP 67 IP 69K	IP 68, IP 69K	IP 68 (pre-cabled version), double insulation ⧈ IP 69K conforming to DIN 40050	
Add the suffix TF to the end of the reference *(3)*								
Add the suffix TT to the end of the reference *(3)*								
XSAV	**XS9●11R**	**XS1M●●●AB1** **XS4P●●AB1**	**XS9●●●●A**	**XS9C2**	**XS9C4**	**XS9●●S●**	**XS2●●SA**	**XS2●●AA**
3/75	3/77	3/79	3/83 and 3/85	3/86	3/86	3/88	3/90 and 3/92	3/94 and 3/96

Inductive proximity sensors
OsiSense XS
Applications

Applications



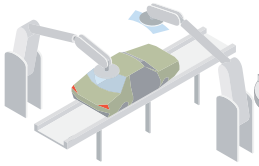
Conveying

Sensor type: flush and non flush mountable	Sensors for conveying and material handling applications		
	Cylindrical, stainless steel 303	12 x 40 x 26 format	80 x 80 x 40 format, increased range

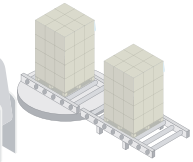
Developed in accordance with the needs expressed by our customers, these sensors provide a complete solution for specific application functions: rotation monitoring, selective detection, analogue control, etc.

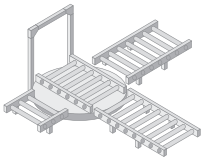
Sensing dist. Sn (mm)	Flush mountable	**3, 6, 10 or 20** *(1)*	**2**	**50**
	Non flush mountable	**6, 10, 20 or 40** *(1)*	**4**	**42**
Form	**Cylindrical**	Threaded: M8, M12, M18, M30	–	–
	Block (W x H x D) dimensions in mm	–	12 x 40 x 26	80 x 80 x 40
Case material		Stainless steel 303	Plastic	Plastic
Supply	⎓	●	●	●
	∼	–	–	–
	⎓/∼	–	●	–
Function	NO	●	●	●
	NC	–	●	–
	NO + NC	–	●	–
	NO/NC	–	–	–
Connection	Pre-cabled (L = 2 m) *(2)*	–	●	–
	M8 connector, 3-pin (⎓ 3-wire)	–	●	–
	M12 connector	●	–	●
	1/2"-20UNF connector	–	–	–
	Remote connector	–	–	–
	Screw terminals	–	–	–
Degree of protection		IP 67 and IP 69K	IP 67	IP 67, double insulation ⧈
Special temperatures	**- 40 °C, + 70 °C**	Add the suffix TF to the end of the reference *(3)*		
	- 25 °C, + 85 °C	Add the suffix TT to the end of the reference *(3)*		
Type reference		**XS9●●R●**	**XS7G XS8G**	**XS7D**
Pages		3/98	3/100	3/104

(1) Depending on model.
(2) Also available in lengths of 5 and 10 m, depending on model.
(3) Product availability depending on model: please consult our Customer Care Centre.



Robotics



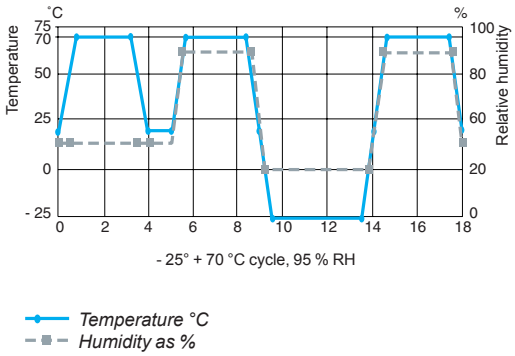


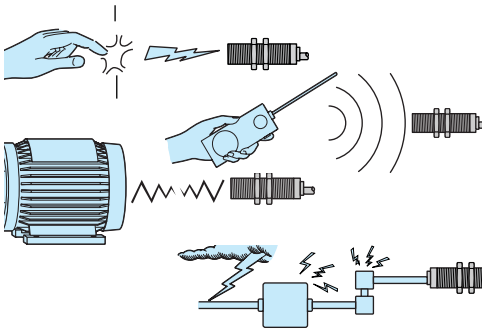
Assembly machines, conveyor systems, material handling

Sensors for welding machine applications	**Factor 1 (Fe/Nfe) sensors for ferrous and non ferrous materials**			**Selective detection sensors for ferrous materials only or non ferrous materials only**
Cylindrical, stainless steel 303	**Cylindrical**	**Cubic**	**Rectangular**	**Cylindrical**
6 or 10 *(1)*	**5, 10 or 15** *(1)*	**20**	**20**	**5**
–	**–**	**–**	**–**	**–**
Threaded: M12, M18	Threaded: M18, M30	–	–	Threaded: M18
–	–	40 x 40 x 70	40 x 40 x 117	–
Stainless steel 303	Metal	PBT	PBT	Metal
●	●	●	●	●
–	–	–	–	–
–	–	–	–	–
●	–	–	–	●
–	–	–	–	–
–	–	●	●	–
–	●	–	–	–
–	●	–	–	●
–	–	–	–	–
●	●	●	–	–
–	–	–	–	–
–	●	–	–	–
–	–	–	●	–
IP 68 and IP 69K	IP 68	IP 65, IP 67 and IP 69K		IP 68
Add the suffix TF to the end of the reference *(3)*				
Add the suffix TT to the end of the reference *(3)*				
XS9●●RW XSLC	**XS1M●●●KP**	**XS9C2**	**XS9C4**	**XS1M18PA**
3/106 and 3/108	3/110	3/112	3/112	3/114

Inductive proximity sensors
OsiSense XS

Standards and certifications
Parameters related to the environment





Recommendations

The sensors detailed in this catalogue are designed for use in standard industrial applications relating to presence detection.
These sensors do not incorporate the required redundant electrical circuit enabling their usage in safety applications.
For safety applications, please refer to our “Safety solutions using Preventa” catalogue.

Quality control

Our inductive proximity sensors are subject to special precautions in order to guarantee their reliability in the most arduous industrial environments.

- Qualification
  - The product characteristics stated in this catalogue are subject to a qualification procedure carried out in our laboratories.
  - In particular, the products are subjected to climatic cycle tests for 3000 hours whilst powered-up to verify their ability to maintain their characteristics over time.
- Production
  - The electrical characteristics and sensing distances at both ambient temperature and extreme temperatures are 100% checked.
  - Products are randomly selected during the course of production and subjected to monitoring tests relating to all their qualified characteristics.
- Customer returns

If, in spite of all these precautions, defective products are returned to us, they are subject to **systematic analysis** and **corrective actions** are implemented to eliminate the risks of the fault recurring.

Conformity to standards

All Telemecanique Sensors brand inductive proximity sensors conform to and are tested in accordance with the recommendations of standard IEC 60947-5-2.

Mechanical shock resistance

The sensors are tested in accordance with standard IEC 60068-2-27, 50 gn, duration 11 ms.

Vibration resistance

The sensors are tested in accordance with standard IEC 60068-2-6, amplitude ± 2 mm, f = 10…55 Hz, 25 gn at 55 Hz.

Resistance to the environment

- Please refer to the characteristics pages for the various sensors.
- IP 67: protection against the effects of immersion.
  Test conforming to IEC 60529: sensor immersed for 30 minutes in 1 m of water.
  No deterioration in either operating or insulation characteristics is permitted.
- IP 68: protection against prolonged immersion.
  Sensor immersed for 336 hours in 40 metres of water at 50 °C.
  No deterioration in either operating or insulation characteristics is permitted.
  Telemecanique Sensors with an IP 68 degree of protection are ideal for use in the most arduous conditions, such as machine tools, automatic car washers.
- IP 69K: protection against the effects of high pressure cleaning. Adherence to standard DIN 40050 which stipulates that the product must withstand a water jet at a pressure of 90 bar and temperature of +80 °C for 3 minutes.
  No deterioration in either operating or insulation characteristics is permitted.

Resistance to electromagnetic interference

■ Electrostatic discharges	∿ and ∿̄ versions: level 4 immunity (15 kV). **IEC 61000-4-2**
■ Radiated electromagnetic fields (electromagnetic waves)	⎓, ∿ and ∿̄ versions: level 2 (3 V/m) or level 3 (10 V/m) immunity. **IEC 61000-4-3**
■ Fast transients (motor start/stop interference)	⎓ version: level 3 immunity (1 kV). ∿ and ∿̄ versions: level 4 immunity (2 kV) except Ø 8 mm model (level 2). **IEC 61000-4-4**
■ Impulse voltage	⎓, ∿ and ∿̄ versions: level 3 immunity (2.5 kV) except Ø 8 mm and smaller models (level 1 kV). **IEC 60947-5-2**

Resistance to chemicals in the environment

- Owing to the very wide range of chemicals encountered in industry, it is very difficult to give general guidelines common to all sensors.
- To ensure lasting efficient operation, it is essential that any chemicals coming into contact with the sensors will not affect their casing and, in doing so, prevent their reliable operation.
- Cylindrical and flat plastic case sensors offer excellent overall resistance to:
  - chemical products such as salts, aliphatic and aromatic oils, petroleum, acids and diluted bases. For alcohols, ketones and phenols, preliminary tests should be made relating to the nature and concentration of the liquid.
  - food and beverage industry products such as animal or vegetable based products (vegetable oils, animal fat, fruit juice, dairy proteins, etc.).

In all cases, the materials selected (see product characteristics) provide satisfactory compatibility in most industrial environments (for further information, please consult our Customer Information Centre).

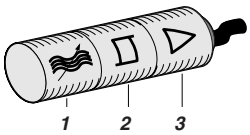
Insulation

Class 2 devices ⧈

Electrical insulation conforming to standards IEC 61140 and NF C 20-030 relating to means of protection against electric shock.

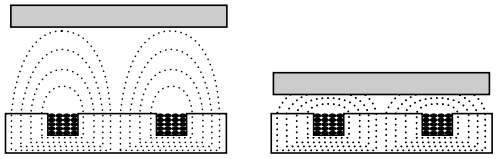
Inductive proximity sensors
OsiSense XS

Principle of inductive detection



1 Oscillator
2 Output driver
3 Output stage

Composition of an inductive proximity sensor



Detection of a metal object

Operating principle

■ An inductive proximity sensor is solely for the detection of metal objects.
It basically comprises an oscillator whose windings constitute the sensing face. An alternating magnetic field is generated in front of these windings.

■ When a metal object is placed within the magnetic field generated by the sensor, the resulting currents induced form an additional load and the oscillations cease.
This causes the output driver to operate and, depending on the sensor type, a normally open (NO) or normally closed (NC) output signal is produced.

Inductive proximity detection

■ Inductive proximity sensors enable the detection, without physical contact, of metal objects.
■ Their range of applications is very extensive and includes:
□ monitoring the position of machine parts (cams, end stops, etc.),
□ counting the presence of metal objects, etc.

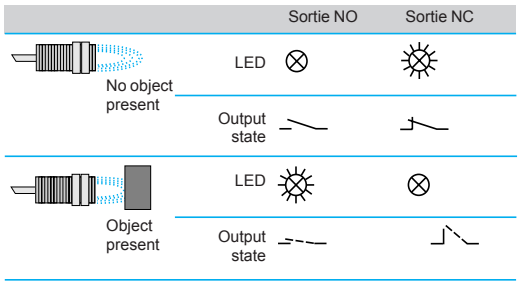
Advantages of inductive detection

■ No physical contact with the object to be detected, thus avoiding wear and enabling detection of fragile objects, freshly painted objects, etc.
■ High operating rates. Fast response.
■ Excellent resistance to industrial environments (robust products, fully encapsulated in resin).
■ Solid-state technology: no moving parts, therefore service life of sensor not related to number of operating cycles.

Flush mountable using teach mode sensors

■ The flush mountable sensors using teach mode are suitable for all metal environments (flush mountable or non flush mountable) since they ensure a maximum sensing distance, even if there is a metal background. Precise detection of the position of the object can be obtained using the teach mode. For further information, see page 3/22.

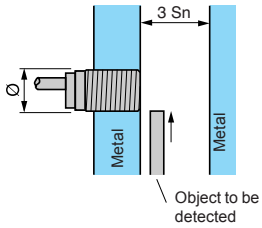
LED indicator



Output LED

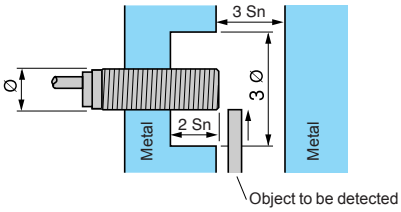
All Telemecanique Sensors inductive proximity sensors incorporate an output state LED indicator.
The flush mountable sensors using teach mode are fitted with a green LED that indicates “Power on” and also assists the user during setting-up (teach mode).

Mounting sensors on a metal support



Flush mountable in metal

■ No side clearance required.
■ All flush mountable sensors using teach mode also enable detection of an object against a metal background. For further information, see pages 3/22 and 3/23.

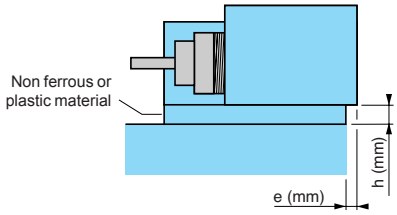


Sensors not suitable for flush mounting in metal

■ Side clearance required.
Sensing distance greater than that for a standard flush mountable model.
■ Flush mountable sensors using teach mode eliminate the need for side clearance. For further information, see pages 3/22 and 3/23.

Inductive proximity sensors
OsiSense XS

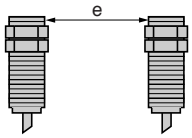
Mounting sensors on a metal support



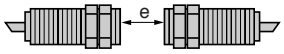
Mounting using fixing clamp

- ■ Standard flush mountable models: e = 0, h = 0
- ■ Standard non flush mountable models
- □ Ø 6.5 / 8 / 12 mm: e = 0, h = 0
- □ Ø 18 mm: if h = 0, e ⩾ 5; e = 0, h ⩾ 3.
- □ Ø 30 mm: if h = 0, e ⩾ 8; e = 0, h ⩾ 4.
- ■ Flush mountable sensors using teach mode: e = 0, h = 0

Mounting distance between sensors



Mounting side by side
e ⩾ 2 Sn



Mounting face to face
e ⩾ 10 Sn

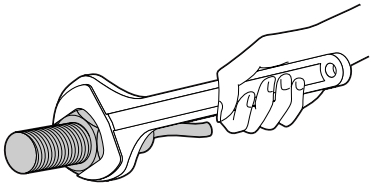
Standard sensors

If 2 standard sensors are mounted too close to each other they are likely to lock in the “detection state” due to interference between their respective oscillating frequencies.
To avoid this condition, the minimum mounting distances stated for the sensors should be adhered to or, alternatively, sensors with staggered oscillating frequencies should be used.

Staggered frequency sensors

For applications where the minimum recommended mounting distances for standard sensors cannot be achieved, it is possible to overcome this restraint by using staggered frequency sensors. Please consult our Customer Care Centre.
In this case, a staggered frequency sensor is mounted adjacent to or opposite each standard sensor.

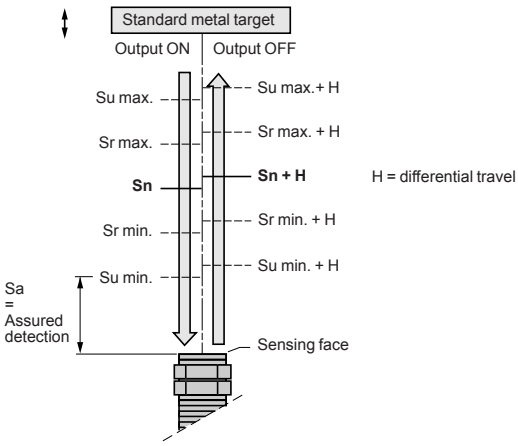
Tightening torque for cylindrical type sensors

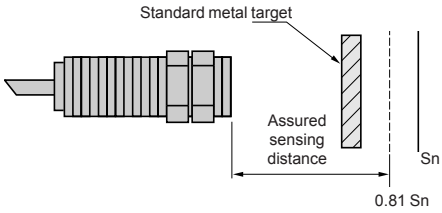


	Maximum tightening torque for the various sensor case materials			
	Brass	Brass	Stainless steel	Plastic
Diameter of sensor (mm)	Short case model	Long case model form A	Long case model form A	All models
	XS5●●B1 XS6●●B3	XS6●●B1 XS6●●B2 XS6●●B4 XSAV●	XS1●● XS2●●	XS4P●●
Ø 5	1.6 N.m	1.6 N.m	2 N.m	–
Ø 8	5 N.m	5 N.m	9 N.m	1 N.m
Ø 12	6 N.m	6 N.m	30 N.m	2 N.m
Ø 18	15 N.m	15 N.m	50 N.m	5 N.m
Ø 30	40 N.m	40 N.m	100 N.m	20 N.m

Inductive proximity sensors
OsiSense XS

Sensing distance





Definitions

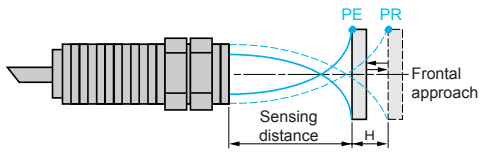
In order to ensure that customers can make reliable product comparisons and selection, the standard IEC 60947-5-2 defines various sensing distances, such as:

- Nominal sensing distance (Sn)
  The rated operating distance for which the sensor is designed. It does not take into account any variations (manufacturing tolerances, temperature, voltage).
- Effective sensing distance (Sr)
  The effective sensing distance is measured at the rated voltage (Un) and the rated ambient temperature (Tn).
  It must be between 90% and 110% of the nominal sensing distance (Sn): 0.9 Sn y Sr y 1.1 Sn.
- Usable sensing distance (Su)
  The usable sensing distance is measured at the limits of the permissible variations in the ambient temperature (Ta) and the supply voltage (Ub). It must be between 90% and 110% of the effective sensing distance: 0.9 Sr y Su y 1.1 Sr.
- Assured operating distance (Sa).
  This is the operating zone of the sensor. The assured sensing distance is between 0 and 81% of the nominal sensing distance (Sn): 0 y Sa y 0.9 x 0.9 x Sn.

Standard metal target

The standard IEC 60947-5-2 defines the standard metal target as a square mild steel (Fe 360) plate, 1 mm thick.
The side dimension of the plate is either equal to the diameter of the circle engraved on the sensing face of the sensor or 3 times the nominal sensing distance (Sn).

Terminology



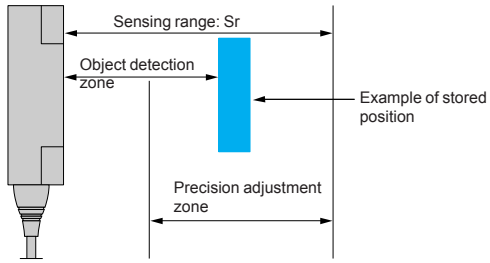
PE = pick-up point, the object is detected
PR = drop-out point, the object is no longer detected

Differential travel

The differential travel (H), or hysteresis, is the distance between the operating point, as the standard metal target moves towards the sensor, and the release point, as it moves away.
This hysteresis is essential for the stable operation of the sensor.

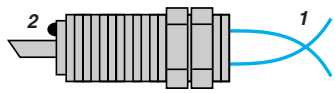
Repeat accuracy

The repeat accuracy (R) is the repeatability of the sensing distance between successive operations. Readings are taken over a period of time whilst the sensor is subjected to voltage and temperature variations: 8 hours, 10 to 30 °C, Un ± 5 %.
It is expressed as a percentage of the effective sensing distance Sr.
For all OsiSense XS sensors, the repeat accuracy is 3 %.



Detection zone and precision adjustment zone

- Flush mountable sensors using teach mode, due to adjustment of sensitivity whilst teaching, enable the position of an object to be detected as it approaches from the front or side.
  The teach mode can be used when the object is located in the zone known as the “precision adjustment zone”. When the object approaches from the front, the detection zone of the object ranges from the stored position down to zero.



1 Detection threshold curves
2 “Object detected” LED

Operating zone

- The operating zone relates to the area in front of the sensing face in which the detection of a metal object is certain.
  The values stated in the characteristics relating to the various types of sensor are for steel objects of a size equal to the sensing face of the sensor.
  For objects of a different nature (smaller than the sensing face of the sensor, other metals, etc.), it is necessary to apply a correction coefficient.

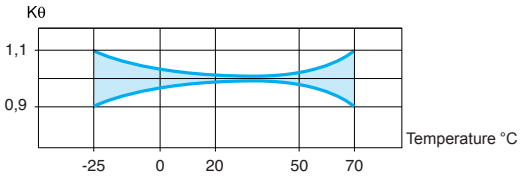
Correction coefficients to apply to the assured operating distance

Assured operating distance of a sensor

In practice, most objects to be detected are generally made of steel and are of a size equal to, or greater, than the sensing face of the sensor.

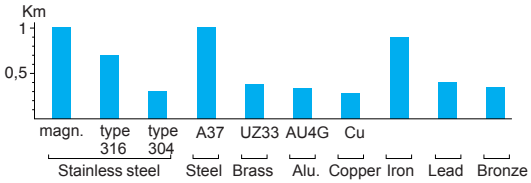
For the calculation of the assured operating distance for different operating conditions, one must take into account the correction coefficients that influence it.

The curves indicated are purely representative of typical curves. They are only given as a guide to the approximate usable sensing distance of a proximity sensor for a given application.



Influence of ambient temperature

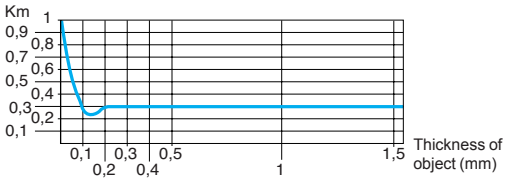
Apply a correction coefficient Kq, determined from the curve shown opposite.



Material of object to be detected

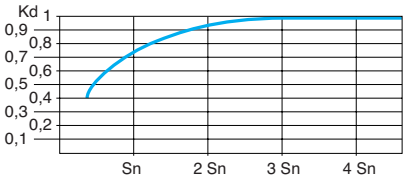
Apply a correction coefficient Km, determined from the diagram shown opposite.

The fixed sensing distance models for ferrous/non ferrous (Fe/NFe) materials enable the detection of different objects at a fixed distance, irrespective of the type of material.



*Typical curve for a **copper** object used with a Ø 18 mm cylindrical sensor*

Special case of a very thin object made of a non ferrous material.



*Typical curve for a **steel** object used with a cylindrical sensor*

Size of object to be detected

Apply a correction coefficient Kd, determined from the curve shown opposite.
When calculating the sensing distance for the selection of a sensor, make the assumption that Kd = 1.

Variation of supply voltage

In all cases, apply the correction coefficient Kt = 0.9.

Calculation examples

Correction of the sensing distance of a sensor

Sensor with nominal sensing distance Sn = 15 mm.
Ambient temperature variation 0 to + 20 °C.
Object material and size: steel, 30 x 30 x 1 mm thick.
The assured sensing distance Sa is determined using the formula:
Sa = Sn x Kq x Km x Kd x Kt = 15 x 0.98 x 1 x 0.95 x 0.9
i.e. Sa = 12.5 mm.

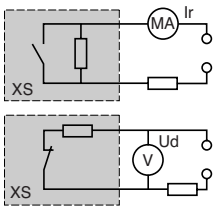
Selecting a sensor for a given application

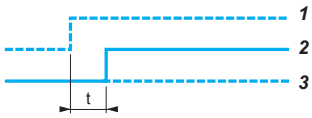
Application characteristics:
- object material and size: iron (Km = 0.9), 30 x 30 mm,
- temperature: 0 to 20 °C (Kθ = 0.98),
- object detection distance: 3 mm ± 1.5 mm, i.e. Sa max. = 4.5 mm,
- assume Kd = 1.

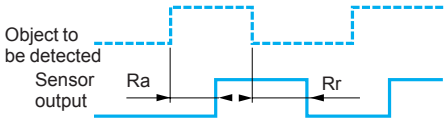
A sensor must be selected for which $\mathbf{Sn \geqslant \frac{Sa}{Kq \times Km \times Kd \times Kt} = \frac{4.5}{0.98 \times 0.9 \times 1 \times 0.9}}$

i.e. **Sn ⩾ 5.7 mm**

Specific aspects of electronic sensors







Terminology

■ Residual current (Ir)
□ The residual current (Ir) corresponds to the current flowing through the sensor when in the "open" state.
□ Characteristic of 2-wire type proximity sensors.

■ Voltage drop (Ud)
□ The voltage drop (Ud) corresponds to the voltage drop at the sensor's terminals when in the "closed" state (value measured at nominal current rating of sensor).

■ First-up delay
□ The first-up delay corresponds to the time (t) between the connection of the power supply to the sensor and its fully operational state.
1 *Supply voltage U on*
2 *Sensor operational at state 1*
3 *Sensor at state 0*

■ Response time
□ Response time (Ra): the time delay between the object to be detected entering the sensor's operating zone and the subsequent change of output state. This parameter limits the speed and size of the object.
□ Recovery time (Rr): the time delay between an object to be detected leaving the sensor's operating zone and the subsequent change of output state. This parameter limits the interval between successive objects.

Supply

Sensors for AC circuits (∿ and ≂ models)

Check that the voltage limits of the sensor are compatible with the nominal voltage of the AC supply used.

Sensors for DC circuits

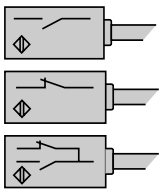
■ DC source: check that the voltage limits of the sensor and the acceptable level of ripple are compatible with the supply used.

■ AC source (comprising transformer, rectifier, smoothing capacitor): the supply voltage must be within the operating limits specified for the sensor.

Where the voltage is derived from a single-phase AC supply, the voltage must be rectified and smoothed to ensure that:
- the peak voltage of the DC supply is lower than the maximum voltage rating of the sensor.
Peak voltage = nominal voltage x $\sqrt{2}$
- the minimum voltage of the supply is greater than the minimum voltage rating of the sensor, given that :
$\Delta V = (I \times t) / C$
ΔV = max. ripple: 10 % (V),
I = anticipated load current (mA),
t = period of 1 cycle (10 ms full-wave rectified for a 50 Hz supply frequency),
C = capacitance (µF).
As a general rule, use a transformer with a lower secondary voltage (Ue) than the required DC voltage (U).

Example:
∿ 18 V to obtain ⎓ 24 V,
∿ 36 V to obtain ⎓ 48 V.

Outputs



Output signal (contact logic)

■ Normally open (NO)
Corresponds to a sensor whose output changes to the closed state when an object is present in the operating zone.

■ Normally closed (NC)
Corresponds to a sensor whose output changes to the open state when an object is present in the operating zone.

■ Complementary outputs (NO + NC)
Corresponds to a sensor with a normally closed output and a normally open output.

Inductive proximity sensors
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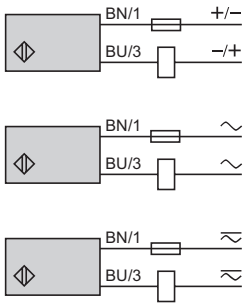
Outputs (continued)

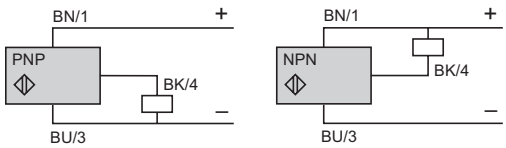


2-wire ⎓ type, non polarised NO or NC output

■ Specific aspects
These sensors are wired in series with the load to be switched.
As a consequence, they are subject to:
□ a residual current in the open state (current flowing through the sensor in the "open" state),
□ A voltage drop in the closed state (voltage drop across the sensor's terminals in the "closed" state).

■ Advantages
□ Only 2 leads to be wired: these sensors can be wired in series in the same way as mechanical limit switches,
□ They can be connected to either positive (PNP) or negative (NPN) logic PLC inputs,
□ No risk of incorrect connections.

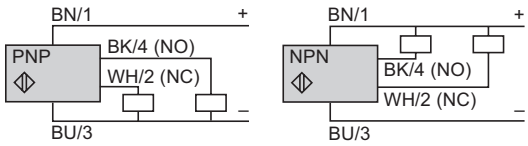
■ Operating precautions
□ Check the possible effects of residual current and voltage drop on the actuator or input connected,
□ For sensors that do not have overload and short-circuit protection (AC or AC/DC symbol), it is essential to connect a 0.4 A "quick-blow" fuse in series with the load.



3-wire ⎓ type, NO or NC output, PNP or NPN

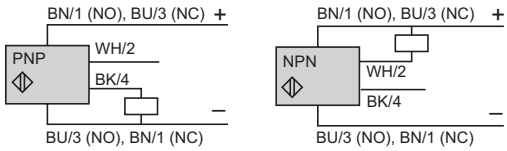
■ Specific aspects
□ These sensors comprise 2 wires for the DC supply and a 3rd wire for the output signal,
□ PNP type: switching the positive side to the load,
□ NPN type: switching the negative side to the load.

■ Advantages
□ Protection against supply reverse polarity,
□ Protection against overload and short-circuit,
□ No residual current, low voltage drop.



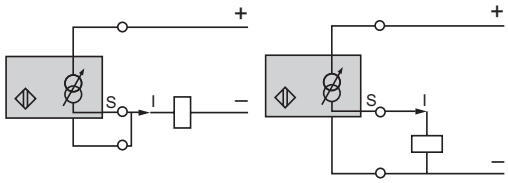
4-wire ⎓ type, complementary NO and NC outputs, PNP or NPN

■ Advantages
□ Protection against supply reverse polarity (+/-).
□ Protection against overload and short-circuit.



4-wire ⎓ type, multifunction, programmable NO or NC output, PNP or NPN

■ Advantages
□ Protection against supply reverse polarity (+/-).
□ Protection against overload and short-circuit.



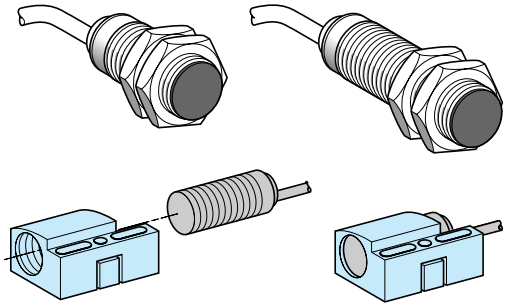
2-wire connection *3-wire connection*

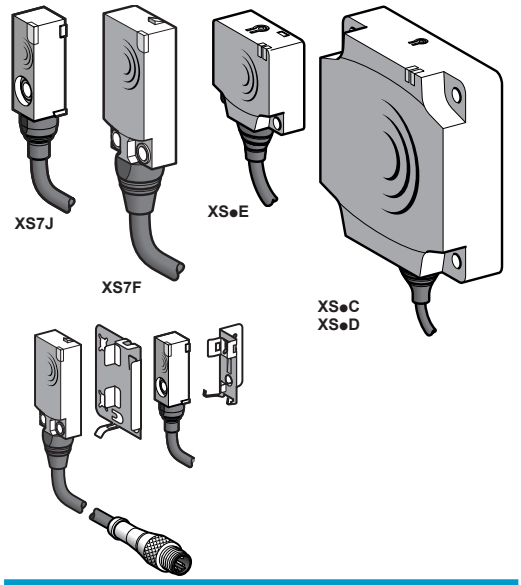
Specific output signals, analogue type

■ These sensors convert the approach of a metal object towards the sensing face into an output current variation which is proportional to the distance between the object and the sensing face.
■ Two models available:
- 0...10 V (0...10 mA) output for 3-wire connection,
- 4-20 mA output for 2-wire connection.

Inductive proximity sensors
OsiSense XS

Features of the various models





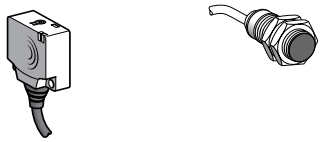
Types of case

- ■ Cylindrical case
- □ Fast installation and setting-up.
- □ Short case and long case, 2-wire c and 3-wire c versions available.
- □ Pre-cabled (moulded cable) and various integral connector (M8, M12, 7/8", M18) and remote connector (on flying lead) versions available.
- □ Small size facilitates mounting in locations with restricted access.
- □ Interchangeability, provided by indexed fixing clamp: when assembled, becomes similar to a block type sensor.

- ■ Flat case
- □ Reduced size (sensor volume divided by 8).
- □ Fast installation by mounting on clip-on brackets.
- □ Precision detection with the flush mountable sensors using teach mode (see page 3/22).

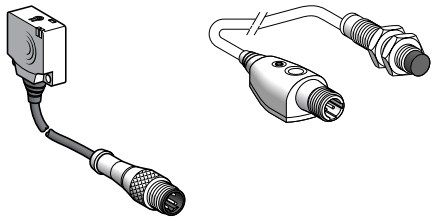
Electrical connection

1



2

3



Connection methods

1 Pre-cabled: factory fitted moulded cable, good protection against splashing liquids (IP 68). Example: machine tool.
2 Connector: easy installation and maintenance (IP 67).
3 Remote connector: easy installation and maintenance (IP 68 at sensor level and IP 67 at remote connector level).

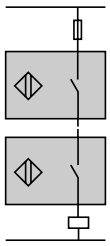
Wiring advice

- ■ Length of cable
- □ No limitation up to 200 m or up to a line capacitance of < 100 nF (characteristics of sensor remain unaffected).
- □ In this case, it is important to take into account the voltage drop on the line.

- ■ Separation of control and power circuit wiring
- □ The sensors are immune to electrical interference encountered in normal industrial conditions.
- □ Where extreme conditions of electrical “noise” could occur (large motors, spot welders, etc.), it is advisable to protect against transients in the normal way:
  - suppress interference at source,
  - separate power and control wiring from each other,
  - smooth the supply,
  - limit the length of cable.

- ■ Connect the sensor with supply switched off.

Setting-up precautions



Connection in series

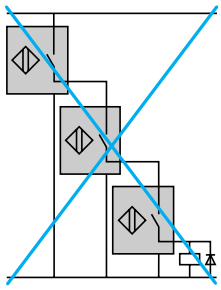
2-wire type sensors

- ■ The following points should be taken into account:
- □ Series wiring is only possible using sensors with wide voltage limits.
  Based on the assumption that each sensor has the same residual current value, each sensor, in the open state, will share the supply voltage, i.e.

$$U\ \text{sensor} = \frac{\textbf{U (supply)}}{\textbf{n sensors}}$$

U sensor and U supply must remain within the sensor's voltage limits.

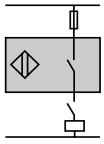
- □ If only one sensor in the circuit is in the open state, it will be supplied at a voltage almost equal to the supply voltage.
- □ When in the closed state, a small voltage drop is present across each sensor. The resultant loss of voltage at the load will be the sum of the individual voltage drops and therefore, the load voltage should be selected accordingly.



3-wire type sensors

This connection method is not recommended.

- ■ Correct operation of the sensors cannot be assured and, if this method is used, tests should be made before installation.
  The following points should be taken into account:
- □ Sensor 1 carries the load current in addition to the no-load current consumption values of the other sensors connected in series. For certain models, this connection method is not possible unless a current limiting resistor is used.
- □ When in the closed state, a small voltage drop is present across each sensor. The load should therefore be selected accordingly.
- □ As sensor 1 closes, sensor 2 does not operate until a certain time (t) has elapsed (corresponding to the first-up delay) and likewise for the following sensors in the sequence.
- □ The use of "flywheel" diodes is recommended when an inductive load is being switched.



Sensors and devices in series with an external mechanical contact

2 and 3-wire type sensors

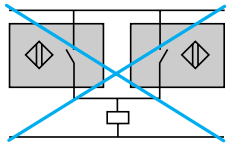
- ■ The following points should be taken into account:
- □ When the mechanical contact is open, the sensor is not supplied.
- □ When the contact closes, the sensor does not operate until a certain time (t) has elapsed (corresponding to the first-up delay).

Connection in parallel

2-wire type sensors

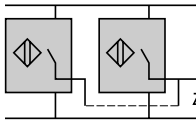
This connection method is not recommended.

- ■ Should one of the sensors be in the closed state, the sensor in parallel will be "shorted-out" and no longer supplied.
  As the first sensor passes into the open state, the second sensor will become energised and will be subject to its first-up delay.
- ■ This configuration is only permissible where the sensors will be working alternately.
- ■ This method of connection can lead to irreversible damage of the units.



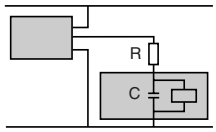
3-wire type sensors

- ■ No specific restrictions. The use of "flywheel" diodes is recommended when an inductive load (relay) is being switched.



AC supply

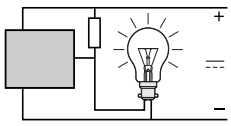
- ■ 2-wire type sensors cannot be connected directly to an AC supply.
- □ This would result in immediate destruction of the sensor and considerable danger to the user.
- □ An appropriate load (refer to the instruction sheet supplied with the sensor) must always be connected in series with the sensor.

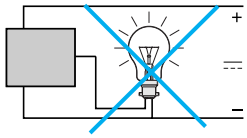


Capacitive load (C > 0.1 µF)

- ■ On power-up, it is necessary to limit (by resistor) the charging current of the capacitive load C.
- □ The voltage drop in the sensor can also be taken into account by subtracting it from the supply voltage for the calculation of R.

$$R = \frac{U\ \text{supply}}{I\ \text{max. (sensor)}}$$





Load comprising an incandescent lamp

- ■ If the load comprises an incandescent lamp, the cold state resistance can be 10 times lower than the hot state resistance. This can cause very high current levels on switching. Fit a pre-heat resistor in parallel with the sensor.

$$R = \frac{U^2}{P} \times 10$$, U = supply voltage and P = lamp power

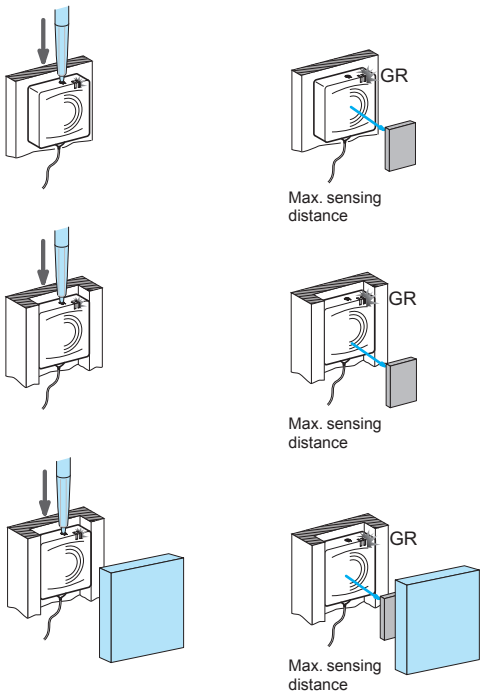
Fast trouble shooting guide

Problem	Possible causes	Remedy
The sensor's output will not change state when a metal object enters the detection zone	On a flush mountable sensor using teach mode: setting-up or programming error.	■ After a RESET, follow the environment teach mode procedure. Refer to instruction sheet supplied with sensor.
	Output stage faulty or complete failure of the sensor or the short-circuit protection has tripped.	■ Check that the sensor is compatible with the supply being used. ■ Check the load current characteristics: □ if load current I u maximum switching capacity, an auxiliary relay, of the CAD N type for example, should be interposed between the sensor and the load, □ if I y maximum switching capacity, check for wiring faults (short-circuit). ■ In all cases, a 0.4 A "quick-blow" fuse should be fitted in series with the sensor.
	Wiring error	■ Check that the wiring conforms to the wiring shown on the sensor label or instruction sheet.
	Supply fault	■ Check that the sensor is compatible with the supply (∼ or ⎓). ■ Check that the supply voltage is within the voltage limits of the sensor. Remember that with a rectified, smoothed supply, U peak = U nominal x $\sqrt{2}$ with a ripple voltage y 10 %.
False or erratic operation, with or without the presence of a metal object in the detection zone	On flush mountable sensor using teach mode: setting-up or programming error.	■ After a RESET, follow the environment teach mode procedure. Refer to instruction sheet supplied with sensor.
	Influence of background or metal environment	■ Refer to the instruction sheet supplied with the sensor. For sensors with adjustable sensitivity, reduce the sensing distance.
	Sensing distance poorly defined for the object to be detected	■ Apply the correction coefficients. ■ Realign the system or run the teach mode again.
	Influence of transient interference on the supply lines	■ Ensure that any DC supplies, when derived from rectified AC, are correctly smoothed (C > 400 µF). ■ Separate AC power cables from low-level DC cables (24 V low level). ■ Where very long distances are involved, use suitable cable: screened and twisted pairs of the correct cross-sectional area.
	Equipment prone to emitting electromagnetic interference	■ Position the sensors as far away as possible from any sources of interference.
	Response time of the sensor too slow for the particular object being detected	■ Check the suitability of the sensor for the position or size of the object to be detected. ■ If necessary, select a sensor with a higher switching frequency.
	Influence of high temperature	■ Eliminate sources of radiated heat or protect the sensor casing with a heat shield. ■ Realign, having adjusted the temperature around the fixing support.
No detection following a period of service	Vibration, shock	■ Realign the system. ■ Replace the support or protect the sensor.

Inductive proximity sensors

OsiSense XS

Flush mountability using teach mode: simplicity through innovation



Operating principle

In proposing flush mountable sensors using teach mode, Telemecanique Sensors offers simplicity through innovation.

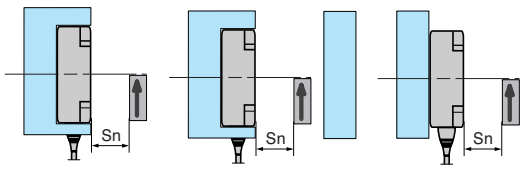
■ A single product enables flush mounting using teach mode and meets all the requirements for inductive detection of metal objects.
By simply pressing the “Teach mode” button, the sensor automatically acquires optimum configuration for all detection, flush mountability and environment requirements.

■ Other advantages of flush mountable sensors using teach mode

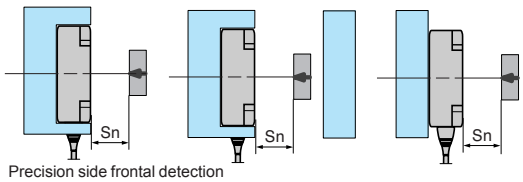
□ Increased performance:
- sensing distance guaranteed and optimised irrespective of the mounting method, object, environment or background,
- suitable for all metal environments.

□ Simplified use provided by:
- the flush mountability using teach mode technology, associated with the availability of the flattest and most compact sensors on the market, ensures full integration in the machine and limits the risks of mechanical damage,
- mechanical adjustments no longer necessary due to teach mode.

□ Lower costs due to:
- the elimination of adjustment times and complex supports
- the elimination of flush mountable and non flush mountable versions, which halves the number of references,
- much easier and much quicker product selection.



Precision side approach detection



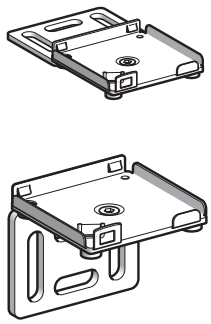
Precision side frontal detection

Precision position detection

All flush mountable inductive proximity sensors using teach mode benefit from ultra precise adjustment, which is very quick irrespective of the metal environment.

■ Precision side approach detection makes it possible to accurately define the distance at which the object will be detected as it passes the sensor.
On the flush mountable sensors using teach mode, the desired detection position can be stored in memory by simply pressing the teach button.

■ Precision frontal approach detection makes it possible to accurately define the distance at which the object will be detected as it approaches the sensor.
On the flush mountable sensors using teach mode, the desired detection position can be stored in memory by simply pressing the teach button.



Mounting accessories

Telemecanique Sensors offers a complete, inexpensive range of mounting accessories (clamps, plates, brackets, etc.) that provide solutions for all installation problems.

■ Fixing kits for quick installation or replacement of sensors

■ No adjustment required. Simple clipping-in enables the sensor to be fixed in position and ready for operation.

Inductive proximity sensors

OsiSense XS
Flush mountability using teach mode: simplicity through innovation

XS8E1A1

XS8C1A1

XS8D1A1

Block type

Dimensions (mm)		26 x 26 x 13	40 x 40 x 15	80 x 80 x 26
Sensing distance (mm)	Flush mounted use	0...10	0...15	0...40
	Non flush mounted use	0...15	0...25	0...60
Sensor type		**XS8E1A1**	**XS8C1A1**	**XS8D1A1**
Page		3/72		

XS612B2

XS618B2

XS630B2

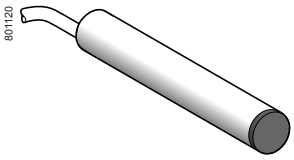
Cylindrical type

Dimensions (mm)		12	18	30
Sensing distance (mm)	Flush mounted use	0...3.4	0...6	0...11
	Non flush mounted use	0...5	0...9	0...18
Sensor type		**XS612B2**	**XS618B2**	**XS630B2**
Page		3/70		

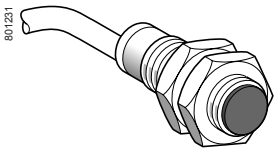
Inductive proximity sensors

OsiSense XS, general purpose

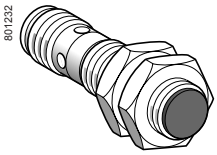
Cylindrical, standard range, flush mountable
Three-wire DC, solid-state output



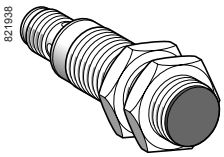
XS506B1●●L2



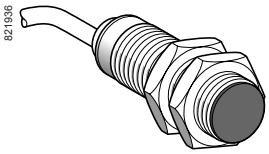
XS508B1●●L2



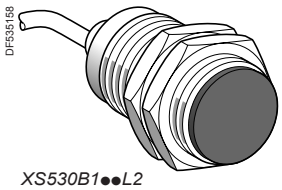
XS512B1●●M12



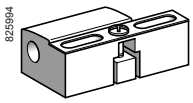
XS518B1●●M12



XS518B1●●●L2



XS530B1●●L2



XSZB1●●

Sensors, 3-wire ⎓ 12-24 V, short case model

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
Ø 6.5, plain					
1.5	NO	PNP	Pre-cabled (L = 2 m) *(1)*	**XS506B1PAL2**	0.035
			M8 connector	**XS506B1PAM8**	0.025
			M12 connector	**XS506B1PAM12**	0.025
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS506B1NAL2**	0.035
			M8 connector	**XS506B1NAM8**	0.025
	NC	PNP	Pre-cabled (L = 2 m) *(1)*	**XS506B1PBL2**	0.035
			M8 connector	**XS506B1PBM8**	0.025
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS506B1NBL2**	0.035
			M8 connector	**XS506B1NBM8**	0.025
Ø 8, threaded M8 x 1					
1.5	NO	PNP	Pre-cabled (L = 2 m) *(1)*	**XS508B1PAL2**	0.035
			M8 connector	**XS508B1PAM8**	0.025
			M12 connector	**XS508B1PAM12**	0.025
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS508B1NAL2**	0.035
			M8 connector	**XS508B1NAM8**	0.025
			M12 connector	**XS508B1NAM12**	0.025
	NC	PNP	Pre-cabled (L = 2 m) *(1)*	**XS508B1PBL2**	0.035
			M8 connector	**XS508B1PBM8**	0.025
			M12 connector	**XS508B1PBM12**	0.025
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS508B1NBL2**	0.035
			M8 connector	**XS508B1NBM8**	0.025
			M12 connector	**XS508B1NBM12**	0.025
Ø 12, threaded M12 x 1					
2	NO	PNP	Pre-cabled (L = 2 m) *(1)*	**XS512B1PAL2**	0.075
			M12 connector	**XS512B1PAM12**	0.035
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS512B1NAL2**	0.075
			M12 connector	**XS512B1NAM12**	0.035
	NC	PNP	Pre-cabled (L = 2 m) *(1)*	**XS512B1PBL2**	0.075
			M12 connector	**XS512B1PBM12**	0.035
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS512B1NBL2**	0.075
			M12 connector	**XS512B1NBM12**	0.035
Ø 18, threaded M18 x 1					
5	NO	PNP	Pre-cabled (L = 2 m) *(1)*	**XS518B1PAL2**	0.120
			M12 connector	**XS518B1PAM12**	0.060
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS518B1NAL2**	0.120
			M12 connector	**XS518B1NAM12**	0.060
	NC	PNP	Pre-cabled (L = 2 m) *(1)*	**XS518B1PBL2**	0.120
			M12 connector	**XS518B1PBM12**	0.060
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS518B1NBL2**	0.120
			M12 connector	**XS518B1NBM12**	0.060
Ø 30, threaded M30 x 1.5					
10	NO	PNP	Pre-cabled (L = 2 m) *(1)*	**XS530B1PAL2**	0.205
			M12 connector	**XS530B1PAM12**	0.145
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS530B1NAL2**	0.205
			M12 connector	**XS530B1NAM12**	0.145
	NC	PNP	Pre-cabled (L = 2 m) *(1)*	**XS530B1PBL2**	0.205
			M12 connector	**XS530B1PBM12**	0.145
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS530B1NBL2**	0.205
			M12 connector	**XS530B1NBM12**	0.145

Accessories *(2)*

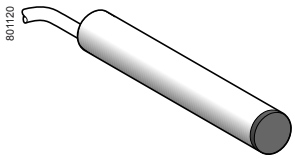
Description	For use with sensors	Reference	Weight kg
Fixing clamps	Ø 6.5 (plain)	**XSZB165**	0.005
	Ø 8	**XSZB108**	0.006
	Ø 12	**XSZB112**	0.006
	Ø 18	**XSZB118**	0.010
	Ø 30	**XSZB130**	0.020

*(1) For a 5 m cable replace L2 by **L5**; for a 10 m cable replace L2 by **L10**.*
*Example: **XS508B1PAL2** becomes **XS508B1PAL5** with a 5 m cable.*
(2) For more information, see page 3/116.

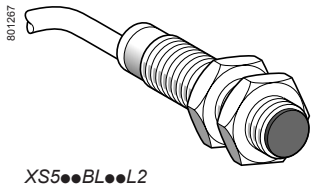
Inductive proximity sensors

OsiSense XS, general purpose

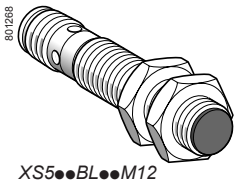
Cylindrical, standard range, flush mountable
Three-wire DC, solid-state output



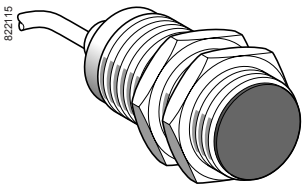
XS506BL●●L2



XS5●●BL●●L2



XS5●●BL●●M12



XS530BL●●L2

Sensors, 3-wire ⎓ 12-48 V, long case model

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
Ø 6.5, plain					
1.5	NO	PNP	Pre-cabled (L = 2 m) *(1)*	**XS506BLPAL2**	0.035
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS506BLNAL2**	0.035
Ø 8, threaded M8 x 1					
1.5	NO	PNP	Pre-cabled (L = 2 m) *(1)*	**XS508BLPAL2**	0.035
			M12 connector	**XS508BLPAM12**	0.025
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS508BLNAL2**	0.035
			M12 connector	**XS508BLNAM12**	0.025
	NC	PNP	Pre-cabled (L = 2 m) *(1)*	**XS508BLPBL2**	0.035
			M12 connector	**XS508BLPBM12**	0.025
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS508BLNBL2**	0.035
			M12 connector	**XS508BLNBM12**	0.025
Ø 12, threaded M12 x 1					
2	NO	PNP	Pre-cabled (L = 2 m) *(1)*	**XS512BLPAL2**	0.075
			M12 connector	**XS512BLPAM12**	0.035
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS512BLNAL2**	0.075
			M12 connector	**XS512BLNAM12**	0.035
	NC	PNP	Pre-cabled (L = 2 m) *(1)*	**XS512BLPBL2**	0.075
			M12 connector	**XS512BLPBM12**	0.035
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS512BLNBL2**	0.075
			M12 connector	**XS512BLNBM12**	0.035
Ø 18, threaded M18 x 1					
5	NO	PNP	Pre-cabled (L = 2 m) *(1)*	**XS518BLPAL2**	0.120
			M12 connector	**XS518BLPAM12**	0.060
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS518BLNAL2**	0.120
			M12 connector	**XS518BLNAM12**	0.060
	NC	PNP	Pre-cabled (L = 2 m) *(1)*	**XS518BLPBL2**	0.120
			M12 connector	**XS518BLPBM12**	0.060
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS518BLNBL2**	0.120
			M12 connector	**XS518BLNBM12**	0.060
Ø 30, threaded M30 x 1.5					
10	NO	PNP	Pre-cabled (L = 2 m) *(1)*	**XS530BLPAL2**	0.205
			M12 connector	**XS530BLPAM12**	0.145
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS530BLNAL2**	0.205
			M12 connector	**XS530BLNAM12**	0.145
	NC	PNP	Pre-cabled (L = 2 m) *(1)*	**XS530BLPBL2**	0.205
			M12 connector	**XS530BLPBM12**	0.145
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS530BLNBL2**	0.205
			M12 connector	**XS530BLNBM12**	0.145

Accessories *(2)*

Description	For use with sensors	Reference	Weight kg
Fixing clamps	Ø 6.5 (plain)	**XSZB165**	0.005
	Ø 8	**XSZB108**	0.006
	Ø 12	**XSZB112**	0.006
	Ø 18	**XSZB118**	0.010
	Ø 30	**XSZB130**	0.020

*(1) For a 5 m cable replace L2 by **L5**; for a 10 m cable replace L2 by **L10**.*
*Example: **XS508BLPAL2** becomes **XS508BLPAL5** with a 5 m cable.*
(2) For more information, see page 3/116.

Inductive proximity sensors

OsiSense XS, general purpose

Cylindrical, standard range, flush mountable
Three-wire DC, solid-state output

Characteristics

Sensor type			XS5●●B1●●M8, XS5●●B1●●M12 XS5●●BL●●M8, XS5●●BL●●M12	XS5●●B1●●L2 XS5●●BL●●L2
Product certifications			UL, CSA, CE, E2	
Connection	Connector		M8 on Ø 6.5 and Ø 8, M12 on Ø 8, Ø 12, Ø 18 and Ø 30	–
	Pre-cabled		–	Length: 2 m
Operating zone	Ø 6.5 and Ø 8	**mm**	**0…1.2**	
	Ø 12	**mm**	**0…1.6**	
	Ø 18	**mm**	**0…4**	
	Ø 30	**mm**	**0…8**	
Differential travel		**%**	1...15 of effective sensing distance (Sr)	
Degree of protection	Conforming to IEC 60529		IP 65 and IP 67	IP 65 and IP 68, double insulation ⧈ (except Ø 6.5 and Ø 8: IP 67)
	Conforming to DIN 40050		IP 69K for Ø 12 to Ø 30	
Storage temperature		**°C**	-40…+85	
Operating temperature		**°C**	-25…+70	
Materials	Case		Nickel plated brass (except XS506 and XS508BL: stainless steel, grade 303)	
	Sensing face		PPS	
	Cable		–	PvR 3 x 0.34 mm² except **XS506** and **XS508**: 3 x 0.11 mm²
Vibration resistance	Conforming to IEC 60068-2-6		25 gn, amplitude ± 2 mm (f = 10 to 50 Hz)	
Shock resistance	Conforming to IEC 60068-2-27		50 gn, duration 11 ms	
Output state indication			Yellow LED: 4 viewing ports at 90°	Yellow LED: annular
Rated supply voltage		**V**	⎓ 12…48 for XS5●●BL ⎓ 12…24 for XS5●●B1 with protection against reverse polarity	
Voltage limits (including ripple)		**V**	⎓ 10…58 for XS5●●BL ⎓ 10…36 for XS5●●B1	
Switching capacity		**mA**	⩽ 200 with overload and short-circuit protection	
Voltage drop, closed state		**V**	⩽ 2	
Current consumption, no-load		**mA**	⩽ 10	
Maximum switching frequency	**XS506, XS508, XS512**	**Hz**	5000	
	XS518	**Hz**	2000	
	XS530	**Hz**	1000	
Delays	First-up	**ms**	⩽ 10	
	Response	**ms**	⩽ 0.1: **XS506, XS508** and **XS512** ⩽ 0.15: **XS518** ⩽ 0.3: **XS530**	
	Recovery	**ms**	⩽ 0.1: **XS506, XS508** and **XS512** ⩽ 0.35: **XS518** ⩽ 0.7: **XS530**	

Inductive proximity sensors

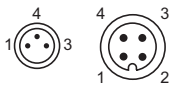
OsiSense XS, general purpose

Cylindrical, standard range, flush mountable
Three-wire DC, solid-state output

Wiring schemes

Connector

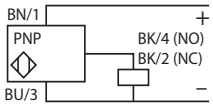
M8 M12



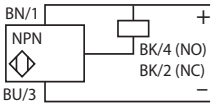
Pre-cabled

BU: Blue
BN: Brown
BK: Black

PNP



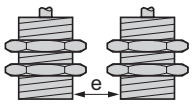
NPN

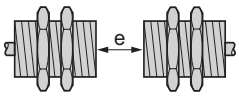


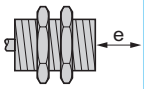
For M8 connector, NO and NC outputs on terminal 4

Setting-up

Minimum mounting distances (mm)

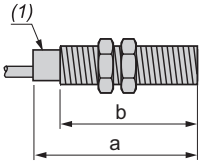






Flush mountable sensors	Side by side	Face to face	Facing a metal object
Ø 6.5	e ⩾ 3	e ⩾ 18	e ⩾ 4.5
Ø 8	e ⩾ 3	e ⩾ 18	e ⩾ 4.5
Ø 12	e ⩾ 4	e ⩾ 24	e ⩾ 6
Ø 18	e ⩾ 10	e ⩾ 60	e ⩾ 15
Ø 30	e ⩾ 20	e ⩾ 120	e ⩾ 30

Dimensions



(1) LED

Sensors		Pre-cabled (mm)		M8 connector (mm)		M12 connector (mm)	
Short case model		a	b	a	b	a	b
Ø 6.5	**XS506B1**	33	–	42	–	45	–
Ø 8	**XS508B1**	33	25	42	26	45	24
Ø 12	**XS512B1**	35	25	–	–	50	30
Ø 18	**XS518B1**	39	28	–	–	50	28
Ø 30	**XS530B1**	43	32	–	–	55	32

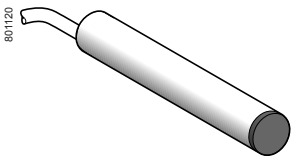
Sensors		Pre-cabled (mm)		M12 connector (mm)	
Long case model		a	b	a	b
Ø 6.5	**XS506BL**	51	–	–	–
Ø 8	**XS508BL**	51	42	62	40
Ø 12	**XS512BL**	53	42	62	42
Ø 18	**XS518BL**	62	52	74	52
Ø 30	**XS530BL**	62	52	74	52

Inductive proximity sensors

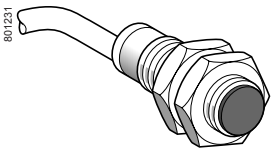
OsiSense XS, general purpose

Cylindrical, standard range, flush mountable

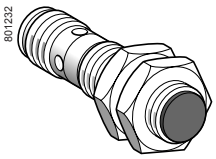
Two-wire DC



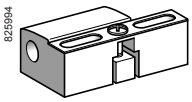
XS506BS●●L2



XS512BS●●L2



XS5●●BS●●M12



XSZB1●●

Sensors, 2-wire ⎓ 12-24 V, short case model

Sensing distance (Sn) mm	Function	Connection	Reference	Weight kg
Ø 6.5, plain				
1.5	NO terminals 1 & 4 *(2)*	Pre-cabled (L = 2 m) *(1)*	**XS506BSCAL2**	0.035
		Remote M12 connector	**XS506BSCAL01M12**	0.050
	NC	Pre-cabled (L = 2 m) *(1)*	**XS506BSCBL2**	0.035
Ø 8, threaded M8 x 1				
1.5	NO terminals 1 & 4 *(2)*	Pre-cabled (L = 2 m) *(1)*	**XS508BSCAL2**	0.035
		Remote M12 connector	**XS508BSCAL01M12**	0.050
		Remote M12 connector	**XS508BSCAL08M12**	0.050
	NC	Pre-cabled (L = 2 m) *(1)*	**XS508BSCBL2**	0.035
		Remote M12 connector	**XS508BSCBL01M12**	0.050
Ø 12, threaded M12 x 1				
2	NO	Pre-cabled (L = 2 m) *(1)*	**XS512BSDAL2**	0.075
		M12 connector	**XS512BSDAM12**	0.035
	NO terminals 1 & 4 *(2)*	M12 connector	**XS512BSCAM12**	0.035
		Remote M12 connector	**XS512BSCAL08M12**	0.060
	NC	Pre-cabled (L = 2 m) *(1)*	**XS512BSDBL2**	0.075
		M12 connector	**XS512BSDBM12**	0.035
Ø 18, threaded M18 x 1				
5	NO	Pre-cabled (L = 2 m) *(1)*	**XS518BSDAL2**	0.120
		M12 connector	**XS518BSDAM12**	0.060
	NO terminals 1 & 4 *(2)*	M12 connector	**XS518BSCAM12**	0.060
		Remote M12 connector	**XS518BSCAL08M12**	0.085
	NC	Pre-cabled (L = 2 m) *(1)*	**XS518BSDBL2**	0.120
		M12 connector	**XS518BSDBM12**	0.060
Ø 30, threaded M30 x 1.5				
10	NO	Pre-cabled (L = 2 m) *(1)*	**XS530BSDAL2**	0.205
		M12 connector	**XS530BSDAM12**	0.145
	NO terminals 1 & 4 *(2)*	M12 connector	**XS530BSCAM12**	0.145
		Remote M12 connector	**XS530BSCAL08M12**	0.170
	NC	Pre-cabled (L = 2 m) *(1)*	**XS530BSDBL2**	0.205
		M12 connector	**XS530BSDBM12**	0.145

Accessories *(3)*

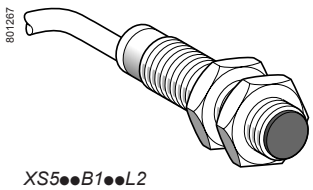
Description	For use with sensors	Reference	Weight kg
Fixing clamps	Ø 6.5 (plain)	**XSZB165**	0.005
	Ø 8	**XSZB108**	0.006
	Ø 12	**XSZB112**	0.006
	Ø 18	**XSZB118**	0.010
	Ø 30	**XSZB130**	0.020

*(1) For a 5 m cable replace L2 by **L5**; for a 10 m cable replace L2 by **L10**.*
*Example: XS508BSCAL2 becomes **XS508BSCAL5** with a 5 m cable.*
(2) The NO output is connected to terminals 1 and 4 of the M12 connector.
(3) For more information, see page 3/116.

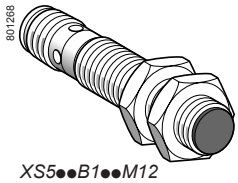
Inductive proximity sensors

OsiSense XS, general purpose

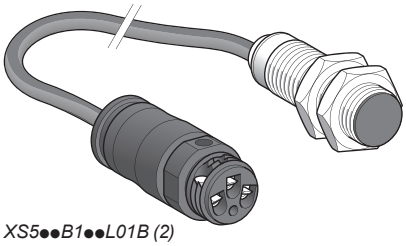
Cylindrical, standard range, flush mountable
Two-wire DC



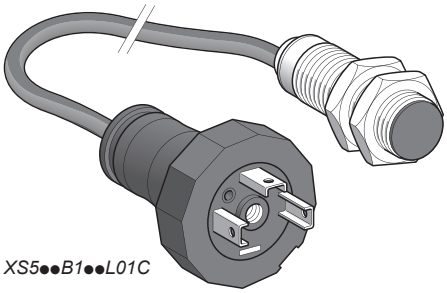
XS5●●B1●●L2



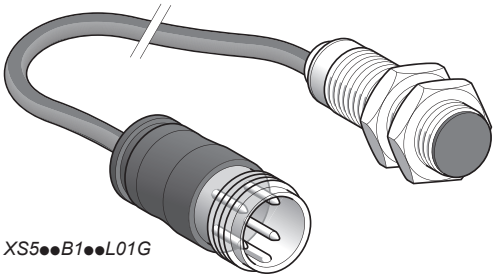
XS5●●B1●●M12



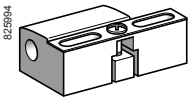
XS5●●B1●●L01B (2)



XS5●●B1●●L01C



XS5●●B1●●L01G



XSZB1●●

Sensors, 2-wire ⎓ 12-48 V, long case model

Sensing distance (Sn) mm	Function	Connection	Reference	Weight kg
Ø 8, threaded M8 x 1				
1.5	NO	Pre-cabled (L = 2 m) *(1)*	**XS508B1DAL2**	0.035
		Remote M12 connector	**XS508B1DAL08M12**	0.050
		M12 connector	**XS508B1DAM12**	0.025
	NO terminals 1 & 4 *(3)*	M12 connector	**XS508B1CAM12**	0.025
		Remote M12 connector	**XS508B1CAL08M12**	0.050
	NC	Pre-cabled (L = 2 m) *(1)*	**XS508B1DBL2**	0.035
		M12 connector	**XS508B1DBM12**	0.025
Ø 12, threaded M12 x 1				
2	NO	Pre-cabled (L = 2 m) *(1)*	**XS512B1DAL2**	0.075
		Remote 7/8" connector	**XS512B1DAL08U78**	0.050
		M12 connector	**XS512B1DAM12**	0.035
	NO terminals 1 & 4 *(3)*	M12 connector	**XS512B1CAM12**	0.035
		Remote M12 connector	**XS512B1CAL08M12**	0.060
	NC	Pre-cabled (L = 2 m) *(1)*	**XS512B1DBL2**	0.075
		M12 connector	**XS512B1DBM12**	0.035
		Remote M12 connector	**XS512B1DBL08M12**	0.060
Ø 18, threaded M18 x 1				
5	NO	Pre-cabled (L = 2 m) *(1)*	**XS518B1DAL2**	0.120
		Low temperature version (-40 °C)	**XS518B1DAL2TF** *(5)*	0.120
		Remote screw terminal connector *(2)*	**XS518B1DAL01B**	0.085
		Remote EN 175301-803-A connector	**XS518B1DAL01C**	0.085
		Remote M18 connector	**XS518B1DAL01G**	0.085
		M12 connector	**XS518B1DAM12**	0.060
	NO terminals 1 & 4 *(3)*	M12 connector	**XS518B1CAM12**	0.060
		Remote M12 connector	**XS518B1CAL08M12**	0.085
	NC	Pre-cabled (L = 2 m) *(1)*	**XS518B1DBL2**	0.120
		M12 connector	**XS518B1DBM12**	0.060
		Remote M12 connector	**XS518B1DBL08M12**	0.085
		Remote screw terminal connector *(2)*	**XS518B1DBL01B**	0.120
Ø 30, threaded M30 x 1.5				
10	NO	Pre-cabled (L = 2 m) *(1)*	**XS530B1DAL2**	0.205
		Low temperature version (-40 °C)	**XS530B1DAL2TF** *(5)*	0.205
		M12 connector	**XS530B1DAM12**	0.145
		Remote screw terminal connector *(2)*	**XS530B1DAL01B**	0.205
		Remote EN 175301-803-A connector	**XS530B1DAL01C**	0.205
		Remote M18 connector	**XS530B1DAL01G**	0.205
	NO terminals 1 & 4 *(3)*	M12 connector	**XS530B1CAM12**	0.145
		Remote M12 connector	**XS530B1CAL08M12**	0.170
	NC	Pre-cabled (L = 2 m) *(1)*	**XS530B1DBL2**	0.205
		M12 connector	**XS530B1DBM12**	0.145
		Remote screw terminal connector *(2)*	**XS530B1DBL01B**	0.205

Accessories *(4)*

Description	For use with sensors	Reference	Weight kg
Fixing clamps	Ø 8	**XSZB108**	0.006
	Ø 12	**XSZB112**	0.006
	Ø 18	**XSZB118**	0.010
	Ø 30	**XSZB130**	0.020

*(1) For a 5 m cable replace L2 by **L5**; for a 10 m cable replace L2 by **L10**.*
*Example: XS508B1DAL2 becomes **XS508B1DAL5** with a 5 m cable.*
(2) Protective cable gland included with sensor.
(3) The NO output is connected to terminals 1 and 4 of the M12 connector.
(4) For more information, see page 3/116.
*(5) For a 5 m cable replace L2 by **L5**.*
Example: *XS518B1DAL2TF becomes **XS518B1DAL5TF** with a 5 m cable.*
For a PUR cable, replace the letter L by P in the reference.
*Example: XS518B1DAL2TF becomes **XS518B1DAP2TF**.*
*For a 5 m PUR cable, replace P2 by **P5**.*
*Example: XS518B1DAP2TF becomes **XS518B1DAP5TF** with a 5 m PUR cable.*

Inductive proximity sensors

OsiSense XS, general purpose

Cylindrical, standard range, flush mountable
Two-wire DC

Characteristics

Sensor type			XS5●●B1●●M12, XS5●●BS●●M12	XS5●●B1D●L2, XS5●●BS●●L2
Product certifications			UL, CSA, CE	
Connection	Connector		M12	–
	Pre-cabled		–	Length: 2 m
	Remote connector		M12 (L01M12), screw terminal (L01B), EN 175301-803-A (L01C) and M18 (L01G) remote connectors on 0.15 m flying lead M12 (L08M12) and 7/8" (L08U78) remote connectors on 0.80 m flying lead	
Operating zone	Ø 6.5	**mm**	**0…1.2**	
	Ø 8	**mm**	**0…1.2**	
	Ø 12	**mm**	**0…1.6**	
	Ø 18	**mm**	**0…4**	
	Ø 30	**mm**	**0…8**	
Differential travel		**%**	1...15 of effective sensing distance (Sr)	
Degree of protection	Conforming to IEC 60529		IP 65 and IP 67	IP 65 and IP 68, double insulation ⧈ (except Ø 6.5 and Ø 8: IP 67)
Storage temperature		**°C**	-40…+85	
Operating temperature		**°C**	-25…+70; TF products: -40…+70	
Materials	Case		Nickel plated brass (except XS506 and XS508B1: stainless steel, grade 303)	
	Sensing face		PPS	
	Cable		–	PvR 2 x 0.34 mm² (except XS506 and XS508: 2 x 0.11 mm²) PUR available *(1)*
Vibration resistance	Conforming to IEC 60068-2-6		25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27		50 gn, duration 11 ms	
Output state indication			Yellow LED: 4 viewing ports at 90°	Yellow LED: annular
Rated supply voltage		**V**	⎓ 12…48 non polarised for XS5●●B1● ⎓ 12…24 non polarised for XS5●●BS (except Ø 6.5 short and Ø 8 short: polarised) with protection against reverse polarity	
Voltage limits (including ripple)		**V**	⎓ 10…58 for XS5●●B1● ⎓ 10…36 for XS5●●BS	
Switching capacity		**mA**	1.5...100 with overload and short-circuit protection	
Voltage drop, closed state		**V**	≤ 4.2	
Residual current, open state		**mA**	≤ 0.5	
Maximum switching frequency	**XS506, XS508**	**Hz**	1000 for XS5●●BS, 1400 for XS5●●B1●	
	XS512	**Hz**	1000	
	XS518	**Hz**	1200	
	XS530	**Hz**	1300	
Delays	First-up	**ms**	≤ 10	
	Response	**ms**	≤ 0.5: **XS506, XS508** and **XS512** ≤ 0.6: **XS518** ≤ 0.6: **XS530**	
	Recovery	**ms**	≤ 0.2 (except **XS530** ≤ 0.4)	

*(1) For PUR cable, replace the letter L in the reference by **P**. Example: XS506BSCAL2 becomes **XS506BSCAP2** with a PUR cable.*

Inductive proximity sensors

OsiSense XS, general purpose

Cylindrical, standard range, flush mountable
Two-wire DC

Wiring schemes

Connector

M12

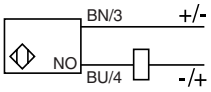
Pre-cabled

BU: Blue
BN: Brown

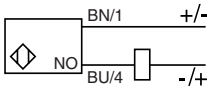
2-wire ⎓ non polarised

NO output

XS5••B•DA•••

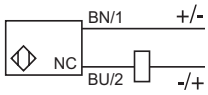


XS5••B1CA•••



NC output

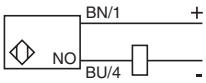
XS5••B•DB•••



2-wire ⎓ polarised

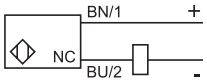
NO output

XS5••BSCA•••



NC output

XS5••BSCB•••

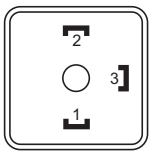


Remote connectors L01B, L01C, L01G

Screw terminal (L01B)

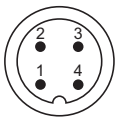
The terminal numbering differs according to the version (2-wire ⎓, 3-wire ⎓, 2-wire ∿).

EN 175301-803-A (L01C)



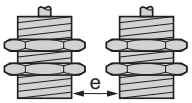
The NO or NC outputs are connected to terminal 2.

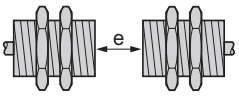
M18 (L01G)

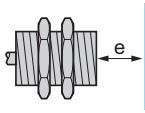


Setting-up

Minimum mounting distances (mm)

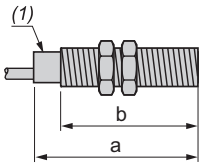






	Side by side	Face to face	Facing a metal object
Ø 6.5	e ⩾ 3	e ⩾ 18	e ⩾ 4.5
Ø 8	e ⩾ 3	e ⩾ 18	e ⩾ 4.5
Ø 12	e ⩾ 4	e ⩾ 24	e ⩾ 6
Ø 18	e ⩾ 10	e ⩾ 60	e ⩾ 15
Ø 30	e ⩾ 20	e ⩾ 120	e ⩾ 30

Dimensions



(1) LED

Sensors		Pre-cabled (mm)		M8 connector (mm)		M12 connector (mm)	
Short case model		**a**	**b**	**a**	**b**	**a**	**b**
Ø 6.5	**XS506BS**	33	–	42	–	45	–
Ø 8	**XS508BS**	33	25	42	26	45	24
Ø 12	**XS512BS**	35	25	–	–	50	30
Ø 18	**XS518BS**	39	28	–	–	50	28
Ø 30	**XS530BS**	43	32	–	–	55	32

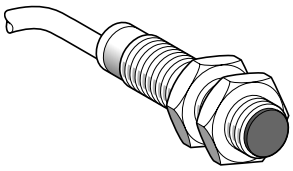
Sensors		Pre-cabled (mm)		M12 connector (mm)	
Long case model		**a**	**b**	**a**	**b**
Ø 8	**XS508B1**	51	42	62	40
Ø 12	**XS512B1**	54	42	61	42
Ø 18	**XS518B1**	56	44	64	44
Ø 30	**XS530B1**	54	41	72	41

Inductive proximity sensors

OsiSense XS, general purpose

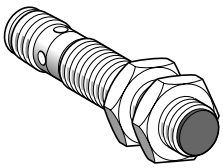
Cylindrical, standard range, flush mountable
Two-wire AC or DC *(1)*

801277



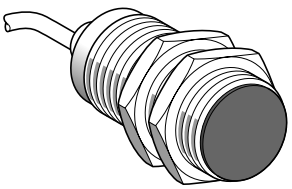
XS5●●B1M●L2

801278



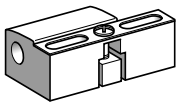
XS5●●B1M●U20

822115



XS530B1●●L2

825994



XSZB1●●

Sensors, 2-wire ∼ 24-240 V, long case model

Ø 12, threaded M12 x 1

Sensing distance (Sn) mm	Function	Connection	Reference	Weight kg
2	NO	Pre-cabled (L = 2 m) *(2)*	**XS512B1MAL2**	0.075
		1/2"-20 UNF connector	**XS512B1MAU20**	0.025
	NC	Pre-cabled (L = 2 m) *(2)*	**XS512B1MBL2**	0.075
		1/2"-20 UNF connector	**XS512B1MBU20**	0.025

Ø 18, threaded M18 x 1

Sensing distance (Sn) mm	Function	Connection	Reference	Weight kg
5	NO	Pre-cabled (L = 2 m) *(2)*	**XS518B1MAL2**	0.100
		1/2"-20 UNF connector	**XS518B1MAU20**	0.060
	NC	Pre-cabled (L = 2 m) *(2)*	**XS518B1MBL2**	0.100
		1/2"-20 UNF connector	**XS518B1MBU20**	0.060

Ø 30, threaded M30 x 1.5

Sensing distance (Sn) mm	Function	Connection	Reference	Weight kg
10	NO	Pre-cabled (L = 2 m) *(2)*	**XS530B1MAL2**	0.205
		1/2"-20 UNF connector	**XS530B1MAU20**	0.145
	NC	Pre-cabled (L = 2 m) *(2)*	**XS530B1MBL2**	0.205
		1/2"-20 UNF connector	**XS530B1MBU20**	0.145

Accessories *(3)*

Description	For use with sensors	Reference	Weight kg
Fixing clamps	Ø 12	**XSZB112**	0.006
	Ø 18	**XSZB118**	0.010
	Ø 30	**XSZB130**	0.020

(1) Ø8 plastic, double insulation version available (see page 3/60).
*(2) For a 5 m cable replace L2 by **L5**; for a 10 m cable replace L2 by **L10**.*
*Example: **XS512B1MAL2** becomes **XS512B1MAL5** with a 5 m cable.*
(3) For more information, see page 3/116.

Inductive proximity sensors

OsiSense XS, general purpose

Cylindrical, standard range, flush mountable
Two-wire AC or DC

Characteristics

Sensor type			XS5●●B1M●U20	XS5●●B1M●L2
Product certifications			UL, CSA, CE	
Connection	Connector		1/2"-20 UNF	–
	Pre-cabled		–	Length: 2 m
Operating zone	Ø 12	**mm**	**0…1.6**	
	Ø 18	**mm**	**0…4**	
	Ø 30	**mm**	**0…8**	
Differential travel		**%**	1...15 of effective sensing distance (Sr)	
Degree of protection	Conforming to IEC 60529		IP 65 and IP 67	IP 65 and IP 68, double insulation ⧈
	Conforming to DIN 40050		IP 69K	
Storage temperature		**°C**	-40…+85	
Operating temperature		**°C**	-25…+70	
Materials	Case		Nickel plated brass	
	Sensing face		PPS	
	Cable		–	PvR 2 x 0.34 mm²
Vibration resistance	Conforming to IEC 60068-2-6		25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27		50 gn, duration 11 ms	
Output state indication			Yellow LED: 4 viewing ports at 90°	Yellow LED: annular
Rated supply voltage		**V**	∿ or ⎓ 24…240 (∿ 50/60 Hz)	
Voltage limits (including ripple)		**V**	∿ or ⎓ 20…264	
Switching capacity	**XS512B1M●●●**	**mA**	5…200 *(1)*	
	XS518B1M●●●, XS530B1M●●●	**mA**	∿ 5…300 or ⎓ 5…200 *(1)*	
Voltage drop, closed state		**V**	≤ 5.5	
Residual current, open state		**mA**	≤ 0.8	
Maximum switching frequency	**XS512B1●●●, XS518B1M●●●**	**Hz**	∿ 25 or ⎓ 1000	
	XS530B1M●●●	**Hz**	∿ 25 or ⎓ 500	
Delays	First-up	**ms**	≤ 20 **XS512B1M●●●** ≤ 25 **XS518B1M●●●** and **XS530B1M●●●**	
	Response	**ms**	≤ 0.5	
	Recovery	**ms**	≤ 0.2 **XS512B1M●●●** ≤ 0.5 **XS518B1M●●●** ≤ 2 **XS518B1M●●●**	

(1) It is essential to connect a 0.4 A "quick-blow" fuse in series with the load.

Wiring schemes

Connector

1/2"-20 UNF

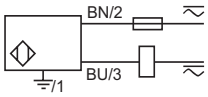
∿: 2
⏚: 1
∿: 3

Pre-cabled

BU: Blue
BN: Brown

2-wire ∿ or ⎓

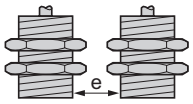
NO or NC output

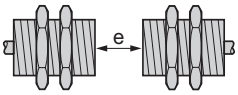


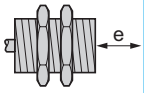
⏚: on connector models only

Setting-up

Minimum mounting distances (mm)

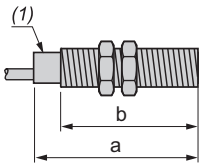






Sensor	Side by side	Face to face	Facing a metal object
Ø 12	e ≥ 8	e ≥ 48	e ≥ 12
Ø 18	e ≥ 16	e ≥ 100	e ≥ 25
Ø 30	e ≥ 30	e ≥ 180	e ≥ 45

Dimensions



(1) LED

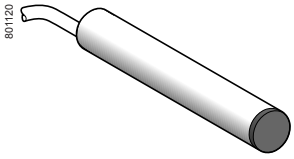
XS6

Sensor	Pre-cabled (mm) a	Pre-cabled (mm) b	Connector (mm) a	Connector (mm) b
XS512B1M	53	42	62	42
XS518B1M	62	52	73	52
XS530B1M	62	52	73	52

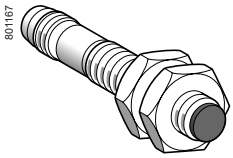
Inductive proximity sensors

OsiSense XS, general purpose

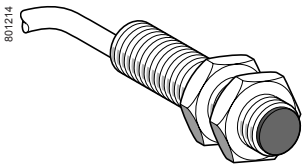
Cylindrical, increased range, flush mountable
Three-wire DC, solid-state output



XS106B3●●L2



XS108B3●●M8



XS112B3●●L2

Sensors, 3-wire ⎓ 12-24 V, short case model

Sensing distance (Sn) mm	Function	Output	Connection	Sold in lots of	Unit reference	Weight kg
Ø 6.5, plain						
2.5	NO	PNP	Pre-cabled (L = 2 m) *(1)*	1	**XS106B3PAL2**	0.060
			M8 connector	1	**XS106B3PAM8**	0.030
			M12 connector	1	**XS106B3PAM12**	0.050
			Pre-cabled (L = 2 m)	20	**XS106B3PAL2TQ**	0.980
			M8 connector	20	**XS106B3PAM8TQ**	0.320
		NPN	Pre-cabled (L = 2 m)	1	**XS106B3NAL2**	0.060
			M8 connector	1	**XS106B3NAM8**	0.030
	NC	PNP	Pre-cabled (L = 2 m) *(1)*	1	**XS106B3PBL2**	0.060
			M8 connector	1	**XS106B3PBM8**	0.030
		NPN	Pre-cabled (L = 2 m) *(1)*	1	**XS106B3NBL2**	0.060
			M8 connector	1	**XS106B3NBM8**	0.030
Ø 8, threaded M8 x 1						
2.5	NO	PNP	Pre-cabled (L = 2 m) *(1)*	1	**XS108B3PAL2**	0.070
			M8 connector	1	**XS108B3PAM8**	0.030
			M12 connector	1	**XS108B3PAM12**	0.060
			Pre-cabled (L = 2 m)	20	**XS108B3PAL2TQ**	1.120
			M8 connector	20	**XS108B3PAM8TQ**	0.460
			M12 connector	20	**XS108B3PAM12TQ**	0.940
		NPN	Pre-cabled (L = 2 m) *(1)*	1	**XS108B3NAL2**	0.070
			M8 connector	1	**XS108B3NAM8**	0.030
			M12 connector	1	**XS108B3NAM12**	0.060
			Pre-cabled (L = 2 m)	20	**XS108B3NAL2TQ**	1.120
			M8 connector	20	**XS108B3NAM8TQ**	0.460
	NC	PNP	Pre-cabled (L = 2 m) *(1)*	1	**XS108B3PBL2**	0.070
			M8 connector	1	**XS108B3PBM8**	0.030
			M12 connector	1	**XS108B3PBM12**	0.060
		NPN	Pre-cabled (L = 2 m) *(1)*	1	**XS108B3NBL2**	0.070
			M8 connector	1	**XS108B3NBM8**	0.030
			M12 connector	1	**XS108B3NBM12**	0.060
Ø 12, threaded M12 x 1						
4	NO	PNP	Pre-cabled (L = 2 m) *(1)*	1	**XS112B3PAL2**	0.090
			M12 connector	1	**XS112B3PAM12**	0.030
			Pre-cabled (L = 2 m)	20	**XS112B3PAL2TQ**	1.600
			M12 connector	20	**XS112B3PAM12TQ**	0.470
		NPN	Pre-cabled (L = 2 m) *(1)*	1	**XS112B3NAL2**	0.090
			M12 connector	1	**XS112B3NAM12**	0.030
			Pre-cabled (L = 2 m)	20	**XS112B3NAL2TQ**	1.600
			M12 connector	20	**XS112B3NAM12TQ**	0.470
	NC	PNP	Pre-cabled (L = 2 m) *(1)*	1	**XS112B3PBL2**	0.090
			M12 connector	1	**XS112B3PBM12**	0.030
			M12 connector	20	**XS112B3PBM12TQ**	0.470
		NPN	Pre-cabled (L = 2 m) *(1)*	1	**XS112B3NBL2**	0.090
			M12 connector	1	**XS112B3NBM12**	0.030

*(1) For a 5 m long cable replace L2 by **L5**.*
*Example: XS106B3PAL2 becomes **XS106B3PAL5** with a 5 m cable.*

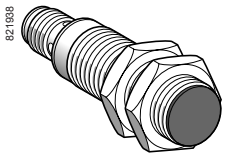
Characteristics: page 3/37
Dimensions: page 3/37
Connections: page 3/37
Setting-up: page 3/37

Telemecanique Sensors

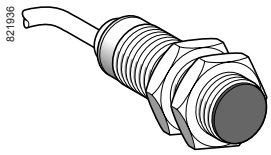
Inductive proximity sensors

OsiSense XS, general purpose

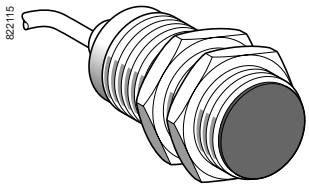
Cylindrical, increased range, flush mountable
Three-wire DC, solid-state output



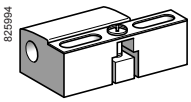
XS118B3●●M12



XS118B3●●L2



XS130B3●●L2



XSZB1●●

Sensors, 3-wire ⎓ 12-24 V, short case model *(continued)*

Sensing distance (Sn) mm	Function	Output	Connection	Sold in lots of	Unit reference	Weight kg
Ø 18, threaded M18 x 1						
8	NO	PNP	Pre-cabled (L = 2 m) *(1)*	1	**XS118B3PAL2**	0.110
			M12 connector	1	**XS118B3PAM12**	0.060
			Pre-cabled (L = 2 m)	20	**XS118B3PAL2TQ**	2.000
			M12 connector	20	**XS118B3PAM12TQ**	1.140
		NPN	Pre-cabled (L = 2 m) *(1)*	1	**XS118B3NAL2**	0.110
			M12 connector	1	**XS118B3NAM12**	0.060
			Pre-cabled (L = 2 m)	20	**XS118B3NAL2TQ**	2.000
			M12 connector	20	**XS118B3NAM12TQ**	1.140
	NC	PNP	Pre-cabled (L = 2 m) *(1)*	1	**XS118B3PBL2**	0.110
			M12 connector	1	**XS118B3PBM12**	0.060
		NPN	Pre-cabled (L = 2 m) *(1)*	1	**XS118B3NBL2**	0.110
			M12 connector	1	**XS118B3NBM12**	0.060
Ø 30, threaded M30 x 1.5						
15	NO	PNP	Pre-cabled (L = 2 m) *(1)*	1	**XS130B3PAL2**	0.180
			M12 connector	1	**XS130B3PAM12**	0.130
			Pre-cabled (L = 2 m)	20	**XS130B3PAL2TQ**	3.360
			M12 connector	20	**XS130B3PAM12TQ**	2.000
		NPN	Pre-cabled (L = 2 m) *(1)*	1	**XS130B3NAL2**	0.180
			M12 connector	1	**XS130B3NAM12**	0.130
			M12 connector	20	**XS130B3NAM12TQ**	2.000
	NC	PNP	Pre-cabled (L = 2 m) *(1)*	1	**XS130B3PBL2**	0.180
			M12 connector	1	**XS130B3PBM12**	0.130
		NPN	Pre-cabled (L = 2 m) *(1)*	1	**XS130B3NBL2**	0.180
			M12 connector	1	**XS130B3NBM12**	0.130

Accessories *(2)*

Description	For use with sensors	Reference	Weight kg
Fixing clamps	Ø 6.5 (plain)	**XSZB165**	0.005
	Ø 8 (M8 x1)	**XSZB108**	0.006
	Ø 12 (M12 x1)	**XSZB112**	0.006
	Ø 18 (M18 x1)	**XSZB118**	0.010
	Ø 30 (M30 x 1.5)	**XSZB130**	0.020

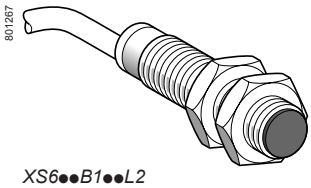
*(1) For a 5 m cable, replace L2 by **L5**.*
*Example: XS118B3PAL2 becomes **XS118B3PAL5** with a 5 m cable.*
(2) For more information, see page 3/116.

Characteristics: page 3/37
Dimensions: page 3/37
Connections: page 3/37
Setting-up: page 3/37

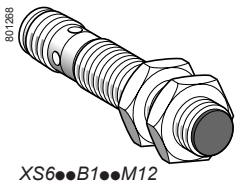
Inductive proximity sensors

OsiSense XS, general purpose

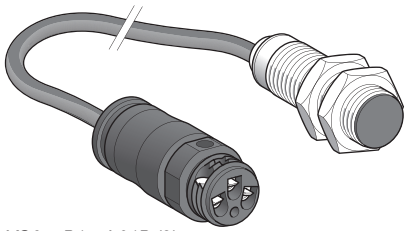
Cylindrical, increased range, flush mountable
Three-wire DC, solid-state output



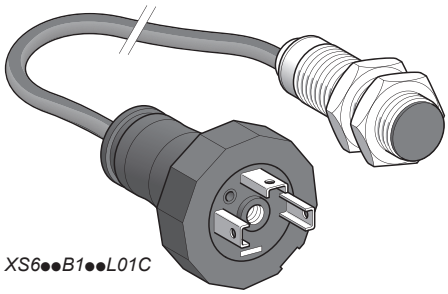
XS6●●B1●●L2



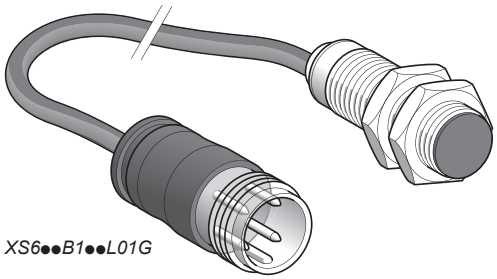
XS6●●B1●●M12



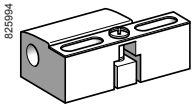
XS6●●B1●●L01B (2)



XS6●●B1●●L01C



XS6●●B1●●L01G



XSZB●●●

Sensors, 3-wire ⎓ 12-48 V, long case model

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
Ø 8, threaded M8 x 1					
2.5	NO	PNP	Pre-cabled (L = 2 m) *(1)*	**XS608B1PAL2**	0.035
			M12 connector	**XS608B1PAM12**	0.015
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS608B1NAL2**	0.035
			M12 connector	**XS608B1NAM12**	0.015
	NC	PNP	Pre-cabled (L = 2 m) *(1)*	**XS608B1PBL2**	0.035
			M12 connector	**XS608B1PBM12**	0.015
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS608B1NBL2**	0.035
			M12 connector	**XS608B1NBM12**	0.015
Ø 12, threaded M12 x 1					
4	NO	PNP	Pre-cabled (L = 2 m) *(1)*	**XS612B1PAL2**	0.075
			M12 connector	**XS612B1PAM12**	0.020
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS612B1NAL2**	0.075
			M12 connector	**XS612B1NAM12**	0.020
	NC	PNP	Pre-cabled (L = 2 m) *(1)*	**XS612B1PBL2**	0.075
			M12 connector	**XS612B1PBM12**	0.020
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS612B1NBL2**	0.075
			M12 connector	**XS612B1NBM12**	0.020
Ø 18, threaded M18 x 1					
8	NO	PNP	Pre-cabled (L = 2 m) *(1)*	**XS618B1PAL2**	0.100
			M12 connector	**XS618B1PAM12**	0.040
			Remote screw terminal connector	**XS618B1PAL01B** *(2)*	0.100
			Remote EN 175301-803-A connector	**XS618B1PAL01C**	0.100
			Remote M18 connector	**XS618B1PAL01G**	0.100
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS618B1NAL2**	0.100
			M12 connector	**XS618B1NAM12**	0.040
			Remote screw terminal connector	**XS618B1NAL01B** *(2)*	0.100
			Remote EN 175301-803-A connector	**XS618B1NAL01C**	0.100
	NC	PNP	Pre-cabled (L = 2 m) *(1)*	**XS618B1PBL2**	0.100
			M12 connector	**XS618B1PBM12**	0.040
			Remote screw terminal connector	**XS618B1PBL01B** *(2)*	0.100
			Remote EN 175301-803-A connector	**XS618B1PBL01C**	0.100
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS618B1NBL2**	0.100
			M12 connector	**XS618B1NBM12**	0.040
			Remote screw terminal connector	**XS618B1NBL01B** *(2)*	0.100
			Remote EN 175301-803-A connector	**XS618B1NBL01C**	0.100
Ø 30, threaded M30 x 1.5					
15	NO	PNP	Pre-cabled (L = 2 m) *(1)*	**XS630B1PAL2**	0.205
			M12 connector	**XS630B1PAM12**	0.145
			Remote screw terminal connector	**XS630B1PAL01B** *(2)*	0.205
			Remote EN 175301-803-A connector	**XS630B1PAL01C**	0.205
			Remote M18 connector	**XS630B1PAL01G**	0.205
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS630B1NAL2**	0.205
			M12 connector	**XS630B1NAM12**	0.145
			Remote screw terminal connector	**XS630B1NAL01B** *(2)*	0.205
			Remote EN 175301-803-A connector	**XS630B1NAL01C**	0.205
	NC	PNP	Pre-cabled (L = 2 m) *(1)*	**XS630B1PBL2**	0.205
			M12 connector	**XS630B1PBM12**	0.145
			Remote screw terminal connector	**XS630B1PBL01B** *(2)*	0.205
			Remote EN 175301-803-A connector	**XS630B1PBL01C**	0.205
			Remote M18 connector	**XS630B1PBL01G**	0.205
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS630B1NBL2**	0.205
			M12 connector	**XS630B1NBM12**	0.145
			Remote screw terminal connector	**XS630B1NBL01B** *(2)*	0.205
			Remote EN 175301-803-A connector	**XS630B1NBL01C**	0.205

Accessories *(3)*

Description	For use with sensors	Reference	Weight kg
Fixing clamps	Ø 8	**XSZB108**	0.006
	Ø 12	**XSZB112**	0.006
	Ø 18	**XSZB118**	0.010
	Ø 30	**XSZB130**	0.020

*(1) For a 5 m long cable replace L2 by **L5**; for a 10 m long cable replace L2 by **L10**.*
*Example: XS608B1PAL2 becomes **XS608B1PAL5** with a 5 m cable.*
(2) Protective cable gland included with sensor.
(3) For more information, see page 3/116.

Inductive proximity sensors

OsiSense XS, general purpose

Cylindrical, increased range, flush mountable
Three-wire DC, solid-state output

Characteristics

Sensor type			XS1/XS6●●B●●●M8	XS1/XS6●●B●●●M12	XS1/XS6●●B●●●L2
Product certifications			UL, CSA, CE, E2		
Connection	Connector		M8	M12	–
	Pre-cabled		–	–	Length 2 m
	Remote connector		Screw terminal (L01B), EN 175301-803-A (L01C) and M18 (L01G) remote connectors on 0.15 m flying lead		
Operating zone *(1)*	Ø 6.5 and Ø 8	**mm**	**0… 2**		
	Ø 12	**mm**	**0…3.2**		
	Ø 18	**mm**	**0…6.4**		
	Ø 30	**mm**	**0…12**		
Differential travel		**%**	1...15 of effective sensing distance (Sr)		
Degree of protection	Conforming to IEC 60529		IP 65 and IP 67		IP 65 and IP 68, double insulation ⧈ except Ø 6.5 and Ø 8: IP 67
	Conforming to DIN 40050		IP 69K for Ø 12, 18 and 30 sensors		
Storage temperature		**°C**	-40…+85		
Operating temperature		**°C**	-25…+70		
Materials	Case		Nickel plated brass (except XS608: stainless steel, grade 303)		
	Sensing face		PPS		
	Cable		–		PvR 3 x 0.34 mm² except Ø 6.5 and 8: 3 x 0.11 mm²
Vibration resistance	Conforming to IEC 60068-2-6		25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)		
Shock resistance	Conforming to IEC 60068-2-27		50 gn, duration 11 ms		
Output state indication			Yellow LED, 4 viewing ports at 90°		Yellow LED, annular
Rated supply voltage		**V**	**XS1**: ⎓ 12…24 with protection against reverse polarity **XS6**: ⎓ 12…48 with protection against reverse polarity		
Voltage limits (including ripple)		**V**	**XS1:** ⎓ 10…36; **XS6:** ⎓ 10…58		
Switching capacity		**mA**	≤ 200 with overload and short-circuit protection		
Voltage drop, closed state		**V**	≤ 2		
Current consumption, no-load		**mA**	≤ 10		
Maximum switching frequency	Ø 6.5, Ø 8 and Ø 12	**Hz**	2500		
	Ø 18	**Hz**	1000		
	Ø 30	**Hz**	500		
Delays	First-up	**ms**	≤ 10		
	Response	**ms**	≤ 0.2 for Ø 6.5, Ø 8 and Ø 12, ≤ 0.3 for Ø 18, ≤ 0.6 for Ø 30		
	Recovery	**ms**	≤ 0.2 for Ø 6.5, Ø 8 and Ø 12, ≤ 0.7 for Ø 18, ≤ 1.4 for Ø 30		

(1) Detection curves, see page 3/120.

Wiring schemes

Connector *(1)*

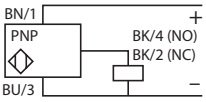
M8

M12

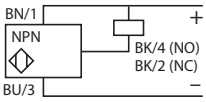
Pre-cabled

BU: Blue
BN: Brown
BK: Black

PNP



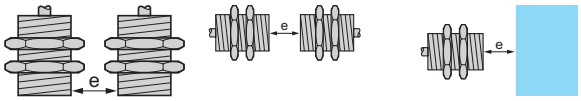
NPN



For M8 connector, NO and NC outputs on terminal 4

Setting-up

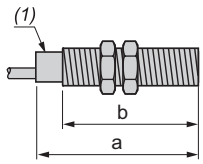
Minimum mounting distances (mm)



Sensors	Side by side	Face to face	Facing a metal object
Ø 6.5	e ≥ 5	e ≥ 30	e ≥ 8
Ø 8	e ≥ 5	e ≥ 30	e ≥ 8
Ø 12	e ≥ 8	e ≥ 50	e ≥ 12
Ø 18	e ≥ 16	e ≥ 100	e ≥ 25
Ø 30	e ≥ 30	e ≥ 180	e ≥ 45

(1) For pin arrangement of remote connectors L01B, L01C and L01G, see page 3/31.

Dimensions

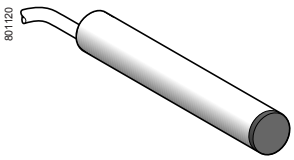


(1) LED

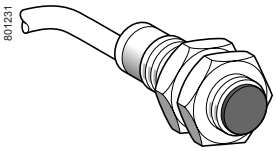
Sensors		Pre-cabled (mm)		M8 connector (mm)		M12 connector (mm)	
Short case model		**a**	**b**	**a**	**b**	**a**	**b**
Ø 6.5	**XS106B3**	33	–	42	–	45	–
Ø 8	**XS108B3**	33	25	42	26	45	24
Ø 12	**XS112B3**	35	25	–	–	50	30
Ø 18	**XS118B3**	39	28	–	–	50	28
Ø 30	**XS130B3**	43	32	–	–	55	32

Sensors		Pre-cabled (mm)		M12 connector (mm)	
Long case model		**a**	**b**	**a**	**b**
Ø 8	**XS608B1**	51	42	62	40
Ø 12	**XS612B1**	53	42	62	42
Ø 18	**XS618B1**	62	52	74	52
Ø 30	**XS630B1**	62	52	74	52

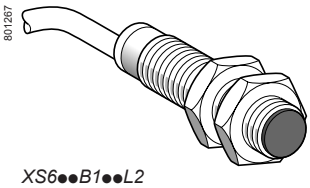
Inductive proximity sensors
OsiSense XS, general purpose
Cylindrical, increased range, flush mountable
Two-wire DC, solid-state output



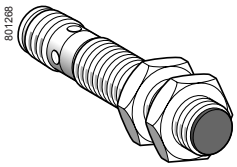
XS606B3●●L2



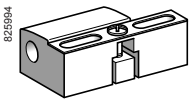
XS612B3●●L2



XS6●●B1●●L2



XS6●●B1●●M12



XSZB1●●

Sensors, 2-wire ⎓ 12-24 V, short case model

Sensing distance (Sn) mm	Function	Connection	Reference	Weight kg
Ø 6.5, plain				
2.5	NO	Pre-cabled (L = 2 m) *(1)*	**XS606B3CAL2**	0.060
		Remote M12 connector	**XS606B3CAL01M12**	0.070
	NC	Pre-cabled (L = 2 m) *(1)*	**XS606B3CBL2**	0.060
Ø 8, threaded M8 x 1				
2.5	NO	Pre-cabled (L = 2 m) *(1)*	**XS608B3CAL2**	0.070
		Remote M12 connector	**XS608B3CAL01M12**	0.070
	NC	Pre-cabled (L = 2 m) *(1)*	**XS608B3CBL2**	0.070
		Remote M12 connector	**XS608B3CBL01M12**	0.070
Ø 12, threaded M12 x 1				
4	NO	Pre-cabled (L = 2 m) *(1)*	**XS612B3DAL2**	0.090
		M12 connector	**XS612B3DAM12**	0.030
	NC	Pre-cabled (L = 2 m) *(1)*	**XS612B3DBL2**	0.090
		M12 connector	**XS612B3DBM12**	0.030
Ø 18, threaded M18 x 1				
8	NO	Pre-cabled (L = 2 m) *(1)*	**XS618B3DAL2**	0.110
		M12 connector	**XS618B3DAM12**	0.060
	NC	Pre-cabled (L = 2 m) *(1)*	**XS618B3DBL2**	0.110
		M12 connector	**XS618B3DBM12**	0.060
Ø 30, threaded M30 x 1.5				
15	NO	Pre-cabled (L = 2 m) *(1)*	**XS630B3DAL2**	0.180
		M12 connector	**XS630B3DAM12**	0.130
	NC	Pre-cabled (L = 2 m) *(1)*	**XS630B3DBL2**	0.180
		M12 connector	**XS630B3DBM12**	0.180

Sensors, 2-wire ⎓ 12-48 V, long case model

Sensing distance (Sn) mm	Function	Connection	Reference	Weight kg
Ø 6.5, plain				
2.5	NO	Pre-cabled (L = 2 m) *(1)*	**XS606B1DAL2**	0.060
	NC	Pre-cabled (L = 2 m) *(1)*	**XS606B1DBL2**	0.060
Ø 8, threaded M8 x 1				
2.5	NO	Pre-cabled (L = 2 m) *(1)*	**XS608B1DAL2**	0.035
		M12 connector	**XS608B1DAM12**	0.015
	NC	Pre-cabled (L = 2 m) *(1)*	**XS608B1DBL2**	0.035
		M12 connector	**XS608B1DBM12**	0.015
Ø 12, threaded M12 x 1				
4	NO	Pre-cabled (L = 2 m) *(1)*	**XS612B1DAL2**	0.180
		M12 connector	**XS612B1DAM12**	0.020
	NC	Pre-cabled (L = 2 m) *(1)*	**XS612B1DBL2**	0.075
		M12 connector	**XS612B1DBM12**	0.020
Ø 18, threaded M18 x 1				
8	NO	Pre-cabled (L = 2 m) *(1)*	**XS618B1DAL2**	0.100
		M12 connector	**XS618B1DAM12**	0.040
	NC	Pre-cabled (L = 2 m) *(1)*	**XS618B1DBL2**	0.100
		M12 connector	**XS618B1DBM12**	0.040
Ø 30, threaded M30 x 1.5				
15	NO	Pre-cabled (L = 2 m) *(1)*	**XS630B1DAL2**	0.205
		M12 connector	**XS630B1DAM12**	0.145
	NC	Pre-cabled (L = 2 m) *(1)*	**XS630B1DBL2**	0.205
		M12 connector	**XS630B1DBM12**	0.145

Accessories *(2)*

Description	For use with sensors	Reference	Weight kg
Fixing clamps	Ø 6.5 (plain)	**XSZB165**	0.005
	Ø 8 (M8 x1)	**XSZB108**	0.006
	Ø 12 (M12 x1)	**XSZB112**	0.006
	Ø 18 (M18 x1)	**XSZB118**	0.010
	Ø 30 (M30 x 1.5)	**XSZB130**	0.020

*(1) For a 5 m cable, replace L2 by **L5**.*
*Example: XS606B3CAL2 becomes **XS606B3CAL5** with a 5 m cable.*
(2) For more information, see page 3/116.

Inductive proximity sensors
OsiSense XS, general purpose
Cylindrical, increased range, flush mountable
Two-wire DC, solid-state output

Characteristics

Sensor type			XS6●●B3●●M12 XS6●●B1D●M12	XS6●●B3●●L2 XS6●●B1D●L2
Product certifications			UL, CSA, CE	
Connection	Connector		M12 or remote M12 connector (L01M12) on 0.15 m flying lead	
	Pre-cabled		Length 2 m	
Operating zone *(1)*	Ø 6.5 and Ø 8	mm	**0… 2**	
	Ø 12	mm	**0…3.2**	
	Ø 18	mm	**0…6.4**	
	Ø 30	mm	**0…12**	
Differential travel		%	1...15 of effective sensing distance (Sr)	
Degree of protection	Conforming to IEC 60529		IP 65 and IP 67	IP 65 and IP 68, double insulation ⧈ (except Ø 6.5 and Ø 8: IP 67)
	Conforming to DIN 40050		IP 69K	
Storage temperature		°C	-40…+85	
Operating temperature		°C	-25…+70	
Materials	Case		Nickel plated brass (except XS606B1D or XS608B1D: stainless steel, grade 303)	
	Sensing face		PPS	
	Cable		PvR 2 x 0.34 mm² except Ø 6.5 and Ø 8: 2 x 0.11 mm²	
Vibration resistance	Conforming to IEC 60068-2-6		25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27		50 gn, duration 11 ms	
Output state indication			Yellow LED, 4 viewing ports at 90°	
Rated supply voltage		V	⎓ 12…48 non polarised for XS6●●B1D ⎓ 12…24 non polarised for XS6●●B3● (except Ø 6.5 short and Ø 8 short: polarised), with protection against reverse polarity	
Voltage limits (including ripple)		V	⎓ 10…58 for XS6●●B1D ⎓ 10…36 for XS6●●B3●	
Switching capacity		mA	≤ 100 with overload and short-circuit protection	
Voltage drop, closed state		V	≤ 4.2	
Residual current, open state		mA	≤ 0.5 mA	
Maximum switching frequency	Ø 6.5, Ø 8	Hz	1400 for XS6●●B1D, 1100 for XS6●●B3●	
	Ø 12	Hz	1300	
	Ø 18	Hz	1500	
	Ø 30	Hz	800	
Delays	First-up	ms	≤ 10	
	Response	ms	≤ 0.5	
	Recovery	ms	≤ 0.2 for Ø 6.5, Ø 8 and Ø 12; 0.3 for Ø 18; 0.6 for Ø 30	

(1) Detection curves, see page 3/120.

Wiring schemes

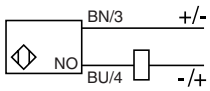
M12 connector

Pre-cabled

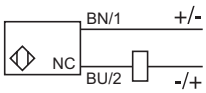
BU: Blue
BN: Brown

2-wire ⎓ non polarised

NO output

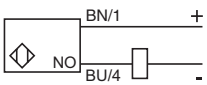


NC output

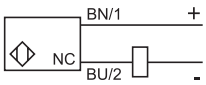


2-wire ⎓ polarised

XS6●●B3CA

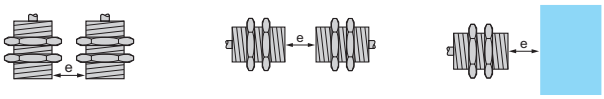


XS6●●B3CB



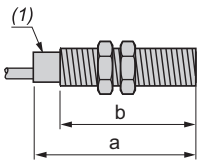
Setting-up

Minimum mounting distances (mm)



Sensors	Side by side	Face to face	Facing a metal object
Ø 6.5	e ≥ 5	e ≥ 30	e ≥ 8
Ø 8	e ≥ 5	e ≥ 30	e ≥ 8
Ø 12	e ≥ 8	e ≥ 50	e ≥ 12
Ø 18	e ≥ 16	e ≥ 100	e ≥ 25
Ø 30	e ≥ 30	e ≥ 180	e ≥ 45

Dimensions



(1) LED

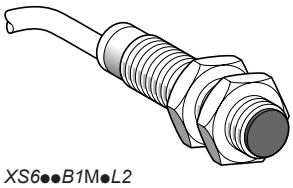
Sensors		Pre-cabled (mm)		M12 connector (mm)	
Short case model		**a**	**b**	**a**	**b**
Ø 6.5	**XS606B3C**	33	–	–	–
Ø 8	**XS608B3C**	33	25	–	24
Ø 12	**XS612B3D**	35	25	50	30
Ø 18	**XS618B3D**	40	28	50	28
Ø 30	**XS630B3D**	44	32	55	32
Long case model		**a**	**b**	**a**	**b**
Ø 6.5	**XS606B1D**	51	–	–	–
Ø 8	**XS608B1D**	51	42	62	40
Ø 12	**XS612B1D**	53	42	61	42
Ø 18	**XS618B1D**	62	52	74	52
Ø 30	**XS630B1D**	62	52	74	52

Inductive proximity sensors

OsiSense XS, general purpose

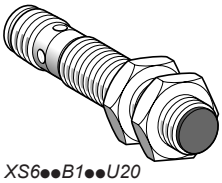
Cylindrical, increased range, flush mountable
Two-wire AC or DC *(1)*

801267

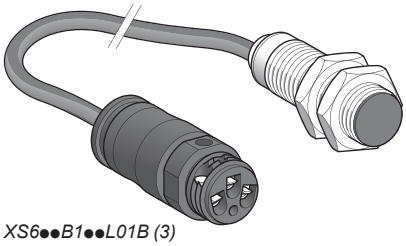


XS6●●B1M●L2

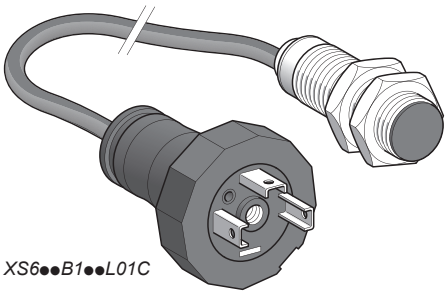
801268



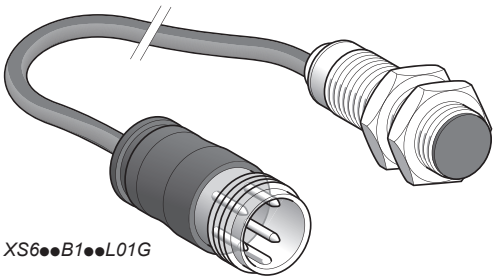
XS6●●B1●●U20



XS6●●B1●●L01B (3)

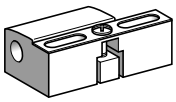


XS6●●B1●●L01C



XS6●●B1●●L01G

826994



XSZB1●●

Sensors, 2-wire ≂ 24-240 V, long case model

Sensing distance (Sn) mm	Function	Connection	Reference	Weight kg
Ø 12, threaded M12 x 1				
4	NO	Pre-cabled (L = 2 m) *(2)*	**XS612B1MAL2**	0.075
		1/2"-20 UNF connector	**XS612B1MAU20**	0.025
	NC	Pre-cabled (L = 2 m) *(2)*	**XS612B1MBL2**	0.075
		1/2"-20 UNF connector	**XS612B1MBU20**	0.025
Ø 18, threaded M18 x 1				
8	NO	Pre-cabled (L = 2 m) *(2)*	**XS618B1MAL2**	0.100
		1/2"-20 UNF connector	**XS618B1MAU20**	0.060
		Remote screw terminal connector	**XS618B1MAL01B** *(3)*	0.100
		Remote EN 175301-803-A connector	**XS618B1MAL01C**	0.100
		Remote M18 connector	**XS618B1MAL01G**	0.100
	NC	Pre-cabled (L = 2 m) *(2)*	**XS618B1MBL2**	0.100
		1/2"-20 UNF connector	**XS618B1MBU20**	0.060
		Remote screw terminal connector	**XS618B1MBL01B** *(3)*	0.100
		Remote EN 175301-803-A connector	**XS618B1MBL01C**	0.100
		Remote M18 connector	**XS618B1MBL01G**	0.100
Ø 30, threaded M30 x 1.5				
15	NO	Pre-cabled (L = 2 m) *(2)*	**XS630B1MAL2**	0.205
		1/2"-20 UNF connector	**XS630B1MAU20**	0.145
		Remote screw terminal connector	**XS630B1MAL01B** *(3)*	0.205
		Remote EN 175301-803-A connector	**XS630B1MAL01C**	0.205
		Remote M18 connector	**XS630B1MAL01G**	0.205
	NC	Pre-cabled (L = 2 m) *(2)*	**XS630B1MBL2**	0.205
		1/2"-20 UNF connector	**XS630B1MBU20**	0.145
		Remote screw terminal connector	**XS630B1MBL01B** *(3)*	0.205
		Remote EN 175301-803-A connector	**XS630B1MBL01C**	0.205
		Remote M18 connector	**XS630B1MBL01G**	0.205

Accessories *(4)*

Description	For use with sensors	Reference	Weight kg
Fixing clamps	Ø 12	**XSZB112**	0.006
	Ø 18	**XSZB118**	0.010
	Ø 30	**XSZB130**	0.020

(1) Ø8 plastic, double insulation version available (see page 3/60).
*(2) For a 5 m cable replace L2 by **L5**; for a 10 m cable replace L2 by **L10**.*
*Example: XS612B1MAL2 becomes **XS612B1MAL5** with a 5 m cable.*
(3) Protective cable gland included with sensor.
(4) For more information, see page 3/116.

Inductive proximity sensors

OsiSense XS, general purpose

Cylindrical, increased range, flush mountable
Two-wire AC or DC

Characteristics

Sensor type			XS6●●B1M●U20	XS6●●B1M●L●
Product certifications			UL, CSA, CE	
Connection	Connector		1/2" - 20 UNF	–
	Pre-cabled		–	Length 2 m
	Remote connector		Screw terminal (L01B), EN 175301-803-A (L01C) and M18 (L01G) remote connectors on 0.15 m flying lead	
Operating zone *(1)*	Ø 12	mm	**0… 3.2**	
	Ø 18	mm	**0… 6.4**	
	Ø 30	mm	**0…12**	
Differential travel		%	1...15 of effective sensing distance (Sr)	
Degree of protection	Conforming to IEC 60529		IP 65, IP 67	IP 65 and IP 68, double insulation ⧈
	Conforming to DIN 40050		IP 69K	
Storage temperature		°C	-40…+85	
Operating temperature		°C	-25…+70	
Materials	Case		Nickel plated brass	
	Sensing face		PPS	
	Cable		PvR 2 x 0.34 mm²	
Vibration resistance	Conforming to IEC 60068-2-6		25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27		50 gn, duration 11 ms	
Output state indication			Yellow LED: annular on pre-cabled version Yellow LED with 4 viewing ports at 90° on connector version	
Rated supply voltage		V	≂ 24…240 (~ 50/60 Hz)	
Voltage limits (including ripple)		V	≂ 20…264	
Switching capacity	**XS612B1M●●●**	mA	5…200 *(2)*	
	XS618B1M●●● **XS630B1M●●●**	mA	∼ 5…300 or ⎓ 5…200 *(2)*	
Voltage drop, closed state		V	≤ 5.5	
Residual current, open state		mA	≤ 0.8	
Maximum switching frequency (DC/AC)	Ø 12	Hz	⎓ 1000 / ∼ 25	
	Ø 18	Hz	⎓ 1000 / ∼ 25	
	Ø 30	Hz	⎓ 500 / ∼ 25	
Delays	First-up	ms	≤ 25 for Ø 18 and Ø 30; ≤ 20 for Ø 12	
	Response	ms	≤ 0.5	
	Recovery	ms	≤ 0.2 for Ø 12; ≤ 0.5 for Ø 18; ≤ 2 for Ø 30	

(1) Detection curves, see page 3/120.
(2) It is essential to connect a 0.4 A "quick-blow" fuse in series with the load.

Wiring schemes

Connector *(1)*

1/2"-20 UNF

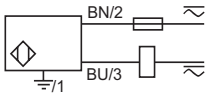
≂: 2
⏚: 1
≂: 3

Pre-cabled

BU: Blue
BN: Brown

2-wire ∼ or ⎓

NO or NC output

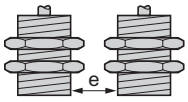


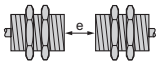
⏚: *on connector models only*

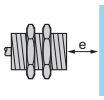
(1) For pin arrangement of remote connectors L01B, L01C and L01G, see page 3/31.

Setting-up

Minimum mounting distances (mm)

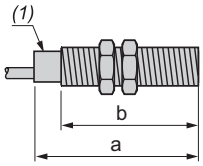






Sensors	Side by side	Face to face	Facing a metal object
Ø 12	e ≥ 8	e ≥ 50	e ≥ 12
Ø 18	e ≥ 16	e ≥ 100	e ≥ 25
Ø 30	e ≥ 30	e ≥ 180	e ≥ 45

Dimensions



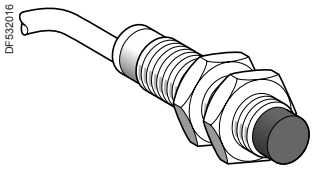
Sensors		Pre-cabled (mm)		Connector (mm)	
		a	b	a	b
Ø 12	**XS612B1M●**	53	42	62	42
Ø 18	**XS618B1M●**	62	52	73	52
Ø 30	**XS630B1M●**	62	52	73	52

(1) LED

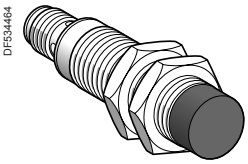
Inductive proximity sensors

OsiSense XS, general purpose

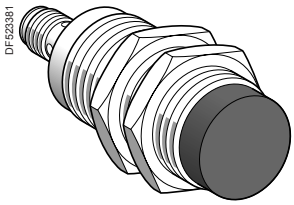
Cylindrical, increased range, non flush mountable
Three-wire DC, solid-state output



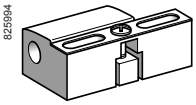
XS612B4●●L2



XS618B4●●M12



XS630B5●●M12



XSZB●●●

Sensors, 3-wire ⎓ 12...48 V, long case model

Ø 12, threaded M12 x 1

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
7	NO	PNP	Pre-cabled (L = 2 m) *(1)*	**XS612B4PAL2**	0.075
			M12 connector	**XS612B4PAM12**	0.020
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS612B4NAL2**	0.075
			M12 connector	**XS612B4NAM12**	0.020
	NC	PNP	Pre-cabled (L = 2 m) *(1)*	**XS612B4PBL2**	0.075
			M12 connector	**XS612B4PBM12**	0.020
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS612B4NBL2**	0.075
			M12 connector	**XS612B4NBM12**	0.020

Ø 18, threaded M18 x 1

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
12	NO	PNP	Pre-cabled (L = 2 m) *(1)*	**XS618B4PAL2**	0.100
			M12 connector	**XS618B4PAM12**	0.040
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS618B4NAL2**	0.100
			M12 connector	**XS618B4NAM12**	0.040
	NC	PNP	Pre-cabled (L = 2 m) *(1)*	**XS618B4PBL2**	0.100
			M12 connector	**XS618B4PBM12**	0.040
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS618B4NBL2**	0.100
			M12 connector	**XS618B4NBM12**	0.040

Ø 30, threaded M30 x 1.5

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
30	NO	PNP	Pre-cabled (L = 2 m) *(1)*	**XS630B5PAL2**	0.205
			M12 connector	**XS630B5PAM12**	0.145
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS630B5NAL2**	0.205
			M12 connector	**XS630B5NAM12**	0.145
	NC	PNP	Pre-cabled (L = 2 m) *(1)*	**XS630B5PBL2**	0.205
			M12 connector	**XS630B5PBM12**	0.145
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS630B5NBL2**	0.205

Accessories *(2)*

Description	For use with sensors	Reference	Weight kg
Fixing clamps	Ø 12	**XSZB112**	0.006
	Ø 18	**XSZB118**	0.010
	Ø 30	**XSZB130**	0.020

*(1) For a 5 m long cable replace L2 by **L5**; for a 10 m long cable replace L2 by **L10**.*
*Example: XS612B4PAL2 becomes **XS612B4PAL5** with a 5 m cable.*
(2) For more information, see page 3/116.

Inductive proximity sensors

OsiSense XS, general purpose

Cylindrical, increased range, non flush mountable
Three-wire DC, solid-state output

Characteristics

Sensor type			XS6●●B●●●M12	XS6●●B●●●L2
Product certifications			UL, CSA, CE, E2	
Connection	Connector		M12	–
	Pre-cabled		–	Length: 2 m
Operating zone	Ø 12	**mm**	**0…5.6**	
	Ø 18	**mm**	**0…9.6**	
	Ø 30	**mm**	**0…24**	
Differential travel		**%**	1...15 of effective sensing distance (Sr)	
Degree of protection	Conforming to IEC 60529		IP 65 and IP 67	IP 65 and IP 68, double insulation ⧈
	Conforming to DIN 40050		IP 69K	–
Storage temperature		**°C**	-40…+85	
Operating temperature		**°C**	-25…+70	
Materials	Case		Nickel plated brass	
	Sensing face		PPS	
	Cable		–	PvR 3 x 0.34 mm²
Vibration resistance	Conforming to IEC 60068-2-6		25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27		50 gn, duration 11 ms	
Output state indication			Yellow LED: 4 viewing ports at 90°	Yellow LED: annular
Rated supply voltage		**V**	⎓ 12…48 with protection against reverse polarity	
Voltage limits (including ripple)		**V**	⎓ 10…58	
Switching capacity		**mA**	≤ 200 with overload and short-circuit protection	
Voltage drop, closed state		**V**	≤ 2	
Current consumption, no-load		**mA**	≤ 10	
Maximum switching frequency	**XS612B4●●●●**	**Hz**	2500	
	XS618B4●●●●	**Hz**	1000	
	XS630B5●●●●	**Hz**	500	
Delays	First-up	**ms**	≤ 10 for Ø 12 and Ø 18; ≤ 15 for Ø 30	
	Response	**ms**	≤ 0.2 for Ø 12; ≤ 0.3 for Ø 18; ≤ 0.6 for Ø 30	
	Recovery	**ms**	≤ 0.2 for Ø12; ≤ 0.7 for Ø 18; ≤ 1.4 for Ø 30	

Wiring schemes

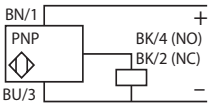
Connector

M12

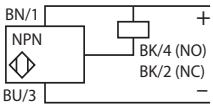
Pre-cabled

BU: Blue
BN: Brown
BK: Black

PNP

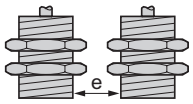


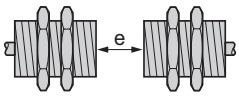
NPN

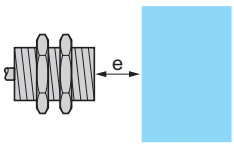


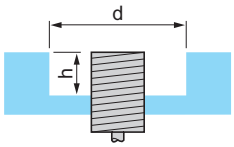
Setting-up

Minimum mounting distances (mm)



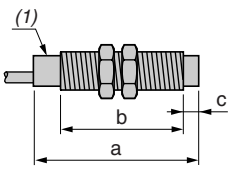






	Side by side	Face to face	Facing a metal object	Mounted in a metal support
Ø 12	e ≥ 48	e ≥ 84	e ≥ 21	d ≥ 36, h ≥ 12
Ø 18	e ≥ 72	e ≥ 144	e ≥ 36	d ≥ 54, h ≥ 18
Ø 30	e ≥ 300	e ≥ 300	e ≥ 90	d ≥ 90, h ≥ 35

Dimensions



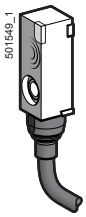
(1) LED

XS6	Pre-cabled (mm) a	b	c	Connector (mm) a	b	c
Ø 12	54	42	5	66	42	5
Ø 18	60	44	8	72	44	8
Ø 30	64	39	13	74	39	13

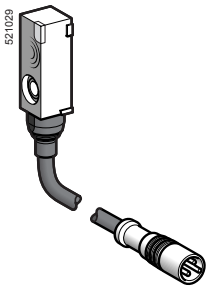
Inductive proximity sensors

OsiSense XS, general purpose, standard range

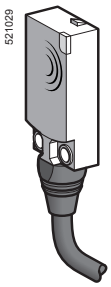
Flat format, flush mountable
Two-wire DC
Three-wire DC, solid-state output



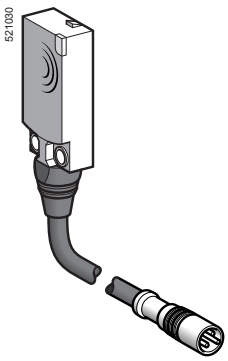
XS7J1A1●●L2



XS7J1A1●●L01M8



XS7F1A1●●L2



XS7F1A1●●L01M8

Flat, 8 x 22 x 8 mm format *(1) (2)*

Three-wire ⎓

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
2.5	NO	PNP	Pre-cabled (L = 2 m) *(3)*	**XS7J1A1PAL2**	0.060
			Remote M8 connector on 0.15 m flying lead	**XS7J1A1PAL01M8**	0.040
		NPN	Pre-cabled (L = 2 m) *(3)*	**XS7J1A1NAL2**	0.060
			Remote M8 connector on 0.15 m flying lead	**XS7J1A1NAL01M8**	0.040
	NC	PNP	Pre-cabled (L = 2 m) *(3)*	**XS7J1A1PBL2**	0.060
			Remote M8 connector on 0.15 m flying lead	**XS7J1A1PBL01M8**	0.040
		NPN	Pre-cabled (L = 2 m) *(3)*	**XS7J1A1NBL2**	0.060
			Remote M8 connector on 0.15 m flying lead	**XS7J1A1NBL01M8**	0.040

Two-wire ⎓

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
2.5	NO		Pre-cabled (L = 2 m) *(3)*	**XS7J1A1DAL2**	0.050
			Remote M8 connector on 0.15 m flying lead	**XS7J1A1DAL01M8**	0.035
	NC		Pre-cabled (L = 2 m) *(3)*	**XS7J1A1DBL2**	0.050
			Remote M8 connector on 0.15 m flying lead	**XS7J1A1DBL01M8**	0.035

Flat, 15 x 32 x 8 mm format *(1)*

Three-wire ⎓

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
5	NO	PNP	Pre-cabled (L = 2 m) *(3)*	**XS7F1A1PAL2**	0.065
			Remote M8 connector on 0.15 m flying lead	**XS7F1A1PAL01M8**	0.045
		NPN	Pre-cabled (L = 2 m) *(3)*	**XS7F1A1NAL2**	0.065
			Remote M8 connector on 0.15 m flying lead	**XS7F1A1NAL01M8**	0.045
	NC	PNP	Pre-cabled (L = 2 m) *(3)*	**XS7F1A1PBL2**	0.065
			Remote M8 connector on 0.15 m flying lead	**XS7F1A1PBL01M8**	0.045
		NPN	Pre-cabled (L = 2 m) *(3)*	**XS7F1A1NBL2**	0.065
			Remote M8 connector on 0.15 m flying lead	**XS7F1A1NBL01M8**	0.045

Two-wire ⎓

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
5	NO		Pre-cabled (L = 2 m) *(3)*	**XS7F1A1DAL2**	0.055
			Remote M8 connector on 0.15 m flying lead	**XS7F1A1DAL01M8**	0.045
	NC		Pre-cabled (L = 2 m) *(3)*	**XS7F1A1DBL2**	0.055
			Remote M8 connector on 0.15 m flying lead	**XS7F1A1DBL01M8**	0.045

(1) For accessories, see page 3/116.
*(2) Sensors **XS7J** include a fixing clamp with screw.*
*(3) For a 5 m long cable replace L2 by **L5**; for a 10 m long cable replace L2 by **L10**.*
*Example: **XS7J1A1PAL2** becomes **XS7J1A1PAL5** with a 5 m long cable.*

Inductive proximity sensors

OsiSense XS, general purpose, standard range
Flat format, flush mountable
Two-wire DC
Three-wire DC, solid-state output

Characteristics

Sensor type			XS7J●●●●●L01M8	XS7F●●●●●L01M8	XS7J●●●●●●L2, XS7F●●●●●●L2
Product certifications			CE	UL, CSA, CE	
Connection	Connector		Remote M8 connector on 0.15 m flying lead		–
	Pre-cabled		–		Length: 2 m
Operating zone	**XS7J**	**mm**	**0…2**		
	XS7F	**mm**	**0…4**		
Differential travel		**%**	1...15 of effective sensing distance (Sr)		
Degree of protection	Conforming to IEC 60529		IP 67 (**XS7J**), IP 68 (**XS7F**)		
Storage temperature		**°C**	- 40….+ 85		
Operating temperature		**°C**	- 25….+ 70		
Materials	Case		PBT		
	Cable		PvR 3 x 0.11 mm² or 2 x 0.11 mm² (XS7F: 2 or 3 x 0.34 mm²)		
Vibration resistance	Conforming to IEC 60068-2-6		25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)		
Shock resistance	Conforming to IEC 60068-2-27		50 gn, duration 11 ms		
Output state indication			Yellow LED		
Rated supply voltage		**V**	⎓ 12…24 with protection against reverse polarity		
Voltage limits (including ripple)		**V**	⎓ 10…36		
Current consumption, no-load	3-wire	**mA**	≤ 10		
Residual current, open state	2-wire	**mA**	≤ 0.5		
Switching capacity	3-wire	**mA**	100 with overload and short-circuit protection		
	2-wire	**mA**	1.5...100 with overload and short-circuit protection		
Voltage drop, closed state	3-wire	**V**	≤ 2		
	2-wire	**V**	≤ 4		
Maximum switching frequency	3-wire	**kHz**	2		
	2-wire	**kHz**	4 for **XS7J,** 5 for **XS7F**		
Delays	First-up	**ms**	Three-wire: 5		
		ms	Two-wire: 10 **XS7J**, 5 **XS7F**		
	Response	**ms**	Three-wire: 0,1		
		ms	Two-wire: 0,5 **XS7J**, 5 **XS7F**		
	Recovery	**ms**	Three-wire: 0,1		
		ms	Two-wire: 1 **XS7J**, 5 **XS7F**		

Wiring schemes

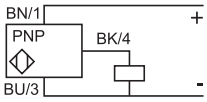
Connector

M8

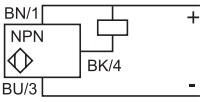
Pre-cabled

BU: Blue
BN: Brown
BK: Black

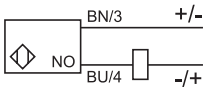
PNP NO or NC



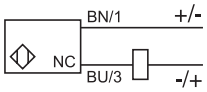
NPN NO or NC



2-wire NO

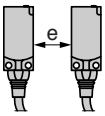


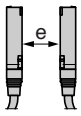
2-wire NC

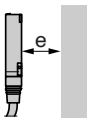


Setting-up

Minimum mounting distances (mm)



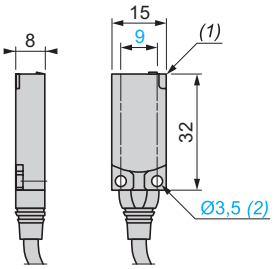




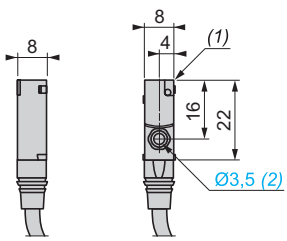
	Side by side	Face to face	Facing a metal object
XS7J	e ≥ 7.5	e ≥ 20	e ≥ 7.5
XS7F	e ≥ 15	e ≥ 40	e ≥ 15

Dimensions

XS7F



XS7J



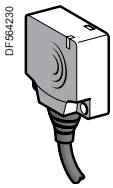
(1) LED
(2) For CHC type screws

Inductive proximity sensors

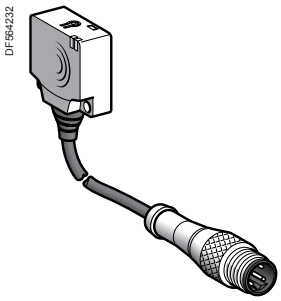
OsiSense XS, general purpose, standard range

Flat format, flush mountable
Two-wire DC
Three-wire DC, solid-state output

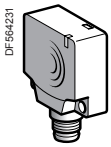
ECOLAB certified



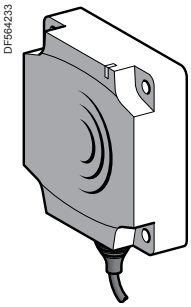
XS7E1A1●●L2



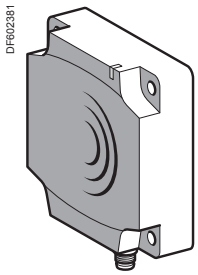
XS7●1A1●L0●M12



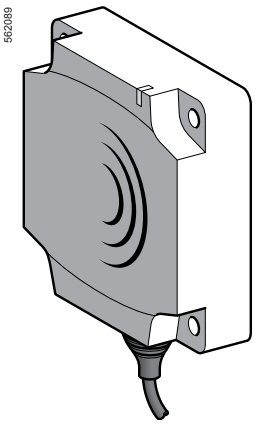
XS7E1A1●●M8



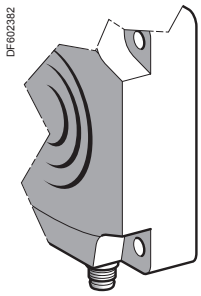
XS7C1A1●●L2



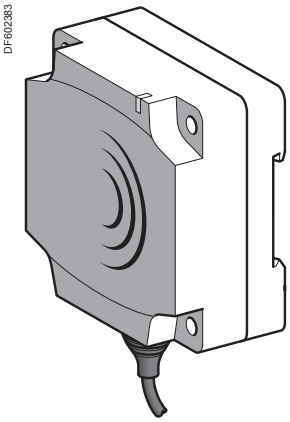
XS7C1A1●●M8



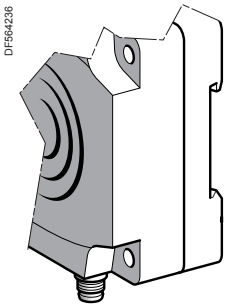
XS7D1A1●●L2



XS7D1A1●●M12



XS7D1A1●●L2DIN



XS7D1A1●●M12DIN

Sens. dist. (Sn) mm	Function	Output	Connection	Reference	Weight kg
Flat, 26 x 26 x 13 mm format *(1)*					
Three-wire ⎓					
10	NO	PNP	Pre-cabled (L = 2 m) *(4)*	**XS7E1A1PAL2**	0.075
			M8 connector	**XS7E1A1PAM8**	0.040
			Remote M12 connector	**XS7E1A1PAL01M12**	0.040
		NPN	Pre-cabled (L = 2 m) *(4)*	**XS7E1A1NAL2**	0.075
			M8 connector	**XS7E1A1NAM8**	0.075
			Remote M12 connector	**XS7E1A1NAL01M12**	0.040
	NC	PNP	Pre-cabled (L = 2 m) *(4)*	**XS7E1A1PBL2**	0.075
			M8 connector	**XS7E1A1PBM8**	0.040
			Remote M12 connector	**XS7E1A1PBL01M12**	0.040
		NPN	Pre-cabled (L = 2 m) *(4)*	**XS7E1A1NBL2**	0.075
			M8 connector	**XS7E1A1NBM8**	0.040
			Remote M12 connector	**XS7E1A1NBL01M12**	0.040
Two-wire ⎓					
10	NO		Pre-cabled (L = 2 m) *(4)*	**XS7E1A1DAL2**	0.070
			M8 connector	**XS7E1A1DAM8**	0.040
			Remote M12 connector	**XS7E1A1DAL01M12**	0.040
	NO terminals 1 and 4 *(2)*		Remote M12 connector	**XS7E1A1CAL01M12**	0.040
			Remote M12 connector *(3)*	**XS7E1A1CAL08M12**	0.065
	NC		Pre-cabled (L = 2 m) *(4)*	**XS7E1A1DBL2**	0.070
			M8 connector	**XS7E1A1DBM8**	0.040
			Remote M12 connector	**XS7E1A1DBL01M12**	0.040
Flat, 40 x 40 x 15 mm format *(1)*					
Three-wire ⎓					
15	NO	PNP	Pre-cabled (L = 2 m) *(4)*	**XS7C1A1PAL2**	0.095
			M8 connector	**XS7C1A1PAM8**	0.060
			Remote M12 connector	**XS7C1A1PAL01M12**	0.060
		NPN	Pre-cabled (L = 2 m) *(4)*	**XS7C1A1NAL2**	0.095
			M8 connector	**XS7C1A1NAM8**	0.060
			Remote M12 connector	**XS7C1A1NAL01M12**	0.060
	NC	PNP	Pre-cabled (L = 2 m) *(4)*	**XS7C1A1PBL2**	0.095
			M8 connector	**XS7C1A1PBM8**	0.060
			Remote M12 connector	**XS7C1A1PBL01M12**	0.060
		NPN	Pre-cabled (L = 2 m) *(4)*	**XS7C1A1NBL2**	0.095
			M8 connector	**XS7C1A1NBM8**	0.060
			Remote M12 connector	**XS7C1A1NBL01M12**	0.060
Two-wire ⎓					
15	NO		Pre-cabled (L = 2 m) *(4)*	**XS7C1A1DAL2**	0.090
			M8 connector	**XS7C1A1DAM8**	0.060
			Remote M12 connector	**XS7C1A1DAL01M12**	0.060
	NO terminals 1 and 4 *(2)*		Remote M12 connector	**XS7C1A1CAL01M12**	0.060
			Remote M12 connector *(3)*	**XS7C1A1CAL08M12**	0.090
	NC		Pre-cabled (L = 2 m) *(4)*	**XS7C1A1DBL2**	0.090
			M8 connector	**XS7C1A1DBM8**	0.060
			Remote M12 connector	**XS7C1A1DBL01M12**	0.060
Flat, 80 x 80 x 26 mm format *(1)*					
Three-wire ⎓					
40	NO	PNP	Pre-cabled (L = 2 m) *(4)*	**XS7D1A1PAL2** *(5)*	0.340
			M12 connector	**XS7D1A1PAM12** *(5)*	0.290
		NPN	Pre-cabled (L = 2 m) *(4)*	**XS7D1A1NAL2** *(5)*	0.340
			M12 connector	**XS7D1A1NAM12** *(5)*	0.290
	NC	PNP	Pre-cabled (L = 2 m) *(4)*	**XS7D1A1PBL2** *(5)*	0.340
			M12 connector	**XS7D1A1PBM12** *(5)*	0.290
		NPN	Pre-cabled (L = 2 m) *(4)*	**XS7D1A1NBL2** *(5)*	0.340
			M12 connector	**XS7D1A1NBM12** *(5)*	0.290
Two-wire ⎓					
40	NO		Pre-cabled (L = 2 m) *(4)*	**XS7D1A1DAL2** *(5)*	0.340
			M12 connector	**XS7D1A1DAM12** *(5)*	0.290
	NO terminals 1 and 4 *(2)*		M12 connector	**XS7D1A1CAM12** *(5)*	0.290
	NC		Pre-cabled (L = 2 m) *(4)*	**XS7D1A1DBL2** *(5)*	0.340
			M12 connector	**XS7D1A1DBM12** *(5)*	0.290

(1) For accessories, see page 3/116.
(2) The NO output is connected to terminals 1 and 4 of the M12 connector.
(3) Remote connector on 0.8 m flying lead.
*(4) For a 5 m long cable replace L2 by **L5**; for a 10 m long cable replace L2 by **L10**. Example: **S7 J1A1PAL2** becomes **XS7J1A1PAL5** with a 5 m long cable.*
*(5) For clipping onto 35 mm omega rail or 80 x 80 x 40 mm format, add DIN to the end of the reference. Example: **XS7D1A1PAL2** becomes **XS7D1A1PAL2DIN**.*

Inductive proximity sensors

OsiSense XS, general purpose, standard range
Flat format, flush mountable
Two-wire DC
Three-wire DC, solid-state output

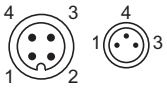
Characteristics

Sensor type				XS7E●●●●●M8, XS7C●●●●●M8, XS7D●●●●●M12	XS7E●●●●●L01M12, XS7C●●●●●L01M12	XS7E●●●●●L2, XS7C●●●●●L2, XS7D●●●●●L2
Product certifications				UL, CSA, CE, ECOLAB		
Connection	Connector			M8 except M12 on **XS7D●●●●●M12**	M12 on 0.15 m flying lead for **XS7●●●●●L01M12**	–
	Pre-cabled			–	–	Length: 2 m
Operating zone	**XS7E**		**mm**	**0…8**		
	XS7C		**mm**	**0…12**		
	XS7D		**mm**	**0…32**		
Differential travel			**%**	1...15 of effective sensing distance (Sr)		
Degree of protection	Conforming to IEC 60529			IP 67, double insulation ⧈ (except for M8 connector: IP 67)		IP 68, ⧈
Storage temperature			**°C**	- 40….+ 85		
Operating temperature			**°C**	- 25….+ 70		
Materials	Case			PBT		
	Cable			–	PvR 3 x 0.34 mm² or 2 x 0.34 mm²	
Vibration resistance	Conforming to IEC 60068-2-6			25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)		
Shock resistance	Conforming to IEC 60068-2-27			50 gn, duration 11 ms		
Output state indication				Yellow LED		
Rated supply voltage			**V**	12…24 with protection against reverse polarity		
Voltage limits (including ripple)			**V**	10…36		
Current consumption, no-load	3-wire		**mA**	≤ 10		
Residual current, open state	2-wire		**mA**	≤ 0.5		
Switching capacity	3-wire		**mA**	≤ 100 with overload and short-circuit protection		
	2-wire		**mA**	1.5...100 with overload and short-circuit protection		
Voltage drop, closed state	3-wire		**V**	≤ 2		
	2-wire		**V**	≤ 4		
Maximum switching frequency	**XS7E, XS7C**		**kHz**	1		
	XS7D		**Hz**	100		
Delays	First-up	3-wire	**ms**	10 **XS7E** and **XS7C**, 30 **XS7D**		
		2-wire	**ms**	5 **XS7E** and **XS7D**, 10 **XS7D**		
	Response	3-wire	**ms**	2 **XS7E** and **XS7C**, 5 **XS7D**		
		2-wire	**ms**	0,3 **XS7E** and **XS7D**, 10 **XS7D**		
	Recovery	3-wire	**ms**	6 **XS7E**, 5 **XS7C**, 35 **XS7D**		
		2-wire	**ms**	0,7 **XS7E** and **XS7D**, 10 **XS7D**		

Wiring schemes

Connector

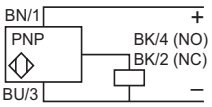
M12 M8



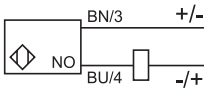
Pre-cabled

BU: Blue
BN: Brown
BK: Black

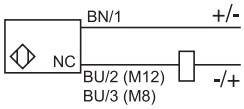
PNP/M12 or M8



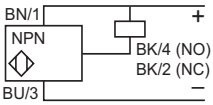
2-wire NO/M12 or M8



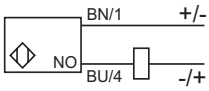
2-wire NC/M12 or M8



NPN/M12 or M8



2-wire NO/M12 XS7●●●●CA●●●

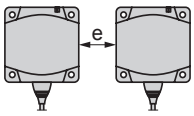


For M8 connector, NO and NC outputs on terminal 4

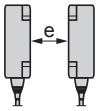
Setting-up

Minimum mounting distances (mm)

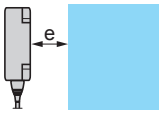
Side by side	e ≥	XS7E	XS7C	XS7D
		30	45	120



Face to face	e ≥	XS7E	XS7C	XS7D
		72	110	300



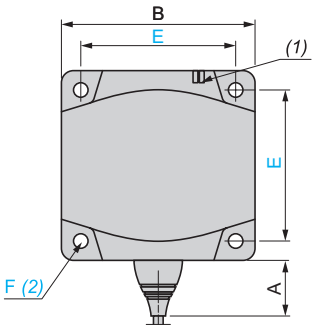
Facing a metal object	e ≥	XS7E	XS7C	XS7D
		30	45	120



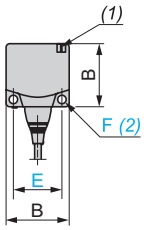
Dimensions

XS7C/D/E

XS7C/D



XS7E



(1) LED
(2) For CHC type screws

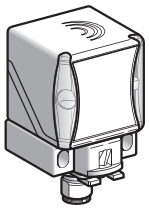
Sensor	A (cable)	A (connector)	B	C	D	E	F
XS7E	14	11	26	13	8.8	**20**	**3.5**
XS7C	14	11	40	15	9.8	**33**	**4.5**
XS7D	23	18	80	26	16	**65**	**5.5**
XS7D●●DIN	23	18	80	40	30	**65**	**5.1**

Inductive proximity sensors

OsiSense XS, general purpose

Cubic case, 40 x 40 x 70 mm, M12 or 1/2”-20UNF connector

5 position turret head

Sensor			Flush mountable in metal		Non flush mountable in metal
					
Nominal sensing distance (Sn)			15 mm	20 mm	40 mm
References					
4-wire ⎓	PNP	NO+NC	–	**XS8C2A1PCM12**	**XS8C2A4PCM12**
	NPN	NO+NC	–	**XS8C2A1NCM12**	**XS8C2A4NCM12**
3-wire ⎓	PNP	NO	**XS7C2A1PAM12**	–	–
	NPN	NO	**XS7C2A1NAM12**	–	–
	PNP	NC	**XS7C2A1PBM12**	–	–
	NPN	NC	**XS7C2A1NBM12**	–	–
2-wire ⎓	NO		**XS7C2A1DAM12**	**XS8C2A1DAM12**	**XS8C2A4DAM12**
	NC		**XS7C2A1DBM12**	**XS8C2A1DBM12**	**XS8C2A4DBM12**
2-wire (∿/⎓) unprotected *(1)*	NO		**XS7C2A1MAU20**	**XS8C2A1MAU20**	**XS8C2A4MAU20**
	NC		**XS7C2A1MBU20**	**XS8C2A1MBU20**	**XS8C2A4MBU20**
Weight (kg)			0.149	0.149	0.149
Characteristics					
Operating zone			0…12 mm	0…16 mm	0…32 mm
Product certifications			UL, CSA, CE, TÜV (4-wire), E2 (3-wire and 4-wire)		
Conformity to standards			IEC 60947-5-2		
Conformity to safety standards *(2)*	For XS8C2A●PCM12		EN 62061 (2005): SILcl2 EN 61508 (2010): SIL 2, EN ISO 13849 (2008): PL d		
Reliability data *(2)*	For XS8C2A●PCM12		MTTFd = 1546 years PFHd = 7.4 10-8 1/h		
Connection			M12 connector for ⎓ versions 1/2 "-20UNF connector for ∿/⎓ versions		
Differential travel			3…15% of Sr		
Degree of protection	Conforming to IEC 60529 and DIN 40050		IP 65, IP 67 and IP 69K		
Temperature	Storage		- 40….+ 85°C		
	Operation *(3)*		- 25….+ 70°C		
Material			Case: PBT		
Vibration resistance	Conforming to IEC 60068-2-6		25 gn, amplitude ± 2 mm (f = 10…55 Hz)		
Shock resistance	Conforming to IEC 60068-2-27		50 gn for 11 ms		
Indicators	Output state		Yellow LED		
	Power on		Green LED, for 4-wire ⎓, 3-wire ⎓ and 2-wire ∿/⎓ versions		
Rated supply voltage	4-wire ⎓		12…48 V with protection against reverse polarity		
	3-wire ⎓		12…24 V with protection against reverse polarity		
	2-wire ⎓		12…48 V with protection against reverse polarity		
	2-wire ∿/⎓		24…240 V (∿ 50/60 Hz)		
Voltage limits (including ripple)	4-wire ⎓		10…58 V		
	3-wire ⎓		10…36 V		
	2-wire ⎓		10…58 V		
	2-wire ∿/⎓		20…264 V		
Current consumption, no-load	3-wire and 4-wire ⎓		< 15 mA		
Residual current, open state	2-wire ⎓		< 0.6 mA		
	2-wire ∿/⎓		1.5 mA		
Switching capacity	3-wire and 4-wire ⎓		< 200 mA with overload and short-circuit protection		
	2-wire ⎓		< 100 mA with overload and short-circuit protection		
	2-wire ∿/⎓		∿: 5…300 mA *(1)* ⎓: 5…200 mA *(1)*		
Voltage drop, closed state	3-wire and 4-wire ⎓		< 2 V		
	2-wire ⎓		< 4.2 V		
	2-wire ⎓/∿		< 5.5 V		
Maximum switching frequency			Flush mountable: ⎓ 300 Hz, ∿ 25 Hz Non flush mountable: ⎓ 150 Hz, ∿ 25 Hz		
Delays	First-up		7 ms (3-wire and 4-wire ⎓), 20 ms (2-wire ⎓ and 2-wire ⎓/∿)		
	Response		Flush mountable: ≤ 1.2 ms. Non flush mountable: ≤ 1.4 ms		
	Recovery		Flush mountable: ≤ 1.8 ms. Non flush mountable: ≤ 3.5 ms		

*(1) Sensor must be protected by a 0.4 A quick-blow fuse (reference **XUZE04**) connected in series with the load.*
(2) SIL 2 protection can only be obtained by connecting both outputs to a safety PLC. Please refer to the “Safety solutions using Preventa” catalogue.
*(3) Sensors are available for very low temperatures (suffix **TF**: - 40°C, + 70°C) or very high temperatures (suffix **TT**: - 25°C, + 85°C). Please consult our Customer Care Centre.*

Inductive proximity sensors

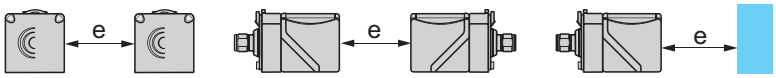
OsiSense XS, general purpose

Cubic case, 40 x 40 x 70 mm, M12 or 1/2”-20UNF connector

5 position turret head

Setting-up precautions

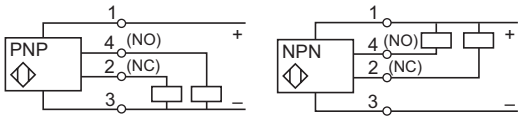
Minimum mounting distances (mm)



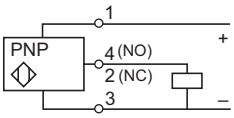
		Side by side	Face to face	Facing a metal object
Sensors flush mountable in metal	**XS7C2A1●●**	e ⩾ 60	e ⩾ 120	e ⩾ 45
	XS8C2A1●●	e ⩾ 80	e ⩾ 160	e ⩾ 60
Sensors non flush mountable in metal	**XS8C2A4●●**	e ⩾ 160	e ⩾ 320	e ⩾ 120

Wiring schemes

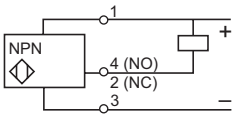
4-wire ⎓, NO + NC outputs



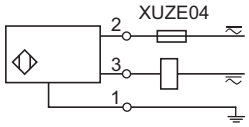
3-wire, PNP



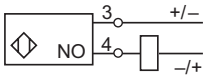
3-wire, NPN



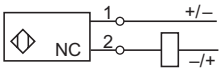
2-wire, 1/2”- 20UNF



2-wire ⎓, NO output (M12 connector)



2-wire ⎓, NC output (M12 connector)



M12 connector

+ V: 1
NC: 2
- V: 3
NO: 4

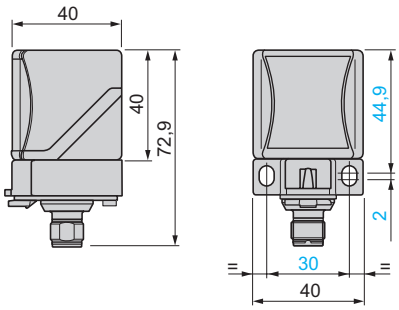
1/2”-20UNF connector

⎓: 2
⏚: 1
⎓: 3

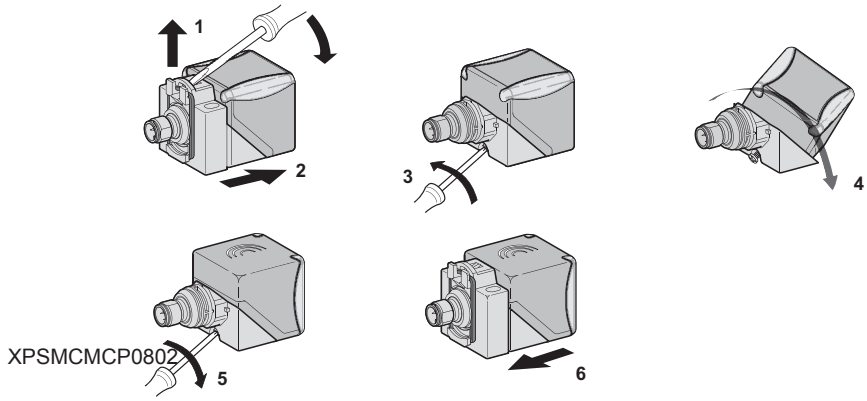
Accessory references

Description	Type	Length m	Reference	Weight kg
Pre-wired M12 connectors Female, 4-pin, zinc die-cast, nickel plated clamping ring	Straight	2	**XZCP1141L2**	0.090
		5	**XZCP1141L5**	0.190
		10	**XZCP1141L10**	0.370
	Elbowed	2	**XZCP1241L2**	0.090
		5	**XZCP1241L5**	0.190
		10	**XZCP1241L10**	0.370
Pre-wired 1/2”-20UNF connectors Female, 3-pin, zinc die-cast, nickel plated clamping ring	Straight	5	**XZCP1865L5**	0.180
		10	**XZCP1865L10**	0.350
	Elbowed	5	**XZCP1965L5**	0.180
		10	**XZCP1965L10**	0.350

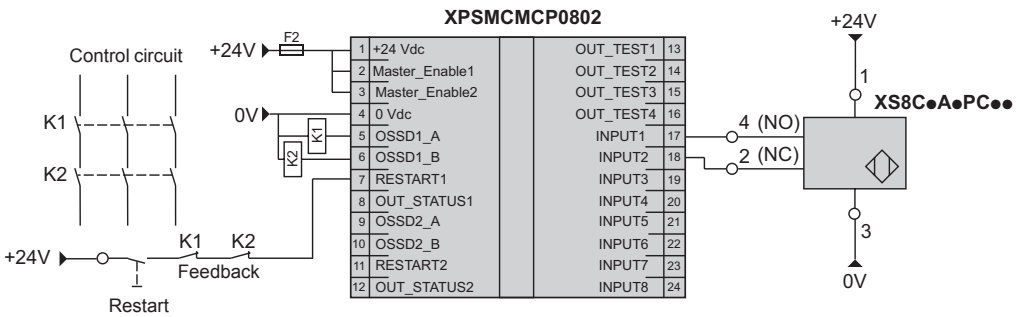
Dimensions



Head positions



Example SIL 2 wiring scheme (with Preventa XPSMCMCP0802 safety PLC)



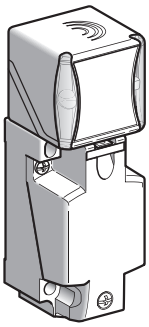
SFF (Safe Failure Fraction): 92,68 %

DC (Diagnosis Coverage): 75,8 %

Inductive proximity sensors

OsiSense XS, general purpose

Plastic case, 40 x 40 x 117 mm, plug-in
5 position turret head

Sensor		Flush mountable in metal		Non flush mountable in metal
				
Nominal sensing distance (Sn)		15 mm	20 mm	40 mm
References				
4-wire ⎓	PNP NO+NC	–	**XS8C4A1PCP20**	**XS8C4A4PCP20**
	NPN NO+NC	–	**XS8C4A1NCP20**	**XS8C4A4NCP20**
2-wire ⎓	NO or NC programmable	**XS7C4A1DPP20**	**XS8C4A1DPP20**	**XS8C4A4DPP20**
2-wire (∿/⎓) unprotected *(1)*	NO or NC programmable	**XS7C4A1MPP20**	**XS8C4A1MPP20**	**XS8C4A4MPP20**
Weight (kg)		0.244	0.244	0.244
		***Note**: These sensors have an M20 cable entry. They can also be supplied with a PG 13.5 cable entry (e.g. **XS8C4A4PCG13**) or a 1/2" NPT cable entry (e.g. **XS8C4A1MPN12**). Please consult our Customer Care Centre.*		
Characteristics				
Operating zone		0…12 mm	0…16 mm	0…32 mm
Product certifications		UL, CSA, CE, TÜV (4-wire), E2 (4-wire)		
Conformity to standards		IEC 60947-5-2		
Conformity to safety standards *(2)*	For XS8C4A●PCP20	EN 62061 (2005): SILcl2, EN 61508 (2010): SIL 2, EN ISO 13849 (2008): PL d		
Reliability data *(2)*	For XS8C4A●PCP20	MTTFd = 1546 years PFHd = 7.4 10-8 1/h		
Connection		Screw terminals, clamping capacity: 2 or 4 x 1.5 mm2 / 2 or 4 x 16 AWG *(3)*		
Differential travel		3…15% of Sr		
Degree of protection	Conforming to IEC 60529 and DIN 40050	IP 65, IP 67 and IP 69K		
Temperature	Storage	- 40….+ 85°C		
	Operation *(4)*	- 25….+ 70°C		
Material		Case: PBT		
Vibration resistance	Conforming to IEC 60068-2-6	25 gn, amplitude ± 2 mm (f = 10…55 Hz)		
Shock resistance	Conforming to IEC 60068-2-27	50 gn for 11 ms		
Indicators	Output state	Yellow LED		
	Power on	Green LED, for 4-wire ⎓ and 2-wire ∿/⎓ versions		
Rated supply voltage	4-wire ⎓	12…48 V with protection against reverse polarity		
	2-wire ⎓	12…48 V with protection against reverse polarity		
	2-wire ∿/⎓	24…240 V (∿ 50/60 Hz)		
Voltage limits (including ripple)	4-wire ⎓	10…58 V		
	2-wire ⎓	10…58 V		
	2-wire ∿/⎓	20…264 V		
Current consumption, no-load	4-wire ⎓	< 15 mA		
Residual current, open state	2-wire ⎓	< 0.6 mA		
	2-wire ∿/⎓	1.5 mA		
Switching capacity	4-wire ⎓	< 200 mA with overload and short-circuit protection		
	2-wire ⎓	< 100 mA with overload and short-circuit protection		
	2-wire ∿/⎓	∿: 5…300 mA *(1)* ⎓: 5…200 mA *(1)*		
Voltage drop, closed state	4-wire ⎓	< 2 V		
	2-wire ⎓	< 4.2 V		
	2-wire ⎓/∿	< 5.5 V		
Maximum switching frequency		Flush mountable: ⎓ 300 Hz, ∿ 25 Hz Non flush mountable: ⎓ 150 Hz, ∿ 25 Hz		
Delays	First-up	7 ms (3-wire and 4-wire ⎓), 20 ms (2-wire ⎓ and 2-wire ⎓/∿)		
	Response	Flush mountable: ⩽ 1.2 ms. Non flush mountable: ⩽ 1.4 ms		
	Recovery	Flush mountable: ⩽ 1.8 ms. Non flush mountable: ⩽ 3.5 ms		

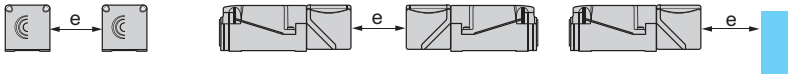
*(1) Sensor must be protected by a 0.4 A quick-blow fuse (reference **XUZE04**) connected in series with the load.*
(2) SIL 2 protection can only be obtained by connecting both outputs to a safety PLC. Please refer to the "Safety solutions using Preventa" catalogue.
*(3) These sensors are supplied without a cable gland. An adaptable PG 13.5 cable gland is available (reference **XSZPE13**). Accessories are available for connection to an M12 or 7/8"-16UN connector which can be added to the PG 13.5 sensor. Please consult our Customer Care Centre.*
*(4) Sensors are available for very low temperatures (suffix **TF**: - 40°C, + 70°C) or very high temperatures (suffix **TT**: - 25°C, + 85°C). Please consult our Customer Care Centre.*

Inductive proximity sensors

OsiSense XS, general purpose
Plastic case, 40 x 40 x 117 mm, plug-in
5 position turret head

Setting-up precautions

Minimum mounting distances (mm)

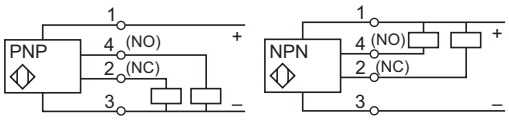


		Side by side	Face to face	Facing a metal object
Sensors flush mountable in metal	XS7C4A1●●	e ⩾ 60	e ⩾ 120	e ⩾ 45
	XS8C4A1●●	e ⩾ 80	e ⩾ 160	e ⩾ 60
Sensors non flush mountable in metal	XS8C4A4●●	e ⩾ 160	e ⩾ 320	e ⩾ 120

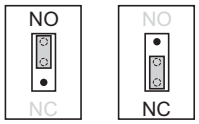
Wiring schemes

NO + NC outputs

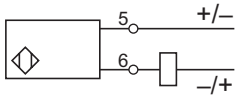
4-wire ⎓



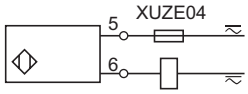
NO or NC outputs, depending on position of link



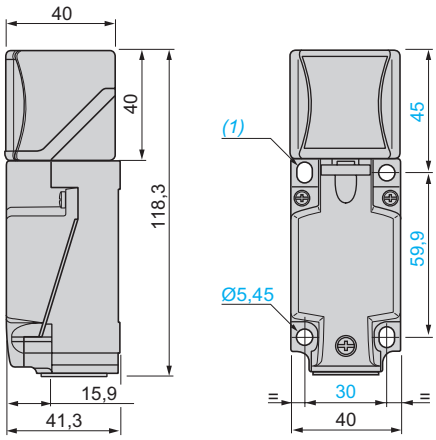
2-wire ⎓ (non polarised)



2-wire ∿ or ⎓ (programmable)

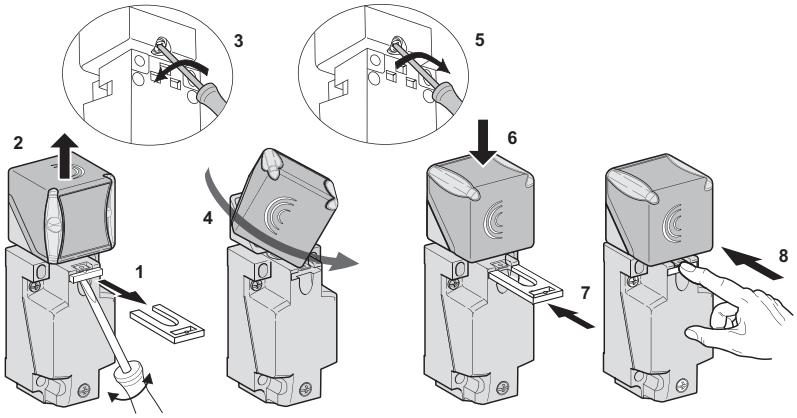


Dimensions

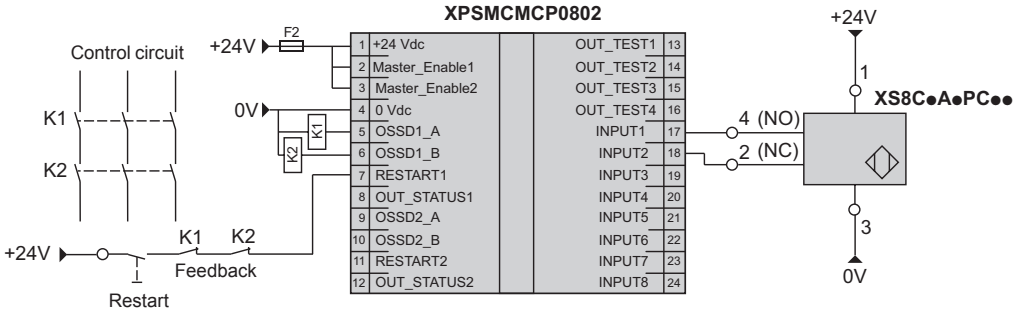


(1) 2 elongated holes Ø 5.3 x 7 cm.
Tightening torque of cover fixing screws and clamp screws: < 1.2 N.m / < 10.62 lb-in

Head positions



Example SIL 2 wiring scheme (with Preventa XPSMCMCP0802 safety PLC)



SFF (Safe Failure Fraction): 92,68 %

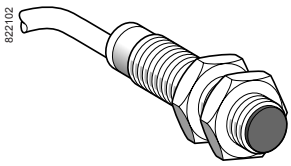
DC (Diagnosis Coverage): 75,8 %

Inductive proximity sensors

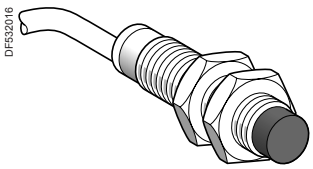
OsiSense XS, general purpose

Multivoltage sensor, cylindrical, flush mountable and non flush mountable

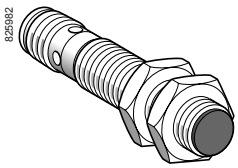
Two-wire AC or DC, short-circuit protection



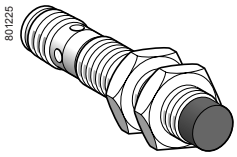
XS1M●●●●250



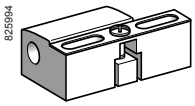
XS2M●●●●250



XS1M●●●●250K



XS2M●●●●250K



XSZB1●●

Sensing distance (Sn) mm	Function	Connection	Reference	Weight kg
Ø 12, threaded M12 x 1				
Flush mountable				
2	NO	Pre-cabled (L = 2 m) *(1)*	**XS1M12MA250**	0.075
		1/2"-20UNF connector	**XS1M12MA250K**	0.025
	NC	Pre-cabled (L = 2 m) *(1)*	**XS1M12MB250**	0.075
		1/2"-20UNF connector	**XS1M12MB250K**	0.025
Non flush mountable				
4	NO	Pre-cabled (L = 2 m) *(1)*	**XS2M12MA250**	0.075
		1/2"-20UNF connector	**XS2M12MA250K**	0.025
	NC	Pre-cabled (L = 2 m) *(1)*	**XS2M12MB250**	0.075
Ø 18, threaded M18 x 1				
Flush mountable				
5	NO	Pre-cabled (L = 2 m) *(1)*	**XS1M18MA250**	0.120
		1/2"-20UNF connector	**XS1M18MA250K**	0.060
	NC	Pre-cabled (L = 2 m) *(1)*	**XS1M18MB250**	0.120
		1/2"-20UNF connector	**XS1M18MB250K**	0.060
Non flush mountable				
8	NO	Pre-cabled (L = 2 m) *(1)*	**XS2M18MA250**	0.120
		1/2"-20UNF connector	**XS2M18MA250K**	0.060
	NC	Pre-cabled (L = 2 m) *(1)*	**XS2M18MB250**	0.120
		1/2"-20UNF connector	**XS2M18MB250K**	0.060
Ø 30, threaded M30 x 1.5				
Flush mountable				
10	NO	Pre-cabled (L = 2 m) *(1)*	**XS1M30MA250**	0.205
		1/2"-20UNF connector	**XS1M30MA250K**	0.145
	NC	Pre-cabled (L = 2 m) *(1)*	**XS1M30MB250**	0.205
		1/2"-20UNF connector	**XS1M30MB250K**	0.145
Non flush mountable				
15	NO	Pre-cabled (L = 2 m) *(1)*	**XS2M30MA250**	0.205
		1/2"-20UNF connector	**XS2M30MA250K**	0.145
	NC	Pre-cabled (L = 2 m) *(1)*	**XS2M30MB250**	0.205
		1/2"-20UNF connector	**XS2M30MB250K**	0.145

Accessories *(2)*

Description mm		Reference	Weight kg
Fixing clamps	Ø 12	**XSZB112**	0.006
	Ø 18	**XSZB118**	0.010
	Ø 30	**XSZB130**	0.020

*(1) For a 5 m long cable add **L1** to the reference; for a 10 m long cable add **L2** to the reference.*
*Example: **XS1M18MA250** becomes **XS1M18MA250L1** with a 5 m long cable.*
(2) For further information, see page 3/116.

Inductive proximity sensors

OsiSense XS, general purpose

Multivoltage sensor, cylindrical, flush mountable and non flush mountable

Two-wire AC or DC, short-circuit protection

Characteristics

Sensor type			XS●M●●M●250K	XS●M●●M●250
Product certifications			UL, CSA, CE	
Connection			1/2"-20UNF connector	Pre-cabled, length: 2 m
Operating zone	Ø 12 flush mountable	**mm**	**0…1.6**	
	Ø 12 non flush mountable	**mm**	**0…3.2**	
	Ø 18 flush mountable	**mm**	**0…4**	
	Ø 18 non flush mountable	**mm**	**0…6.4**	
	Ø 30 flush mountable	**mm**	**0…8**	
	Ø 30 non flush mountable	**mm**	**0…12**	
Differential travel		**%**	1...15 of effective sensing distance (Sr)	
Degree of protection	Conforming to IEC 60529		IP 67	IP 68, double insulation
Storage temperature		**°C**	- 40…+ 85	
Operating temperature		**°C**	- 25…+ 70	
Materials	Case		Nickel plated brass	
	Cable		–	PvR 2 x 0.34 mm²
Vibration resistance	Conforming to IEC 60068-2-6		25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27		50 gn, duration 11 ms	
Indicators	Output state		Yellow LED, 4 viewing ports at 90°	Yellow LED
	Supply on		–	Green LED (only on Ø 18 and Ø 30)
Rated supply voltage		**V**	∿ 24…240 (50/60 Hz) or ⎓ 24…210	
Voltage limits (including ripple)		**V**	∿ or ⎓ 20…264	
Switching capacity		**mA**	∿ 5…300 or ⎓ 5…200 (except Ø 12: ∿ or ⎓ 5…200) with overload and short-circuit protection	
Voltage drop, closed state		**V**	≤ 5.5	
Current consumption, no-load		**mA**	–	
Residual current, open state		**mA**	≤ 1.5	
Maximum switching frequency	Ø 12	**Hz**	∿ 25 or ⎓ 4000	
	Ø 18	**Hz**	∿ 25 or ⎓ 2000	
	Ø 30 flush mountable	**Hz**	∿ 25 or ⎓ 2000	
	Ø 30 non flush mountable	**Hz**	∿ 25 or ⎓ 1000	
Delays	First-up	**ms**	≤ 70	
	Response	**ms**	≤ 0.2 for Ø 12, ≤ 2 for Ø 18 and Ø 30	
	Recovery	**ms**	≤ 0.2 for Ø 12, ≤ 4 for Ø 18, ≤ 5 for Ø 30 flush mountable, ≤ 10 for Ø 30 non flush mountable	

Wiring schemes

1/2"-20UNF connector

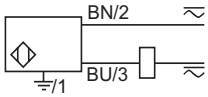
+/- : 2
⏚ : 1
+/- : 3

Pre-cabled

BU: Blue
BN: Brown

2-wire ∿ or ⎓

NO or NC output

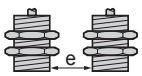


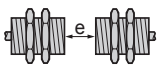
⏚ : on connector models only.

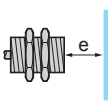
Setting-up

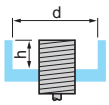
Minimum mounting distances (mm)

Sensor	Side by side	Face to face	Facing a metal object	Mounted in a metal support
Ø 12 flush mountable	e ≥ 4	e ≥ 24	e ≥ 6	d ≥ 12 h ≥ 0
Ø 12 non flush mountable	e ≥ 16	e ≥ 48	e ≥ 12	d ≥ 36 h ≥ 8
Ø 18 flush mountable	e ≥ 10	e ≥ 60	e ≥ 15	d ≥ 18 h ≥ 0
Ø 18 non flush mountable	e ≥ 16	e ≥ 96	e ≥ 24	d ≥ 54 h ≥ 16
Ø 30 flush mountable	e ≥ 20	e ≥ 120	e ≥ 30	d ≥ 30 h ≥ 0
Ø 30 non flush mountable	e ≥ 60	e ≥ 180	e ≥ 45	d ≥ 90 h ≥ 30

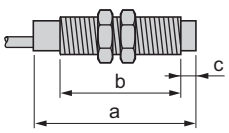








Dimensions



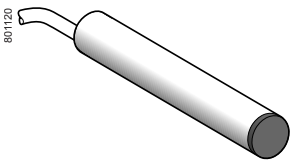
Sensor	Flush mountable in metal					Non flush mountable in metal				
	Pre-cabled		Connector			Pre-cabled		Connector		
	a	b	a	b	c	a	b	a	b	c
Ø 12	57	42	66	48	5	57	42	66	42	5
Ø 18	60	51	72	51	8	60	44	72	44	8
Ø 30	60	51	72	51	13	63	41	75	41	13

Inductive proximity sensors

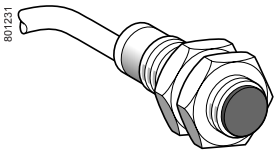
OsiSense XS, general purpose

Cylindrical, metal and plastic, flush mountable and non flush mountable

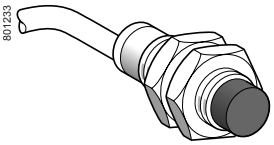
Four-wire DC, solid-state NO + NC output



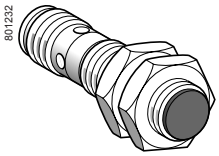
XS1L06●C410



XS1●●●●C410



XS2●●●●C410



XS1N●●●C410D

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
Ø 6.5 plain					
Stainless steel case, flush mountable					
1.5	NO + NC	PNP	Pre-cabled (L = 2 m)	**XS1L06PC410**	0.025
		NPN	Pre-cabled (L = 2 m)	**XS1L06NC410**	0.025
Ø 8, threaded M8 x 1					
Stainless steel case, flush mountable					
1.5	NO + NC	PNP	Pre-cabled (L = 2 m)	**XS1M08PC410**	0.035
			M12 connector	**XS1M08PC410D**	0.025
		NPN	Pre-cabled (L = 2 m)	**XS1M08NC410**	0.035
			M12 connector	**XS1M08NC410D**	0.025
Stainless steel case, non flush mountable					
2.5	NO + NC	PNP	Pre-cabled (L = 2 m) *(1)*	**XS2M08PC410**	0.035
			M12 connector	**XS2M08PC410D**	0.025
		NPN	Pre-cabled (L = 2 m)	**XS2M08NC410**	0.035
			M12 connector	**XS2M08NC410D**	0.025
Plastic case, non flush mountable					
2.5	NO + NC	PNP *(3)*	Pre-cabled (L = 2 m) *(1)*	**XS4P08PC410**	0.035
Ø 12, threaded M12 x 1					
Brass case, flush mountable					
2	NO + NC	PNP	Pre-cabled (L = 2 m) *(1) (2)*	**XS1N12PC410**	0.070
			M12 connector	**XS1N12PC410D**	0.020
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS1N12NC410**	0.070
			M12 connector	**XS1N12NC410D**	0.020
Plastic case, non flush mountable					
4	NO + NC	PNP *(3)*	Pre-cabled (L = 2 m) *(1)*	**XS4P12PC410**	0.070
			M12 connector	**XS4P12PC410D**	0.020

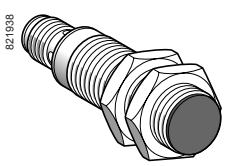
*(1) For a 5 m long cable add **L1** to the reference. Example: **XS1N12PC410** becomes **XS1N12PC410L1** with a 5 m long cable.*
*(2) For a 10 m long cable add **L2** to the reference. Example: **XS1N12PC410** becomes **XS1N12PC410L2** with a 10 m long cable.*
(3) These sensors can be supplied in NPN versions. Please contact our Customer Care Centre.

Inductive proximity sensors

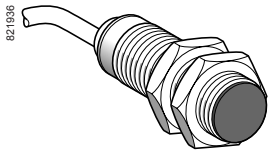
OsiSense XS, general purpose

Cylindrical, metal and plastic, flush mountable and non flush mountable

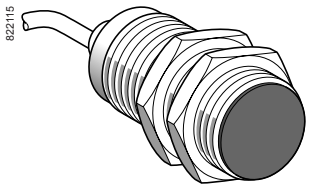
Four-wire DC, solid-state NO + NC output



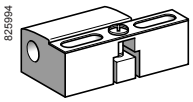
XS●●18●C410



XS●●18●C410D



XS●●30●C410



XSZB1●●

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
Ø 18, threaded M18 x 1					
Brass case, flush mountable					
5	NO + NC	PNP	Pre-cabled (L = 2 m) *(1) (2)*	**XS1N18PC410**	0.100
			M12 connector	**XS1N18PC410D**	0.040
		NPN	Pre-cabled (L = 2 m)	**XS1N18NC410**	0.100
			M12 connector	**XS1N18NC410D**	0.040
Plastic case, non flush mountable					
8	NO + NC	PNP *(3)*	Pre-cabled (L = 2 m)	**XS4P18PC410**	0.100
			M12 connector	**XS4P18PC410D**	0.040
Ø 30, threaded M30 x 1.5					
Brass case, flush mountable					
10	NO + NC	PNP	Pre-cabled (L = 2 m) *(1) (2)*	**XS1N30PC410**	0.160
			M12 connector	**XS1N30PC410D**	0.100
		NPN	Pre-cabled (L = 2 m)	**XS1N30NC410**	0.160
			M12 connector	**XS1N30NC410D**	0.100
Plastic case, non flush mountable					
15	NO + NC	PNP *(3)*	Pre-cabled (L = 2 m)	**XS4P30PC410**	0.160
			M12 connector	**XS4P30PC410D**	0.100

Accessories *(4)*

Description		Reference	Weight kg
Fixing clamps	Ø 8	**XSZB108**	0.006
	Ø 12	**XSZB112**	0.006
	Ø 18	**XSZB118**	0.010
	Ø 30	**XSZB130**	0.020

*(1) For a 5 m long cable add **L1** to the reference. Example: **XS1N18PC410** becomes **XS1N18PC410L1** with a 5 m long cable.*
*(2) For a 10 m long cable add **L2** to the reference. Example: **XS1N18PC410** becomes **XS1N18PC410L2** with a 10 m long cable.*
(3) These sensors can be supplied in NPN versions. Please contact our Customer Care Centre.
(4) For further information, see page 3/116.

Inductive proximity sensors

OsiSense XS, general purpose

Cylindrical, metal and plastic, flush mountable and non flush mountable

Four-wire DC, solid-state NO + NC output

Characteristics

Sensor type			XS●●●●PC410D	XS●●●●NC410D	XS●●●●PC410	XS●●●●NC410
Product certifications	Ø 6.5 and Ø 8		UL, CSA, CE			
	Ø 12, Ø 18 and Ø 30		UL, CSA, CE, E2 *(1)*	UL, CSA, CE	UL, CSA, CE, E2 *(2)*	UL, CSA, CE
Conformity to safety standards	Ø 6.5 and Ø 8		–			
	Ø 12, Ø 18 and Ø 30		EN/IEC 61508: SIL 2 EN/ISO 13849-1: PL =d IEC 62061: SILcl2 *(3)*	–	EN/IEC 61508: SIL 2 EN/ISO 13849-1: PL =d IEC 62061: SILcl2 *(4)*	–
Reliability data	Ø 12, Ø 18 and Ø 30		MTTFd = 1810 years, PFHd = 69.9 10^{-9} 1/h, SFF > 92 %, DC > 75 % (with a safety controller) *(3)*	–	MTTFd = 1810 years, PFHd = 69.9 10^{-9} 1/h, SFF > 92 %, DC > 75 % (with a safety controller) *(4)*	–
Connection			M12 connector		Pre-cabled, length: 2 m	
Operating zone	Ø 6.5 and Ø 8 flush mountable	**mm**	**0…1.2**			
	Ø 8 non flush mountable	**mm**	**0…2**			
	Ø 12 flush mountable	**mm**	**0…1.6**			
	Ø 12 non flush mountable	**mm**	**0…3.2**			
	Ø 18 flush mountable	**mm**	**0…4**			
	Ø 18 non flush mountable	**mm**	**0…6.4**			
	Ø 30 flush mountable	**mm**	**0…8**			
	Ø 30 non flush mountable	**mm**	**0…12**			
Differential travel		**%**	1...15 of effective sensing distance (Sr)			
Degree of protection	Conforming to IEC 60529		IP 65 and IP 67	IP 67	IP 67, double insulation (Ø 6.5 and Ø 8) IP 68, double insulation (Ø 12, Ø 18 and Ø 30)	
	Conforming to DIN 40050		IP 69K (Ø 12, Ø 18 and Ø 30)	–	–	
Storage temperature		**°C**	- 40…+ 85			
Operating temperature		**°C**	- 25…+ 70 *(5)*			
Materials	Case		Nickel plated brass for XS1N●●●. Stainless steel 303 for XS1M08●●● and XS2M08●●●. Plastic, PPS, for XS4P●●●.			
	Cable		–		PvR 4 x 0.08 mm^2 (Ø 6.5 and Ø 8) PvR 4 x 0.22 mm^2 (Ø 12, Ø 18 and Ø 30)	
Vibration resistance	Conforming to IEC 60068-2-6		25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)			
Shock resistance	Conforming to IEC 60068-2-27		50 gn, duration 11 ms			
Output state indication			Yellow LED, 4 viewing ports at 90°		Yellow LED, annular	
Rated supply voltage		**V**	⎓ 12…24 with protection against reverse polarity			
Voltage limits (including ripple)		**V**	⎓ 9…36 (⎓ 10…36 for XS4P●●●)	⎓ 10…36	⎓ 9…36 (⎓ 10…36 for XS4P18●●●)	⎓ 10…36
Switching capacity		**mA**	≤ 200 with overload and short-circuit protection			
Voltage drop, closed state		**V**	≤ 2			
Current consumption, no-load		**mA**	≤ 10			
Maximum switching frequency	Ø 6.5, Ø 8 and Ø 12	**Hz**	5000			
	Ø 18	**Hz**	2000			
	Ø 30	**Hz**	1000			
Delays	First-up	**ms**	≤ 5			
	Response	**ms**	≤ 0.1 for Ø 8 and Ø 12, ≤ 0.15 for Ø 18, ≤ 0.3 for Ø 30			
	Recovery	**ms**	≤ 0.1 for Ø 8 and Ø 12, ≤ 0.35 for Ø 18, ≤ 0.7 for Ø 30			

*(1) Except **XS4P●●●**: UL, CSA and CE.*
*(2) Except **XS4P18●●●**: UL, CSA and CE.*
*(3) Except **XS4P●●●**.*
*(4) Except **XS4P18●●●**.*
*(5) Sensors are available for very low temperatures (suffix **TF**: -40°C, + 70°C) or very high temperatures (suffix **TT**: - 25°C, + 85°C). Please consult our Customer Care Centre.*

Inductive proximity sensors

OsiSense XS, general purpose
Cylindrical, metal and plastic, flush mountable and non flush mountable
Four-wire DC, solid-state NO + NC output

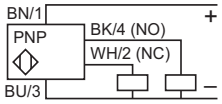
Wiring schemes

M12 connector

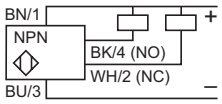
Pre-cabled

BU: Blue
BN: Brown
BK: Black
WH: White

PNP 4-wire



NPN 4-wire

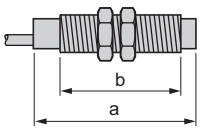


Setting-up

Minimum mounting distances (mm)

Sensor		Side by side	Face to face	Facing a metal object	Mounted in a metal support
Ø 6.5 flush mountable	**XS1L06**	e ≥ 3	e ≥ 18	e ≥ 4.5	d ≥ 6.5 h ≥ 0
Ø 8 flush mountable	**XS1M08**	e ≥ 3	e ≥ 18	e ≥ 4.5	d ≥ 8 h ≥ 0
Ø 8 non flush mountable	**XS4P08**	e ≥ 10	e ≥ 30	e ≥ 7.5	d ≥ 24 h ≥ 5
Ø 12 flush mountable	**XS1N12**	e ≥ 4	e ≥ 24	e ≥ 6	d ≥ 12 h ≥ 0
Ø 12 non flush mountable	**XS4P12**	e ≥ 16	e ≥ 48	e ≥ 12	d ≥ 36 h ≥ 8
Ø 18 flush mountable	**XS1N18**	e ≥ 10	e ≥ 60	e ≥ 15	d ≥ 18 h ≥ 0
Ø 18 non flush mountable	**XS4P18**	e ≥ 16	e ≥ 96	e ≥ 24	d ≥ 54 h ≥ 16
Ø 30 flush mountable	**XS1N30**	e ≥ 20	e ≥ 120	e ≥ 30	d ≥ 30 h ≥ 0
Ø 30 non flush mountable	**XS4P30**	e ≥ 60	e ≥ 180	e ≥ 45	d ≥ 90 h ≥ 30

Dimensions



Flush mountable in metal

Sensor		Pre-cabled (mm) a	Pre-cabled (mm) b	M12 connector (mm) a	M12 connector (mm) b
Ø 6.5 stainless steel	**XS1L06**	50	–	–	–
Ø 8 stainless steel	**XS1M08**	51	42	62	40
Ø 12 brass	**XS1N12**	37	25	50	31
Ø 18 brass	**XS1N18**	41	29	51	28
Ø 30 brass	**XS1N30**	45	33	54	33

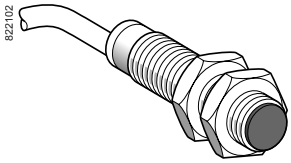
Non flush mountable in metal

Sensor		Pre-cabled (mm) a	Pre-cabled (mm) b	M12 connector (mm) a	M12 connector (mm) b
Ø 8 stainless steel	**XS2M08**	54	42	65	40
Ø 8 plastic	**XS4P08**	34	25	–	–
Ø 12 plastic	**XS4P12**	37	25	50	31
Ø 18 plastic	**XS4P18**	41	29	51	28
Ø 30 plastic	**XS4P30**	45	33	54	33

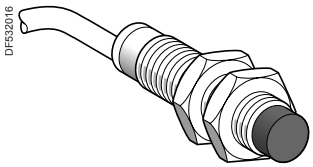
Inductive proximity sensors

OsiSense XS, general purpose

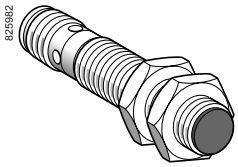
Cylindrical, metal and plastic, flush and non flush mountable
Four-wire DC, solid-state PNP + NPN NO/NC programmable output



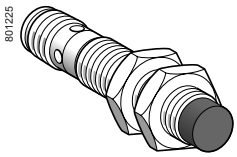
XS1M●●KP340
XS4P●●KP340



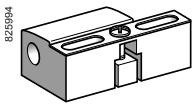
XS2M●●KP340



XS1M●●KP340D
XS4P●●KP340D



XS2M●●KP340D



XSZB1●●

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
Ø 12, threaded M12 x 1					
Metal case, flush mountable					
2	NO/NC programmable	PNP + NPN	Pre-cabled (L = 2 m) *(1)*	**XS1M12KP340**	0.075
			M12 connector	**XS1M12KP340D**	0.025
Metal case, non flush mountable					
4	NO/NC programmable	PNP + NPN	Pre-cabled (L = 2 m) *(1)*	**XS2M12KP340**	0.075
			M12 connector	**XS2M12KP340D**	0.025
Plastic case, non flush mountable					
4	NO/NC programmable	PNP + NPN	Pre-cabled (L = 2 m) *(1)*	**XS4P12KP340**	0.075
			M12 connector	**XS4P12KP340D**	0.025
Ø 18, threaded M18 x 1					
Metal case, flush mountable					
5	NO/NC programmable	PNP + NPN	Pre-cabled (L = 2 m) *(1)*	**XS1M18KP340**	0.120
			M12 connector	**XS1M18KP340D**	0.060
Metal case, non flush mountable					
8	NO/NC programmable	PNP + NPN	Pre-cabled (L = 2 m) *(1)*	**XS2M18KP340**	0.120
			M12 connector	**XS2M18KP340D**	0.060
Plastic case, non flush mountable					
8	NO/NC programmable	PNP + NPN	Pre-cabled (L = 2 m) *(1)*	**XS4P18KP340**	0.120
			M12 connector	**XS4P18KP340D**	0.060
Ø 30, threaded M30 x 1.5					
Metal case, flush mountable					
10	NO/NC programmable	PNP + NPN	Pre-cabled (L = 2 m) *(1)*	**XS1M30KP340**	0.205
			M12 connector	**XS1M30KP340D**	0.145
Metal case, non flush mountable					
15	NO/NC programmable	PNP + NPN	Pre-cabled (L = 2 m) *(1)*	**XS2M30KP340**	0.205
			M12 connector	**XS2M30KP340D**	0.145
Plastic case, non flush mountable					
15	NO/NC programmable	PNP + NPN	Pre-cabled (L = 2 m) *(1)*	**XS4P30KP340**	0.205
			M12 connector	**XS4P30KP340D**	0.145

Accessories *(2)*

Description mm		Reference	Weight kg
Fixing clamps	Ø 12	**XSZB112**	0.006
	Ø 18	**XSZB118**	0.010
	Ø 30	**XSZB130**	0.020

*(1) For a 5 m long cable add **L1** to the reference; for a 10 m long cable add **L2** to the reference.*
*Example: **XS1M12KP340** becomes **XS1M12KP340L1** with a 5 m long cable.*
(2) For further information, see page 3/116.

Inductive proximity sensors

OsiSense XS, general purpose

Cylindrical, metal and plastic, flush and non flush mountable
Four-wire DC, solid-state PNP + NPN NO/NC programmable output

Characteristics

Sensor type			XS●M●●KP340D	XS●M●●KP340
Product certifications			UL, CSA, CE	
Connection			M12 connector	Pre-cabled, length: 2 m
Operating zone	Ø 12 flush mountable	mm	**0…1.6**	
	Ø 12 non flush mountable	mm	**0…3.2**	
	Ø 18 flush mountable	mm	**0…4**	
	Ø 18 non flush mountable	mm	**0…6.4**	
	Ø 30 flush mountable	mm	**0…8**	
	Ø 30 non flush mountable	mm	**0…12**	
Differential travel		%	1...15 of effective sensing distance (Sr)	
Degree of protection	Conforming to IEC 60529		IP 67	IP 68, double insulation
Storage temperature		°C	- 40…+ 85	
Operating temperature		°C	- 25…+ 70	
Materials	Case		Nickel plated brass for XS1M and XS2M, PPS for XS4P	
	Cable		–	PvR 4 x 0.34 mm²
Vibration resistance	Conforming to IEC 60068-2-6		25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27		50 gn, duration 11 ms	
Output state indication			Yellow LED, 4 viewing ports at 90°	Yellow LED, annular
Rated supply voltage		V	⎓ 12…24 with protection against reverse polarity	
Voltage limits (including ripple)		V	⎓ 10…36	
Switching capacity		mA	≤ 200 with overload and short-circuit protection	
Voltage drop, closed state		V	≤ 2.6	
Current consumption, no-load		mA	≤ 10	
Maximum switching frequency	Ø 12	Hz	5000	
	Ø 18	Hz	2000	
	Ø 30 flush mountable	Hz	1000	
	Ø 30 non flush mountable	Hz	1000	
Delays	First-up	ms	≤ 5	
	Response	ms	≤ 0.1 for Ø 12, ≤ 0.15 for Ø 18, ≤ 0.3 for Ø 30	
	Recovery	ms	≤ 0.1 for Ø 12, ≤ 0.35 for Ø 18, ≤ 0.7 for Ø 30	

Wiring schemes

M12 connector

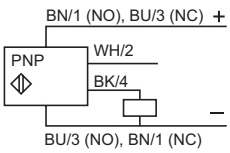
Pre-cabled

BU: Blue
BN: Brown
BK: Black
WH: White

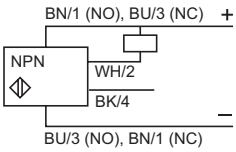
PNP + NPN

4-wire programmable, NO or NC output

PNP



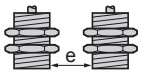
NPN

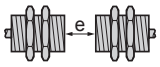


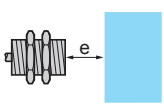
Setting-up

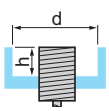
Minimum mounting distances (mm)

Sensor	Side by side	Face to face	Facing a metal object	Mounted in a metal support
Ø 12 flush mountable **XS1M12**	e ≥ 4	e ≥ 24	e ≥ 6	d ≥ 12 h ≥ 0
Ø 12 non flush mountable **XS2M12** and **XS4P12**	e ≥ 16	e ≥ 48	e ≥ 12	d ≥ 36 h ≥ 8
Ø 18 flush mountable **XS1M18**	e ≥ 10	e ≥ 60	e ≥ 15	d ≥ 18 h ≥ 0
Ø 18 non flush mountable **XS2M18** and **XS4P18**	e ≥ 16	e ≥ 96	e ≥ 24	d ≥ 54 h ≥ 16
Ø 30 flush mountable **XS1M30**	e ≥ 20	e ≥ 120	e ≥ 30	d ≥ 30 h ≥ 0
Ø 30 non flush mountable **XS2M30** and **XS4P30**	e ≥ 60	e ≥ 180	e ≥ 45	d ≥ 90 h ≥ 30

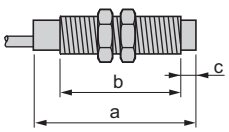








Dimensions



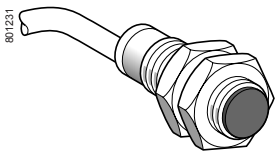
Sensor	Flush mountable in metal				Non flush mountable in metal				
	Pre-cabled		Connector		Pre-cabled		Connector		
	a	b	a	b	a	b	a	b	c
Ø 12 metal	54	42	61	42	55	42	66	42	5
Ø 12 plastic	–	–	–	–	54	42	61	43	0
Ø 18 metal	60	51	72	51	60	44	72	44	8
Ø 18 plastic	–	–	–	–	60	51	70	51	0
Ø 30 metal	60	51	72	51	63	41	75	41	13
Ø 30 plastic	–	–	–	–	60	51	70	51	0

Inductive proximity sensors

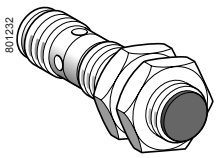
OsiSense XS, general purpose

Plastic, cylindrical, non flush mountable
Two-wire AC or DC
Three-wire DC, solid-state output

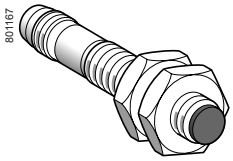
ECOLAB certified



XS4P●●●●340
XS4P●●●●370
XS4P●●●●230



XS4P●●●●340D
XS4P●●●●370D
XS4P●●●●230K



XS4P08●●340S

Sensing dist. (Sn) mm	Function	Output	Connection	Reference	Weight kg
Ø 8, threaded M8 x 1					
Three-wire ⎓ 12-24 V					
2.5	NO	PNP	Pre-cabled (L = 2 m) *(1) (2)*	**XS4P08PA340**	0.025
		NPN	Pre-cabled (L = 2 m) *(1) (2)*	**XS4P08NA340**	0.025
	NC	PNP	Pre-cabled (L = 2 m) *(1) (2)*	**XS4P08PB340**	0.025
		NPN	Pre-cabled (L = 2 m) *(1) (2)*	**XS4P08NB340**	0.025
Three-wire ⎓ 12-48 V					
2.5	NO	PNP	Pre-cabled (L = 2 m) *(1)*	**XS4P08PA370**	0.030
		NPN	Pre-cabled (L = 2 m)	**XS4P08NA370**	0.030
	NC	PNP	Pre-cabled (L = 2 m)	**XS4P08PB370**	0.030
		NPN	Pre-cabled (L = 2 m)	**XS4P08NB370**	0.030
Two-wire ∿ or ⎓ 24-240 V					
2.5	NO		Pre-cabled (L = 2 m) *(1)*	**XS4P08MA230**	0.030
			1/2"-20UNF connector	**XS4P08MA230K**	0.020
	NC		Pre-cabled (L = 2 m) *(1)*	**XS4P08MB230**	0.030
			1/2"-20UNF connector	**XS4P08MB230K**	0.020
Ø 12, threaded M12 x 1					
Three-wire ⎓ 12-24 V					
4	NO	PNP	Pre-cabled (L = 2 m) *(1) (3)*	**XS4P12PA340**	0.060
		NPN	Pre-cabled (L = 2 m) *(1) (3)*	**XS4P12NA340**	0.060
	NC	PNP	Pre-cabled (L = 2 m) *(1) (3)*	**XS4P12PB340**	0.060
		NPN	Pre-cabled (L = 2 m) *(1) (3)*	**XS4P12NB340**	0.060
Three-wire ⎓ 12-48 V					
4	NO	PNP	Pre-cabled (L = 2 m) *(1) (3)*	**XS4P12PA370**	0.065
		NPN	Pre-cabled (L = 2 m) *(1) (3)*	**XS4P12NA370**	0.065
	NC	PNP	Pre-cabled (L = 2 m) *(1) (3)*	**XS4P12PB370**	0.065
		NPN	Pre-cabled (L = 2 m) *(3)*	**XS4P12NB370**	0.065
Two-wire ∿ or ⎓ 24-240 V					
4	NO		Pre-cabled (L = 2 m) *(1)*	**XS4P12MA230**	0.065
			1/2"-20UNF connector	**XS4P12MA230K**	0.030
	NC		Pre-cabled (L = 2 m) *(1)*	**XS4P12MB230**	0.065
			1/2"-20UNF connector	**XS4P12MB230K**	0.030
Ø 18, threaded M18 x 1					
Three-wire ⎓ 12-24 V					
8	NO	PNP	Pre-cabled (L = 2 m) *(1) (3)*	**XS4P18PA340**	0.090
		NPN	Pre-cabled (L = 2 m) *(1) (3)*	**XS4P18NA340**	0.090
	NC	PNP	Pre-cabled (L = 2 m) *(1) (3)*	**XS4P18PB340**	0.090
		NPN	Pre-cabled (L = 2 m) *(1) (3)*	**XS4P18NB340**	0.090
Three-wire ⎓ 12-48 V					
8	NO	PNP	Pre-cabled (L = 2 m) *(1) (3)*	**XS4P18PA370**	0.100
		NPN	Pre-cabled (L = 2 m) *(1) (3)*	**XS4P18NA370**	0.100
	NC	PNP	Pre-cabled (L = 2 m) *(1) (3)*	**XS4P18PB370**	0.100
		NPN	Pre-cabled (L = 2 m) *(3)*	**XS4P18NB370**	0.100
Two-wire ∿ or ⎓ 24-240 V					
8	NO		Pre-cabled (L = 2 m) *(1)*	**XS4P18MA230**	0.100
			1/2"-20UNF connector	**XS4P18MA230K**	0.040
	NC		Pre-cabled (L = 2 m) *(1)*	**XS4P18MB230**	0.100
			1/2"-20UNF connector	**XS4P18MB230K**	0.040
Ø 30, threaded M30 x 1.5					
Three-wire ⎓ 12-24 V					
15	NO	PNP	Pre-cabled (L = 2 m) *(1) (3)*	**XS4P30PA340**	0.120
		NPN	Pre-cabled (L = 2 m) *(1) (3)*	**XS4P30NA340**	0.120
	NC	PNP	Pre-cabled (L = 2 m) *(1) (3)*	**XS4P30PB340**	0.120
		NPN	Pre-cabled (L = 2 m) *(1) (3)*	**XS4P30NB340**	0.120
Three-wire ⎓ 12-48 V					
15	NO	PNP	Pre-cabled (L = 2 m) *(1) (3)*	**XS4P30PA370**	0.140
		NPN	Pre-cabled (L = 2 m) *(1) (3)*	**XS4P30NA370**	0.140
	NC	PNP	Pre-cabled (L = 2 m) *(3)*	**XS4P30PB370**	0.140
		NPN	Pre-cabled (L = 2 m) *(3)*	**XS4P30NB370**	0.140
Two-wire ∿ or ⎓					
15	NO		Pre-cabled (L = 2 m) *(1)*	**XS4P30MA230**	0.140
			1/2"-20UNF connector	**XS4P30MA230K**	0.080
	NC		Pre-cabled (L = 2 m) *(1)*	**XS4P30MB230**	0.140
			1/2"-20UNF connector	**XS4P30MB230K**	0.080

*(1) For a 5 m long cable add **L1** to the reference; for a 10 m long cable add **L2** to the reference. Example: **XS4P08PA340** becomes **XS4P08PA340L1** with a 5 m long cable.*
*(2) For an M8 connector, add **S** to the reference. Example: **XS4P08PA340** becomes **XS4P08PA340S** with an M8 connector.*
*(3) For an M12 connector, add **D** to the reference. Example: **XS4P12PA370** becomes **XS4P12PA370D** with an M12 connector.*

Inductive proximity sensors

OsiSense XS, general purpose
Plastic, cylindrical, non flush mountable
Two-wire AC or DC
Three-wire DC, solid-state output

Characteristics

Sensor type			XS4P●●●●340●	XS4P●●●●370●	XS4P●●M●230●
Product certifications			UL, CSA, CE, ECOLAB		
Connection	Pre-cabled		Length: 2 m		
	Connector		M8 on Ø 8 M12 on Ø 12, Ø 18 and Ø 30		1/2"-20UNF
Operating zone	Ø 6.5 and Ø 8	**mm**	**0…2**		
	Ø 12	**mm**	**0…3.2**		
	Ø 18	**mm**	**0…6.4**		
	Ø 30	**mm**	**0…12**		
Differential travel		**%**	1...15 of effective sensing distance (Sr)		
Degree of protection	Conforming to IEC 60529		IP 68, double insulation for pre-cabled version (except Ø 8: IP 67) IP 67 for connector version		
Storage temperature		**°C**	- 40…+ 85		
Operating temperature		**°C**	- 25…+ 70		
Materials	Case		PPS		
	Cable		PvR 3 x 0.34 mm² except Ø 6.5 and 8: 3 x 0.11 mm²		PvR 2 x 0.34 mm² except Ø 8: 2 x 0.11 mm²
Vibration resistance	Conforming to IEC 60068-2-6		25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)		
Shock resistance	Conforming to IEC 60068-2-27		50 gn, duration 11 ms		
Output state indication			Yellow LED: annular on pre-cabled version Yellow LED: 4 viewing ports at 90° on connector version		
Rated supply voltage		**V**	⎓ 12…24 with protection against reverse polarity	⎓ 12…48 with protection against reverse polarity	∿ or ⎓ 24…240 (50/60 Hz)
Voltage limits (including ripple)		**V**	⎓ 10…36	⎓ 10…58	∿ or ⎓ 20…264
Switching capacity		**mA**	⩽ 200 with overload and short-circuit protection		5…100 for Ø 8, 5…200 for Ø 12, 5…200 ⎓ and 5…300 ∿ for Ø 18 and 30
Voltage drop, closed state		**V**	⩽ 2		⩽ 5.5
Residual current, open state		**mA**	–		⩽ 0.6
Current consumption, no-load		**mA**	⩽ 10		–
Maximum switching frequency	Ø 6.5, Ø 8 and Ø 12	**Hz**	5000		⎓ 3000, ∿ 25
	Ø 18	**Hz**	2000		⎓ 2000, ∿ 25
	Ø 30	**Hz**	1000		⎓ 1000, ∿ 25
Delays	First-up	**ms**	⩽ 10		⩽ 40
	Response	**ms**	⩽ 0.1 for Ø 8 and Ø 12, ⩽ 0.15 for Ø 18, ⩽ 0.3 for Ø 30		⩽ 0.2
	Recovery	**ms**	⩽ 0.1 for Ø 8 and Ø 12, ⩽ 0.35 for Ø 18, ⩽ 0.7 for Ø 30		⩽ 0.2 for Ø 8, Ø 12 and Ø 18, ⩽ 0.4 for Ø 30

Wiring schemes

Connector

M8

M12

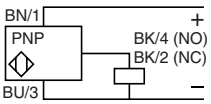
1/2"-20UNF

⎓: 2
⎓: 3

Pre-cabled

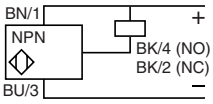
BU: Blue
BN: Brown
BK: Black

PNP

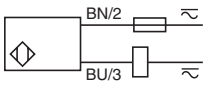


For M8 connector, NO and NC outputs on terminal 4

NPN



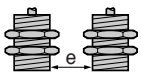
2-wire ∿ or ⎓

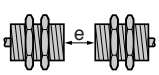


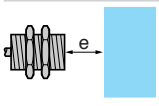
Setting-up

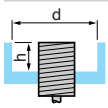
Minimum mounting distances (mm)

	Side by side	Face to face	Facing a metal object	Mounted in a metal support
Ø 8	e ⩾ 10	e ⩾ 30	e ⩾ 7.5	d ⩾ 24 h ⩾ 5
Ø 12	e ⩾ 16	e ⩾ 48	e ⩾ 12	d ⩾ 36 h ⩾ 8
Ø 18	e ⩾ 16	e ⩾ 96	e ⩾ 24	d ⩾ 54 h ⩾ 16
Ø 30	e ⩾ 60	e ⩾ 180	e ⩾ 45	d ⩾ 90 h ⩾ 30

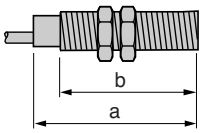








Dimensions

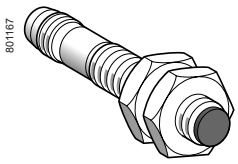


	3-wire ⎓ 12-24 V				3-wire ⎓ 12-48 V or 2-wire ∿/⎓ 24-240 V			
	Pre-cabled (mm)		Connector (mm)		Pre-cabled (mm)		Connector (mm)	
XS4P	**a**	**b**	**a**	**b**	**a**	**b**	**a**	**b**
Ø 8	33	26	42	26	50	42	61	40
Ø 12	35	25	48	27	54	42	61	42
Ø 18	36	25	48	29	62	52	70	52
Ø 30	43	32	50	34	62	52	70	52

Inductive proximity sensors

OsiSense XS, general purpose

Basic, cylindrical, metal, flush and non flush mountable
Three-wire DC, solid-state output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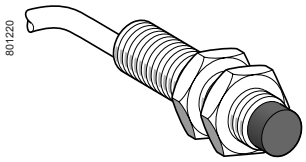
XS108BLPAM8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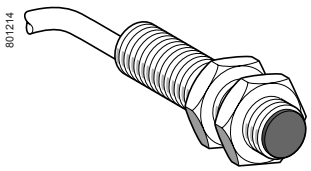
XS208BL●AL●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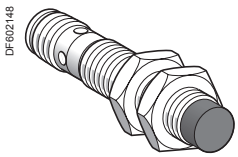
XS112BL●●L●


DF602148

XS212BL●AM12

Sensing distance (Sn)	Function	Output	Connection	Reference	Weight
mm					kg
Ø 8, threaded M8 x 1					
Three-wire ⎓ 12-24 V, flush mountable					
1.5	NO	PNP	Pre-cabled (L = 2 m)	**XS108BLPAL2**	0.035
			Pre-cabled (L = 5 m)	**XS108BLPAL5**	0.105
			M8 connector	**XS108BLPAM8**	0.008
			M12 connector	**XS108BLPAM12**	0.015
		NPN	Pre-cabled (L = 2 m)	**XS108BLNAL2**	0.035
			M12 connector	**XS108BLNAM12**	0.015
Three-wire ⎓ 12-24 V, non flush mountable					
2.5	NO	PNP	Pre-cabled (L = 2 m)	**XS208BLPAL2**	0.035
			Pre-cabled (L = 5 m)	**XS208BLPAL5**	0.105
			M8 connector	**XS208BLPAM8**	0.008
			M12 connector	**XS208BLPAM12**	0.015
		NPN	Pre-cabled (L = 2 m)	**XS208BLNAL2**	0.035
			M12 connector	**XS208BLNAM12**	0.015
Ø 12, threaded M12 x 1					
Three-wire ⎓ 12-24 V, flush mountable					
2	NO	PNP	Pre-cabled (L = 2 m)	**XS112BLPAL2**	0.070
			Pre-cabled (L = 3 m)	**XS112BLPAL3**	0.095
			Pre-cabled (L = 5 m)	**XS112BLPAL5**	0.140
			M12 connector	**XS112BLPAM12**	0.015
		NPN	Pre-cabled (L = 2 m)	**XS112BLNAL2**	0.070
			M12 connector	**XS112BLNAM12**	0.015
	NC	PNP	Pre-cabled (L = 2 m)	**XS112BLPBL2**	0.070
			M12 connector	**XS112BLPBM12**	0.015
Three-wire ⎓ 12-24 V, non flush mountable					
4	NO	PNP	Pre-cabled (L = 2 m)	**XS212BLPAL2**	0.070
			Pre-cabled (L = 5 m)	**XS212BLPAL5**	0.140
			M12 connector	**XS212BLPAM12**	0.015
		NPN	Pre-cabled (L = 2 m)	**XS212BLNAL2**	0.070
			Pre-cabled (L = 7 m)	**XS212BLNAL7**	0.185
			M12 connector	**XS212BLNAM12**	0.015
	NC	PNP	Pre-cabled (L = 2 m)	**XS212BLPBL2**	0.070
			Pre-cabled (L = 5 m)	**XS212BLPBL5**	0.140
		NPN	Pre-cabled (L = 2 m)	**XS212BLNBL2**	0.070

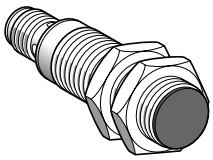
Characteristics: page 3/64
Schemes: page 3/64
Dimensions: page 3/65

Inductive proximity sensors

OsiSense XS, general purpose

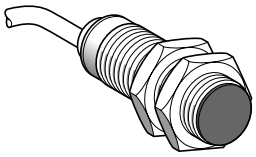
Basic, cylindrical, metal, flush and non flush mountable
Three-wire DC, solid-state output

821938



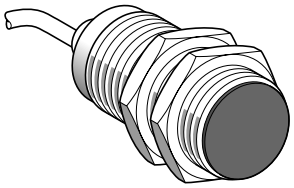
XS118BL●●M12

821936



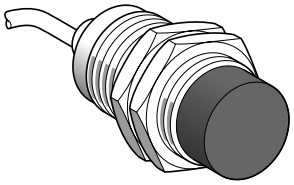
XS118BL●●L2●

822115



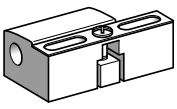
XS130BL●●L●

822116



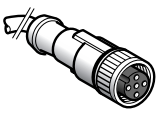
XS230BL●●L●

825994



XSZB1●●

DF532604



XZCPV1141L●●

Sensing distance (Sn)	Function	Output	Connection	Reference	Weight
mm					kg
Ø 18, threaded M18 x 1					
Three-wire ⎓ 12-24 V, flush mountable					
5	NO	PNP	Pre-cabled (L = 2 m)	**XS118BLPAL2**	0.105
			Pre-cabled (L = 5 m)	**XS118BLPAL5**	0.175
			M12 connector	**XS118BLPAM12**	0.035
		NPN	Pre-cabled (L = 2 m)	**XS118BLNAL2**	0.105
			Pre-cabled (L = 5 m)	**XS118BLNAL5**	0.175
			M12 connector	**XS118BLNAM12**	0.035
	NC	PNP	Pre-cabled (L = 2 m)	**XS118BLPBL2**	0.105
			M12 connector	**XS118BLPBM12**	0.035
Three-wire ⎓ 12-24 V, non flush mountable					
8	NO	PNP	Pre-cabled (L = 2 m)	**XS218BLPAL2**	0.105
			Pre-cabled (L = 5 m)	**XS218BLPAL5**	0.175
			M12 connector	**XS218BLPAM12**	0.035
		NPN	Pre-cabled (L = 2 m)	**XS218BLNAL2**	0.105
			Pre-cabled (L = 5 m)	**XS218BLNAL5**	0.175
			Pre-cabled (L = 7 m)	**XS218BLNAL7**	0.220
			M12 connector	**XS218BLNAM12**	0.035
	NC	PNP	Pre-cabled (L = 2 m)	**XS218BLPBL2**	0.105
		NPN	Pre-cabled (L = 2 m)	**XS218BLNBL2**	0.105
Ø 30, threaded M30 x 1.5					
Three-wire ⎓ 12-24 V, flush mountable					
10	NO	PNP	Pre-cabled (L = 2 m)	**XS130BLPAL2**	0.165
			M12 connector	**XS130BLPAM12**	0.075
		NPN	Pre-cabled (L = 2 m)	**XS130BLNAL2**	0.165
			Pre-cabled (L = 3 m)	**XS130BLNAL3**	0.190
			M12 connector	**XS130BLNAM12**	0.075
	NC	PNP	Pre-cabled (L = 2 m)	**XS130BLPBL2**	0.165
			M12 connector	**XS130BLPBM12**	0.075
Three-wire ⎓ 12-24 V, non flush mountable					
15	NO	PNP	Pre-cabled (L = 2 m)	**XS230BLPAL2**	0.155
			Pre-cabled (L = 5 m)	**XS230BLPAL5**	0.225
			M12 connector	**XS230BLPAM12**	0.085
		NPN	Pre-cabled (L = 2 m)	**XS230BLNAL2**	0.155
			Pre-cabled (L = 7 m)	**XS230BLNAL7**	0.225
			M12 connector	**XS230BLNAM12**	0.085
	NC	PNP	Pre-cabled (L = 2 m)	**XS230BLPBL2**	0.155

Fixing accessories *(1)*

Description	For use with sensors	Reference	Weight kg
Fixing clamps	Ø 8	**XSZB108**	0.006
	Ø 12	**XSZB112**	0.006
	Ø 18	**XSZB118**	0.010
	Ø 30	**XSZB130**	0.020

Cabling accessories

Description	Length of cable	Reference	Weight
	m		kg
Pre-wired connectors female straight M12 connector, 4 pins PVC cable	5	**XZCPV1141L5**	0.210
	10	**XZCPV1141L10**	0.390

(1) For further information, see page 3/116.

Characteristics: page 3/64
Schemes: page 3/64
Dimensions: page 3/65

Inductive proximity sensors

OsiSense XS, general purpose

Basic, cylindrical, metal, flush and non flush mountable
Three-wire DC, solid-state output

Characteristics

Sensor type			XS1••BLP•L• XS1••BLN•L•	XS1••BLP•M• XS1••BLN•M•	XS2••BLP•L XS2••BLN•L	XS2••BLP•M• XS2••BLN•M•
Product certifications			UL, CSA, CE			
Connection	Pre-cabled		Length 2, 3 or 5 m, depending on model	–	Length 2, 5 or 7m, depending on model	–
	Connector		–	M8 on Ø 8 M12 on Ø 8, Ø 12, Ø 18 and Ø 30	–	M8 on Ø 8 M12 onØ 8, Ø 12, Ø 18 and Ø 30
Operating zone *(1)*	Ø 8	**mm**	**0…1.2**		**0…2**	
	Ø 12	**mm**	**0…1.6**		**0…3.2**	
	Ø 18	**mm**	**0…4**		**0…6.4**	
	Ø 30	**mm**	**0…8**		**0…12**	
Differential travel		**%**	1...15 of effective sensing distance (Sr)			
Degree of protection	Conforming to IEC 60529		IP 65 and IP 67			
Storage temperature		**°C**	- 40…+ 85			
Operating temperature		**°C**	- 25…+ 70			
Materials	Case		Nickel plated brass			
	Cable		PVC 3 x 0.14 mm² except Ø 8 : 3 x 0.11 mm²	–	PVC 3 x 0.14 mm² except Ø 8 : 3 x 0.11 mm²	–
Vibration resistance	Conforming to IEC 60068-2-6		25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)			
Shock resistance	Conforming to IEC 60068-2-27		50 gn, duration 11 ms			
Output state indication			Yellow LED, on rear	Yellow LED: 2 viewing ports at 180°	Yellow LED, on rear	Yellow LED: 2 viewing ports at 180°
Rated supply voltage		**V**	⎓ 12…24 with protection against reverse polarity			
Voltage limits (including ripple)		**V**	⎓ 10…36			
Switching capacity		**mA**	≤ 200 (except Ø 8: ≤ 50) with overload and short-circuit protection *(2)*			
Voltage drop, closed state		**V**	≤ 2			
Current consumption, no-load		**mA**	≤ 10			
Residual current, open state		**mA**	–			
Maximum switching frequency	Ø 8	**Hz**	1000		1000	
	Ø 12	**Hz**	2500		1200	
	Ø 18	**Hz**	1200		500	
	Ø 30	**Hz**	500		300	
Delays First-up		**ms**	≤ 15		≤ 15	
Response	Ø 8	**ms**	≤ 5		≤ 5	
	Ø 12	**ms**	≤ 0.1		≤ 0.1	
	Ø 18	**ms**	≤ 0.1		≤ 0.1	
	Ø 30	**ms**	≤ 0.1		≤ 0.2	
Recovery	Ø 8	**ms**	≤ 0.3		≤ 0.3	
	Ø 12	**ms**	≤ 0.15		≤ 0.4	
	Ø 18	**ms**	≤ 0.3		≤ 1	
	Ø 30	**ms**	≤ 1		≤ 1.4	

Wiring schemes

Connector

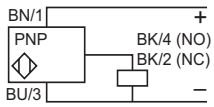
M8

M12

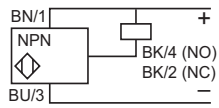
Pre-cabled

BU: Blue
BN: Brown
BK: Black

PNP



NPN



(1) Detection curves, see page 3/120.
(2) These sensors do not incorporate overload or short-circuit protection and therefore, it is essential to connect a 0.4 A "quick-blow" fuse in series with the load, see page 3/116.

References:
pages 3/62 and 3/63

Dimensions:
page 3/65

Telemecanique Sensors

Inductive proximity sensors

OsiSense XS, general purpose

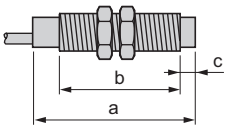
Basic, cylindrical, metal, flush and non flush mountable
Three-wire DC, solid-state output

Setting-up

Minimum mounting distances (mm)

Sensors		Side by side	Face to face	Facing a metal object	Mounted in a metal support
Ø 8 flush mountable	**XS108**	e ≥ 3	e ≥ 18	e ≥ 4.5	d ≥ 8 h ≥ 0
Ø 8 non flush mountable	**XS208**	e ≥ 10	e ≥ 30	e ≥ 7.5	d ≥ 24 h ≥ 5
Ø 12 flush mountable	**XS112**	e ≥ 4	e ≥ 24	e ≥ 6	d ≥ 12 h ≥ 0
Ø 12 non flush mountable	**XS212**	e ≥ 16	e ≥ 48	e ≥ 12	d ≥ 36 h ≥ 8
Ø 18 flush mountable	**XS118**	e ≥ 10	e ≥ 60	e ≥ 15	d ≥ 18 h ≥ 0
Ø 18 non flush mountable	**XS218**	e ≥ 16	e ≥ 96	e ≥ 24	d ≥ 54 h ≥ 16
Ø 30 flush mountable	**XS130**	e ≥ 20	e ≥ 120	e ≥ 30	d ≥ 30 h ≥ 0
Ø 30 non flush mountable	**XS230**	e ≥ 60	e ≥ 180	e ≥ 45	d ≥ 90 h ≥ 30

Dimensions



Flush mountable in metal

Sensors		Pre-cabled (mm)		M8 connector (mm)		M12 connector (mm)	
		a	b	a	b	a	b
Ø 8	**XS108**	42	40	53	42	62	39
Ø 12	**XS112**	44	31	–	–	55	34
Ø 18	**XS118**	53	41	–	–	64	43
Ø 30	**XS130**	57	44	–	–	68	47

Non flush mountable in metal

Sensors		Pre-cabled (mm)			M8 connector (mm)			M12 connector (mm)		
		a	b	c	a	b	c	a	b	c
Ø 8	**XS208**	42	36	4	53	38	4	62	36	4
Ø 12	**XS212**	44	26	5	–	–	–	55	29	5
Ø 18	**XS218**	53	33	8	–	–	–	64	35	8
Ø 30	**XS230**	57	32	13	–	–	–	68	34	13

References:
pages 3/62 and 3/63

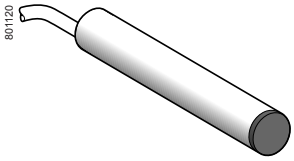
Characteristics:
page 3/64

Schemes:
page 3/64

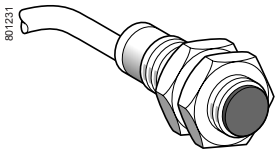
Inductive proximity sensors

OsiSense XS, general purpose

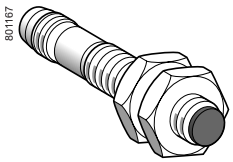
Cylindrical, almost flush mountable, increased range
Three-wire DC, solid-state output



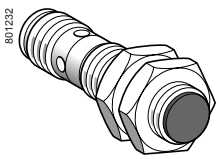
XS1L06●A349



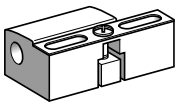
XS1N●●●●349



XS1N08●●349S



XS1N●●●●349D



XSZB1●●

Sensing distance (Sn) (mm)	Function	Output	Connection	Reference	Weight kg
Ø 6.5, plain					
2.5	NO	PNP	Pre-cabled (L = 2 m)	**XS1L06PA349**	0.025
			M8 connector	**XS1L06PA349S**	0.010
			M12 connector	**XS1L06PA349D**	0.015
		NPN	Pre-cabled (L = 2 m)	**XS1L06NA349**	0.025
			M8 connector	**XS1L06NA349S**	0.010
			M12 connector	**XS1L06NA349D**	0.015
	NC	PNP	Pre-cabled (L = 2 m)	**XS1L06PB349**	0.025
			M8 connector	**XS1L06PB349S**	0.010
		NPN	Pre-cabled (L = 2 m)	**XS1L06NB349**	0.025
			M8 connector	**XS1L06NB349S**	0.010
Ø 8, threaded M8 x 1					
2.5	NO	PNP	Pre-cabled (L = 2 m)	**XS1N08PA349**	0.035
			M8 connector	**XS1N08PA349S**	0.015
			M12 connector	**XS1N08PA349D**	0.020
		NPN	Pre-cabled (L = 2 m)	**XS1N08NA349**	0.035
			M8 connector	**XS1N08NA349S**	0.015
			M12 connector	**XS1N08NA349D**	0.020
	NC	PNP	Pre-cabled (L = 2 m)	**XS1N08PB349**	0.035
			M8 connector	**XS1N08PB349S**	0.015
			M12 connector	**XS1N08PB349D**	0.020
		NPN	Pre-cabled (L = 2 m)	**XS1N08NB349**	0.035
			M8 connector	**XS1N08NB349S**	0.015
			M12 connector	**XS1N08NB349D**	0.020
Ø 12, threaded M12 x 1					
4	NO	PNP	Pre-cabled (L = 2 m)	**XS1N12PA349**	0.070
			M12 connector	**XS1N12PA349D**	0.020
		NPN	Pre-cabled (L = 2 m)	**XS1N12NA349**	0.070
			M12 connector	**XS1N12NA349D**	0.020
	NC	PNP	Pre-cabled (L = 2 m)	**XS1N12PB349**	0.070
			M12 connector	**XS1N12PB349D**	0.020
		NPN	Pre-cabled (L = 2 m)	**XS1N12NB349**	0.070
			M12 connector	**XS1N12NB349D**	0.020
Ø 18, threaded M18 x 1					
10	NO	PNP	Pre-cabled (L = 2 m)	**XS1N18PA349**	0.100
			M12 connector	**XS1N18PA349D**	0.040
		NPN	Pre-cabled (L = 2 m)	**XS1N18NA349**	0.100
			M12 connector	**XS1N18NA349D**	0.040
	NC	PNP	Pre-cabled (L = 2 m)	**XS1N18PB349**	0.100
			M12 connector	**XS1N18PB349D**	0.040
		NPN	Pre-cabled (L = 2 m)	**XS1N18NB349**	0.100
			M12 connector	**XS1N18NB349D**	0.040
Ø 30, threaded M30 x 1.5					
20	NO	PNP	Pre-cabled (L = 2 m)	**XS1N30PA349**	0.160
			M12 connector	**XS1N30PA349D**	0.100
		NPN	Pre-cabled (L = 2 m)	**XS1N30NA349**	0.160
			M12 connector	**XS1N30NA349D**	0.100
	NC	PNP	Pre-cabled (L = 2 m)	**XS1N30PB349**	0.160
			M12 connector	**XS1N30PB349D**	0.100
		NPN	Pre-cabled (L = 2 m)	**XS1N30NB349**	0.160
			M12 connector	**XS1N30NB349D**	0.100

Accessories *(1)*

Description mm		Reference	Weight kg
Fixing clamps	Ø 6.5 (plain)	**XSZB165**	0.005
	Ø 8	**XSZB108**	0.006
	Ø 12	**XSZB112**	0.006
	Ø 18	**XSZB118**	0.010
	Ø 30	**XSZB130**	0.020

(1) For further information, see page 3/116.

Inductive proximity sensors

OsiSense XS, general purpose

Cylindrical, almost flush mountable, increased range
Three-wire DC, solid-state output

Characteristics

Sensor type			XS1●●●●●349D	XS1●●●●●349S	XS1●●●●●349
Product certifications			UL, CSA, CE		
Connection			M12 connector	M8 connector	Pre-cabled, length: 2 m
Operating zone	Ø 6.5 and Ø 8	**mm**	**0…2**		
	Ø 12	**mm**	**0…3.2**		
	Ø 18	**mm**	**0…8**		
	Ø 30	**mm**	**0…16**		
Differential travel		**%**	1...15 of effective sensing distance (Sr)		
Degree of protection	Conforming to IEC 60529		IP 67		IP 68, double insulation (except Ø 6.5 and Ø 8: IP 67)
	Conforming to DIN 40050		IP 69K for Ø 12 to Ø 30		
Storage temperature		**°C**	- 40…+ 85		
Operating temperature		**°C**	- 25…+ 70		
Materials	Case		Nickel plated brass		
	Cable		–		PvR 3 x 0.34 mm² except Ø 6.5 and 8: 3 x 0.11 mm²
Vibration resistance	Conforming to IEC 60068-2-6		25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)		
Shock resistance	Conforming to IEC 60068-2-27		50 gn, duration 11 ms		
Output state indication			Yellow LED, 4 viewing ports at 90°		Yellow LED, annular
Rated supply voltage		**V**	⎓ 12…24 with protection against reverse polarity		
Voltage limits (including ripple)		**V**	⎓ 10…36		
Switching capacity		**mA**	≤ 200 with overload and short-circuit protection		
Voltage drop, closed state		**V**	≤ 2		
Current consumption, no-load		**mA**	≤ 10		
Maximum switching frequency	Ø 6.5, Ø 8 and Ø 12	**Hz**	2500		
	Ø 18	**Hz**	1000		
	Ø 30	**Hz**	500		
Delays	First-up	**ms**	≤ 5		
	Response	**ms**	≤ 0.2 for Ø 8 and Ø 12, ≤ 0.3 for Ø 18, ≤ 0.6 for Ø 30		
	Recovery	**ms**	≤ 0.2 for Ø 8 and Ø 12, ≤ 0.7 for Ø 18, ≤ 1.4 for Ø 30		

Wiring schemes

Connector

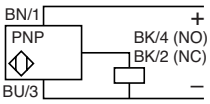
M8

M12

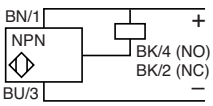
Pre-cabled

BU: Blue
BN: Brown
BK: Black

PNP 3-wire



NPN 3-wire

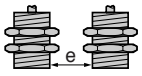


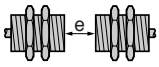
For M8 connector, NO and NC outputs on terminal 4

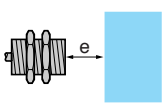
Setting-up precautions

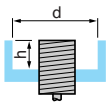
Minimum mounting distances (mm)

Sensor	Side by side	Face to face	Facing a metal object	Mounted in a metal support
Ø 6.5	e ≥ 5	e ≥ 30	e ≥ 7.5	d ≥ 10 h ≥ 1.6
Ø 8	e ≥ 5	e ≥ 30	e ≥ 7.5	d ≥ 10 h ≥ 1.6
Ø 12	e ≥ 8	e ≥ 48	e ≥ 12	d ≥ 14 h ≥ 2.4
Ø 18	e ≥ 20	e ≥ 96	e ≥ 30	d ≥ 28 h ≥ 3.6
Ø 30	e ≥ 40	e ≥ 240	e ≥ 60	d ≥ 50 h ≥ 6

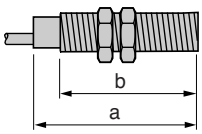








Dimensions



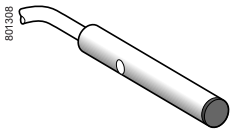
Flush mountable in metal

Sensor	Pre-cabled a	Pre-cabled b	M8 connector a	M8 connector b	M12 connector a	M12 connector b
Ø 6.5	33	–	42	–	45	–
Ø 8	33	25	42	26	45	23
Ø 12	35	25	–	–	50	30
Ø 18	39	28	–	–	50	28
Ø 30	43	32	–	–	55	32

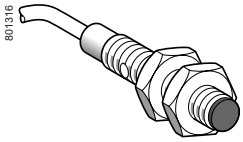
Inductive proximity sensors

OsiSense XS, general purpose

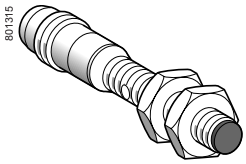
Miniature, cylindrical, flush and non flush mountable
Three-wire DC, solid-state output



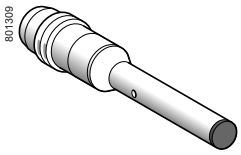
XS1L04●●310



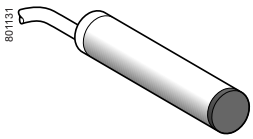
XS1N05●●310



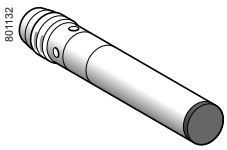
XS1N05●●311S



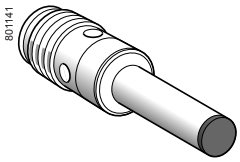
XS1L04●●310S



XS●L06●●340



XS●L06●●340S
XS●L06●●349S



XS●L06●●340D

Ø 4 plain *(1)*

Sensing distance (Sn) mm	Function	Output	Connection *(2)*	Reference	Weight kg
Brass case, flush mountable					
1	NO	PNP	Pre-cabled (L = 2 m)	**XS1L04PA310**	0,025
			M8 connector	**XS1L04PA310S**	0.010
		NPN	Pre-cabled (L = 2 m)	**XS1L04NA310**	0.025
			M8 connector	**XS1L04NA310S**	0.010
	NC	PNP	Pre-cabled (L = 2 m)	**XS1L04PB310**	0.025
			M8 connector	**XS1L04PB310S**	0.010
		NPN	Pre-cabled (L = 2 m)	**XS1L04NB310**	0.025
			M8 connector	**XS1L04NB310S**	0.010
Stainless steel case, flush mountable					
0,8	NO	PNP	Pre-cabled (L = 2 m)	**XS1L04PA311**	0.025
			M8 connector	**XS1L04PA311S**	0.010
		NPN	Pre-cabled (L = 2 m)	**XS1L04NA311**	0.025
			M8 connector	**XS1L04NA311S**	0.010
	NC	PNP	Pre-cabled (L = 2 m)	**XS1L04PB311**	0.025
			M8 connector	**XS1L04PB311S**	0,010
		NPN	Pre-cabled (L = 2 m)	**XS1L04NB311**	0.025
			M8 connector	**XS1L04NB311S**	0.010

Ø 5, threaded M5 x 0.5 *(1)*

Sensing distance (Sn) mm	Function	Output	Connection *(2)*	Reference	Weight kg
Brass case, flush mountable					
1	NO	PNP	Pre-cabled (L = 2 m)	**XS1N05PA310**	0,030
		NPN	Pre-cabled (L = 2 m)	**XS1N05NA310**	0,030
	NC	PNP	Pre-cabled (L = 2 m)	**XS1N05PB310**	0,030
		NPN	Pre-cabled (L = 2 m)	**XS1N05NB310**	0,030
Stainless steel case, flush mountable					
0.8	NO	PNP	Pre-cabled (L = 2 m)	**XS1N05PA311**	0.030
			M8 connector	**XS1N05PA311S**	0.015
		NPN	Pre-cabled (L = 2 m)	**XS1N05NA311**	0.030
			M8 connector	**XS1N05NA311S**	0.015
	NC	PNP	Pre-cabled (L = 2 m)	**XS1N05PB311**	0.030
			M8 connector	**XS1N05PB311S**	0.015
		NPN	Pre-cabled (L = 2 m)	**XS1N05NB311**	0.030
			M8 connector	**XS1N05NB311S**	0.015

Ø 6.5 plain *(1)*

Sensing distance (Sn) mm	Function	Output	Connection *(2)*	Reference	Weight kg
Stainless steel case, non flush mountable					
2.5	NO	PNP	Pre-cabled (L = 2 m)	**XS2L06PA340**	0.025
			M8 connector	**XS2L06PA340S**	0.010
			M12 connector	**XS2L06PA340D**	0.015
		NPN	Pre-cabled (L = 2 m)	**XS2L06NA340**	0.025
			M8 connector	**XS2L06NA340S**	0.010
			M12 connector	**XS2L06NA340D**	0.015
	NC	PNP	Pre-cabled (L = 2 m)	**XS2L06PB340**	0.025
			M8 connector	**XS2L06PB340S**	0.010
			M12 connector	**XS2L06PB340D**	0.015
		NPN	Pre-cabled (L = 2 m)	**XS2L06NB340**	0.025
			M8 connector	**XS2L06NB340S**	0.010
			M12 connector	**XS2L06NB340D**	0.015

(1) For accessories, see page 3/116.
*(2) For a 5 m long cable add **L1** to the reference; for a 10 m long cable add **L2** to the reference.*
*Example: **XS1L04PA310** becomes **XS1L04PA310L1** with a 5 m long cable.*

Inductive proximity sensors

OsiSense XS, general purpose

Miniature, cylindrical, flush and non flush mountable
Three-wire DC, solid-state output

Characteristics

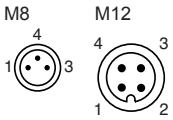
Sensor type			XS1●●●●●●●●S, XS1●●●●●●●●D, XS2L06●A340●	XS1●●●●●●●, XS2L06●A340
Product certifications			UL, CSA, CE	
Connection *(1)*	Connector		M8 on **XS1●●●●●●●●S** and M12 on **XS1●●●●●●●●D**	–
	Pre-cabled		–	Length: 2 m
Operating zone	Ø 4	**mm**	**0…0.8 (brass), 0…0.6 (stainless steel)**	
	Ø 5	**mm**	**0…0.8 (brass), 0…0.6 (stainless steel)**	
	Ø 6.5 non flush mountable	**mm**	**0…2 (stainless steel)**	
Degree of protection	Conforming to IEC 60529		IP 67	
Storage temperature		**°C**	- 40…+ 85	
Operating temperature		**°C**	- 25…+ 70	
Materials	Case		Nickel plated brass or stainless steel 303	
	Cable		PvR 3 x 0.11 mm² or 4 x 0.08 mm²	
Vibration resistance	Conforming to IEC 60068-2-6		25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27		50 gn, duration 11 ms	
Output state indication			Yellow LED, 4 viewing ports at 90°	Yellow LED, annular
Rated supply voltage		**V**	⎓ 5…24 for **XS1L04●●●●●●** and **XS1N05●●●●●●** ⎓ 12…24 for **XS2L06●●●●●●**	
Voltage limits (including ripple)		**V**	⎓ 5…30 for **XS1L04●●●●●●** and **XS1N05●●●●●●** ⎓ 10…38 for **XS2L06●●●●●●**	
Current consumption, no-load		**mA**	≤ 10	
Switching capacity	3-wire PNP/NPN	**mA**	≤ 100 with overload and short-circuit protection ≤ 200 for **XS2L06** with overload and short-circuit protection	
Voltage drop, closed state		**V**	≤ 2	
Maximum switching frequency		**kHz**	5	
Delays	First-up	**ms**	≤ 5	
	Response	**ms**	≤ 0.1	
	Recovery	**ms**	≤ 0.1	

(1) Detection curves, see page 3/120

Wiring schemes

Connector

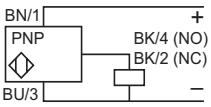
M8 M12



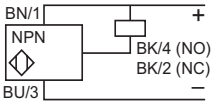
Pre-cabled

BU: Blue
BN: Brown
BK: Black
WH: White

PNP 3-wire



NPN 3-wire

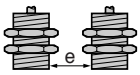


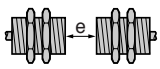
For M8 connector, NO and NC outputs on terminal 4.

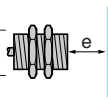
Setting-up

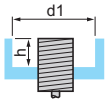
Minimum mounting distances (mm)

Sensor	Side by side	Face to face	Facing a metal object	
Ø 4	e ≥ 2	e ≥ 12	e ≥ 3	d1 ≥ 4, h ≥ 0
Ø 5	e ≥ 2	e ≥ 12	e ≥ 3	d1 ≥ 5, h ≥ 0
Ø 6.5	e ≥ 5	e ≥ 30	e ≥ 7.5	d1 ≥ 10, h ≥ 4





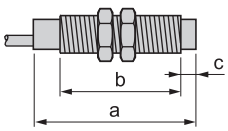




Tightening torque

Stainless steel: 2.2 N.m. Brass: 1.6 N.m (values obtained with washers mounted)

Dimensions

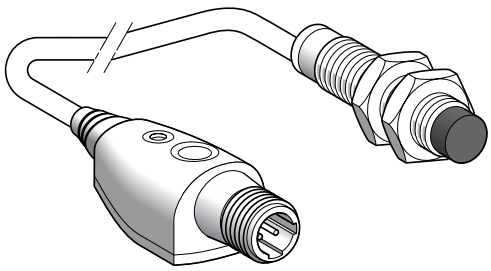


Sensor	Pre-cabled			M8 connector			M12 connector		
	a	b	c	a	b	c	a	b	c
Ø 4	28	–	–	42	–	–	–	–	–
Ø 5	28	24	–	42	24	–	–	–	–
Ø 6.5	33	–	4	46	–	4	49	–	4

Inductive proximity sensors

OsiSense XS Application
Adjustable range sensors
Cylindrical, flush mountable and non flush mountable
Three-wire DC, solid-state output

520030



XS6●●B2●●L01M12

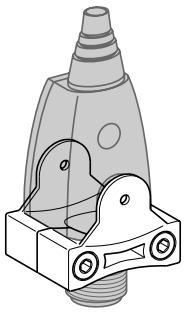
Ø 12, threaded M12 x 1

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
5	NO	PNP	Remote M12 connector on 0.15 m flying lead	**XS612B2PAL01M12**	0.100
		NPN	Remote M12 connector on 0.15 m flying lead	**XS612B2NAL01M12**	0.100
	NC	PNP	Remote M12 connector on 0.15 m flying lead	**XS612B2PBL01M12**	0.100
		NPN	Remote M12 connector on 0.15 m flying lead	**XS612B2NBL01M12**	0.100

Ø 18, threaded M18 x 1

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
9	NO	PNP	Remote M12 connector on 0.15 m flying lead	**XS618B2PAL01M12**	0.140
		NPN	Remote M12 connector on 0.15 m flying lead	**XS618B2NAL01M12**	0.140
	NC	PNP	Remote M12 connector on 0.15 m flying lead	**XS618B2PBL01M12**	0.140
		NPN	Remote M12 connector on 0.15 m flying lead	**XS618B2NBL01M12**	0.140

520031

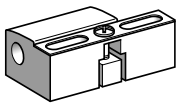


XSZBPM12

Ø 30, threaded M30 x 1.5

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
18	NO	PNP	Remote M12 connector on 0.15 m flying lead	**XS630B2PAL01M12**	0.220
		NPN	Remote M12 connector on 0.15 m flying lead	**XS630B2NAL01M12**	0.220
	NC	PNP	Remote M12 connector on 0.15 m flying lead	**XS630B2PBL01M12**	0.220
		NPN	Remote M12 connector on 0.15 m flying lead	**XS630B2NBL01M12**	0.220

825994



XSZB●●●

Accessories *(1)*

Description		Reference	Weight kg
Remote control fixing clamp		**XSZBPM12**	0.015
Sensor fixing clamps	Ø 12	**XSZB112**	0.006
	Ø 18	**XSZB118**	0.010
	Ø 30	**XSZB130**	0.020

(1) For further information, see page 3/116.

Inductive proximity sensors

OsiSense XS Application
Adjustable range sensors
Cylindrical, flush mountable and non flush mountable
Three-wire DC, solid-state output

Characteristics

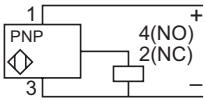
Sensor type				XS6●●B2●●L01M12
Product certifications				UL, CSA, CE
Connection	Connector			Remote M12 connector on 0.15 m flying lead
Sensing distance and adjustment zone	Ø 12	Nominal sensing distance (Sn)	mm	**0…5** non flush mounted / **0…3.4** flush mounted
		Precision adjustment zone	mm	**1.7…5** non flush mounted / **1.7…3.4** flush mounted
	Ø 18	Nominal sensing distance (Sn)	mm	**0…9** non flush mounted / **0…6** flush mounted
		Precision adjustment zone	mm	**3…9** non flush mounted / **3…6** flush mounted
	Ø 30	Nominal sensing distance (Sn)	mm	**0…18** non flush mounted / **0…11** flush mounted
		Precision adjustment zone	mm	**6…18** non flush mounted / **6…11** flush mounted
Differential travel			%	**1...15** of effective sensing distance (Sr)
Degree of protection	Conforming to IEC 60529			IP 67, ⧈
Storage temperature			°C	- 40…+ 85
Operating temperature			°C	- 25…+ 70
Materials	Case			Nickel plated brass
	Remote control			PBT
	Cable			PvR - Ø 4.2 mm
Vibration resistance	Conforming to IEC 60068-2-6			25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)
Shock resistance	Conforming to IEC 60068-2-27			50 gn, duration 11 ms
Indicators	Output state			Yellow LED
	Supply on and teach mode			Green LED
Rated supply voltage			V	⎓ 12…24 with protection against reverse polarity
Voltage limits (including ripple)			V	⎓ 10…36
Switching capacity			mA	≤ 100 with overload and short-circuit protection
Voltage drop, closed state			V	≤ 2
Current consumption, no-load			mA	≤ 10
Maximum switching frequency			Hz	1000
Delays	First-up		ms	≤ 10
	Response		ms	≤ 0.3
	Recovery		ms	≤ 0.7

Wiring schemes

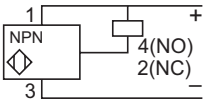
Connector

M12

PNP

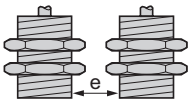


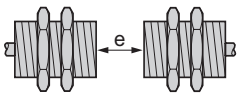
NPN

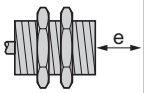


Setting-up

Minimum mounting distances (mm)



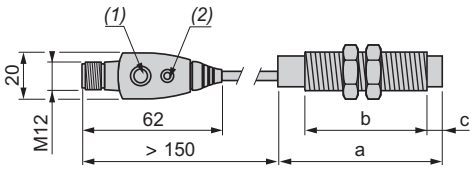




	Side by side		Face to face		Facing a metal object
	flush mounted	not flush mounted	flush mounted	not flush mounted	
Ø 12	e ≥ 14	50	e ≥ 50	100	e ≥ 3.4
Ø 18	e ≥ 28	100	e ≥ 100	200	e ≥ 6
Ø 30	e ≥ 48	180	e ≥ 180	360	e ≥ 11

Dimensions

XS6



(1) Teach mode button
(2) LED

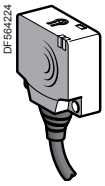
	Connector (mm)		
	a	b	c
Ø 12	59	42	5
Ø 18	64	44	8
Ø 30	62.6	41	13

Inductive proximity sensors

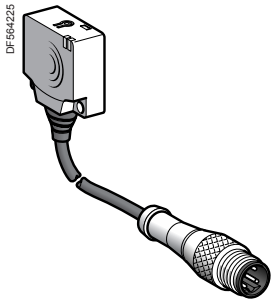
OsiSense XS, general purpose with increased range

Flat, flush mountable/non flush mountable + teach mode *(1)*
Two-wire AC or DC
Three-wire DC, solid-state output

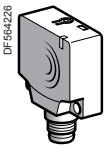
ECOLAB certified



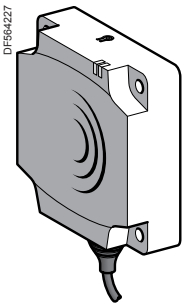
XS8E1A1●●L2



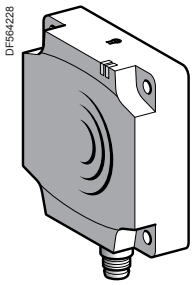
XS8●1A1●●L01M12
XS8●1A1●●L01U20



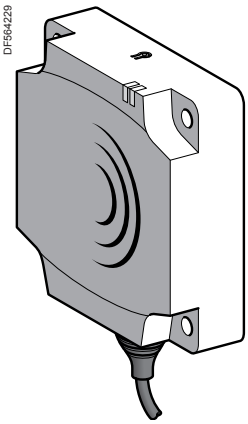
XS8E1A1●●M8



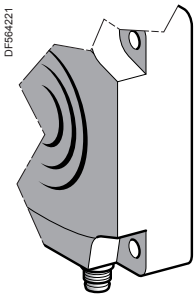
XS8C1A1●●L2



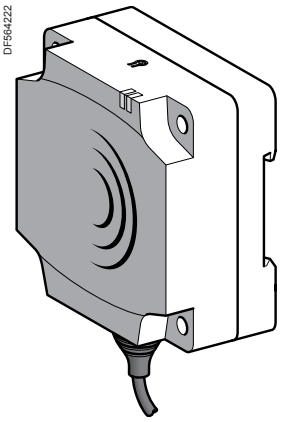
XS8C1A1●●M8



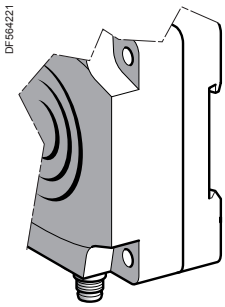
XS8D1A1●●L2



XS8D1A1●●M12



XS8D1A1●●L2DIN



XS8D1A1●●M12DIN

Flat, 26 x 26 x 13 mm format *(2)*

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
Three-wire ⎓ with overload and short-circuit protection					
15	NO	PNP	Pre-cabled (L = 2 m) *(3)*	**XS8E1A1PAL2**	0.075
			M8 connector	**XS8E1A1PAM8**	0.040
			Remote M12 connector	**XS8E1A1PAL01M12**	0.040
		NPN	Pre-cabled (L = 2 m) *(3)*	**XS8E1A1NAL2**	0.075
			M8 connector	**XS8E1A1NAM8**	0.040
			Remote M12 connector	**XS8E1A1NAL01M12**	0.040
	NC	PNP	Pre-cabled (L = 2 m) *(3)*	**XS8E1A1PBL2**	0.075
			M8 connector	**XS8E1A1PBM8**	0.040
			Remote M12 connector	**XS8E1A1PBL01M12**	0.040
		NPN	Pre-cabled (L = 2 m) *(3)*	**XS8E1A1NBL2**	0.075
			M8 connector	**XS8E1A1NBM8**	0.040
			Remote M12 connector	**XS8E1A1NBL01M12**	0.040
Two-wire ∿ or ⎓ unprotected *(4)*					
15	NO	–	Pre-cabled (L = 2 m) *(3)*	**XS8E1A1MAL2**	0.070
			Remote 1/2"-20UNF connector	**XS8E1A1MAL01U20**	0.040
	NC	–	Pre-cabled (L = 2 m) *(3)*	**XS8E1A1MBL2**	0.070
			Remote 1/2"-20UNF connector	**XS8E1A1MBL01U20**	0.040

Flat, 40 x 40 x 15 mm format *(2)*

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
Three-wire ⎓ with overload and short-circuit protection					
25	NO	PNP	Pre-cabled (L = 2 m) *(3)*	**XS8C1A1PAL2**	0.095
			M8 connector	**XS8C1A1PAM8**	0.060
			Remote M12 connector	**XS8C1A1PAL01M12**	0.060
		NPN	Pre-cabled (L = 2 m) *(3)*	**XS8C1A1NAL2**	0.095
			M8 connector	**XS8C1A1NAM8**	0.060
			Remote M12 connector	**XS8C1A1NAL01M12**	0.060
	NC	PNP	Pre-cabled (L = 2 m) *(3)*	**XS8C1A1PBL2**	0.095
			M8 connector	**XS8C1A1PBM8**	0.060
			Remote M12 connector	**XS8C1A1PBL01M12**	0.060
		NPN	Pre-cabled (L = 2 m) *(3)*	**XS8C1A1NBL2**	0.095
			M8 connector	**XS8C1A1NBM8**	0.060
			Remote M12 connector	**XS8C1A1NBL01M12**	0.060
Two-wire ∿ or ⎓ unprotected *(4)*					
25	NO	–	Pre-cabled (L = 2 m) *(3)*	**XS8C1A1MAL2**	0.090
			Remote 1/2"-20UNF connector	**XS8C1A1MAL01U20**	0.060
	NC	–	Pre-cabled (L = 2 m) *(3)*	**XS8C1A1MBL2**	0.090
			Remote 1/2"-20UNF connector	**XS8C1A1MBL01U20**	0.060

Flat, 80 x 80 x 26 mm format *(2)*

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
Three-wire ⎓ with overload and short-circuit protection					
60	NO	PNP	Pre-cabled (L = 2 m) *(3)*	**XS8D1A1PAL2** *(5)*	0.390
			M12 connector	**XS8D1A1PAM12** *(5)*	0.340
		NPN	Pre-cabled (L = 2 m) *(3)*	**XS8D1A1NAL2** *(5)*	0.390
			M12 connector	**XS8D1A1NAM12** *(5)*	0.340
	NC	PNP	Pre-cabled (L = 2 m) *(3)*	**XS8D1A1PBL2** *(5)*	0.390
			M12 connector	**XS8D1A1PBM12** *(5)*	0.340
		NPN	Pre-cabled (L = 2 m) *(3)*	**XS8D1A1NBL2** *(5)*	0.390
			M12 connector	**XS8D1A1NBM12** *(5)*	0.340
Two-wire ∿ or ⎓ unprotected *(4)*					
60	NO	–	Pre-cabled (L = 2 m) *(3)*	**XS8D1A1MAL2** *(5)*	0.390
			1/2"-20UNF connector	**XS8D1A1MAU20** *(5)*	0.340
	NC	–	Pre-cabled (L = 2 m) *(3)*	**XS8D1A1MBL2** *(5)*	0.390
			1/2"-20UNF connector	**XS8D1A1MBU20** *(5)*	0.340

(1) For further information on flush or non flush mountable sensors using teach mode, see page 3/22.
(2) For accessories, see page 3/116.
*(3) For a 5 m long cable replace L2 by **L5**; for a 10 m long cable replace L2 by **L10**.*
(4) It is essential to connect a 0.4 A "quick-blow" fuse in series with the load.
*(5) For clipping onto 35 mm omega rail or 80 x 80 x 40 mm format, add DIN to the end of the reference. Example: **XS8D1A1PAL2 DIN**.*

Inductive proximity sensors

OsiSense XS, general purpose with increased range

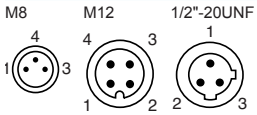
Flat, flush mountable/non flush mountable + teach mode *(1)*
Two-wire AC or DC
Three-wire DC, solid-state output

Characteristics

Sensor type				XS8E●●●●●M8, XS8C●●●●●M8, XS8D●●●●●M12, XS8D●●●●●U20	XS8E●●●●●L01M12, XS8E●●●●●L01U20, XS8C●●●●●L01M12, XS8C●●●●●L01U20	XS8E●●●●●L2, XS8C●●●●●L2, XS8D●●●●●L2
Product certifications				UL, CSA, CE, ECOLAB		
Connection	Connector			M8 except XS8●●●●●●M12: M12 XS8●●●●●●U20: 1/2"-20UNF	Remote on 0.15 m flying lead XS8●●●●●●L01M12: M12 XS8●●●●●●L01U20: 1/2"-20UNF	–
	Pre-cabled			–	–	Length: 2 m
Sensing distance and adjustment zone	XS8E	Nominal sensing dist. Sn	mm	**0…15** not flush mounted / **0…10** flush mounted		
		Fine adjustment zone	mm	**5…15** not flush mounted / **5…10** flush mounted		
	XS8C	Nominal sensing dist. Sn	mm	**0…25** not flush mounted / **0…15** flush mounted		
		Fine adjustment zone	mm	**8…25** not flush mounted / **8…15** flush mounted		
	XS8D	Nominal sensing dist. Sn	mm	**0…60** not flush mounted / **0…40** flush mounted		
		Fine adjustment zone	mm	**20…60** not flush mounted / **20…40** flush mounted		
Differential travel			%	**1…15** of effective sensing distance (Sr)		
Degree of protection	Conforming to IEC 60529			IP 67, double insulation ⧈ (except M8 connector: IP 67)		IP 68, ⧈
Storage temperature			°C	- 40….+85		
Operating temperature			°C	- 25….+70		
Materials	Case			PBT		
	Cable			–	PvR 3 x 0.34 mm² ⎓ and PvR 2 x 0.34 mm² ≂	
Vibration resistance	Conforming to IEC 60068-2-6			25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)		
Shock resistance	Conforming to IEC 60068-2-27			50 gn, duration 11 ms		
Indicators	Output state			Yellow LED		
	Supply on and teach mode			Green LED		
Rated supply voltage	3-wire		V	12…24 with protection against reverse polarity		
	2-wire		V	∼ or ⎓ 24…240 (∼ 50/60 Hz)		
Voltage limits (including ripple)	3-wire		V	10…36		
	2-wire		V	∼ or ⎓ 20…264		
Current consumption, no-load	3-wire		mA	⩽ 10		
Residual current, open state	2-wire		mA	⩽ 1.5		
Switching capacity	3-wire		mA	⩽ 100 **XS8E**, ⩽ 200 **XS8C** and **XS8D**, with overload and short-circuit protection		
	2-wire		mA	5…200 ≂ **XS8E**, 5…300 ∼ **XS8C** and **XS8D**, 5…200 ⎓ **XS8C** and **XS8D**		
Voltage drop, closed state	3-wire		V	⩽ 2		
	2-wire		V	⩽ 5.5		
Maximum switching frequency			Hz	2000 **XS8E**, 1000 **XS8C**, 150 **XS8D**		
Delays	First-up		ms	⩽ 10 **XS8E**, **XS8C** and **XS8D** (3-wire), ⩽ 10 **XS8E** and **XS8C**, ⩽ 15 **XS8D** (2-wire)		
	Response		ms	⩽ 0.3		
	Recovery		ms	⩽ 0.8 **XS8E** and **XS8C**, ⩽ 6 **XS8D**		

Wiring schemes

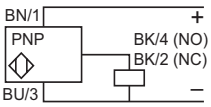
Connector



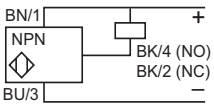
Pre-cabled

BU: Blue
BN: Brown
BK: Black

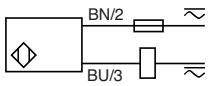
PNP/M12 or M8



NPN/M12 or M8



2-wire 1/2"-20UNF

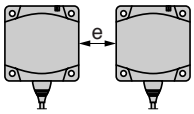


For M8 connector, NO and NC outputs on terminal 4

Setting-up

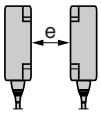
Minimum mounting distances (mm)

Side by side



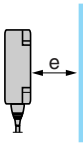
e ⩾	XS8E	XS8C	XS8D
Flush mounted	40	60	200
Not flush mounted	150	125	600

Face to face



e ⩾	XS8E	XS8C	XS8D
Flush mounted	80	120	400
Not flush mounted	300	250	not recom-mended

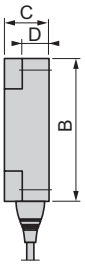
Facing a metal object



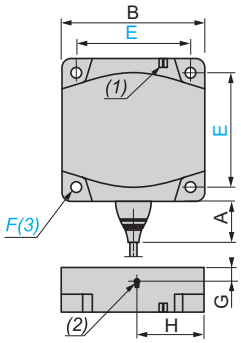
e ⩾	XS8E	XS8C	XS8D
	10	15	40

Dimensions

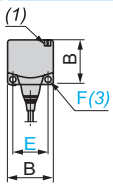
XS8C/D/E



XS8C/D



XS8E



(1) LED
(2) Teach mode button
(3) For CHC type screws

Sensor	A (cable)	A (connector)	B	C	D	E	F	G	H
XS8E	14	11	26	13	8.8	**20**	**3.5**	6.8	6.6
XS8C	14	11	40	15	9.8	**33**	**4.5**	8.3	13.6
XS8D	23	18	80	26	16	**65**	**5.5**	8.5	37.8
XS8D●●DIN	23	18	80	40	30	**65**	**5.1**	22.5	37.8

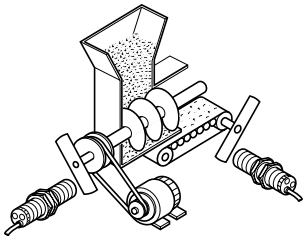
Inductive proximity sensors

OsiSense XS Application

Sensors for rotation monitoring, slip detection, shaft overload detection
Cylindrical form

Example:
Coupling breakage monitoring

822138



Functions

These self-contained rotation speed monitoring sensors have the special feature of incorporating, in the same case, the pulse sensing and processing electronics as well as the output switching amplifier that are required to establish an integrated rotation monitoring device.

The unit provides an economical solution for detecting slip, belt breakage, drive shaft shear and overloading, etc., in the following applications: conveyor belts, bucket elevators, Archemedian screws, grinders, crushers, pumps, centrifugal driers, mixers, etc.

Operating principle

The output signal of this type of sensor is processed by an impulse comparator incorporated in the sensor. The impulse frequency Fc generated by the moving part to be monitored is compared to the frequency Fr preset on the sensor. The output switching circuit of the sensor is in the closed state for Fc > Fr and the open state for Fc < Fr.

Sensors XSAV are particularly suitable for the detection of underspeed: when the speed of the moving part Fc falls below a preset threshold Fr, this causes the output circuit of the sensor to switch off.

Note: *Following power-up, the operational status of the sensor is subject to a delay of 9 seconds in order for the moving part being monitored to run-up to its nominal speed. During this time, the output of the sensor remains in the closed state.*

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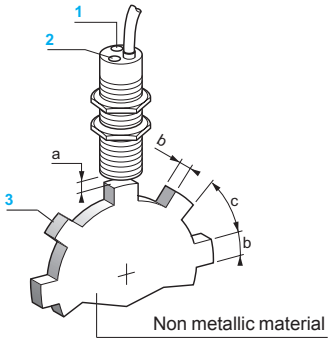


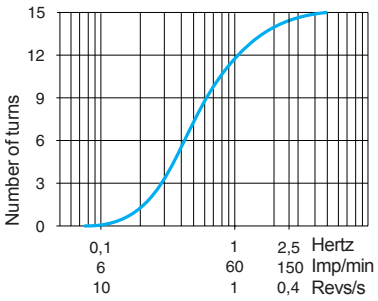
Adjustment of frequency threshold

- Adjustment of sensor's frequency threshold: using potentiometer, 15 turns approximately.
- To increase the frequency threshold: turn the adjustment screw clockwise (+).
- To decrease the frequency threshold: turn the adjustment screw anti-clockwise (–).

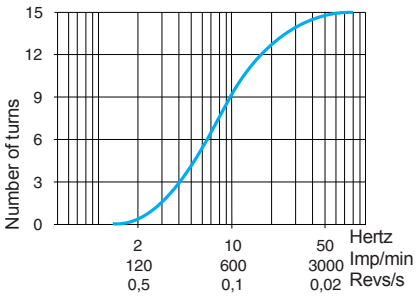
	Diameter of sensor			
1: Potentiometer		a	b	c
2: LED				
3: Metal target	M30	4…6 mm	30 mm	60 mm

Potentiometer adjustment curves (for **XSAV1●801**, 2-wire ∿ or ⎓ sensors)

Low speed version (6…150 impulses/minute)



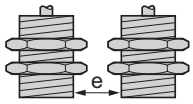
High speed version (120…3000 impulses/minute)



Setting-up

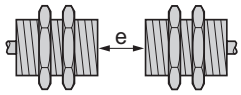
Minimum distances (mm)

Side by side



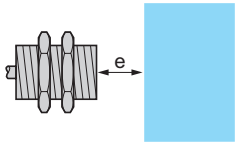
e ⩾ 20

Face to face



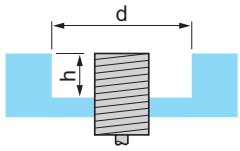
e ⩾ 120

Facing a metal object



e ⩾ 30

Mounted in a metal support



d ⩾ 30, h ⩾ 0

Fixing nut tightening torque: < 50 N.m

Telemecanique Sensors

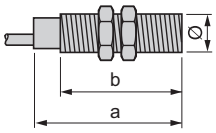
Inductive proximity sensors

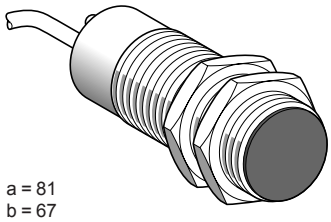
OsiSense XS Application

Sensors for rotation monitoring, slip detection, shaft overload detection

Cylindrical form

Flush mountable in metal





Lengths (mm):
a = Overall
b = Threaded section

a = 81
b = 67
Ø = M30

	DC	DC	AC/DC	AC/DC
Nominal sensing distance (Sn)	10 mm	10 mm	10 mm	10 mm
Adjustable frequency range	6…150 impulses/min	120…3000 impulses/min	6…150 impulses/min	120…3000 impulses/min

References

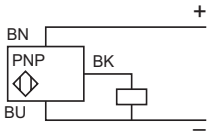
3-wire ⎓	**PNP / NC**	**XSAV11373**	**XSAV12373**	–	–
2-wire	**⎓ or ∿ / NC**	–	–	**XSAV11801**	**XSAV12801**
Weight (kg)		0.300			

Characteristics

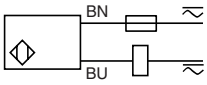
Connection	**Pre-cabled, 3 x 0.34 mm², length 2 m** *(1)*	**Pre-cabled, 2 x 0.34 mm², length 2 m** *(1)*
Degree of protection conforming to IEC 60529	IP 67	
Operating zone	0…8 mm	
Repeat accuracy	3 % of Sr	
Differential travel	3…15 % of Fr	
Operating temperature	- 25…+ 70 °C	
Output state indication	Red LED	
Rated supply voltage	**⎓ 12…48 V with protection against reverse polarity**	**∿ 24…240 V (50/60 Hz) or ⎓ 24…210 V**
Voltage limits (including ripple)	⎓ 10…58 V	∿ or ⎓ 20…264 V
Switching capacity	**≤ 200 mA with overload and short-circuit protection**	**∿ 5…350 mA or ⎓ 5…200 mA** *(2)*
Voltage drop, closed state	≤ 1.8 V	≤ 5.7 V
Residual current, open state	–	≤ 1.5 mA
Current consumption, no-load	≤ 15 mA	–
Maximum switching frequency	6000 impulses/min (for **XSAV11●●●**); 48,000 impulses/min (for **XSAV12●●●**)	
"Run-up" delay following power-up	9 seconds ± 20 % + 1/Fr (3)	

Wiring schemes

3-wire ⎓
XSAV1●373



2-wire ∿ or ⎓
XSAV1●801



(1) For a 5 m long cable add L05 to the reference, for a 10 m long cable add L10 to the reference.
*Example: XSAV11373 becomes **XSAV11373L05** with a 5 m long cable.*
(2) These sensors do not incorporate overload or short-circuit protection and therefore, it is essential to connect a 0.4 A "quick-blow" fuse in series with the load, see page 3/116.
*(3) For a sensor without a "run-up" delay following power-up, replace XSAV1 in the reference by XSAV0. Example: XSAV11801 becomes **XSAV01801** without a "run-up" delay. For a reduced "run-up" delay of 3 s, replace XSAV1 in the reference by XSAV3.*

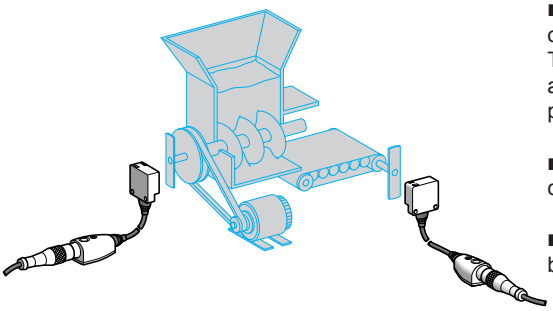
Accessories:
page 3/116

Inductive proximity sensors

OsiSense XS Application

Sensors for rotation monitoring, slip detection and shaft overload detection, with teach mode

Operating principle and applications



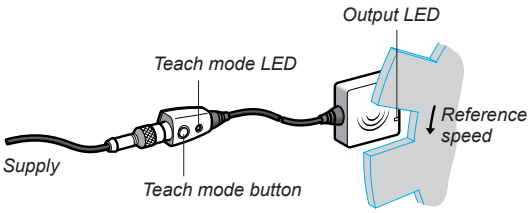
■ These inductive proximity sensors are designed for monitoring rotational speed or the speed of the flow of objects to be protected or monitored.
They operate on the principle of comparing a speed threshold preset by the operator against the instantaneous measurement of the speed of the moving object to be protected.

■ They provide a simple, economical solution for detecting slip, belt breakage, coupling breakage and overload, etc.

■ They are widely used in grinder/crusher, mixer, pump, centrifugal driver, conveyor belt, bucket elevator, Archimedean screw, etc. type applications.

3

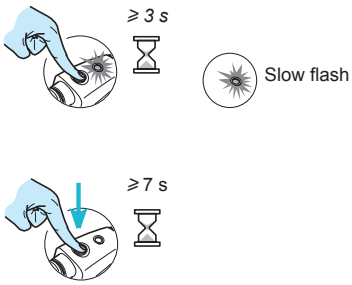
Installation and setting-up



Setting-up and positioning the sensor

■ In the positioning phase, the XS9 sensor can operate as a standard inductive sensor (Schneider Electric patent).
Operation in inductive mode enables validation of reliable detection of all the moving objects to be monitored.

■ Using this system, the positioning is therefore made 100 % reliable and can be checked at any time without altering the settings of the sensor.



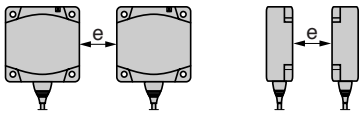
Speed adjustment in teach mode

■ The normal or reference speed of the moving object (1) to be monitored is adjusted by simply pressing the teach mode button (*2*) and is then validated by the display LED.
□ If in doubt, the sensor can be reset at any time to the factory settings.

(1) To allow the moving object to reach its normal speed (machine inertia), the sensor holds its output closed for 9 seconds.
(2) The sensor's default drop-out underspeed corresponds to the preset speed - 30 %.
Example: If the preset speed is 1000 rpm, the sensor drops out on underspeed when the speed of the moving object drops below 1000 - (1000 x 0.3) = 700 rpm.
- 20 %, - 11 % and - 6 % thresholds can be obtained by pressing the teach mode button.

Setting-up

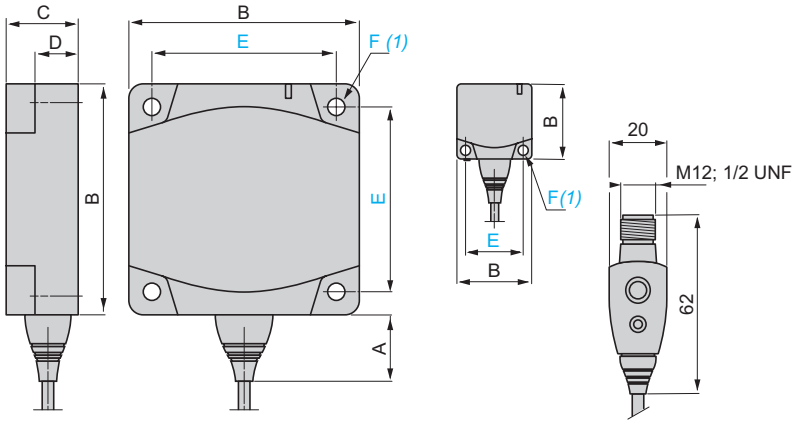
Minimum mounting distances (mm)



Type	Side by side	Face to face
XS9E	e ≥ 40	e ≥ 80
XS9C	e ≥ 60	e ≥ 120

Dimensions

XS9E, XS9C



(1) For CHC type screws

Type	A	B	C	D	E	F
XS9E	14	26	13	8.8	20	3.5
XS9C	14	40	15	9.8	33	4.5

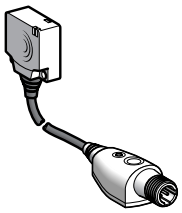
Inductive proximity sensors

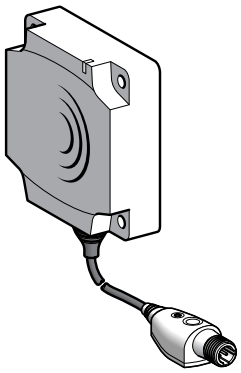
OsiSense XS Application

Sensors for rotation monitoring, slip detection and shaft overload detection, with teach mode

Flush mountable in metal

PBT case





Nominal sensing distance (Sn)		**10 mm**	**15 mm**	**10 mm**	**15 mm**
Adjustable frequency range		6…6000 impulses/min			
References					
3-wire	PNP / NC	**XS9E11RPBL01M12**	**XS9C11RPBL01M12**	–	–
2-wire	⎓ or ∿ / NC	–	–	**XS9E11RMBL01U20**	**XS9C11RMBL01U20**
Weight (kg)		0.040	0.060	0.040	0.060
Characteristics					
Product certifications		UL, CSA, CE			
Connection		Remote M12 connector on 0.15 m flying lead		Remote 1/2"-20UNF connector on 0.15 m flying lead	
Operating zone		**0…8 mm**	**0…12 mm**	**0…8 mm**	**0…12 mm**
Degree of protection	Conforming to IEC 60529	IP 67, double insulation ⧈			
Storage temperature		- 40…+ 85 °C			
Operating temperature		- 25…+ 70 °C			
Vibration resistance	Conforming to IEC 60068-2-6	25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)			
Shock resistance	Conforming to IEC 60068-2-27	50 gn, duration 11 ms			
Indicators	Output state	Yellow LED			
	Supply on	Green LED			
Rated supply voltage		⎓ 12…24 V		∿ or ⎓ 24…240 V (50/60 Hz)	
Voltage limits (including ripple)		⎓ 10…36 V		∿ or ⎓ 20…264 V	
Switching capacity		≤ 100 mA *(1)*	≤ 200 mA *(1)*	∿ or ⎓ 5…100 mA *(2)*	⎓ 5…200 mA, ∿ 5…300 mA*(2)*
Voltage drop, closed state		≤ 2 V		≤ 5.5 V	
Residual current, open state		≤ 100 mA		≤ 1.5 mA	
Current consumption, no-load		≤ 10 mA		–	
Maximum switching frequency		48,000 impulses/min			
"Run-up" delay following power-up		9 seconds + 1/Fr			

(1) With overload and short-circuit protection.
(2) It is essential to connect a 0.4 A "quick-blow" fuse in series with the load.

Wiring schemes

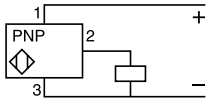
Connector

M12

1/2"-20UNF

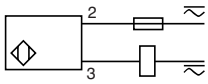
3-wire ⎓

XS9●11RPBL01M12

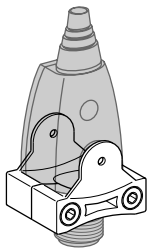


2-wire ∿ or ⎓

XS9●11RMBL01U20



Accessory *(1)*



XSZBPM12

Description	Reference	Weight kg
Remote control fixing clamp	**XSZBPM12**	0.015

(1) For accessories, see page 3/116.

Inductive proximity sensors

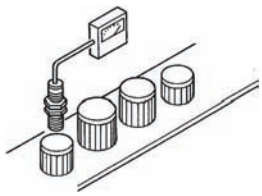
OsiSense XS Application

Sensors with analogue output signal 0...10 V *(1)* or 4…20 mA

For position, displacement and deformation control/monitoring

Functions

Example:
Sorting parts



These analogue output proximity sensors are solid-state sensors designed for monitoring displacement. They are not measuring sensors. They are suitable for use in many sectors, particularly for applications involving:

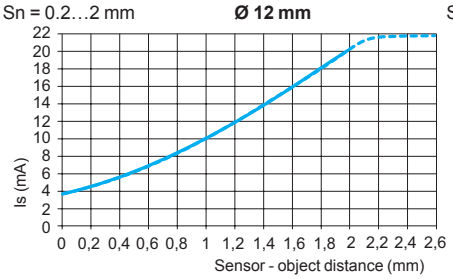
- deformation and displacement monitoring,
- vibration amplitude and frequency monitoring,
- control of dimensional tolerances,
- position control,
- concentricity or eccentricity monitoring.

Operating principle

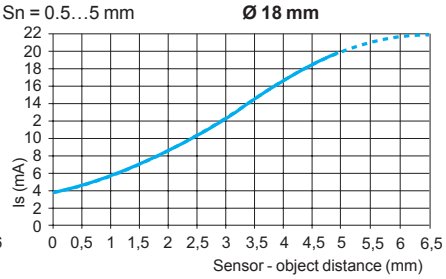
The operating principle of the sensor is that of a damped oscillator. The degree of damping will depend on the distance of an object from the sensing face. The sensor will sense the distance and produce an output current with a value directly proportional to this distance.

Output curves 4..0.20 mA, 2-wire connection

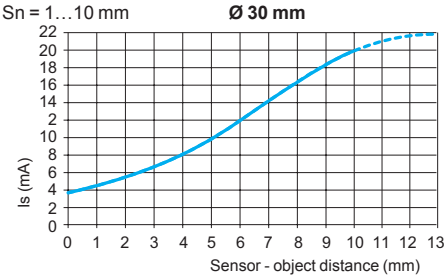
XS1M12AB120
Sn = 0.2…2 mm **Ø 12 mm**



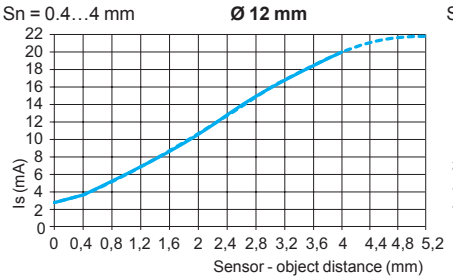
XS1M18AB120
Sn = 0.5…5 mm **Ø 18 mm**



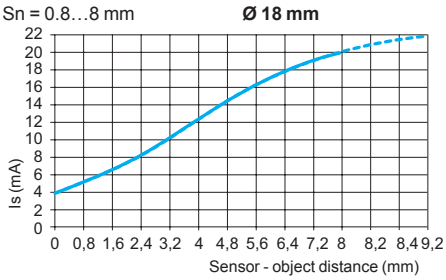
XS1M30AB120
Sn = 1…10 mm **Ø 30 mm**



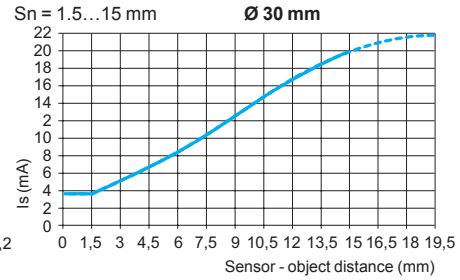
XS4P12AB120
Sn = 0.4…4 mm **Ø 12 mm**



XS4P18AB120
Sn = 0.8…8 mm **Ø 18 mm**

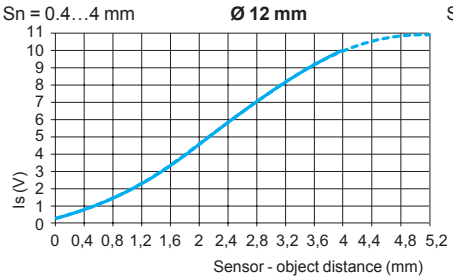


XS4P30AB120
Sn = 1.5…15 mm **Ø 30 mm**

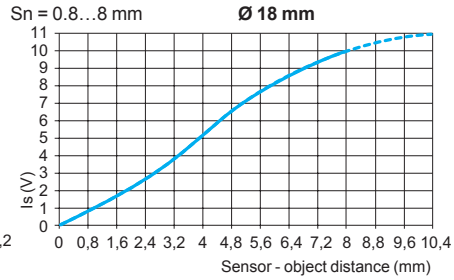


Output curves 0...10 V, 3-wire connection

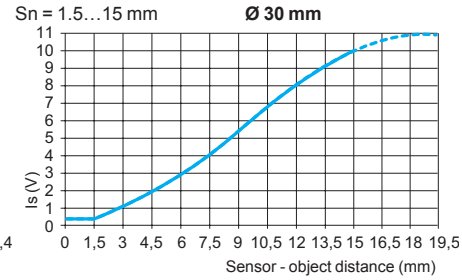
XS4P12AB110
Sn = 0.4…4 mm **Ø 12 mm**



XS4P18AB110
Sn = 0.8…8 mm **Ø 18 mm**

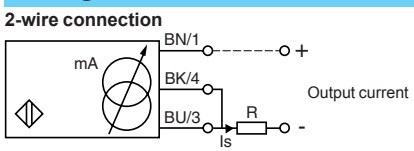


XS4P30AB110
Sn = 1.5…15 mm **Ø 30 mm**



Wiring schemes

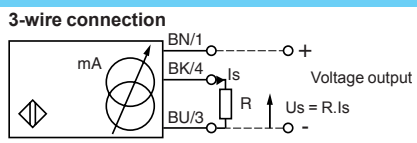
2-wire connection



	Output current	Load impedance value
12 V	4…20 mA	R ≤ 8.2 Ω
24 V	4…20 mA	R ≤ 470 Ω

Ensure a minimum of 10 V between the + and the - (terminal 3) of the sensor.

3-wire connection



	Output current	Load impedance value	Output voltage	Load impedance value
24 V	0…10 mA	R ≤ 1500 Ω	0…10 V	R = 1000 Ω
48 V	0…10 mA	R ≤ 3300 Ω	0…10 V	R = 1000 Ω

Ensure a minimum of 5 V between the + and the sensor output (terminal 4).

(1) Voltage range only obtained with a load impedance of 1000 Ω.

References:
pages 3/79 to 3/81

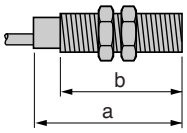
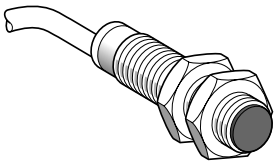
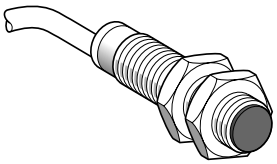
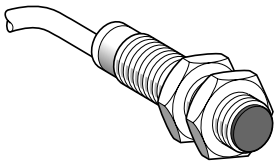
Characteristics:
pages 3/79 to 3/81

Inductive proximity sensors

OsiSense XS Application

Sensors with analogue output signal 0...10 V *(1)* or 4…20 mA

For position, displacement and deformation control/monitoring

Sensor	Flush mountable in metal	Non flush mountable in metal	
			
Lengths (mm): a = Overall b = Threaded section	a = 50 b = 42	a = 50 b = 42	a = 54 b = 42
	Metal case	**Plastic case**	**Plastic case**
Nominal sensing distance (Sn)	2 mm	4 mm	4 mm

References

3-wire ⎓ Output 0…10 V *(2)*	–	–	**XS4P12AB110**
2-wire ⎓ Output 4…20 mA *(2)*	**XS1M12AB120**	**XS4P12AB120**	–
Weight (kg)	0.075	0.065	0.065

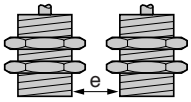
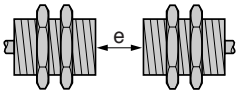
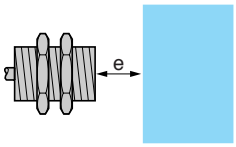
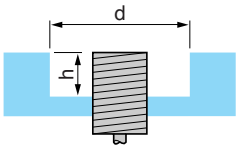
Characteristics

Product certifications	CE, UL, CSA		
Connection	**Pre-cabled, PvR 3 x 0.34 mm², length 2 m**		
Degree of protection Conforming to IEC 60529	IP 67		
Operating zone	**0.2…2 mm**	**0.4…4 mm**	**0.4…4 mm**
Repeat accuracy	± 3 %		
Linearity error	± 2 mA		± 1 V
Ambient air temperature	For operation: - 25…+ 70 °C		
Rated supply voltage	**⎓ 12...24 V**	**⎓ 12...24 V**	**⎓ 24…48 V**
Voltage limits (including ripple)	⎓ 10…36 V	⎓ 10…36 V	⎓ 15…58 V
Output current drift Ambient temperature: - 25…+ 70 °C	⩽ 10 %		
Current consumption, no-load	4 mA		
Maximum operating rate	1500 Hz		

(1) Voltage range only obtained with a load impedance of 1000 Ω.
(2) Output current range Is, see page 3/78.

Setting-up

Minimum mounting distances (mm)

	Side by side	Face to face	Facing a metal object	Mounted in a metal support
				
XS1M12AB120 flush mountable	e ⩾ 4	e ⩾ 24	e ⩾ 6	d ⩾ 12, h ⩾ 0
XS4P12AB110 non flush mountable	e ⩾ 16	e ⩾ 48	e ⩾ 12	d ⩾ 36, h ⩾ 8
XS4P12AB120 non flush mountable	e ⩾ 16	e ⩾ 48	e ⩾ 12	d ⩾ 36, h ⩾ 8

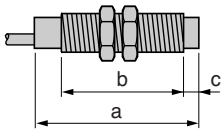
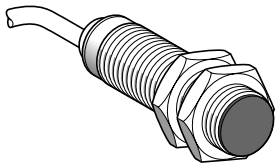
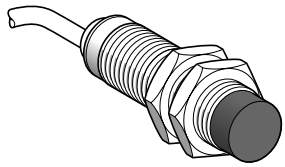
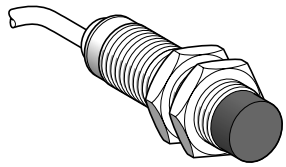
Fixing nut tightening torque	< 6 N.m (metal case), < 2 N.m (plastic case)
Other versions	Please consult our Customer Care Centre.

Accessories: page 3/116
Functions: page 3/78

Inductive proximity sensors

OsiSense Application

Sensors with analogue output signal 0...10 V *(1)* or 4…20 mA

Sensor	Flush mountable in metal	Non flush mountable in metal	
			
Lengths (mm): a = Overall b = Threaded section c = For non flush mountable sensors	a = 53 b = 44 c = 0	a = 41 b = 26 c = 8	a = 41 b = 26 c = 8
	Metal case	**Plastic case**	**Plastic case**
Nominal sensing distance (Sn)	5 mm	8 mm	8 mm

References

3-wire ⎓ Output 0…10 V *(2)*	–	–	**XS4P18AB110**
2-wire ⎓ Output 4…20 mA *(2)*	**XS1M18AB120**	**XS4P18AB120**	–
Weight (kg)	0.120	0.080	0.080

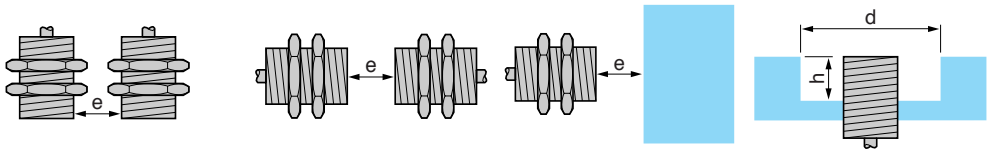
Characteristics

Product certifications	CE, UL, CSA		
Connection	**Pre-cabled, PvR 3 x 0.34 mm², length 2 m**		
Degree of protection Conforming to IEC 60529	IP 67		
Operating zone	**0.5…5 mm**	**0.8…8 mm**	**0.8…8 mm**
Repeat accuracy	± 3 %		
Linearity error	± 2 mA		± 1 V
Ambient air temperature	For operation: - 25…+ 70 °C		
Rated supply voltage	⎓ **12...24 V**	⎓ **12...24 V**	⎓ **24…48 V**
Voltage limits (including ripple)	⎓ 10…36 V	⎓ 10…36 V	⎓ 15…58 V
Output current drift Ambient temperature: - 25…+ 70 °C	⩽ 10 %		
Current consumption, no-load	4 mA		
Maximum operating rate	500 Hz		

(1) Voltage range only obtained with a load impedance of 1000 Ω.
(2) Output current range Is, see page 3/78.

Setting-up

Minimum mounting distances (mm)



	Side by side	Face to face	Facing a metal object	Mounted in a metal support
XS1M18AB120 flush mountable	e ⩾ 10	e ⩾ 60	e ⩾ 15	d ⩾ 18, h ⩾ 0
XS4P18AB110 non flush mountable	e ⩾ 32	e ⩾ 96	e ⩾ 24	d ⩾ 54, h ⩾ 16
XS4P18AB120 non flush mountable	e ⩾ 32	e ⩾ 96	e ⩾ 24	d ⩾ 54, h ⩾ 16

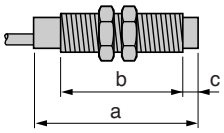
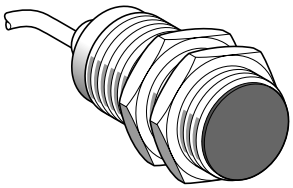
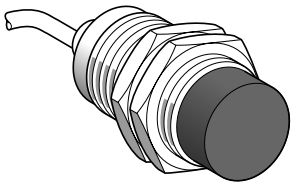
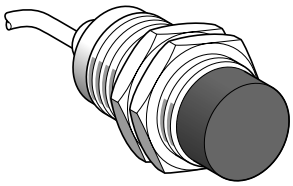
Fixing nut tightening torque	< 15 N.m (metal case), < 5 N.m (plastic case)
Other versions	Please consult our Customer Care Centre.

Accessories: page 3/116
Schemes: page 3/78

Inductive proximity sensors

OsiSense Application

Sensors with analogue output signal 0...10 V (1) or 4…20 mA

Sensor	Flush mountable in metal	Non flush mountable in metal	
			
Lengths (mm): a = Overall b = Threaded section c = For non flush mountable sensors	a = 50 b = 42 c = 0	a = 53 b = 32 c = 13	a = 53 b = 32 c = 13
	Metal case	**Plastic case**	**Plastic case**
Nominal sensing distance (Sn)	10 mm	15 mm	15 mm

References

3-wire ⎓ Output 0…10 V *(2)*	–	–	**XS4P30AB110**
2-wire ⎓ Output 4…20 mA *(2)*	**XS1M30AB120**	**XS4P30AB120**	–
Weight (kg)	0.200	0.100	0.100

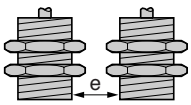
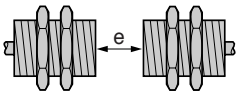
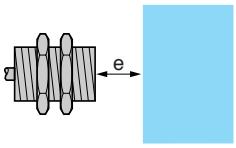
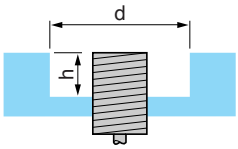
Characteristics

Product certifications	CE, UL, CSA		
Connection	**Pre-cabled, PvR 3 x 0.34 mm², length 2 m**		
Degree of protection Conforming to IEC 60529	IP 67		
Operating zone	**1…10 mm**	**1.5…15 mm**	**1.5…15 mm**
Repeat accuracy	± 3 %		
Linearity error	± 2 mA		± 1 V
Ambient air temperature	For operation: - 25…+ 70 °C		
Rated supply voltage	**⎓ 12...24 V**	**⎓ 12...24 V**	**⎓ 24…48 V**
Voltage limits (including ripple)	⎓ 10…36 V	⎓ 10…36 V	⎓ 15…58 V
Output current drift Ambient temperature: - 25…+ 70 °C	⩽ 10 %		
Current consumption, no-load	4 mA		
Maximum operating rate	300 Hz		

(1) Voltage range only obtained with a load impedance of 1000 Ω.
(2) Output current range Is, see page 3/78.

Setting-up

Minimum mounting distances (mm)

	Side by side	Face to face	Facing a metal object	Mounted in a metal support
				
XS1M30AB120 flush mountable	e ⩾ 20	e ⩾ 120	e ⩾ 30	d ⩾ 30, h ⩾ 0
XS4P30AB110 non flush mountable	e ⩾ 60	e ⩾ 180	e ⩾ 45	d ⩾ 90, h ⩾ 30
XS4P30AB120 non flush mountable	e ⩾ 60	e ⩾ 180	e ⩾ 45	d ⩾ 90, h ⩾ 30

Fixing nut tightening torque	< 40 N.m (metal case), < 20 N.m (plastic case)
Other versions	Please consult our Customer Care Centre.

Accessories: page 3/116
Schemes: page 3/78

Inductive proximity sensors

OsiSense XS Application

Sensors with analogue output signal 0…10 V *(1)*
For position, displacement and deformation control/monitoring

Functions

These analogue output proximity sensors are solid-state sensors designed for monitoring displacement. They are not measuring sensors.

They are suitable for use in many sectors, particularly for applications involving:
- deformation and displacement monitoring,
- vibration amplitude and frequency monitoring,
- control of dimensional tolerances,
- position control,
- concentricity or eccentricity monitoring.

Operating principle

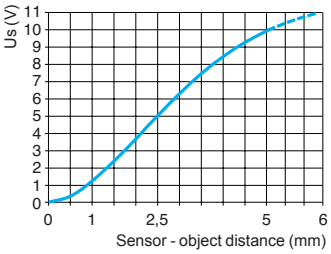
The operating principle of the sensor is that of a damped oscillator. The degree of damping will depend on the distance of an object from the sensing face. The sensor will sense the distance and produce an output current with a value directly proportional to this distance.

3

Output curves 0…10 V, 3-wire connection

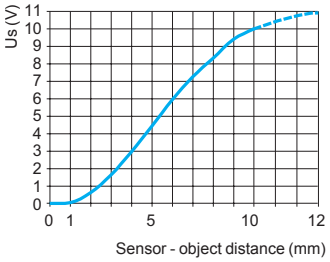
XS9F

Sn = 1…5 mm



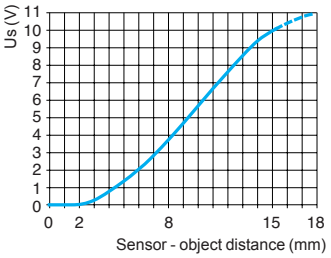
XS9E

Sn = 1…10 mm



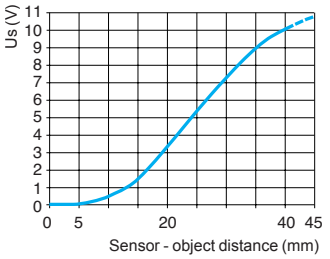
XS9C

Sn = 2…15 mm



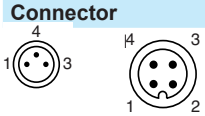
XS9D

Sn = 5…40 mm



Wiring schemes

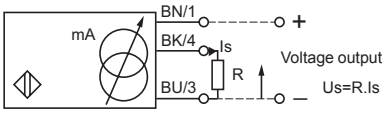
Connector



Pre-cabled

BN: Brown
BU: Blue
BK: Black

3-wire connection



	Output current	Load impedance value	Output voltage	Load impedance value
24 V	0…10 mA	R ⩽ 1400 Ω	0…10 V	R = 1000 Ω

Note: *Ensure a minimum of 5 V between the + (terminal 1) and the sensor output (terminal 4).*

(1) Voltage range only obtained with a load impedance of 1000 Ω.

Telemecanique Sensors

Inductive proximity sensors

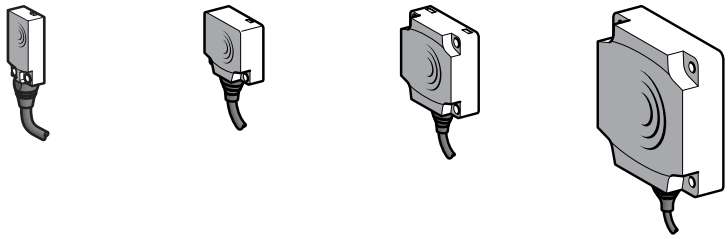
OsiSense XS Application

Sensors with analogue output signal 0…10 V *(1)*
For position, displacement and deformation control/monitoring

Flush mountable in metal

ECOLAB certified

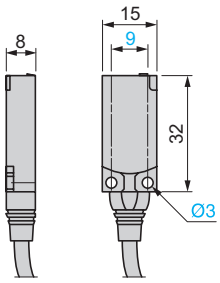
PBT case



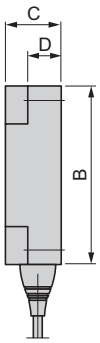
Nominal sensing distance (Sn)		**5 mm**	**10 mm**	**15 mm**	**40 mm**
References					
3-wire ⎓ 0…10 V	Pre-cabled (L = 2 m) *(2)*	**XS9F111A1L2**	**XS9E111A1L2**	**XS9C111A1L2**	**XS9D111A1L2**
	Connector	**XS9F111A1L01M8**	**XS9E111A1L01M12**	**XS9C111A1L01M12**	**XS9D111A1M12**
Weight (kg)	Pre-cabled (L = 2 m) *(2)*	0.060	0.075	0.095	0.340
	Connector	0.040	0.055	0.075	0.320
Characteristics					
Product certifications		UL, CSA, CE	UL, CSA, CE, ECOLAB		
Connection	Pre-cabled	PvR 3 x 0.34 mm², length 2 m for **XS9●111A●L2**			
	Connector	0.15 m flying lead with M8 connector	0.15 m flying lead with M12 connector		M12
Operating zone		**1…5 mm**	**1…10 mm**	**2…15 mm**	**5…40 mm**
Degree of protection Conforming to IEC 60529	Pre-cabled	IP 68	IP 68, double insulation ⧈		
	Connector	IP 67	IP 67, double insulation ⧈		
Storage temperature		- 40…+ 85 °C			
Operating temperature		- 25…+ 70 °C			
Materials		PBT case			
Vibration resistance	Conforming to IEC 60068-2-6	25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)			
Shock resistance	Conforming to IEC 60068-2-27	50 gn, duration 11 ms			
Output state indication		No			
Rated supply voltage		⎓ 24 V			
Voltage limits (including ripple)		⎓ 15…36 V			
Repeat accuracy		± 3 %			
Linearity error		± 1 V			
Current consumption, no-load		⩽ 4 mA with overload and short-circuit protection			
Maximum operating frequency		2000 Hz	1000 Hz		100 Hz
Output current drift		⩽ 10 % (throughout the operating temperature range)			

Dimensions

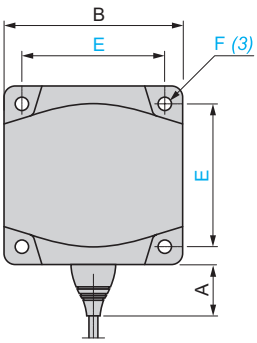
XS9F



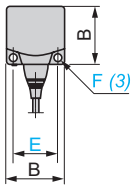
XS9E/C/D



XS9C/D



XS9E

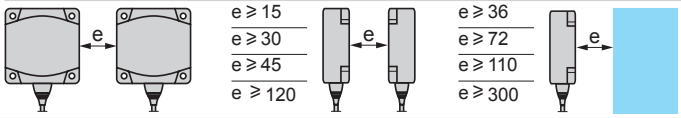


(3) For CHC type screws

Type	A (L2)	A (M12)	B	C	D	E	F
XS9E	14	–	26	13	8.8	20	3.5
XS9C	14	–	40	15	9.8	33	4.5
XS9D	23	14	80	26	16	65	5.5

Setting-up (Minimum mounting distances (mm))

Type	Side by side	Face to face	Facing a metal object
XS9F	e ⩾ 15	e ⩾ 36	e ⩾ 15
XS9E	e ⩾ 30	e ⩾ 72	e ⩾ 30
XS9C	e ⩾ 45	e ⩾ 110	e ⩾ 45
XS9D	e ⩾ 120	e ⩾ 300	e ⩾ 120



(1) Voltage range only obtained with a load impedance of 1000 Ω.
*(2) For a 5 m long cable replace L2 by **L5**, for a 10 m long cable replace L2 by **L10**.*
*Example: XS9C111A1L2 becomes **XS9C111A1L5** with a 5 m long cable.*

Accessories:
page 3/116

Inductive proximity sensors

OsiSense XS Application

Sensors with analogue output signal 4…20 mA
For position, displacement and deformation control/monitoring

Functions

These analogue output proximity sensors are solid-state sensors designed for monitoring displacement. They are not measuring sensors.

They are suitable for use in many sectors, particularly for applications involving:

- deformation and displacement monitoring,
- vibration amplitude and frequency monitoring,
- control of dimensional tolerances,
- position control,
- concentricity or eccentricity monitoring.

Operating principle

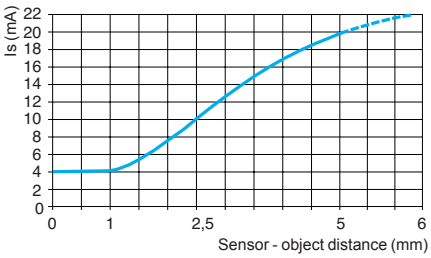
The operating principle of the sensor is that of a damped oscillator. The degree of damping will depend on the distance of an object from the sensing face. The sensor will sense the distance and produce an output current with a value directly proportional to this distance.

3

Output curves 4…20 mA, 2-wire connection

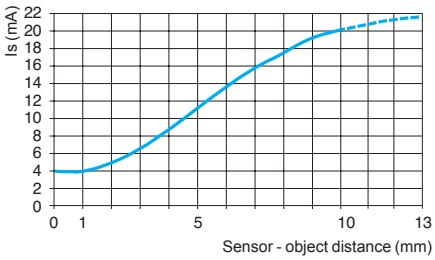
XS9F

Sn = 1…5 mm



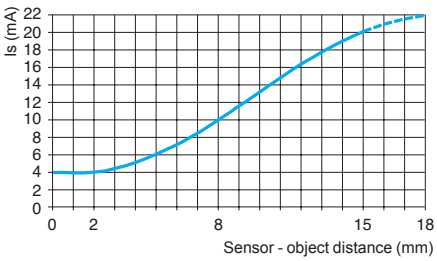
XS9E

Sn = 1…10 mm



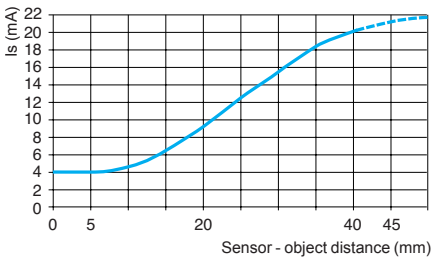
XS9C

Sn = 2…15 mm



XS9D

Sn = 5…40 mm



Wiring schemes

Connector

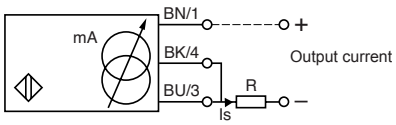
M8

M12

Pre-cabled

BN: Brown
BU: Blue
BK: Black

2-wire connection



	Output current	Load impedance value
12 V	4…20 mA	R ≤ 8.2 Ω
24 V	4…20 mA	R ≤ 470 Ω

Note: *Ensure a minimum of 10 V between the + (terminal 1) and - (terminal 3) of the sensor.*

Inductive proximity sensors

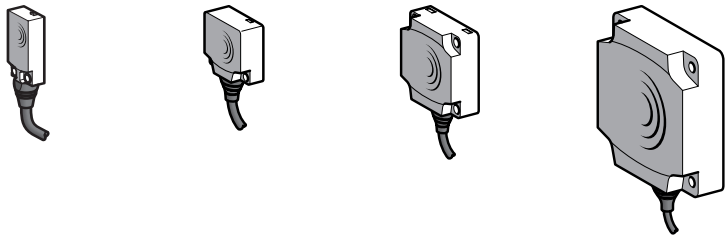
OsiSense XS Application

Sensors with analogue output signal 4…20 mA
For position, displacement and deformation control/monitoring

Flush mountable in metal

ECOLAB certified

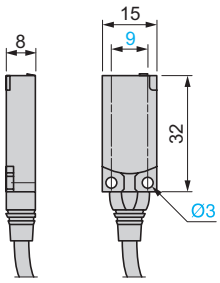
PBT case



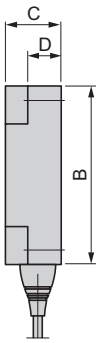
Nominal sensing distance (Sn)		**5 mm**	**10 mm**	**15 mm**	**40 mm**
References					
2-wire ⎓ 4…20 mA	Pre-cabled (L = 2 m) *(1)*	**XS9F111A2L2**	**XS9E111A2L2**	**XS9C111A2L2**	**XS9D111A2L2**
	Connector	**XS9F111A2L01M8**	**XS9E111A2L01M12**	**XS9C111A2L01M12**	**XS9D111A2M12**
Weight (kg)	Pre-cabled (L = 2 m)	0.060	0.075	0.095	0.340
	Connector	0.040	0.055	0.075	0.320
Characteristics					
Product certifications		UL, CSA, CE	UL, CSA, CE, ECOLAB		
Connection	Pre-cabled	PvR 3 x 0.34 mm², length 2 m for **XS9●111A●L2**			
	Connector	0.15 m flying lead with M8 connector	0.15 m flying lead with M12 connector		M12
Operating zone		**1…5 mm**	**1…10 mm**	**2…15 mm**	**5…40 mm**
Degree of protection Conforming to IEC 60529	Pre-cabled	IP 68	IP 68, double insulation ⧈		
	Connector	IP 67	IP 67, double insulation ⧈		
Storage temperature		- 40…+ 85 °C			
Operating temperature		- 25…+ 60 °C	- 25…+ 70 °C		
Materials		PBT case			
Vibration resistance	Conforming to IEC 60068-2-6	25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)			
Shock resistance	Conforming to IEC 60068-2-27	50 gn, duration 11 ms			
Output state indication		No			
Rated supply voltage		⎓ 12…24 V			
Voltage limits (including ripple)		⎓ 10…36 V			
Repeat accuracy		± 3 %			
Linearity error		± 2 mA			
Current consumption, no-load		⩽ 4 mA with overload and short-circuit protection			
Maximum operating frequency		2000 Hz	1000 Hz		100 Hz
Output current drift		⩽ 10 % (throughout the operating temperature range)			

Dimensions

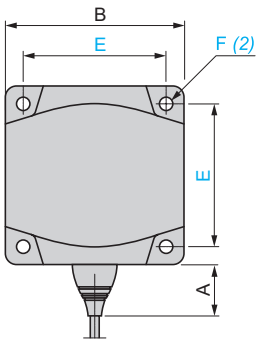
XS9F



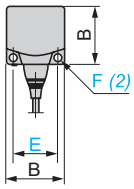
XS9E/C/D



XS9C/D



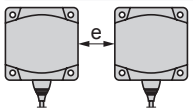
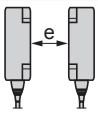
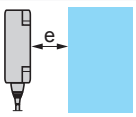
XS9E



(2) For CHC type screws

Type	A (L2)	A (M12)	B	C	D	E	F
XS9E	14	–	26	13	8.8	20	3.5
XS9C	14	–	40	15	9.8	33	4.5
XS9D	23	14	80	26	16	65	5.5

Setting-up (Minimum mounting distances (mm))

Type	Side by side		Face to face		Facing a metal object	
XS9F		e ⩾ 15		e ⩾ 36		e ⩾ 15
XS9E		e ⩾ 30		e ⩾ 72		e ⩾ 30
XS9C		e ⩾ 45		e ⩾ 110		e ⩾ 45
XS9D		e ⩾ 120		e ⩾ 300		e ⩾ 120

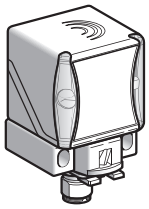
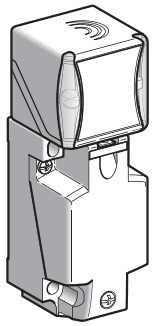
*(1) For a 5 m long cable replace L2 by **L5**; for a 10 m long cable replace L2 by **L10**.*
*Example: XS9F111A2L2 becomes **XS9F111A2L5** with a 5 m long cable.*

Accessories:
page 3/116

Inductive proximity sensors

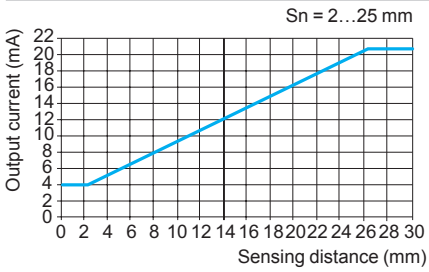
OsiSense XS Application

Sensors with analogue output signal 0…10 V *(1)* or 4…20 mA. Plastic case, 40 x 40 mm front face 5 position turret head

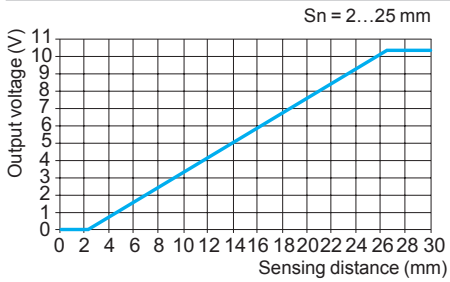
Sensor		**Non flush mountable in metal**	
Dimensions		**40 x 40 x 70 mm**	**40 x 40 x 117 mm**
			
Nominal sensing distance (Sn)		25 mm	
References			
3-wire ⎓	0…10 V output *(1)*	**XS9C2A2A1M12**	**XS9C4A2A1P20** *(2)*
2-wire ⎓	4…20 mA output	**XS9C2A2A2M12**	**XS9C4A2A2P20** *(2)*
		XS9C4●●●P20 sensors are available with an ISO M20 cable entry and can be supplied with a PG 13.5 (e.g. **XS9C4A2A1G13**) or a 1/2" NPT (e.g. **XS9C4A2A2N12**) cable entry: please consult our Customer Care Centre for more information.	
Weight (kg)		0.149	0.244
Characteristics			
Product certifications		UL, CSA, CE	
Conformity to standards		IEC 60947-5-2 and IEC 60947-5-7	
Connection		M12 connector (4-pin)	Screw terminals, clamping capacity 3 x 1.5 mm^2 / 3 x 16 AWG
Operating zone		2…27 mm	
Linearity error		< 3%	
Repeat accuracy		< 3%	
Output current drift		< 5%	
Degree of protection	Conforming to IEC 60529 and DIN 40050	IP 65, IP 67 and IP 69K	
Temperature	Storage	- 40….+ 85°C	
	Operation *(3)*	- 25….+ 70°C	
Material		Case: PBT	
Vibration resistance	Conforming to IEC 60068-2-6	25 gn, amplitude ± 2 mm (f = 10…55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27	50 gn for 11 ms	
Indicators	Output state (alignment aid)	Yellow LED	
Rated supply voltage	4...20 mA	⎓ 12…24 V with protection against reverse polarity	
	0...10 V	⎓ 24 V with protection against reverse polarity	
Voltage limits (including ripple)	4...20 mA	⎓ 12…36 V	
	0...10 V	⎓ 15…36 V	
Current consumption, no-load	3-wire ⎓	< 4 mA	
Delays	First-up	< 7 ms	
	Response	< 6 ms	
	Recovery	< 6 ms	

Analogue outputs 4-20 mA and 0-10 V

XS9C2A2A2M12 and **XS9C4A2A2P20**



XS9C2A2A1M12 and **XS9C4A2A1P20**



(1) Voltage range only obtained with a load impedance of 1000 Ω.
*(2) These sensors are supplied without a cable gland. An adaptable PG 13.5 cable gland is available (reference **XSZPE13**).*
*(3) Sensors are available for very low temperatures (suffix **TF**: - 40°C, + 70°C) or very high temperatures (suffix **TT**: - 25°C, + 85°C); please consult our Customer Care Centre.*

Inductive proximity sensors

OsiSense XS Application

Sensors with analogue output signal 0…10 V *(1)* or 4…20 mA. Plastic case, 40 x 40 mm front face 5 position turret head

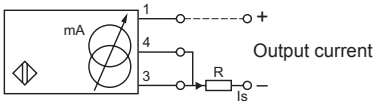
Setting-up precautions

Minimum mounting distances (mm)

	Side by side	Face to face	Facing a metal object
Sensors non flush mountable in metal	e ⩾ 120	e ⩾ 240	e ⩾ 90

Wiring schemes

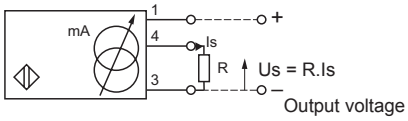
2-wire



	Output current	Load impedance value
12 V	4...20 mA	R ⩽ 82 Ω
24 V	4...20 mA	R ⩽ 560 Ω

Ensure a minimum of 10 V between the + and the - (terminal 3) of the sensor.

3-wire

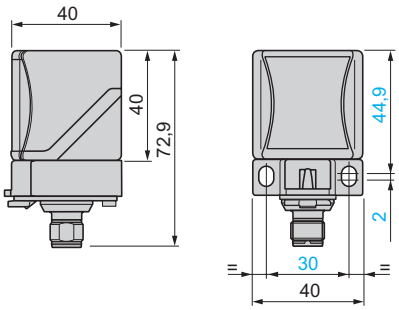


	Output current	Load impedance value	Output voltage	Load impedance value
12 V	0...10 mA	R ⩽ 630 Ω	–	–
24 V	0...10 mA	R ⩽ 1500 Ω	0...10 V	R = 1000 Ω

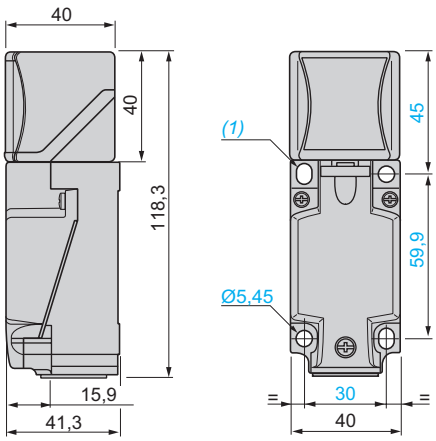
Ensure a minimum of 5 V between the + and the sensor output (terminal 4).

Dimensions

XS9C2A2A1M12 and **XS9C2A2A2M12**



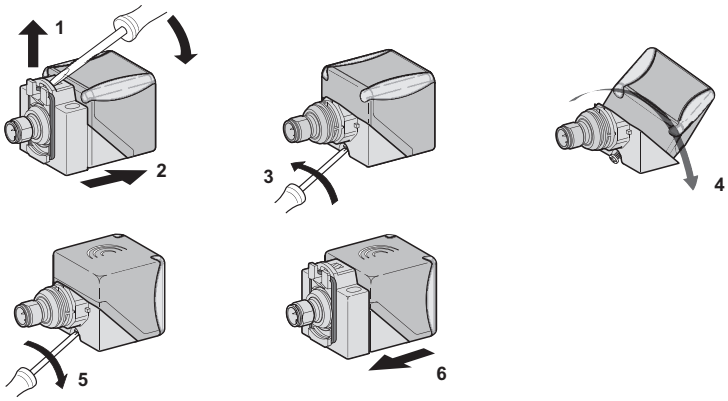
XS9C4A2A1P20 and **XS9C4A2A2P20**



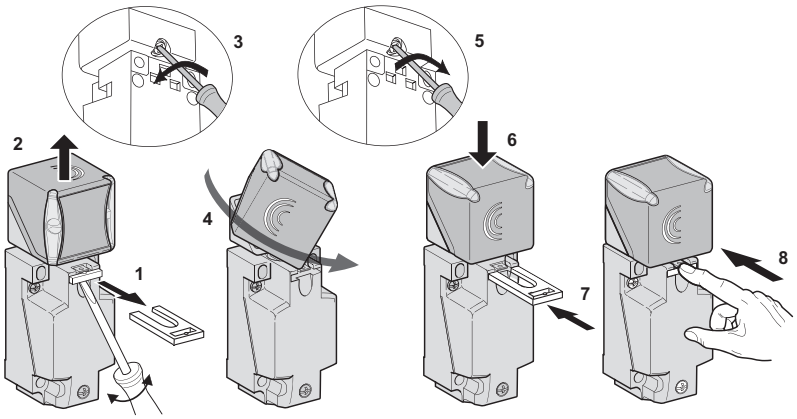
(1) 2 elongated holes Ø 5.3 x 7 mm.
Tightening torque of cover fixing screws and clamp screws: < 1.2 N.m / < 10.62 lb-in

Head positions

XS9C2A2A1M12 and **XS9C2A2A2M12**



XS9C4A2A1P20 and **XS9C4A2A2P20**



(1) Voltage range only obtained with a load impedance of 1000 Ω.

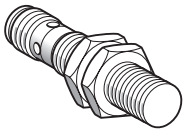
Inductive proximity sensors

OsiSense XS Application

Cylindrical, stainless steel 316L front face for food and beverage applications and harsh industrial environments. Three-wire DC, solid-state output

ECOLAB certified

DF513369



XS912●1PAM12

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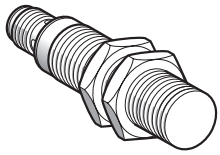

XS918●1PAM12

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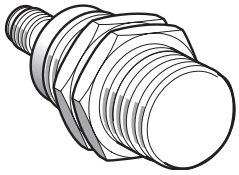

XS930●1PAM12

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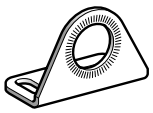
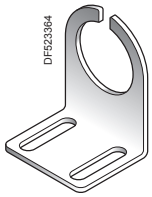


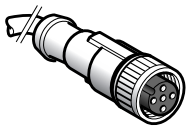
XUZA118

DF523364



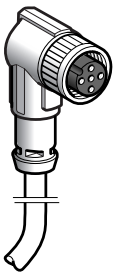
XSZBS30

DF532604



XZCP1141L●

DF503630



XZCP1241L●

Ø 12 mm, threaded M12 x 1

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
Three-wire 12-24V ⎓, flush mountable					
6	NO	PNP	M12	**XS912S1PAM12**	0.024
Three-wire 12-24V ⎓, non flush mountable					
10	NO	PNP	M12	**XS912S4PAM12**	0.023

Ø 18 mm, threaded M18 x 1

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
Three-wire 12-24V ⎓, flush mountable					
10	NO	PNP	M12	**XS918S1PAM12**	0.051
Three-wire 12-24V ⎓, non flush mountable					
20	NO	PNP	M12	**XS918S4PAM12**	0.051

Ø 30 mm, threaded M30 x 1.5

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
Three-wire 12-24V ⎓, flush mountable					
20	NO	PNP	M12	**XS930S1PAM12**	0.140
Three-wire 12-24V ⎓, non flush mountable					
40	NO	PNP	M12	**XS930S4PAM12**	0.145

Accessories

Description	For use with sensor	Reference	Weight kg
Stainless steel mounting bracket	Ø 12	**XSZBS12**	0.090
	Ø 18	**XUZA118**	0.190
	Ø 30	**XSZBS30**	0.370

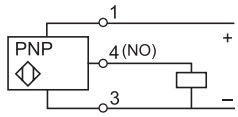
Connecting cables (PVC) *(1)*

Description	Type	Length m	Reference	Weight kg
Pre-wired M12 connectors Female, 4-pin Stainless steel clamping ring	Straight	2	**XZCPA1141L2**	0.090
		5	**XZCPA1141L5**	0.190
		10	**XZCPA1141L10**	0.370
	Elbowed	2	**XZCPA1241L2**	0.090
		5	**XZCPA1241L5**	0.190
		10	**XZCPA1241L10**	0.370

Wiring schemes

M12 connector

PNP



(1) For further information, please consult the catalogue "Cabling accessories OsiSense XZ" on our site www.tesensors.com.

Inductive proximity sensors

OsiSense XS Application

Cylindrical, stainless steel 316L front face for food and beverage applications and harsh industrial environments. Three-wire DC, solid-state output

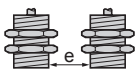
Characteristics

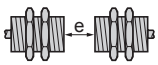
Sensor type	Flush		XS912S1PAM12	XS918S1PAM12	XS930S1PAM12
	Non flush		XS912S4PAM12	XS918S4PAM12	XS930S4PAM12
Product certifications			CE, cULus, ECOLAB		
Connection	Connector		M12		
Operating zone	Flush	mm	0…4.8	0…8	0…16
	Non flush	mm	0…8	0…16	0…32
Differential travel		%	1…15 (real sensing distance Sr)		
Degree of protection	Conforming to IEC 60529		IP 68 (5 meters underwater for 1 month)		
	Conforming to DIN 40050		IP 69K		
Storage temperature		°C	-25…+ 85 (-13…185°F)		
Operating temperature		°C	-25…+ 85 (-13…185°F)		
Materials	Case		Stainless steel 316L		
Front face thickness		mm	0.4	0.6	1.0
Mechanical shock resistance	Conforming to EN 50102		IK10		
Vibration resistance	Conforming to IEC 60068-2-6		25 gn, amplitude ± 1 mm (f = 10 to 55 Hz)		
Shock resistance	Conforming to IEC 60068-2-27		30 gn, duration 11 ms		
Output state indication			Yellow LED, 4 viewing points at 90° (blinking from 0.8 Sr and Sr)		
Rated supply voltage		V	⎓ 12…24 with protection against reverse polarity		
Voltage limits (including ripple)		V	⎓ 10…30		
Switching capacity		mA	≤ 200 with overload and short-circuit protection		
Voltage drop, closed state		V	≤ 2		
Current consumption, no-load		mA	≤ 10		
Maximum switching frequency	Flush	Hz	600	300	100
	Non flush	Hz	400	200	90
Delays	First set-up	ms	40		
	Response	µs	0.06		
	Recovery	µs	15		

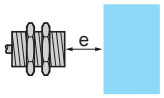
Setting-up

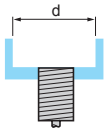
Minimum mounting distances in mm, flush version

	Side by side	Face to face	Facing a metal object	Mounted in a metal support
Ø 12	e ≥ 38	e ≥ 30	e ≥ 20	d ≥ 24
Ø 18	e ≥ 42	e ≥ 40	e ≥ 30	d ≥ 50
Ø 30	e ≥ 80	e ≥ 70	e ≥ 60	d ≥ 90



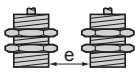


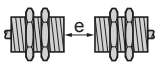


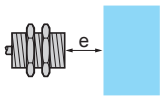


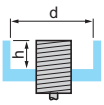
Minimum mounting distances in mm, non flush version

	Side by side	Face to face	Facing a metal object	Mounted in a metal support	
Ø 12	e ≥ 108	e ≥ 40	e ≥ 30	d ≥ 30	h ≥ 22
Ø 18	e ≥ 182	e ≥ 70	e ≥ 60	d ≥ 60	h ≥ 34
Ø 30	e ≥ 270	e ≥ 130	e ≥ 120	d ≥ 120	h ≥ 34

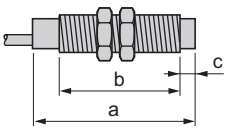








Dimensions



Lengths (mm):
a = overall
b = threaded
c = for non flush mountable sensors

	Flush sensor			Non flush sensor		
	M12	M18	M30	M12	M18	M30
a (mm)	60	63.5	63.5	60	63.5	63.5
b (mm)	41	42	42	36	35	32
c (mm)	0	0	0	5	7	10

Reduction coefficient

Flush-non mounted

		Flush sensor			Non flush sensor		
		M12	M18	M30	M12	M18	M30
Steel		1	1	1	1	1	1
Aluminum		1	1	1	1	1	1
Brass		1.3	1.2	1.3	1.4	1.35	1.2
Cupper		0.85	0.8	0.9	0.8	0.9	0.9
Stainless steel	Thickness 1 mm	0.5	0.5	0.35	*(1)*	0.3	*(1)*
	Thickness 2 mm	0.9	0.9	0.7	0.66	0.6	0.25

(1) No detection.

Flush mounted

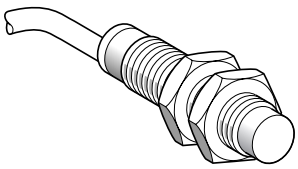
	M12	M18	M30
Steel	0.7	0.75	0.9
Aluminum	1.15	0.9	0.7
Brass	1.05	0.75	0.6
Stainless steel	0.8	0.8	1.3

Inductive proximity sensors

OsiSense XS Application, food and beverage processing series

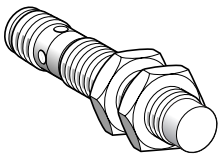
Cylindrical, stainless steel, non flush mountable
Three-wire DC, solid-state output

DF532016



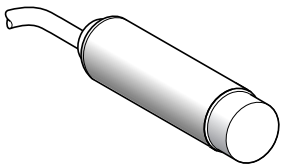
XS2●●SA●●L2

DF532015



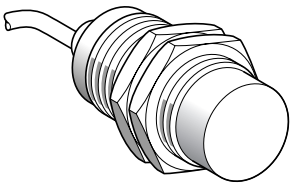
XS2●●SA●●M12

534440



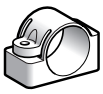
XS2L2SA●●L2

822116



XS230SA●●L2

503663

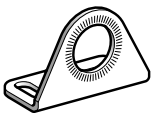


XUZB2005

523363

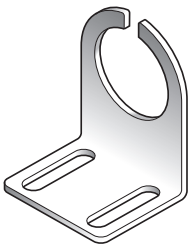
XSZBS12

805817



XUZA118

523364



XSZBS30

Ø 12, threaded M12 x 1

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
7	NO	PNP	Pre-cabled (L = 2 m) *(1)*	**XS212SAPAL2**	0.075
			M12 connector	**XS212SAPAM12**	0.035
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS212SANAL2**	0.075
			M12 connector	**XS212SANAM12**	0.035

Ø 18, threaded M18 x 1

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
12	NO	PNP	Pre-cabled (L = 2 m) *(1)*	**XS218SAPAL2**	0.120
			M12 connector	**XS218SAPAM12**	0.060
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS218SANAL2**	0.120
			M12 connector	**XS218SANAM12**	0.060

Ø 18, plain

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
12	NO	PNP	Pre-cabled (L = 2 m) *(1)*	**XS2L2SAPAL2**	0.120
			M12 connector	**XS2L2SAPAM12**	0.060
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS2L2SANAL2**	0.120
			M12 connector	**XS2L2SANAM12**	0.060

Ø 30, threaded M30 x 1.5

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
22	NO	PNP	Pre-cabled (L = 2 m) *(1)*	**XS230SAPAL2**	0.205
			M12 connector	**XS230SAPAM12**	0.145
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS230SANAL2**	0.205
			M12 connector	**XS230SANAM12**	0.145

Accessories *(2)*

Description	For use with	Reference	Weight kg
Plastic fixing clamp, 24.1 mm centres, with locking screw	Ø 18 sensor, plain case	**XUZB2005**	0.007
Stainless steel fixing bracket	Ø 12 sensor	**XSZBS12**	0.060
	Ø 18 sensor	**XUZA118**	0.045
	Ø 30 sensor	**XSZBS30**	0.080

Connecting cables

Description	Type	Length m	Reference	Weight kg
Pre-wired M12 connectors Female, 4-pin, stainless steel clamping ring	Straight	2	**XZCPA1141L2**	0.090
		5	**XZCPA1141L5**	0.210
		10	**XZCPA1141L10**	0.410
	Elbowed	2	**XZCPA1241L2**	0.090
		5	**XZCPA1241L5**	0.210
		10	**XZCPA1241L10**	0.410
M12 jumper cable Male, 3-pin, stainless steel clamping ring	Straight	2	**XZCRA151140A2**	0.095
		5	**XZCRA151140A5**	0.200

*(1) For a 5 m long cable replace L2 by **L5**; for a 10 m long cable replace L2 by **L10**.*
*Example: **XS212SAPAL2** becomes **XS212SAPAL5** with a 5 m long cable.*
(2) For further information, see page 3/116.

Inductive proximity sensors

OsiSense XS Application, food and beverage processing series

Cylindrical, stainless steel, non flush mountable
Three-wire DC, solid-state output

Characteristics

Sensor type			XS2●●SA●●M12	XS2●●SA●●L2
Product certifications/approvals			UL, CSA, CE	
Connection	Connector		M12	–
	Pre-cabled		–	Length: 2 m
Operating zone	Ø 12	**mm**	**0…5.6**	
	Ø 18	**mm**	**0…9.6**	
	Ø 30	**mm**	**0…17.6**	
Differential travel		**%**	1...15 of effective sensing distance (Sr)	
Degree of protection	Conforming to IEC 60529		IP 67	IP 68, double insulation ⧈
	DIN 40050		IP 69K	
Storage temperature		**°C**	- 40…+ 85 *(1)*	
Operating temperature		**°C**	- 25…+ 85	
Materials	Case		Stainless steel 316 L	
	Cable		–	Non-poisonous PVC, 3 x 0.34 mm²
Vibration resistance	Conforming to IEC 60068-2-6		25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27		50 gn, duration 11 ms	
Output state indication			Yellow LED: 4 viewing ports at 90°	Yellow LED: annular
Rated supply voltage		**V**	⎓ 12…24 with protection against reverse polarity	
Voltage limits (including ripple)		**V**	⎓ 10…36	
Switching capacity		**mA**	≤ 200 with overload and short-circuit protection	
Voltage drop, closed state		**V**	≤ 2	
Current consumption, no-load		**mA**	≤ 10	
Maximum switching frequency	**XS212SA●●●●**	**Hz**	2500	
	XS218SA●●●● and **XS2L2●●●●**	**Hz**	1000	
	XS230SA●●●●	**Hz**	500	
Delays	First-up	**ms**	≤ 10	
	Response	**ms**	≤ 0.2 Ø 12, ≤ 0.3 Ø 18, ≤ 0.6 Ø 30	
	Recovery	**ms**	≤ 0.2 Ø 12, ≤ 0.7 Ø 18, ≤ 1.4 Ø 30	

(1) + 100 °C for cleaning and sterilization phases whilst not in service.

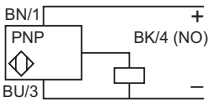
Wiring schemes

Connector

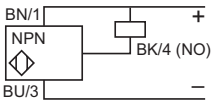
Pre-cabled

BU: Blue
BN: Brown
BK: Black

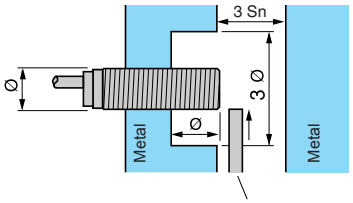
PNP



NPN

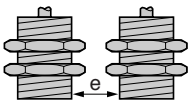


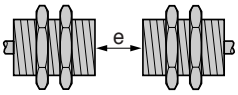
Setting-up

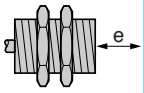


Object to be detected

Minimum mounting distances (mm)



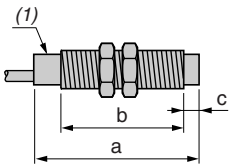




	Side by side	Face to face	Facing a metal object
Ø 12	e ≥ 48	e ≥ 84	e ≥ 21
Ø 18	e ≥ 72	e ≥ 144	e ≥ 36
Ø 30	e ≥ 120	e ≥ 264	e ≥ 66

Dimensions

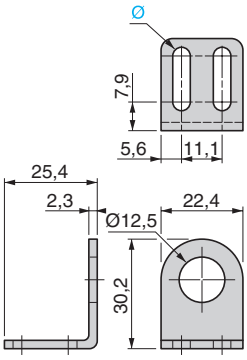
XS2



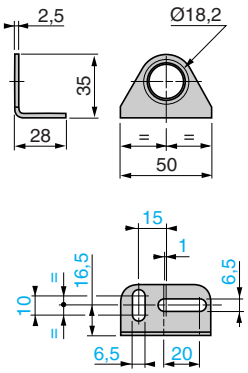
(1) LED

XS2	Pre-cabled (mm) a	Pre-cabled (mm) b	Connector (mm) a	Connector (mm) b	Connector (mm) c
Ø 12	54.5	38	61	37	5
Ø 18	60	40	70	42	8
Ø 30	62.5	41	70	36	13

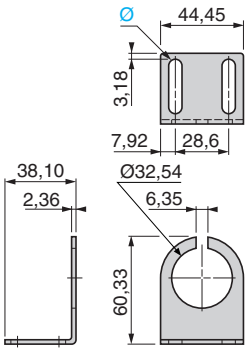
XSZBS12



XUZA118



XSZBS30



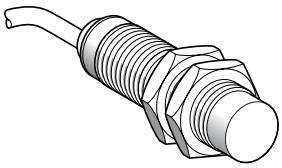
Ø: 2 elongated holes Ø 4.8 x 12.7

Inductive proximity sensors

OsiSense Application, food and beverage processing series

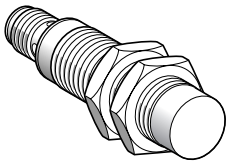
Cylindrical, stainless steel, non flush mountable
Two-wire AC or DC

523361



XS218SAM●L2

523362



XS218SAM●U20

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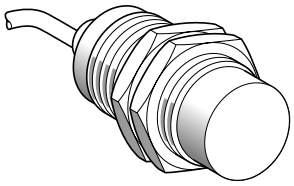
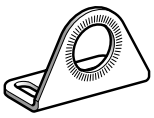


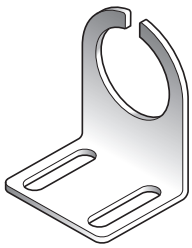
XS230SAM●L2

805817



XUZA118

523364



XSZBS30

Ø 18, threaded M18 x 1

Sensing distance (Sn) mm	Function	Connection	Reference	Weight kg
12	NO	Pre-cabled (L = 2 m) *(1)*	**XS218SAMAL2**	0.120
		1/2"-20UNF connector	**XS218SAMAU20**	0.060

Ø 30, threaded M30 x 1.5

Sensing distance (Sn) mm	Function	Connection	Reference	Weight kg
22	NO	Pre-cabled (L = 2 m) *(1)*	**XS230SAMAL2**	0.205
		1/2"-20UNF connector	**XS230SAMAU20**	0.145

Connecting cables

Description	Type	Length m	Reference	Weight kg
Pre-wired connectors 1/2"-20UNF 3-pin female, stainless steel clamping ring	Straight	5	**XZCPA1865L5**	0.210
		10	**XZCPA1865L10**	0.410
	Elbowed	5	**XZCPA1965L5**	0.250
		10	**XZCPA1965L10**	0.485

Accessories

Description	For use with	Reference	Weight kg
Stainless steel fixing brackets	Ø 18 sensor	**XUZA118**	0.045
	Ø 30 sensor	**XSZBS30**	0.080

*(1) For a 5 m long cable replace L2 by **L5**; for a 10 m long cable replace L2 by **L10**.*
*Example: **XS218SAMAL2** becomes **XS218SAMAL5** with a 5 m long cable.*

Inductive proximity sensors

OsiSense Application, food and beverage processing series

Cylindrical, stainless steel, non flush mountable
Two-wire AC or DC

Characteristics

Sensor type			XS2●●SAM●U20	XS2●●SAM●L2
Product certifications/approvals			UL, CSA, CE	
Connection	Connector		1/2"-20UNF	–
	Pre-cabled		–	Length: 2 m
Operating zone	Ø 18	**mm**	**0…9.6**	
	Ø 30	**mm**	**0...17.6**	
Differential travel		**%**	1...15 of effective sensing distance (Sr)	
Degree of protection	Conforming to IEC 60529		IP 67	IP 68, double insulation ⧈
	DIN 40050		IP 69K	
Storage temperature		**°C**	- 40…+ 85 *(1)*	
Operating temperature		**°C**	- 25…+ 85	
Materials	Case		Stainless steel 316 L	
	Cable		–	Non-poisonous PVC, 2 x 0.34 mm²
Vibration resistance	Conforming to IEC 60068-2-6		25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27		50 gn, duration 11 ms	
Output state indication			Yellow LED: 4 viewing ports at 90°	Yellow LED: annular
Rated supply voltage		**V**	∼ or ⎓ 24…240 (∼ 50/60 Hz)	
Voltage limits (including ripple)		**V**	∼ or ⎓ 20…264	
Switching capacity		**mA**	∼ 5…300 or ⎓ 5…200 *(2)*	
Voltage drop, closed state		**V**	≤ 5.5	
Residual current, open state		**mA**	≤ 0.8	
Maximum switching frequency	**XS218SAM●●●**	**Hz**	∼ 25 or ⎓ 1000	
	XS230SAM●●●	**Hz**	∼ 25 or ⎓ 300	
Delays	First-up	**ms**	≤ 30	
	Response	**ms**	≤ 0.5	
	Recovery	**ms**	≤ 0.5 **XS218SAM●●●**, ≤ 2 **XS230SAM●●●**	

(1) + 100 °C for cleaning and sterilization phases whilst not in service.
(2) It is essential to connect a 0.4 A "quick-blow" fuse in series with the load.

Wiring schemes

Connector

1/2"-20UNF

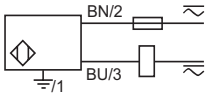
AC/DC: 2
⏚ : 1
AC/DC: 3

Pre-cabled

BU: Blue
BN: Brown

2-wire ∼ or ⎓

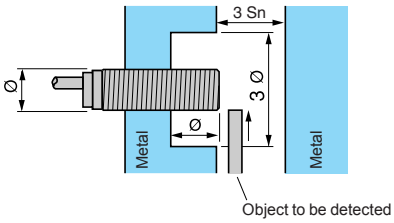
NO output

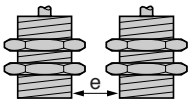


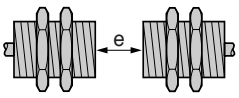
⏚: on connector models only

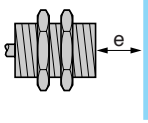
Setting-up

Minimum mounting distances (mm)





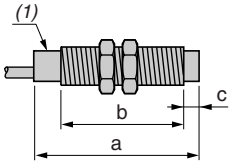




	Side by side	Face to face	Facing a metal object
Ø 18	e ≥ 72	e ≥ 144	e ≥ 36
Ø 30	e ≥ 120	e ≥ 264	e ≥ 66

Dimensions

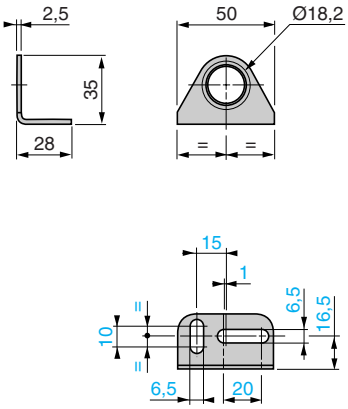
XS2



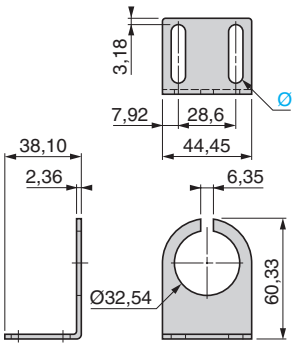
(1) LED

XS2	Pre-cabled (mm) a	Pre-cabled (mm) b	Connector (mm) a	Connector (mm) b	Connector (mm) c
Ø 18	60	40	72	44	8
Ø 30	62.5	41	74	40	13

XSZA118



XSZBS30

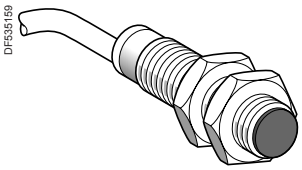


Ø: 2 elongated holes Ø 7.14 x 29.36

Inductive proximity sensors

OsiSense Application, food and beverage processing series

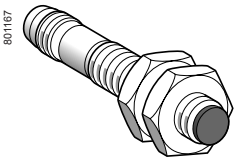
Cylindrical, plastic, non flush mountable
Three-wire DC, solid-state output



XS2●●AA●●L2

Ø 12, threaded M12 x 1

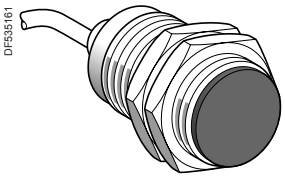
Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
7	NO	PNP	Pre-cabled (L = 2 m) *(1)*	**XS212AAPAL2**	0.065
			M12 connector	**XS212AAPAM12**	0.030
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS212AANAL2**	0.065
			M12 connector	**XS212AANAM12**	0.030



XS2●●AA●●M12

Ø 18, threaded M18 x 1

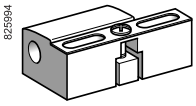
Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
12	NO	PNP	Pre-cabled (L = 2 m) *(1)*	**XS218AAPAL2**	0.100
			M12 connector	**XS218AAPAM12**	0.040
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS218AANAL2**	0.100
			M12 connector	**XS218AANAM12**	0.040



XS230AA●●L2

Ø 30, threaded M30 x 1.5

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
22	NO	PNP	Pre-cabled (L = 2 m) *(1)*	**XS230AAPAL2**	0.140
			M12 connector	**XS230AAPAM12**	0.080
		NPN	Pre-cabled (L = 2 m) *(1)*	**XS230AANAL2**	0.140
			M12 connector	**XS230AANAM12**	0.080



XSZB●●●

Accessories *(2)*

Description		Reference	Weight kg
Fixing clamps	Ø 12	**XSZB112**	0.006
	Ø 18	**XSZB118**	0.010
	Ø 30	**XSZB130**	0.020

Connecting cables

Description	Type	Length m	Reference	Weight kg
Pre-wired M12 connectors Female, 4-pin, stainless steel clamping ring	Straight	2	**XZCPA1141L2**	0.090
		5	**XZCPA1141L5**	0.190
		10	**XZCPA1141L10**	0.370
	Elbowed	2	**XZCPA1241L2**	0.090
		5	**XZCPA1241L5**	0.190
		10	**XZCPA1241L10**	0.370
M12 jumper cable Male, 3-pin, stainless steel clamping ring	Straight	2	**XZCRA151140A2**	0.090
		5	**XZCRA151140A5**	0.190

*(1) For a 5 m long cable replace L2 by **L5**; for a 10 m long cable replace L2 by **L10**.*
*Example: **XS212AAPAL2** becomes **XS212AAPAL5** with a 5 m long cable.*
(2) For further information, see page 3/116.

Inductive proximity sensors

OsiSense Application, food and beverage processing series

Cylindrical, plastic, non flush mountable
Three-wire DC, solid-state output

Characteristics

Sensor type			XS2●●AA●●M12	XS2●●AA●●L2
Product certifications/approvals			UL, CSA, CE	
Connection	Connector		M12	–
	Pre-cabled		–	Length: 2 m
Operating zone	Ø 12	**mm**	**0…5.6**	
	Ø 18	**mm**	**0…9.6**	
	Ø 30	**mm**	**0…17.6**	
Differential travel		**%**	1...15 of effective sensing distance (Sr)	
Degree of protection	Conforming to IEC 60529		IP 67	IP 68, double insulation ⧈
	DIN 40050		IP 69K	
Storage temperature		**°C**	- 40…+ 85	
Operating temperature		**°C**	- 25…+ 85	
Materials	Case		PPS	
	Cable		–	PvR and 3 x 0.34 mm²
Vibration resistance	Conforming to IEC 60068-2-6		25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27		50 gn, duration 11 ms	
Output state indication			Yellow LED: annular	
Rated supply voltage		**V**	⎓ 12…48 for T - 25…+ 85 °C	
Voltage limits (including ripple)		**V**	⎓ 10…58 for T - 25…+ 85 °C	
Switching capacity		**mA**	⩽ 200 with overload and short-circuit protection	
Voltage drop, closed state		**V**	⩽ 2	
Current consumption, no-load		**mA**	⩽ 10	
Maximum switching frequency	**XS212AA●●●●**	**Hz**	2500	
	XS218AA●●●●	**Hz**	1000	
	XS230AA●●●●	**Hz**	500	
Delays	First-up	**ms**	⩽ 10	
	Response	**ms**	⩽ 0.2 Ø 12, ⩽ 0.3 Ø 18, ⩽ 0.6 Ø 30	
	Recovery	**ms**	⩽ 0.2 Ø 12, ⩽ 0.7 Ø 18, ⩽ 1.4 Ø 30	

Wiring schemes

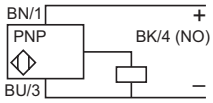
Connector

M12

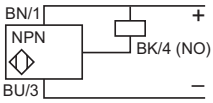
Pre-cabled

BU: Blue
BN: Brown
BK: Black

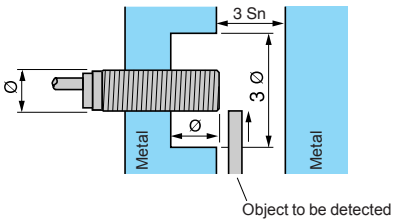
PNP



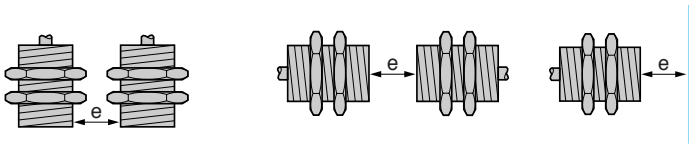
NPN



Setting-up

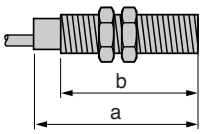


Minimum mounting distances (mm)



	Side by side	Face to face	Facing a metal object
Ø 12	e ⩾ 48	e ⩾ 84	e ⩾ 21
Ø 18	e ⩾ 72	e ⩾ 144	e ⩾ 36
Ø 30	e ⩾ 120	e ⩾ 264	e ⩾ 66

Dimensions



XS2

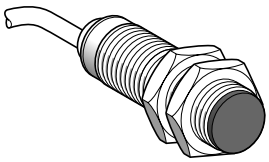
XS2	Pre-cabled (mm) a	Pre-cabled (mm) b	Connector (mm) a	Connector (mm) b
Ø 12	50	42	61	43
Ø 18	60	51	70	52
Ø 30	60	51	70	52

Inductive proximity sensors

OsiSense XS Application, food and beverage processing series

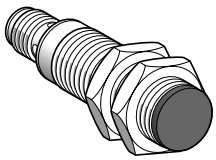
Cylindrical, plastic, non flush mountable
Two-wire AC or DC

535156



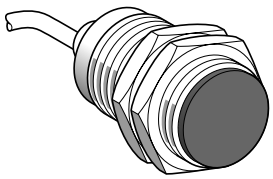
XS2●●AAM●L2

523382



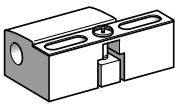
XS2●●AAM●U20

535158



XS230AAM●L2

825994



XSZB1●●

Ø 18, threaded M18 x 1

Sensing distance (Sn) mm	Function	Connection	Reference	Weight kg
12	NO	Pre-cabled (L = 2 m) *(1)*	**XS218AAMAL2**	0.100
		1/2"-20UNF connector	**XS218AAMAU20**	0.040

Ø 30, threaded M30 x 1.5

Sensing distance (Sn) mm	Function	Connection	Reference	Weight kg
22	NO	Pre-cabled (L = 2 m) *(1)*	**XS230AAMAL2**	0.140
		1/2"-20UNF connector	**XS230AAMAU20**	0.080

Accessories *(2)*

Description		Reference	Weight kg
Fixing clamps	Ø 18	**XSZB118**	0.010
	Ø 30	**XSZB130**	0.020

Connecting cables

Description	Type	Length m	Reference	Weight kg
Pre-wired connectors 1/2"-20UNF 3-pin female, stainless steel 316 L clamping ring	Straight	5	**XZCPA1865L5**	0.180
		10	**XZCPA1865L10**	0.350
	Elbowed	5	**XZCPA1965L5**	0.180
		10	**XZCPA1965L10**	0.350

*(1) For a 5 m long cable replace L2 by **L5**; for a 10 m long cable replace L2 by **L10**.*
*Example: **XS218AAMAL2** becomes **XS218AAMAL5** with a 5 m long cable.*
(2) For further information, see page 3/116.

Inductive proximity sensors

OsiSense XS Application, food and beverage processing series

Cylindrical, plastic, non flush mountable
Two-wire AC or DC

Characteristics

Sensor type			XS2●●AAM●U20	XS2●●AAM●L2
Product certifications/approvals			UL, CSA, CE	
Connection	Connector		1/2"-20UNF	–
	Pre-cabled		–	Length: 2 m
Operating zone	Ø 18	**mm**	**0…9.6**	
	Ø 30	**mm**	**0...17.6**	
Differential travel		**%**	1...15 of effective sensing distance (Sr)	
Degree of protection	Conforming to IEC 60529		IP 67	IP 68, double insulation ⧈
	DIN 40050		IP 69K	
Storage temperature		**°C**	- 40…+ 85	
Operating temperature		**°C**	- 25…+ 85	
Materials	Case		PPS	
	Cable		–	PvR and 2 x 0.34 mm²
Vibration resistance	Conforming to IEC 60068-2-6		25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27		50 gn, duration 11 ms	
Output state indication			Yellow LED: annular	
Rated supply voltage		**V**	∼ or ⎓ 24…240 (∼ 50/60 Hz)	
Voltage limits (including ripple)		**V**	∼ or ⎓ 20…264	
Switching capacity		**mA**	∼ 5…300 or ⎓ 5…200 *(1)*	
Voltage drop, closed state		**V**	⩽ 5.5	
Residual current, open state		**mA**	⩽ 0.8	
Maximum switching frequency	**XS218AAM●●●**	**Hz**	∼ 25 or ⎓ 1000	
	XS230AAM●●●	**Hz**	∼ 25 or ⎓ 300	
Delays	First-up	**ms**	⩽ 30	
	Response	**ms**	⩽ 0.5	
	Recovery	**ms**	⩽ 0.5 **XS218AAM●●●**, ⩽ 2 **XS230AAM●●●**	

(1) It is essential to connect a 0.4 A "quick-blow" fuse in series with the load.

Wiring schemes

Connector

1/2"-20UNF

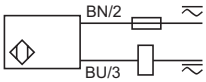
⎓: 2
⎓: 3

Pre-cabled

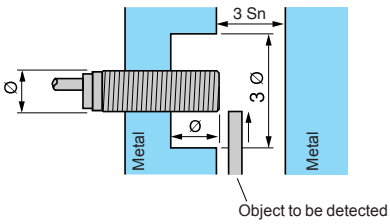
BU: Blue
BN: Brown

2-wire ∼ or ⎓

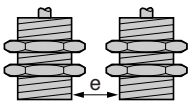
NO output

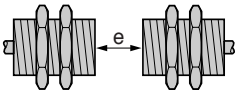


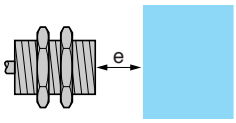
Setting-up



Minimum mounting distances (mm)



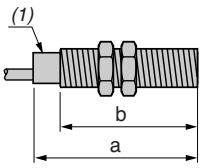




	Side by side	Face to face	Facing a metal object
Ø 18	e ⩾ 72	e ⩾ 144	e ⩾ 36
Ø 30	e ⩾ 120	e ⩾ 264	e ⩾ 66

Dimensions

XS2



(1) LED

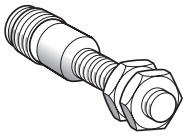
XS2	Pre-cabled (mm) a	Pre-cabled (mm) b	Connector (mm) a	Connector (mm) b
Ø 18	60	51	70	52
Ø 30	60	51	70	52

Inductive proximity sensors

OsiSense XS Application

Cylindrical, stainless steel 303 front face
for harsh industrial environments
Three-wire DC, solid-state output

DF513376



XS908●1PAM12

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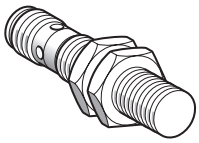

XS912●1PAM12

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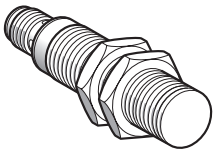

XS918●1PAM12

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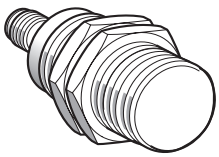

XS930●1PAM12

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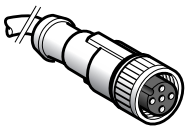

XZCP1141L●

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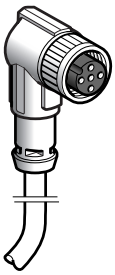


XZCP1241L●

Ø 8 mm, threaded M8 x 1

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
Three-wire 12-24V ⎓, flush mountable					
3	NO	PNP	M12	**XS908R1PAM12**	0.018
Three-wire 12-24V ⎓, non flush mountable					
6	NO	PNP	M12	**XS908R4PAM12**	0.018

Ø 12 mm, threaded M12 x 1

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
Three-wire 12-24V ⎓, flush mountable					
6	NO	PNP	M12	**XS912R1PAM12**	0.024
Three-wire 12-24V ⎓, non flush mountable					
10	NO	PNP	M12	**XS912R4PAM12**	0.023

Ø 18 mm, threaded M18 x 1

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
Three-wire 12-24V ⎓, flush mountable					
10	NO	PNP	M12	**XS918R1PAM12**	0.044
Three-wire 12-24V ⎓, non flush mountable					
20	NO	PNP	M12	**XS918R4PAM12**	0.051

Ø 30 mm, threaded M30 x 1.5

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
Three-wire 12-24V ⎓, flush mountable					
20	NO	PNP	M12	**XS930R1PAM12**	0.140
Three-wire 12-24V ⎓, non flush mountable					
40	NO	PNP	M12	**XS930R4PAM12**	0.144

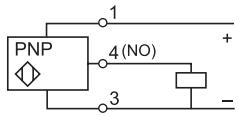
Connecting cables (PUR) *(1)*

Description	Type	Length m	Reference	Weight kg
Pre-wired M12 connectors Female, 4-pin Metal clamping	Straight	2	**XZCP1141L2**	0.090
		5	**XZCP1141L5**	0.190
		10	**XZCP1141L10**	0.370
	Elbowed	2	**XZCP1241L2**	0.090
		5	**XZCP1241L5**	0.190
		10	**XZCP1241L10**	0.370

Wiring schemes

M12 connector

PNP



(1) For further information, please consult the catalogue "Cabling accessories OsiSense XZ", on our site www.tesensors.com.

Inductive proximity sensors

OsiSense XS Application

Cylindrical, stainless steel 303 front face
for harsh industrial environments
Three-wire DC, solid-state output

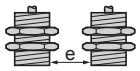
Characteristics

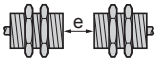
Sensor type	Flush		XS908R1PAM12	XS912R1PAM12	XS918R1PAM12	XS930R1PAM12
	Non flush		XS908R4PAM12	XS912R4PAM12	XS918R4PAM12	XS930R4PAM12
Product certifications			CE, cULus			
Connection	Connector		M12			
Operating zone	Flush	mm	0…2.4	0…4.8	0…8	0…16
	Non flush	mm	0…4.8	0…8	0…16	0…32
Differential travel		%	1…15 (real sensing distance Sr)			
Degree of protection	Conforming to IEC 60529		IP 67	IP 68 (5 meters underwater for 1 month)		
	Conforming to DIN 40050		IP 69K			
Storage temperature		°C	-25…+ 70 (-13…158°F)			
Operating temperature		°C	-25…+ 70 (-13…158°F)			
Materials	Case		Stainless steel, 303 grade			
Front face thickness		mm	0.25	0.4	0.6	1.0
Mechanical shock resistance	Conforming to EN 50102		IK10			
Vibration resistance	Conforming to IEC 60068-2-6		25 gn, amplitude ± 1 mm (f = 10 to 55 Hz)			
Shock resistance	Conforming to IEC 60068-2-27		30 gn, duration 11 ms			
Output state indication			Yellow LED, 4 viewing points at 90° (blinking from 0.8 Sr and Sr)			
Rated supply voltage		V	⎓ 12…24 with protection against reverse polarity			
Voltage limits (including ripple)		V	⎓ 10…30			
Switching capacity		mA	⩽ 200 with overload and short-circuit protection			
Voltage drop, closed state		V	⩽ 2			
Current consumption, no-load		mA	⩽ 10			
Maximum switching frequency	Flush	Hz	1000	600	300	100
	Non flush	Hz	700	400	200	90
Delays	First set-up	ms	40			
	Response	µs	0.05	0.06		
	Recovery	µs	23	15		

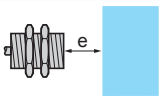
Setting-up

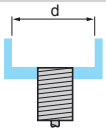
Minimum mounting distances in mm, flush version

Side by side		Face to face	Facing a metal object	Mounted in a metal support	
Ø 8	e ⩾ 14	e ⩾ 15	e ⩾ 10	d ⩾ 12	
Ø 12	e ⩾ 38	e ⩾ 30	e ⩾ 20	d ⩾ 24	
Ø 18	e ⩾ 42	e ⩾ 40	e ⩾ 30	d ⩾ 50	
Ø 30	e ⩾ 80	e ⩾ 70	e ⩾ 60	d ⩾ 90	



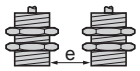


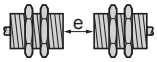


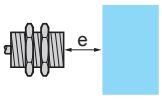


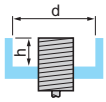
Minimum mounting distances in mm, non flush version

Side by side		Face to face	Facing a metal object	Mounted in a metal support	
Ø 8	e ⩾ 52	e ⩾ 25	e ⩾ 20	d ⩾ 20	h ⩾ 15
Ø 12	e ⩾ 108	e ⩾ 40	e ⩾ 30	d ⩾ 30	h ⩾ 22
Ø 18	e ⩾ 182	e ⩾ 70	e ⩾ 60	d ⩾ 60	h ⩾ 34
Ø 30	e ⩾ 270	e ⩾ 130	e ⩾ 120	d ⩾ 120	h ⩾ 34

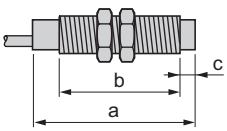








Dimensions



Lengths (mm):
a = overall
b = threaded
c = for non flush mountable sensors

	Flush sensor				Non flush sensor			
	M8	M12	M18	M30	M8	M12	M18	M30
a (mm)	66	60	63.5	63.5	66	60	63.5	63.5
b (mm)	46	41	42	42	42	36	35	32
c (mm)	0	0	0	0	4	5	7	10

Reduction coefficient

Non flush mounted

		Flush sensor				Non flush sensor			
		M8	M12	M18	M30	M8	M12	M18	M30
Steel		1	1	1	1	1	1	1	1
Aluminum		1	1	1	1	1	1	1	1
Brass		1.35	1.3	1.2	1.3	1.4	1.4	1.35	1.2
Cupper		0.9	0.85	0.8	0.9	0.85	0.8	0.9	0.9
Stainless steel	Thickness 1 mm	0.3	0.5	0.5	0.35	0.3	*(1)*	0.3	*(1)*
	Thickness 2 mm	0.6	0.9	0.9	0.7	0.9	0.66	0.6	0.25

(1) No detection.

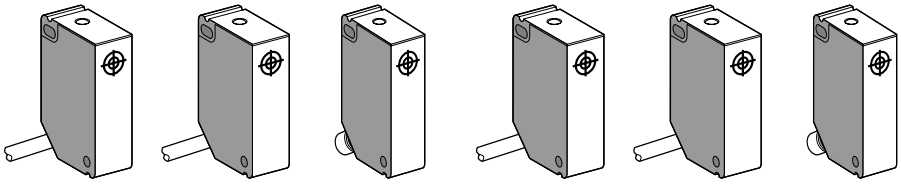
Flush mounted

	M8	M12	M18	M30
Steel	1	0.7	0.75	0.9
Aluminum	0.9	1.15	0.9	0.7
Brass	0.9	1.05	0.75	0.6
Stainless steel	1	0.8	0.8	1.3

Inductive proximity sensors

OsiSense XS Application

For assembly, packaging and light material handling
Plastic case, 12 x 26 x 40 mm
DC supply, solid-state output

Sensor		Flush mountable in metal			Non flush mountable in metal		
							
Nominal sensing distance (Sn)		2 mm			4 mm		
References							
3-wire ⎓	PNP NO	**XS7G12PA140**	–	**XS7G12PA140S**	**XS8G12PA140**	–	**XS8G12PA140S**
	NPN NO	**XS7G12NA140**	–	**XS7G12NA140S**	**XS8G12NA140**	–	**XS8G12NA140S**
4-wire ⎓ (complementary outputs)	PNP NO + NC	–	**XS7G12PC440**	–	–	**XS8G12PC440**	–
	NPN NO + NC	–	**XS7G12NC440**	–	–	**XS8G12NC440**	–
Weight (kg)		0.100	0.100	0.030	0.100	0.100	0.030
Characteristics							
Product certifications		CSA, UL, CE					
Connection	Pre-cabled	3 x 0.34 mm², length 2 m *(1)*	4 x 0.34 mm², length 2 m *(1)*	–	3 x 0.34 mm², length 2 m *(1)*	4 x 0.34 mm², length 2 m *(1)*	–
	Connector	–	–	M8	–	–	M8
Operating zone		**0…1.6 mm**			**0…3.2 mm**		
Repeat accuracy		⩽ 10 % of Sr					
Differential travel		3...20 % of Sr					
Degree of protection		IP 67					
Storage temperature		- 40…+ 85 °C					
Operating temperature		- 25…+ 70 °C					
Materials		Case: PBT, cable: PVC					
Vibration resistance Conforming to IEC 60068-2-6		25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)					
Shock resistance Conforming to IEC 60068-2-27		50 gn, duration 11 ms					
Output state indication		Yellow LED (on top of case)					
Rated supply voltage		⎓ 12…24 V	⎓ 12…48 V	⎓ 12…24 V	⎓ 12…24 V	⎓ 12…48 V	⎓ 12…24 V
Voltage limits (including ripple)		⎓ 10…30 V	⎓ 10…58 V	⎓ 10…30 V	⎓ 10…30 V	⎓ 10…58 V	⎓ 10…30 V
Current consumption, no-load		⩽ 10 mA					
Switching capacity		0…100 mA *(2)*	0…200 mA *(2)*	0…100 mA *(2)*	0…100 mA *(2)*	0…200 mA *(2)*	0…100 mA *(2)*
Voltage drop, closed state		⩽ 1.8 V	⩽ 2.6 V	⩽ 1.8 V	⩽ 1.8 V	⩽ 2.6 V	⩽ 1.8 mA
Maximum switching frequency		⩽ 2 kHz			⩽ 1 kHz		
Delays	First-up	⩽ 4 ms					
	Response	⩽ 0.5 ms					
	Recovery	⩽ 1 ms					

(1) Sensors available with other cable lengths:

Length of cable	Suffix to be added to references stated above for 2 m pre-cabled sensors	Weight increase
5 m	**L1**	0.120 kg
10 m	**L2**	0.320 kg

Example: sensor **XS7G12PA140** with 5 m long cable becomes **XS7G12PA140L1.**

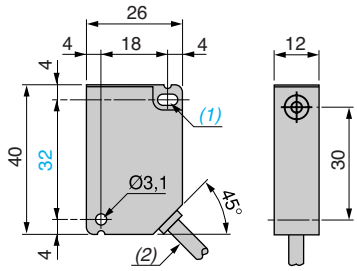
(2) With overload and short-circuit protection

Inductive proximity sensors

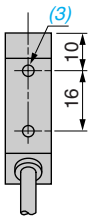
OsiSense XS Application
For assembly, packaging and light material handling
Plastic case, 12 x 26 x 40 mm
DC supply, solid-state output

Dimensions

XS● G12●A140, XS● G12●C440

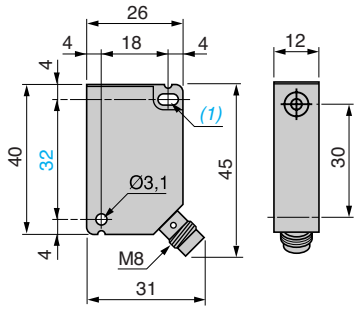


Rear view

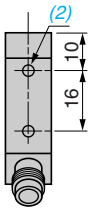


(1) 1 elongated hole Ø 3.1 x 5.1.
(2) Cable L = 2 m.
(3) 2 holes M3 x 5.

XS● G12●A140S



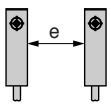
Rear view

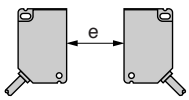


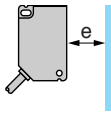
(1) 1 elongated hole Ø 3.1 x 5.1.
(2) 2 holes M3 x 5.

Setting-up

Minimum mounting distances (mm)



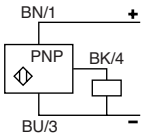


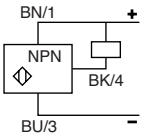


	Side by side	Face to face	Facing a metal object and mounting in a metal support
XS7G flush mountable	e ≥ 0	e ≥ 15	e ≥ 6
XS8G non flush mountable	e ≥ 10	e ≥ 60	e ≥ 12

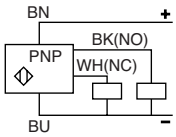
Wiring schemes

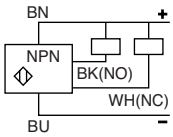
3-wire ⎓, NO output





4-wire ⎓, NO + NC output





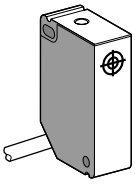
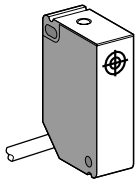
Connector

M8

Détecteurs de proximité inductifs

OsiSense XS Application

Pour assemblage, emballage et petite manutention
Boîtier en plastique 12 x 26 x 40 mm
Alimentation en courant alternatif ou continu

Appareils		Noyables dans le métal	Non noyables dans le métal
			
Portée nominale (Sn)		2 mm	4 mm
Références			
2 fils ⎓ ou ∿	NO	**XS7G12MA230**	**XS8G12MA230**
	NC	**XS7G12MB230**	**XS8G12MB230**
Masse (kg)		0,100	0,100
Caractéristiques			
Certifications de produits		CSA, UL, CE	
Mode de raccordement		Par câble 2 x 0,34 mm², longueur 2 m *(1)*	
Domaine de fonctionnement		**0…1,6 mm**	**0…3,2 mm**
Reproductibilité		≤ 10 % de Sr	
Hystérésis		3...20 % de Sr	
Degré de protection		IP 67	
Température de stockage		- 40…+ 85 °C	
Température de fonctionnement		- 25…+ 70 °C	
Matériaux		Boîtier : PBT, câble : PVC	
Tenue aux vibrations Selon IEC 60068-2-6		25 gn, amplitude ± 2 mm (f = 10 à 55 Hz)	
Tenue aux chocs Selon IEC 60068-2-27		50 gn, durée 11 ms	
Signalisation d'état de sortie		DEL jaune (sur partie supérieure)	
Tension assignée d'alimentation		∿ 24…240 V (50/60 Hz) ou ⎓ 24…210 V	
Limites de tension (ondulation comprise)		∿ ou ⎓ 20…264 V	
Courant commuté		5…200 mA (2)	
Tension de déchet, état fermé		≤ 5,5 V	
Courant résiduel, état ouvert		≤ 0,8 mA / 24 V, 1,5 mA / 120 V	
Fréquence maximale de commutation		∿ 25 Hz ou ⎓ 250 Hz	
Retards	A la disponibilité	≤ 40 ms	
	A l'action	≤ 1 ms	
	Au relâchement	≤ 2 ms	

(1) Détecteurs avec autres longueurs de câble :

Longueur de câble	Repère à ajouter en fin de référence du détecteur choisi avec câble de 2 m	Masse augmentée de
5 m	**L1**	0,120 kg
10 m	**L2**	0,320 kg

Exemple : détecteur **XS7G12MA230** avec câble de 5 m devient **XS7G12MA230L1.**

(2) Ces détecteurs n'étant pas protégés contre les surcharges et les courts-circuits, il est impératif de mettre, en série avec la charge, un fusible à action rapide de 0,4 A.

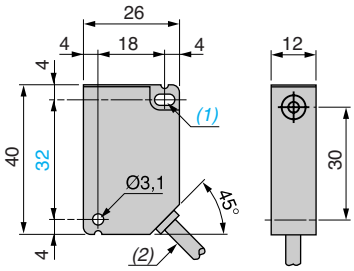
Telemecanique Sensors

Détecteurs de proximité inductifs

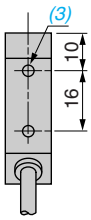
OsiSense XS Application
Pour assemblage, emballage et petite manutention
Boîtier en plastique 12 x 26 x 40 mm
Alimentation en courant alternatif ou continu

Encombrements

XS●G12M●230



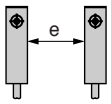
Vue arrière

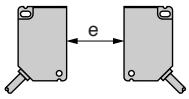


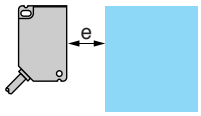
(1) 1 trou oblong 3,1 x 5,1.
(2) Câble L = 2 m.
(3) 2 trous M3 x 5.

Précautions de mise en œuvre

Distances à respecter au montage (mm)



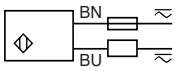




	Côte à côte	Face à face	Face à masse métallique et montage dans support métallique
XS7G noyable	e ⩾ 0	e ⩾ 15	e ⩾ 6
XS8G non noyable	e ⩾ 10	e ⩾ 60	e ⩾ 12

Raccordements

Type 2 fils ∿ ou ⎓, sortie NO ou NC

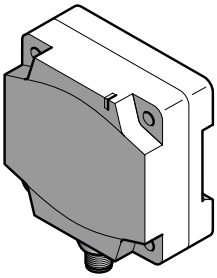


Inductive proximity sensors

OsiSense XS Application

Flat sensor, flush mountable, increased range, switching capacity 300 mA
80 x 80 x 40 format, DIN rail mounting, solid-state output

Sensor		**Flush mountable in metal**



Dimensions (mm)		80 x 80 x 40
Nominal sensing distance (Sn)		50 mm (not flush mounted: 42 mm)
Reference		
2-wire ⎓ (non polarised)	NO	**XS7D1A3CAM12DIN**
Weight (kg)		0.374
Characteristics		
Product certifications		CE
Degree of protection	Conforming to IEC 60529	IP 67, double insulation ⧈
Temperature	Operating	- 25…+ 70 °C
	Storage	- 40…+ 85 °C
Vibration resistance	Conforming to IEC 60068-2-6	25 gn, amplitude ± 2 mm (f = 10 to 55 Hz)
Shock resistance	Conforming to IEC 60068-2-27	50 gn, duration 11 ms
Connection		M12 connector
Operating zone		**0…40 mm (not flush mounted: 0…35 mm)**
Repeat accuracy		3 % of Sr
Differential travel		1…15 % of Sr
Output state indication		Yellow LED
Rated supply voltage		**⎓ 12…48 V with protection against reverse polarity**
Voltage limits (including ripple)		⎓ 10…58 V
Residual current, open state		⩽ 0.5 mA
Switching capacity		**1.5…300 mA with overload and short-circuit protection**
Voltage drop, closed state		⩽ 4.5 V
Maximum switching frequency		100 Hz
Delays	First-up	⩽ 10 ms
	Response	⩽ 2 ms
	Recovery	⩽ 5 ms

Inductive proximity sensors

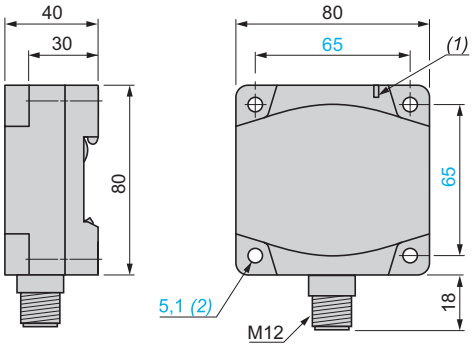
OsiSense XS Application

Flat sensor, flush mountable, increased range, switching capacity 300 mA

80 x 80 x 40 format, DIN rail mounting, solid-state output

Dimensions

XS7D1A3CAM12DIN

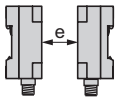
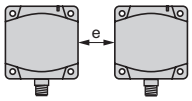
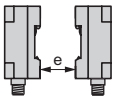
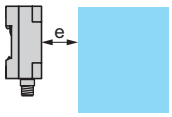


(1) Output LED

(2) For CHC type screws

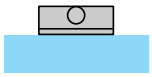
Setting-up

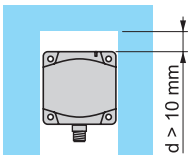
Minimum mounting distances (mm)

	Face to face	Side by side	Back to back	Facing a metal object
				
Flush mounted	450	140	90	150
Not flush mounted	450	180	180	150

Flush/non flush conditions

In A37 steel

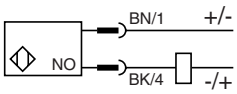




Sn	Su	Sn	Su
42 mm	35 mm	50 mm	40 mm

Wiring schemes

2-wire NO/M12 XS7D1A3CAM12DIN

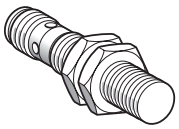


Inductive proximity sensors

OsiSense XS Application

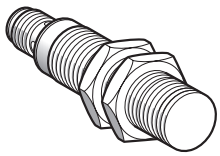
Cylindrical, stainless steel 303 front face
for welding environments
Three-wire DC, solid-state output

DF513369



XS912RWPAM12

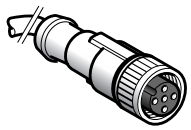
DF513373



XS918RWPAM12

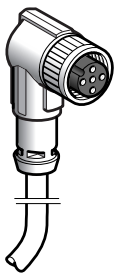
3

DF532604



XZCP1141L●

DF503630



XZCP1241L●

Ø 12 mm, threaded M12 x 1

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
Three-wire 12-24V ⎓, flush mountable					
6	NO	PNP	M12	**XS912RWPAM12**	0.024

Ø 18 mm, threaded M18 x 1

Sensing distance (Sn) mm	Function	Output	Connection	Reference	Weight kg
Three-wire 12-24V ⎓, flush mountable					
10	NO	PNP	M12	**XS918RWPAM12**	0.051

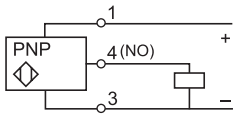
Connecting cables (PUR) *(1)*

Description	Type	Length m	Reference	Weight kg
Pre-wired M12 connectors Female, 4-pin Metal clamping ring	Straight	2	**XZCP1141L2**	0.090
		5	**XZCP1141L5**	0.190
		10	**XZCP1141L10**	0.370
	Elbowed	2	**XZCP1241L2**	0.090
		5	**XZCP1241L5**	0.190
		10	**XZCP1241L10**	0.370

Wiring schemes

M12 connector

PNP



(1) For further information, please consult the catalogue "Cabling accessories OsiSense XZ" on our site www.tesensors.com.

Inductive proximity sensors

OsiSense XS Application

Cylindrical, stainless steel 303 front face
for welding environments
Three-wire DC, solid-state output

Characteristics

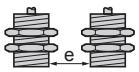
Sensor type	Flush		XS912RWPAM12	XS918RWPAM12
Product certifications			CE, cULus	
Connection	Connector		M12	
Operating zone		mm	0…4.8	0…8
Differential travel		%	1…15 (real sensing distance Sr)	
Degree of protection	Conforming to IEC 60529		IP 68 (5 meters underwater for 1 month)	
	Conforming to DIN 40050		IP 69K	
Storage temperature		°C	-25…+ 70 (-13…158°F)	
Operating temperature		°C	-25…+ 70 (-13…158°F)	
Materials	Case		Stainless steel, 303 grade	
Front face thickness		mm	0.4	0.6
Mechanical shock resistance	Conforming to EN 50102		IK10	
Vibration resistance	Conforming to IEC 60068-2-6		25 gn, amplitude ± 1 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27		30 gn, duration 11 ms	
Output state indication			Yellow LED, 4 viewing points at 90° (blinking from 0.8 Sr and Sr)	
Rated supply voltage		V	⎓ 12…24 with protection against reverse polarity	
Voltage limits (including ripple)		V	⎓ 10…30	
Switching capacity		mA	≤ 200 with overload and short-circuit protection	
Voltage drop, closed state		V	≤ 2	
Current consumption, no-load		mA	≤ 10	
Maximum switching frequency		Hz	15	
Delays	First set-up	ms	80	
	Response	µs	100	
	Recovery	µs	15	

Setting-up

Minimum mounting distances in mm, flush version

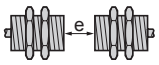
Side by side

Ø 12 / e ≥ 38
Ø 18 / e ≥ 42



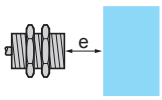
Face to face

e ≥ 30
e ≥ 40



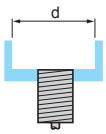
Facing a metal object

e ≥ 20
e ≥ 30

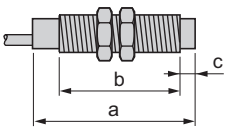


Mounted in a metal support

d ≥ 24
d ≥ 50



Dimensions



Lengths (mm):
a = overall
b = threaded
c = for non flush mountable sensors

	Flush sensor	
	M12	M18
a (mm)	60	63.5
b (mm)	41	42
c (mm)	0	0

Reduction coefficient

Non flush mounted

		Flush sensor	
		M12	M18
Steel		1	1
Aluminum		1	1
Brass		1.3	1.2
Cupper		0.85	0.8
Stainless steel	Thickness 1 mm	0.5	0.5
	Thickness 2 mm	0.9	0.9

Flush mounted

	M12	M18
Steel	0.7	0.75
Aluminum	1.15	0.9
Brass	1.05	0.75
Stainless steel	0.8	0.8

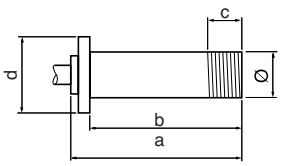
Inductive proximity sensors

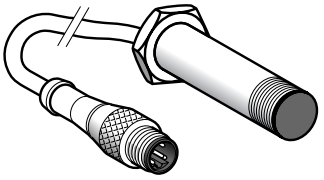
OsiSense XS Application

For welding machine applications

Cylindrical type. Metal case, plain, with shoulder

Flush mountable in metal





Lengths (mm):
a = Overall
b = To shoulder
c = Removal
d = Shoulder

Ø = 12
a = 55
b = 50
c = 9 (threaded end)
d = 15 hexagonal

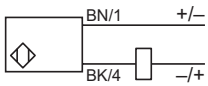
Nominal sensing distance (Sn)			**3 mm**	**3 mm**	**3 mm**
References					
2-wire ⎓ (non polarised) Terminal connections	1-4	NO	**XSLC1401393L1**	**XSLC1401393L3**	**XSLC1401393L4**
Weight (kg)			0.050	0.065	0.050

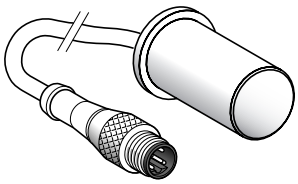
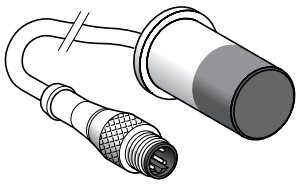
Characteristics

Connection	Remote M12 connector on 1.2 m flying lead	Remote M12 connector on 0.8 m flying lead	Remote M12 connector on 0.15 m flying lead
Degree of protection conforming to IEC 60529	IP 67		
Operating zone	0…2.4 mm		
Repeat accuracy	≤ 3 % of Sr		
Differential travel	1…15 % of Sr		
Operating temperature	- 25…+ 80 °C		
Output state indication	Yellow LED, annular		
Rated supply voltage	⎓ 12…48 V		
Voltage limits (including ripple)	⎓ 10…58 V		
Switching capacity	1.5…100 mA with overload and short-circuit protection		
Voltage drop, closed state	≤ 4 V		
Residual current, open state	≤ 0.5 mA		
Current consumption, no-load	–		
Maximum switching frequency	800 Hz		
Delays	First-up: ≤ 5 ms; response: ≤ 05 ms; recovery: ≤ 0.5 ms		

Wiring schemes

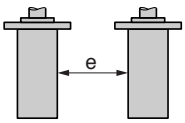
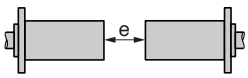
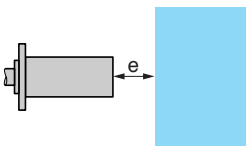
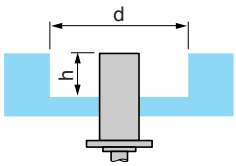
2-wire ⎓ , non polarised, NO output



Flush mountable in metal	Non flush mountable in metal	
		
Ø = 18 a = 40 b = 35 c = 0 (PPS front face) d = Ø 22	Ø = 18 a = 45 b = 35 c = 20 (Teflon front face and case) d = Ø 22	
6.3 mm	**10 mm**	**10 mm**
XSLC1401392L1	**XSLC1401405L3**	**XSLC1401405L4**
0.100	0.065	0.050
Remote M12 connector on 1.2 m flying lead	Remote M12 connector on 0.8 m flying lead	Remote M12 connector on 0.15 m flying lead
IP 67		
0…5 mm	0…8 mm	
3 % of Sr		
1…15 % of Sr		
- 25…+ 70 °C		
Yellow LED, annular		
⎓ 12…48 V		
⎓ 10…58 V		
1.5…100 mA with overload and short-circuit protection		
⩽ 4 V		
⩽ 0.5 mA		
–		
100 Hz		
First-up: ⩽ 10 ms; response: ⩽ 10 ms; recovery: ⩽ 2 ms		

Setting-up

Minimum mounting distances (mm)

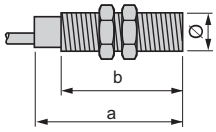
		Side by side	Face to face	Facing a metal object	Mounted in a metal support
					
XSLC	**Ø 12 (flush mountable)**	e ⩾ 10	e ⩾ 60	e ⩾ 15	d = 12, h = 0
	Ø 18 (non flush mountable)	e ⩾ 16	e ⩾ 96	e ⩾ 24	d = 54, h = 16

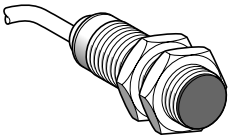
Inductive proximity sensors

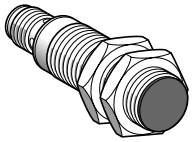
OsiSense XS

Detection at fixed sensing distance. Factor 1 (Fe/Nfe) sensors *(1)* for ferrous and non ferrous materials
Solid-state output

Flush mountable in metal







Lengths (mm): a = Overall b = Threaded section	a = 60 b = 51.5 Ø = M18 x 1	a = 70 b = 51.5 Ø = M18 x 1
	Brass case	**Brass case**
Nominal sensing distance (Sn)	**5 mm**	**5 mm**

References

4-wire ⎓	PNP/PNP programmable NO/NC	**XS1M18KPM40**	**XS1M18KPM40D**
Weight (kg)		0.120	0.060

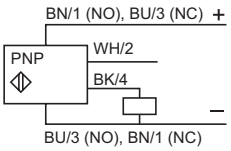
Characteristics

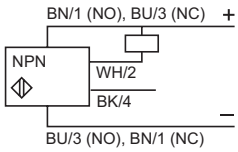
Product certifications		CE, UL, CSA	
Connection		**Pre-cabled, PvR 4 x 0.34 mm², length 2 m** *(2)*	**M12 connector**
Degree of protection	Conforming to IEC 60529	IP 68	IP 67
Operating zone		**0…4 mm**	
Repeat accuracy		3 % of Sr	
Differential travel		1…15 % of Sr	
Operating temperature		0…+ 50 °C	
Output state indication		Yellow LED, annular	Yellow LED, 4 viewing ports at 90°
Rated supply voltage		**⎓ 12…24 V with protection against reverse polarity**	
Voltage limits (including ripple)		⎓ 10…38 V	
Switching capacity		**0...200 mA with overload and short-circuit protection**	
Voltage drop, closed state		⩽ 2.6 V	
Current consumption, no-load		⩽ 15 mA	
Maximum switching frequency		1000 Hz	
Delays	First-up	⩽ 10 ms	
	Response	⩽ 0.3 ms	
	Recovery	⩽ 0.7 ms	

Wiring schemes

M12 connector	Pre-cabled	4-wire ⎓, PNP/NPN, NO or NC output	
		PNP	**NPN**

BN: brown
BU: blue
BK: black
WH: white





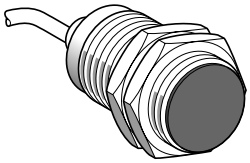
(1) The variation in sensing distance between ferrous and non ferrous materials is typically less than 5 %.
(2) Sensors available with other cable lengths: please consult our Customer Care Centre.

Telemecanique Sensors

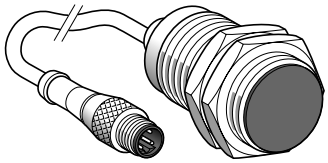
Inductive proximity sensors

OsiSense XS

Detection at fixed sensing distance. Factor 1 (Fe/Nfe) sensors *(1)* for ferrous and non ferrous materials
Solid-state output



a = 60
b = 51.5
Ø = M30 x 1.5



a = 60
b = 51.5
Ø = M30 x 1.5

Stainless steel case	Stainless steel case
10 mm	**10 mm**

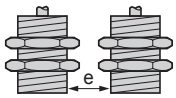
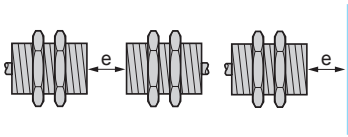
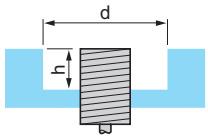
References

XS1M30KPM40	**XS1M30KPM40LD**
0.205	0.145

Characteristics

CE, UL, CSA	
Pre-cabled, PvR 4 x 0.34 mm², length 2 m *(2)*	**M12 connector on 0.8 m flying lead**
IP 68	IP 67
0…8 mm	
3 % of Sr	
1…15 % of Sr	
0…+ 50 °C	
Yellow LED, annular	
⎓ 12…24 V with protection against reverse polarity	
⎓ 10…38 V	
0…200 mA with overload and short-circuit protection	
≤ 2.6 V	
≤ 15 mA	
1000 Hz	
≤ 5 ms	
≤ 0.3 ms	
≤ 0.7 ms	

Setting-up

Minimum mounting distances (mm)	Side by side	Face to face	Facing a metal object	Mounted in a metal support
				
XS1M18 flush mountable	e ≥ 10	e ≥ 60	e ≥ 15	d ≥ 18, h ≥ 0
XS1M30 flush mountable	e ≥ 20	e ≥ 120	e ≥ 30	d ≥ 30, h ≥ 0

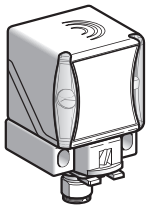
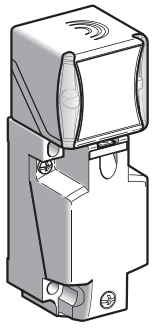
***Fixing nut tightening torque: XS1M18**: < 35 N.m, **XS1M30**: < 100 N.m*

(1) The variation in sensing distance between ferrous and non ferrous materials is typically less than 5 %.
(2) Sensors available with other cable lengths: please consult our Customer Care Centre.

Inductive proximity sensors

OsiSense XS Application

Factor 1 sensors for ferrous or non ferrous material detection and welding applications. Plastic case, 40 x 40 mm front face. 5 position turret head

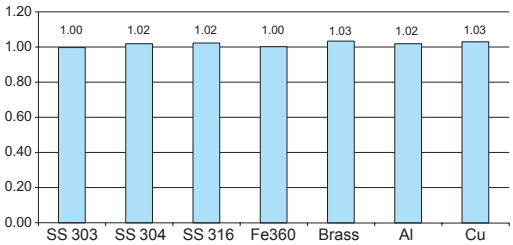
Sensor		Flush mountable in metal	
Dimensions		**40 x 40 x 70 mm**	**40 x 40 x 117 mm**
			
Nominal sensing distance (Sn)		20 mm	
References			
4-wire ⎓	PNP NO+NC	**XS9C2A1PCM12**	**XS9C4A1PCP20** *(1)*
	NPN NO+NC	**XS9C2A1NCM12**	**XS9C4A1NCP20** *(1)*
		XS9C4●●●P20 sensors are available with an ISO M20 cable entry and can be supplied with a Pg 13.5 (e.g. **XS9C4A1PCG13**) or a 1/2" NPT (e.g. **XS9C4A1PCN12**) cable entry: please consult our Customer Care Centre for more information.	
Weight (kg)		0.110	0.220

Characteristics

Product certifications		UL, CSA, CE	
Conformity to standards		IEC 60947-5-2	
Connection		M12 connector (4-pin)	Screw terminals, clamping capacity 4 x 1.5 mm^2 / 4 x 16 AWG
Operating zone		0…16 mm	
Differential travel		3…15% of Sr	
Repeat accuracy		< 3%	
Immunity to magnetic fields		< 250 mTesla	
Degree of protection	Conforming to IEC 60529 and DIN 40050	IP 65, IP 67 and IP 69K	
Temperature	Storage	- 40….+ 85°C	
	Operation *(2)*	- 25….+ 70°C	
Material		Case: PBT	
Vibration resistance	Conforming to IEC 60068-2-6	25 gn, amplitude ± 2 mm (f = 10…55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27	50 gn for 11 ms	
Indicators		Output state: yellow LED. Supply on: green LED	
Rated supply voltage	4-wire ⎓	⎓ 12…24 V with protection against reverse polarity	
Voltage limits (including ripple)	4-wire ⎓	⎓ 10…36 V	
Current consumption, no-load	4-wire ⎓	< 30 mA	
Switching capacity	4-wire ⎓	< 200 mA with protection against overload and short-circuit	
Voltage drop, closed state	4-wire ⎓	< 2 V	
Maximum switching frequency	4-wire ⎓	250 Hz	
Delays	First-up	< 15 ms	
	Response	< 2.5 ms	
	Recovery	< 2.5 ms	

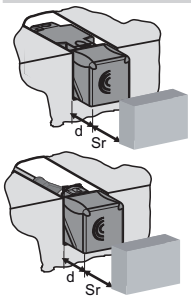
Setting-up

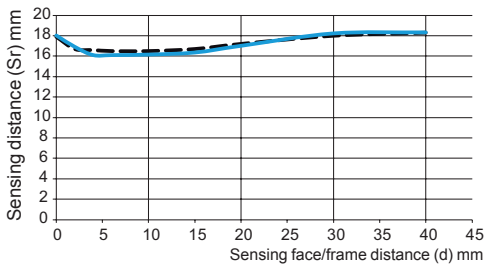
Sensing distance correction factor



SS: stainless steel, Fe: steel, Al: aluminium, Cu: copper.

Operating distance (according to the sensor's level of flush mounting)





: Flush mounted in Fe360 : Flush mounted in aluminium

*(1) These sensors are supplied without a cable gland. A suitable Pg 13.5 cable gland is available (reference **XSZPE13**).*
*(2) Sensors are available for very low temperatures (suffix **TF**: - 40°C, + 70°C) or very high temperatures (suffix **TT**: - 25°C, + 85°C); please consult our Customer Care Centre.*

Inductive proximity sensors

OsiSense XS Application

Factor 1 sensors for ferrous or non ferrous material detection and welding applications. Plastic case, 40 x 40 mm front face. 5 position turret head

Setting-up *(continued)*

Minimum mounting distances (mm)

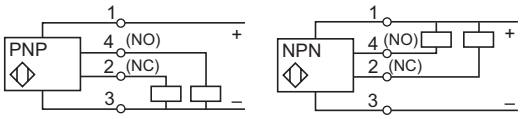
	Side by side	Face to face	Facing a metal object
Sensors flush mountable in metal	e ⩾ 80	e ⩾ 200	e ⩾ 60

Wiring schemes

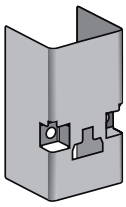
M12 connector

1: + V
2: NC Output
3: 0 V
4: NO Output

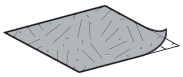
4-wire ⎓, NO + NC outputs



Accessories



XSZPSC2

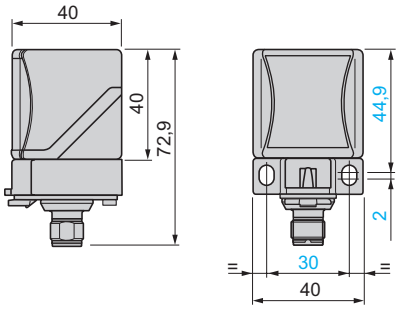


XSZPKC2

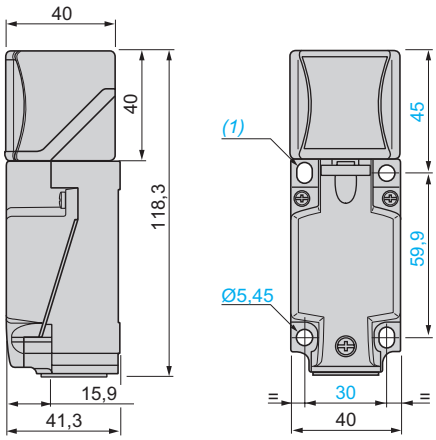
Description	Use for	Reference	Weight kg
Stainless steel rigid protective cover (only suitable for use when detecting from the top)	Welding	**XSZPSC2**	0.010
Protective sheet (for sensing face of sensor) Sold in lots of 5	Welding	**XSZPKC2**	0.010

Dimensions

XS9C2A1PCM12 and **XS9C2A1NCM12**



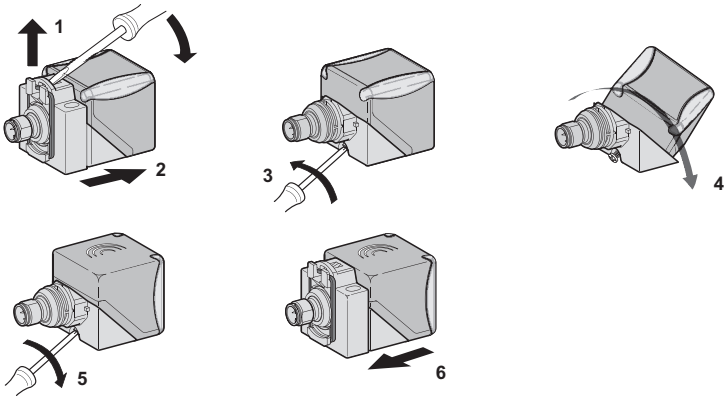
XS9C4A1PCP20 and **XS9C4A1NCP20**



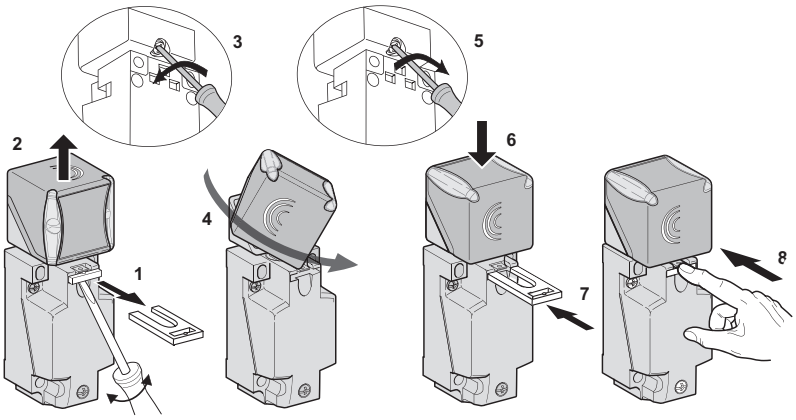
(1) 2 elongated holes Ø 5.3 x 7 mm.
Tightening torque of cover fixing screws and clamp screws: < 1.2 N.m / < 10.62 lb-in.

Head positions

XS9C2A1PCM12 and **XS9C2A1NCM12**



XS9C4A1PCP20 and **XS9C4A1NCP20**



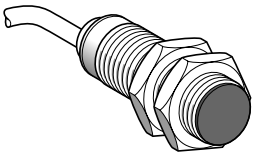
Inductive proximity sensors

OsiSense XS Application

Selective detection of ferrous materials
Selective detection of non ferrous materials
Cylindrical type, solid-state output

Flush mountable

Stainless steel case



Nominal sensing distance (Sn)	5 mm

References

3-wire, ferrous version Insensitive to non ferrous materials	PNP	NO	**XS1M18PAS40**
3-wire, non ferrous version Insensitive to ferrous materials	PNP	NO	**XS1M18PAS20**
Weight (kg)			0.120

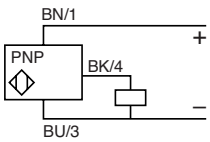
Characteristics

Product certifications		UL, CSA, CE
Connection		**Pre-cabled, PvR,** 3 x 0.34 mm², length 2 m *(1)*
Operating zone		**0…4 mm**
Degree of protection conforming to IEC 60529		IP 68
Operating temperature		- 25…+ 70 °C
Output state indication		Yellow LED, annular
Rated supply voltage		⎓ 12…24 V with protection against reverse polarity
Voltage limits (including ripple)		⎓ 10…38 V
Switching capacity		0…200 mA with overload and short-circuit protection
Voltage drop, closed state		⩽ 2.6 V
Residual current, open state		–
Current consumption, no-load		⩽ 15 mA
Maximum switching frequency		1000 Hz
Delays	First-up	⩽ 10 ms
	Response	⩽ 0.3 ms
	Recovery	⩽ 0.7 ms

(1) Sensors available with other cable lengths: please consult our Customer Care Centre.

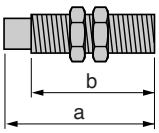
Wiring schemes

3-wire ⎓ PNP



Dimensions

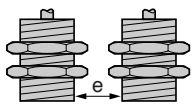
XS1M

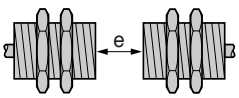


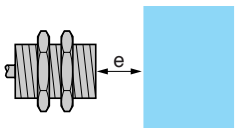
a (mm)	b (mm)
60	51.5

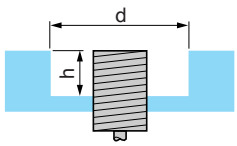
Setting-up

Minimum mounting distances (mm)









	Side by side	Face to face	Facing a metal object	Mounted in a metal support
XS1M18	e ⩾ 10	e ⩾ 60	e ⩾ 15	d ⩾ 18, h ⩾ 0 (ferrous metal) d ⩾ 18, h ⩾ 5 (non ferrous metal)

Accessories:
page 3/116

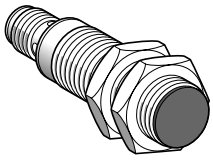
Inductive proximity sensors

OsiSense XS Application

Selective detection of ferrous materials
Selective detection of non ferrous materials
Cylindrical type, solid-state output

Flush mountable

Stainless steel case



Nominal sensing distance (Sn)	5 mm

References

3-wire, ferrous version Insensitive to non ferrous materials	PNP	NO	**XS1M18PAS40D**
3-wire, non ferrous version Insensitive to ferrous materials	PNP	NO	**XS1M18PAS20D**
Weight (kg)			0.060

Characteristics

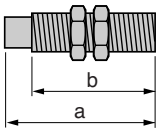
Product certifications		UL, CSA, CE
Connection		M12 connector
Degree of protection conforming to IEC 60529		IP 67
Operating zone		**0…4 mm**
Operating temperature		- 25…+ 70 °C
Output state indication		Yellow LED, 4 viewing ports at 90°
Rated supply voltage		⎓ 12…24 V with protection against reverse polarity
Voltage limits (including ripple)		⎓ 10…38 V
Switching capacity		0…200 mA with overload and short-circuit protection
Voltage drop, closed state		⩽ 2.6 V
Residual current, open state		–
Current consumption, no-load		⩽ 15 mA
Maximum switching frequency		1000 Hz
Delays	First-up	⩽ 10 ms
	Response	⩽ 0.3 ms
	Recovery	⩽ 0.7 ms

Wiring schemes

M12 connector — **3-wire ⎓ PNP**

Dimensions

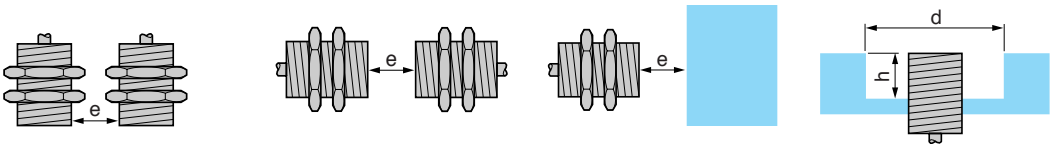
XS1M



a (mm)	b (mm)
70	51.5

Setting-up

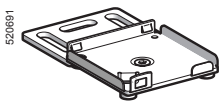
Minimum mounting distances (mm)



	Side by side	Face to face	Facing a metal object	Mounted in a metal support
XS1M18	e ⩾ 10	e ⩾ 60	e ⩾ 15	d ⩾ 18, h ⩾ 0 (ferrous metal) d ⩾ 18, h ⩾ 5 (non ferrous metal)

Accessories:
page 3/116

Inductive proximity sensors
OsiSense XS
Accessories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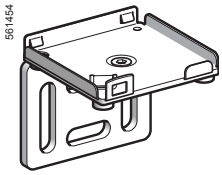
XSZB●00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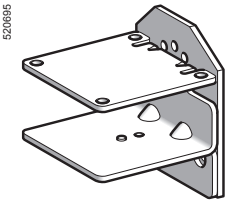
XSZB●90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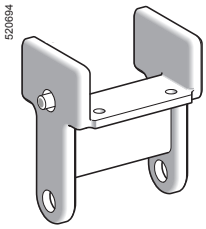
XSZBC10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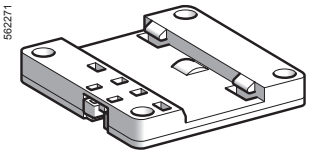
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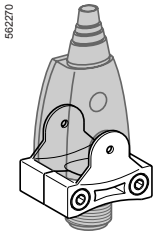
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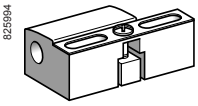
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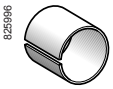
XSZB1●●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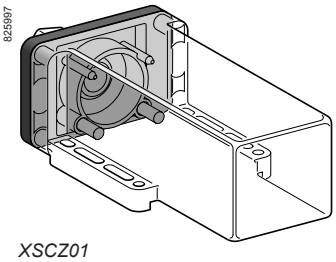
XSZA0●●

825995
XSZP1●●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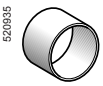
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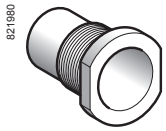

821980
XTAZ30

Mounting and fixing accessories

Description	For use with sensor		Unit reference	Weight kg
	Type	Diameter (mm)		
"Clip" mounting plate Can be mounted without "clip" on threaded holes	XS●J	–	**XSZBJ00**	0.003
	XS●F	–	**XSZBF00**	0.005
	XS●E	–	**XSZBE00**	0.025
	XS●C	–	**XSZBC00**	0.060
"Clip" 90° mounting bracket Can be mounted without "clip" on threaded holes	XS●J	–	**XSZBJ90**	0.003
	XS●F	–	**XSZBF90**	0.005
	XS●E	–	**XSZBE90**	0.025
	XS●C	–	**XSZBC90**	0.060
Replacement bracket	XS●E Replaces: XS7T2, XS8T2, XSE	–	**XSZBE10**	0.060
	XS●C Replaces: XS7T4, XS7C40, XS8T4, XS8C40 and XSC	–	**XSZBC10**	0.110
	XS●D (for XSD) *(1)*	–	**XSZBD10**	0.065
Fixing clamp for remote control	XS9, XS6●●●B2	–	**XSZBPM12**	0.015
Fixing clamps	XS1	4 (plain)	**XSZB104**	0.005
		5 (M5 x 0.5)	**XSZB105**	0.005
	XS1, XS2	6.5 (plain)	**XSZB165**	0.005
	XS1, XS2, XS4, XS5, XS6	8 (M8 x 1)	**XSZB108**	0.006
	XS1, XS2, XS4, XS5, XS6, XT1	12 (M12 x 1)	**XSZB112**	0.006
		18 (M18 x 1)	**XSZB118**	0.010
		30 (M30 x 1.5)	**XSZB130**	0.020
	XT1	32 (plain)	**XUZB32**	0.050
Set of 2 metal fixing nuts, nickel plated	XS1	5 (M5 x 0.5)	**XSZE105**	0.010
	XS1, XS2, XS5, XS6	8 (M8 x 1)	**XSZE108**	0.015
	XS1, XS2, XT1, XS5, XS6	12 (M12 x 1)	**XSZE112**	0.015
		18 (M18 x 1)	**XSZE118**	0.020
		30 (M30 x 1.5)	**XSZE130**	0.050
Set of 2 stainless steel fixing nuts	XS1, XS2, XS5, XS6	8 (M8 x 1)	**XSZE308**	0.015
	XS1, XS2, XT1, XS5, XS6	12 (M12 x 1)	**XSZE312**	0.015
		18 (M18 x 1)	**XSZE318**	0.020
		30 (M30 x 1.5)	**XSZE330**	0.050
Set of 2 plastic fixing nuts	XS4	8 (M8 x 1)	**XSZE208**	0.002
		12 (M12 x 1)	**XSZE212**	0.003
	XS4	18 (M18 x 1)	**XSZE218**	0.004
		30 (M30 x 1.5)	**XSZE230**	0.005
Adaptor collar Ø 20	XS●, XT●	18 (M18 x 1)	**XSZA020**	0.005
Ø 34	XS●, XT●	30 (M30 x 1.5)	**XSZA034**	0.005

Protection accessories

Cable sleeve adaptor (CNOMO type)	XS●, XT●	12 (M12 x 1)	**XSZP112**	0.005
		18 (M18 x 1)	**XSZP118**	0.005
		30 (M30 x 1.5)	**XSZP130**	0.010
Outer cover (IP 68)	XT7, XS7, XS8 and XS9 (C format)	–	**XSCZ01**	0.100
Thread adaptor	XS●, XT●	30 (M30 x 1.5)	**XTAZ30**	0.035
13P cable gland	Clamping capacity Ø 9 to 12 mm		**XSZPE13**	0.010
Protective cover Sold in lots of 50	M12 universal connectors		**XSZF10**	0.020

Fixings

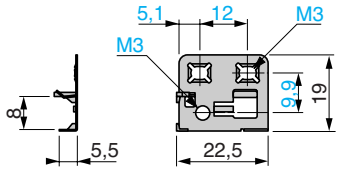
Threaded inserts for rear fixing	XS●E	M3	**XSZVF03**	0.002
	XS●C	M4	**XSZVF04**	0.005
	XS●D	M5	**XSZVF05**	0.006

Fuses (for unprotected 2-wire ⎓/∿ sensors)

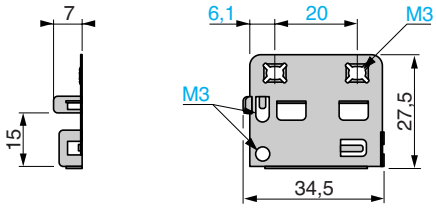
Description	Type	Sold in lots of	Unit reference	Weight kg
Cartridge fuses 5 x 20	0.4 A "quick-blow"	10	**XUZE04**	0.001
	0.63 A "quick-blow"	10	**XUZE06**	0.001
	0.8 A "quick-blow"	10	**XUZE08**	0.001
Fuse terminal block for XUZE0●		50	**AB1FU10135U**	0.040

(1) Depth adjustment shim for converting 80 x 80 x 26 mm format to 80 x 80 x 40 mm format. Also enables clipping onto 35 mm omega rail.

XSZBJ00



XSZBF00



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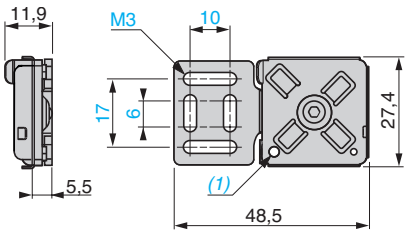
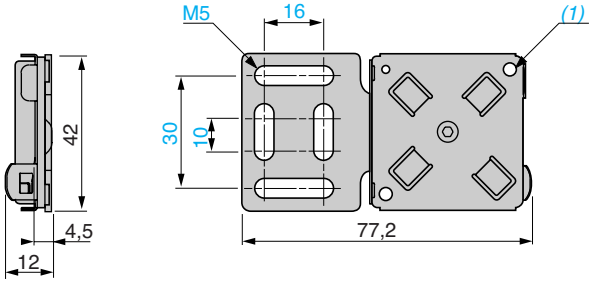


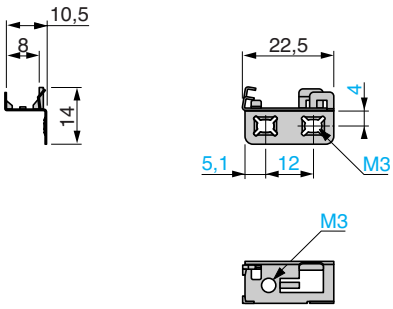
(1) 2 screws M3 x 12 (included).

XSZBC00

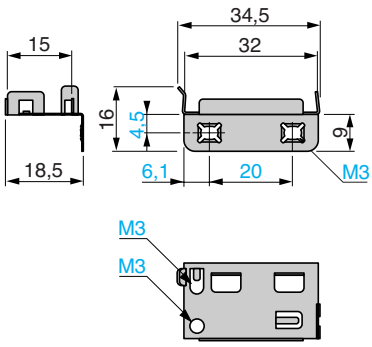


(1) 4 screws M4 x 14 (included).

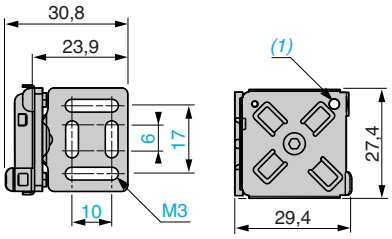
XSZBJ90



XSZBF90

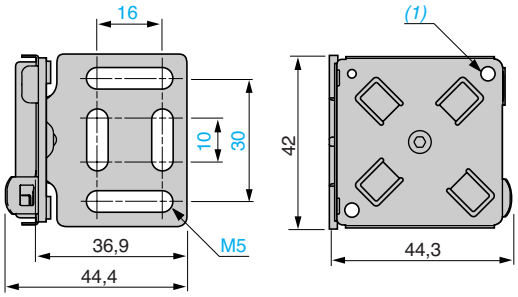


XSZBE90



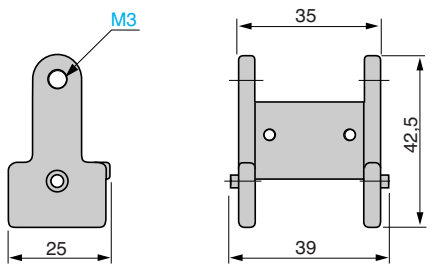
(1) 2 screws M3 x 12 (included).

XSZBC90

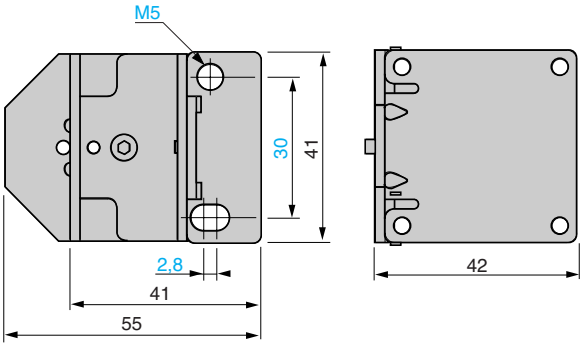


(1) 4 screws M4 x 14 (included).

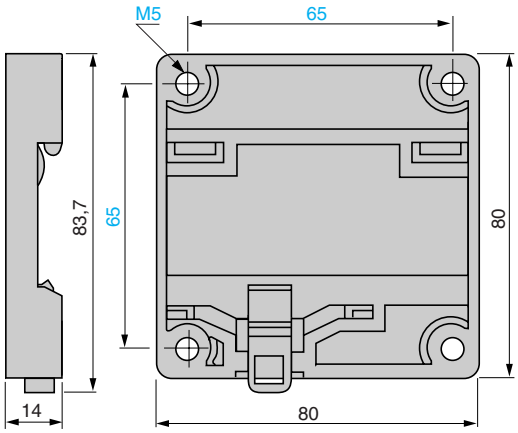
XSZBE10



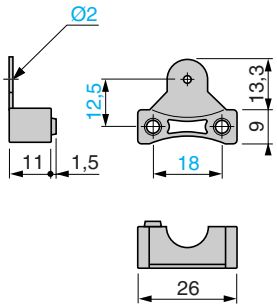
XSZBC10



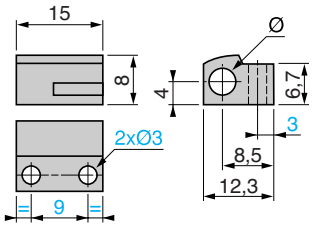
XSZBD10 (for mounting on XS●D●●●●)



XSZBPM12



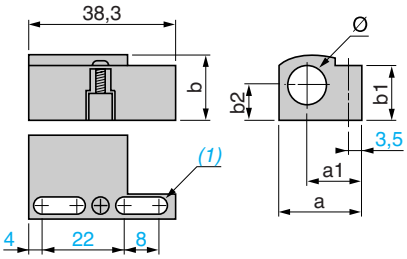
XSZB104, B105



XSZ	Ø
B104	4
B105	5

Note: *for fixing clamps XSZB118 and XSZB130, see mounting precautions, page 3/19.*

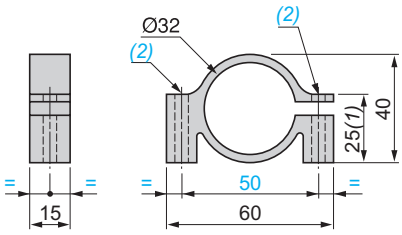
XSZB108, B112, B118, B130, B165



XSZ	a	a1	b	b1	b2	Ø
B108	19.9	14.5	14	12.5	7.5	8
B112	21.9	14.5	16	15.5	8.5	12
B118	26	15.7	22.3	20.1	11.5	18
B130	39	21.7	35.5	31	18.5	30
B165	19.9	14.5	14	12.5	7.5	6.5

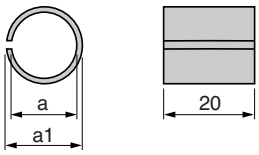
(1) 2 elongated holes 4 x 8 mm.

XUZB32



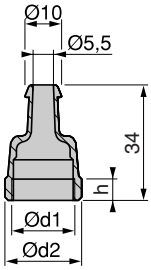
(1) Maximum value
(2) 2 holes Ø 5.5
2 x M5 screws, HM head, included with fixing clamp

XSZA0●●



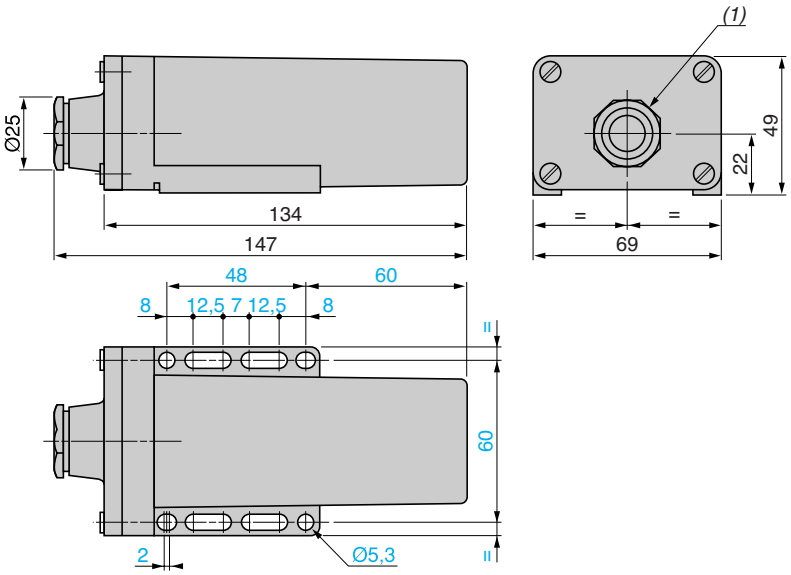
XSZ	a	a1
A020	Ø18	Ø20
A034	Ø30	Ø34

XSZP112, P118, P130



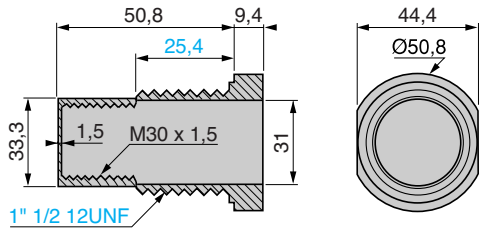
XSZ	h	Ø d1	Ø d2
P112	7	12	16,8
P118	6,2	18	23
P130	6,2	30	34,4

XSCZ01



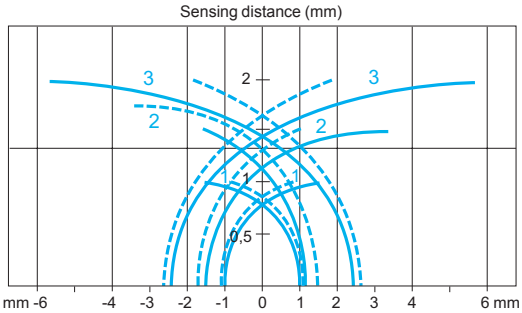
(1) 13P cable gland

XTAZ30



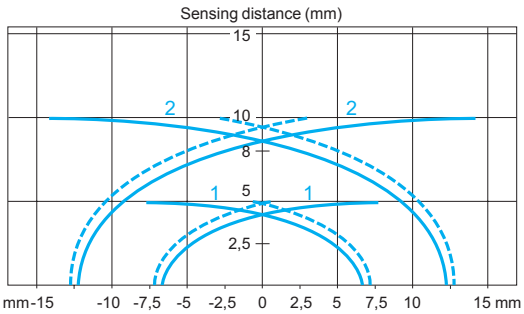
Cylindrical type sensors

Flush mountable in metal



Sensor (mm)	Standard steel target (mm)	Operating zone (mm)
Ø 4	5 x 5 x 1	0…0.8
Ø 5	5 x 5 x 1	0…0.8
Ø 6.5	8 x 8 x 1	0…1.2
Ø 8	8 x 8 x 1	0…1.2
Ø 12	12 x 12 x 1	0…1.6

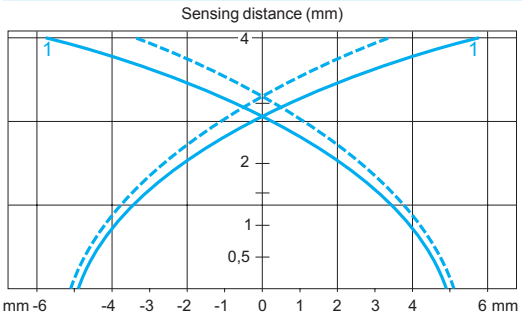
pick-up points
drop-out points (object approaching from the side)
1 Ø 4 (plain) XS1 and Ø 5 (M5 x 0.5) XS1
2 Ø 6.5 (plain) XS1 and Ø 8 (M8 x 1) XS5
3 Ø 12 (M12 x 1) XS5



Sensor (mm)	Standard steel target (mm)	Operating zone (mm)
Ø 18	18 x 18 x 1	0…4
Ø 30	30 x 30 x 1	0…8

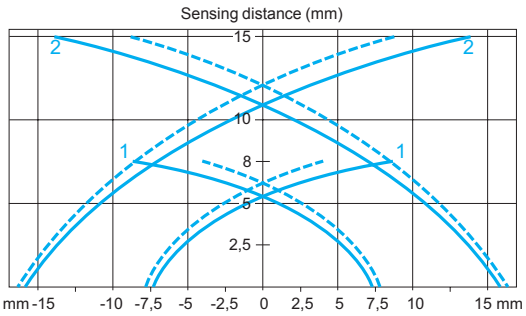
pick-up points
drop-out points (object approaching from the side)
1 Ø 18 (M18 x 1) XS5
2 Ø 30 (M30 x 1.5) XS5

Non flush mountable in metal



Sensor (mm)	Standard steel target (mm)	Operating zone (mm)
Ø 12	12 x 12 x 1	0…3.2

pick-up points
drop-out points (object approaching from the side)
1 Ø 12 (M12 x 1) XS4



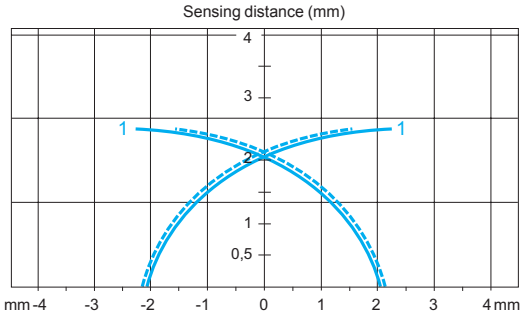
Sensor (mm)	Standard steel target (mm)	Operating zone (mm)
Ø 18	24 x 24 x 1	0…6.4
Ø 30	45 x 45 x 1	0…12

pick-up points
drop-out points (object approaching from the side)
1 Ø 18 (M18 x 1) XS4
2 Ø 30 (M30 x 1.5) XS4

Cylindrical type sensors, increased range

Flush mountable in metal

Non flush mountable in metal



Sensor (mm)

Ø 6,5 and Ø 8

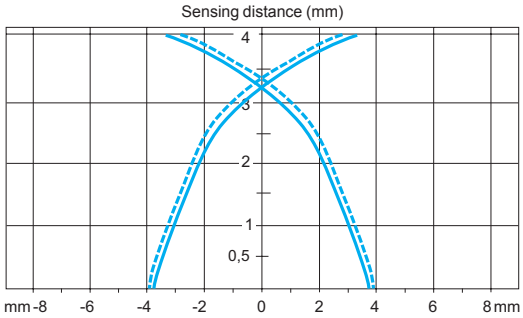
Standard steel target (mm)

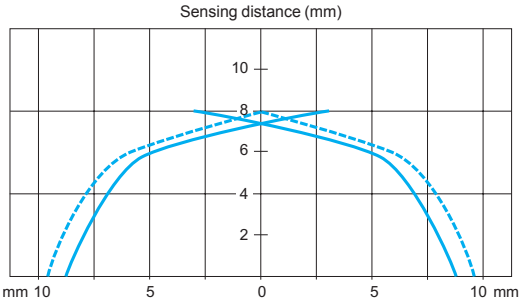
8 x 8 x 1

Operating zone (mm)

0…2 (flush mounted)

1 Ø 6.5 (plain) XS106B3●● and Ø 8 (M8 x 1) XS108B3 and XS608●●





Sensor (mm)

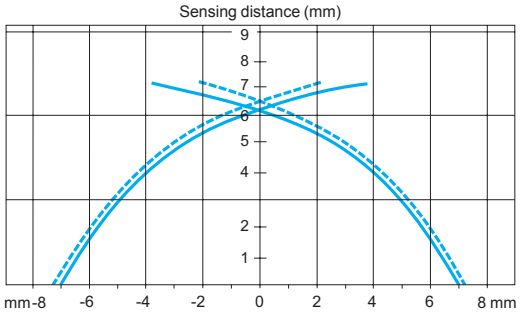
Ø 12

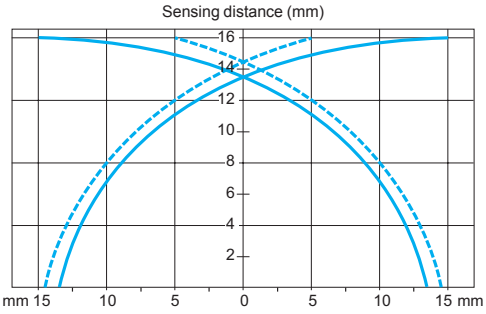
Standard steel target (mm)

12 x 12 x 1

Operating zone (mm)

0…3.2 (flush mounted)
0…6.4 (not flush mounted)





Sensor (mm)

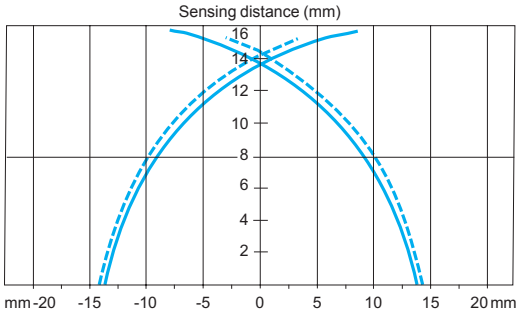
Ø 18

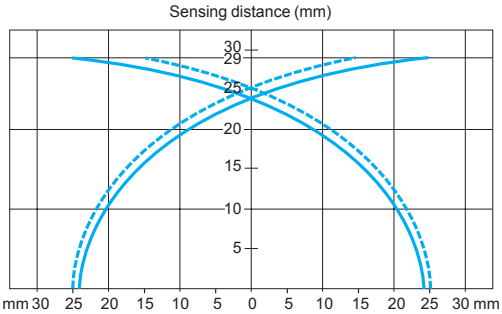
Standard steel target (mm)

24 x 24 x1

Operating zone (mm)

0…6.4 (flush mounted)
0…12.8 (not flush mounted)





Sensor (mm)

Ø 30

Standard steel target (mm)

45 x 45 x 1

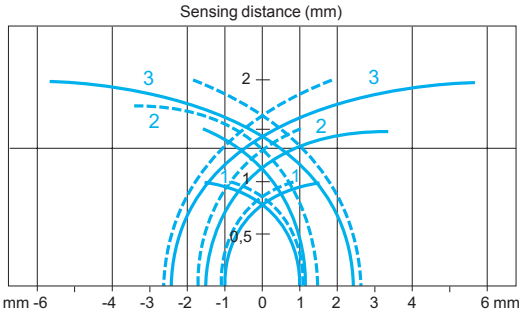
Operating zone (mm)

0…12 (flush mounted)
0…24 (not flush mounted)

pick-up points
drop-out points (object approaching from the side)

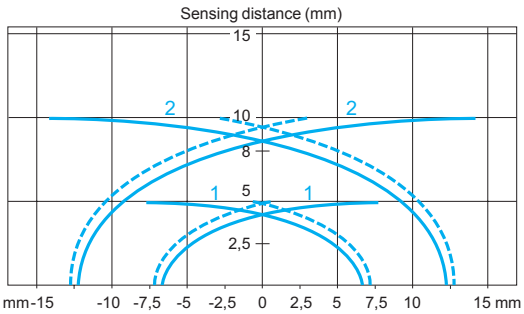
Cylindrical type sensors

Flush mountable in metal



Sensor (mm)	Standard steel target (mm)	Operating zone (mm)
Ø 4	5 x 5 x 1	0…0.8
Ø 5	5 x 5 x 1	0…0.8
Ø 6.5	8 x 8 x 1	0…1.2
Ø 8	8 x 8 x 1	0…1.2
Ø 12	12 x 12 x 1	0…1.6

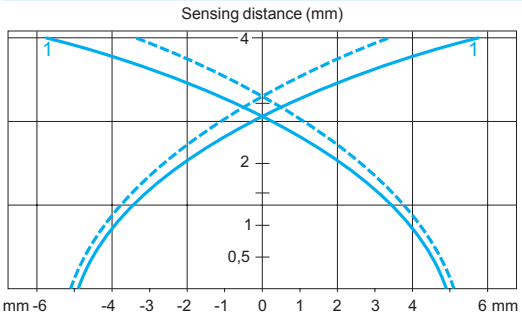
pick-up points
drop-out points (object approaching from the side)
1 Ø 4 (plain) XS1 and Ø 5 (M5 x 0.5) XS1
2 Ø 6.5 (plain) XS1 and Ø 8 (M8 x 1) XS5
3 Ø 12 (M12 x 1) XS5



Sensor (mm)	Standard steel target (mm)	Operating zone (mm)
Ø 18	18 x 18 x 1	0…4
Ø 30	30 x 30 x 1	0…8

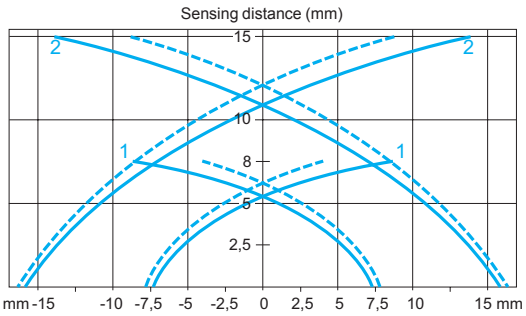
pick-up points
drop-out points (object approaching from the side)
1 Ø 18 (M18 x 1) XS5
2 Ø 30 (M30 x 1.5) XS5

Non flush mountable in metal



Sensor (mm)	Standard steel target (mm)	Operating zone (mm)
Ø 12	12 x 12 x 1	0…3.2

pick-up points
drop-out points (object approaching from the side)
1 Ø 12 (M12 x 1) XS4

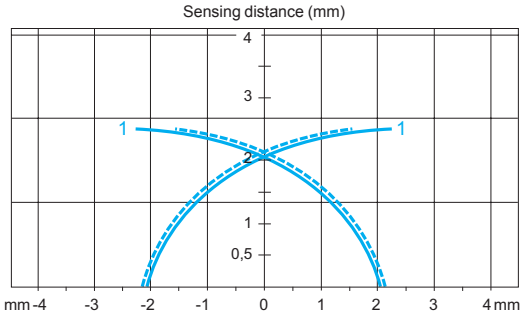


Sensor (mm)	Standard steel target (mm)	Operating zone (mm)
Ø 18	24 x 24 x 1	0…6.4
Ø 30	45 x 45 x 1	0…12

pick-up points
drop-out points (object approaching from the side)
1 Ø 18 (M18 x 1) XS4
2 Ø 30 (M30 x 1.5) XS4

Cylindrical type sensors, increased range

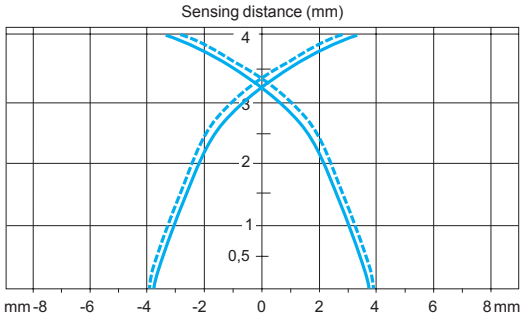
Flush mountable in metal

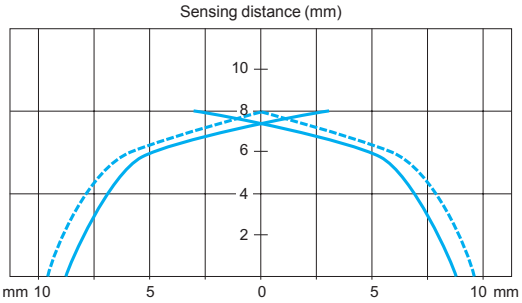


Non flush mountable in metal

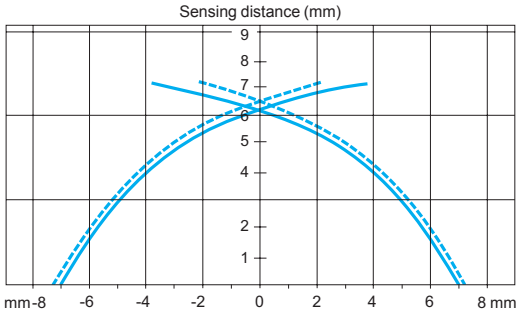
Sensor (mm)
Ø 6,5 and Ø 8
Standard steel target (mm)
8 x 8 x 1
Operating zone (mm)
0…2 (flush mounted)

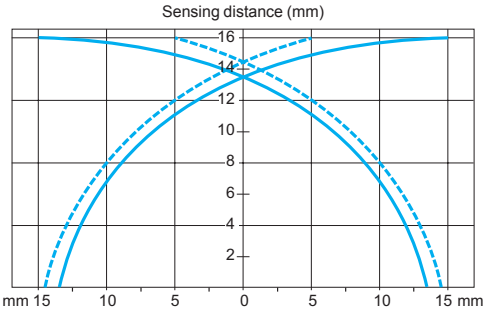
1 Ø 6.5 (plain) XS106B3●● and Ø 8 (M8 x 1) XS108B3 and XS608●●



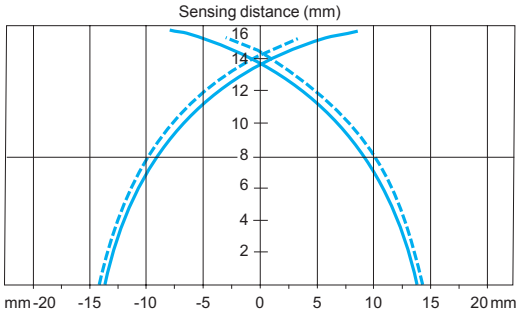


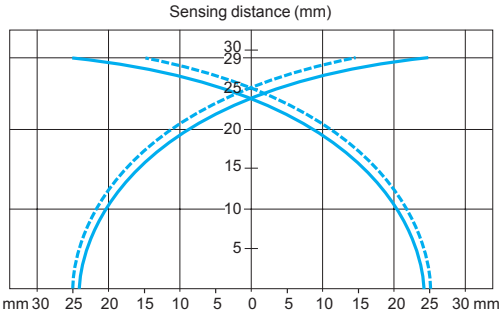
Sensor (mm)
Ø 12
Standard steel target (mm)
12 x 12 x 1
Operating zone (mm)
0…3.2 (flush mounted) 0…6.4 (not flush mounted)





Sensor (mm)
Ø 18
Standard steel target (mm)
24 x 24 x1
Operating zone (mm)
0…6.4 (flush mounted) 0…12.8 (not flush mounted)





Sensor (mm)
Ø 30
Standard steel target (mm)
45 x 45 x 1
Operating zone (mm)
0…12 (flush mounted) 0…24 (not flush mounted)

pick-up points
drop-out points (object approaching from the side)

Old sensor	New OsiSense XS sensor
Cylindrical type, DC	
Diameter 6.5 mm	
XS1	
XS1L06NA340	**XS506B1NAL2**
XS1L06NA340S	**XS506B1NAM8**
XS1L06NB340	**XS506B1NBL2**
XS1L06NB340S	**XS506B1NBM8**
XS1L06PA340	**XS506B1PAL2**
XS1L06PA340L1	**XS506B1PAL5**
XS1L06PA340D	**XS506B1PAM12**
XS1L06PA340S	**XS506B1PAM8**
XS1L06PB340	**XS506B1PBL2**
XS1L06PB340L1	**XS506B1PBL5**
XS1L 06PB340S	**XS506B1PBM8**
XS1L06NA349	**XS106B3NAL2**
XS1L06NA349S	**XS106B3NAM8**
XS1L06NB349	**XS106B3NBL2**
XS1L06NB349S	**XS106B3NBM8**
XS1L06PA349	**XS106B3PAL2**
XS1L06PA349L1	**XS106B3PAL5**
XS1L06PA349D	**XS106B3PAM12**
XS1L06PA349S	**XS106B3PAM8**
XS1L06PB349	**XS106B3PBL2**
XS1L06PB349L1	**XS106B3PBL5**
XS1L06PB349S	**XS106B3PBM8**
Diameter 8 mm	
XS1	
XS1D08NA140	**XS108BLNAL2**
XS1D08NA140D	**XS108BLNAM12**
XS1D08PA140	**XS108BLPAL2**
XS1D08PA140D	**XS108BLPAM12**
XS1D08PA140L1	**XS108BLPAL5**
XS1M08DA210	**XS508B1DAL2**
XS1M08DA210D	**XS508B1DAM12**
XS1M08DA210L1	**XS508B1DAL5**
XS1M08DA210L2	**XS508B1DAL10**
XS1M08DA210LD	**XS508B1DAL08M12**
XS1M08DB210	**XS508B1DBL2**
XS1M08DB210D	**XS508B1DBM12**
XS1M08DB210L1	**XS508B1DBL5**
XS1M08DB210LD	**XS508B1DBM12** *(1)*
XS1M08DA214D	**XS508B1CAM12**
XS1M08DA214LD	**XS508B1CAL08M12**

Old sensor	New OsiSense XS sensor
XS1M08NA370	**XS508BLNAL2**
XS1M08NA370D	**XS508BLNAM12**
XS1M08NA370L1	**XS508BLNAL5**
XS1M08NB370	**XS508BLNBL2**
XS1M08NB370D	**XS508BLNBM12**
XS1M08PA370	**XS508BLPAL2**
XS1M08PA370D	**XS508BLPAM12**
XS1M08PA370L1	**XS508BLPAL5**
XS1M08PA370L2	**XS508BLPAL10**
XS1M08PA370LD	**XS508BLPAM12** *(1)*
XS1M08PA370S	**XS508BLPAM12** *(2)*
XS1M08PB370	**XS508BLPBL2**
XS1M08PB370D	**XS508BLPBM12**
XS1M08PB370L1	**XS508BLPBL5**
XS1M08PB370L2	**XS508BLPBL10**
XS1N08NA340	**XS508B1NAL2**
XS1N08NA340D	**XS508B1NAM12**
XS1N08NA340L1	**XS508B1NAL5**
XS1N08NA340L2	**XS508B1NAL10**
XS1N08NA340S	**XS508B1NAM8**
XS1N08NB340	**XS508B1NBL2**
XS1N08NB340D	**XS508B1NBM12**
XS1N08NB340S	**XS508B1NBM8**
XS1N08PA340	**XS508B1PAL2**
XS1N08PA340D	**XS508B1PAM12**
XS1N08PA340L1	**XS508B1PAL5**
XS1N08PA340L2	**XS508B1PAL10**
XS1N08PA340LD	**XS508B1PAM12**
XS1N08PA340S	**XS508B1PAM8**
XS1N08PB340	**XS508B1PBL2**
XS1N08PB340D	**XS508B1PBM12**
XS1N08PB340L1	**XS508B1PBL5**
XS1N08PB340L2	**XS508B1PBL10**
XS1N08PB340S	**XS508B1PBM8**
XS1N08NA349	**XS108B3NAL2**
XS1N08NA349L1	**XS108B3NAL5**
XS1N08NA349D	**XS108B3NAM12**
XS1N08NA349S	**XS108B3NAM8**
XS1N08NB349	**XS108B3NBL2**
XS1N08NB349L1	**XS108B3NBL5**
XS1N08NB349D	**XS108B3NBM12**
XS1N08NB349S	**XS108B3NBM8**
XS1N08PA349	**XS108B3PAL2**
XS1N08PA349L1	**XS108B3PAL5**
XS1N08PA349D	**XS108B3PAM12**
XS1N08PA349S	**XS108B3PAM8**
XS1N08PB349	**XS108B3PBL2**

Old sensor	New OsiSense XS sensor
XS1N08PB349L1	**XS108B3PBL5**
XS1N08PB349D	**XS108B3PBM12**
XS1N08PB349S	**XS108B3PBM8**
XS2	
XS2M08NA340	**XS608B1NAL2**
XS2N08NA340	**XS108B3NAL2**
XS2N08NA340D	**XS108B3NAM12**
XS2N08NA340L1	**XS108B3NAL5**
XS2N08NA340L2	**XS108B3NAL10**
XS2N08NA340S	**XS108B3NAM8**
XS2N08NB340	**XS108B3NBL2**
XS2N08NB340D	**XS108B3NBM12**
XS2N08NB340S	**XS108B3NBM8**
XS2N08PA340	**XS108B3PAL2**
XS2N08PA340D	**XS108B3PAM12**
XS2N08PA340L1	**XS108B3PAL5**
XS2N08PA340L2	**XS108B3PAL10**
XS2N08PA340S	**XS108B3PAM8**
XS2N08PB340	**XS108B3PBL2**
XS2N08PB340D	**XS108B3PBM12**
XS2N08PB340S	**XS108B3PBM8**
XS3	
XS3P08NA340	**XS508B1NAL2** *(3)*
XS3P08NA340D	**XS508B1NAM12** *(3)*
XS3P08NA340L1	**XS508B1NAL5** *(3)*
XS3P08PA340	**XS508B1PAL2** *(3)*
XS3P08PA340D	**XS508B1PAM12** *(3)*
XS3P08PA340L1	**XS508B1PAL5** *(3)*
XS3P08NA370	**XS508BLNAL2** *(3)*
XS3P08NA370L1	**XS508BLNAL5** *(3)*
XS3P08PA370	**XS508BLPAL2** *(3)*
XS3P08PA370L1	**XS508BLPAL5** *(3)*

(1) For the new sensor an integral M12 connector replaces the remote M12 connector on a 0.80 m flying lead.
(2) For the new sensor an M12 connector replaces the M8 connector.
(3) For the new OsiSense XS sensor, the metal case replaces the plastic case.

Old sensor	New OsiSense XS sensor
Cylindrical type, DC *(continued)*	
Diameter 12 mm	
XS1	
XS1M12DA210	**XS512B1DAL2**
XS1M12DA210D	**XS512B1DAM12**
XS1M12DA210L1	**XS512B1DAL5**
XS1M12DA210L2	**XS512B1DAL10**
XS1M12DA210LA	**XS512B1DAL08U78**
XS1M12DA210LD	**XS512B1DAL08M12**
XS1M12DB210	**XS512B1DBL2**
XS1M12DB210D	**XS512B1DBM12**
XS1M12DB210L1	**XS512B1DBL5**
XS1M12DB210L2	**XS512B1DBL10**
XS1M12DB210LD	**XS512B1DBL08M12**
XS1M12DA214D	**XS512B1CAM12**
XS1M12DA214LD	**XS512B1CAL08M12**
XS1M12NA370	**XS512BLNAL2**
XS1M12NA370D	**XS512BLNAM12**
XS1M12NA370L1	**XS512BLNAL5**
XS1M12NA370L2	**XS512BLNAL10**
XS1M12NA370S	**XS612B1NAM12** *(2)*
XS1M12NB370	**XS512BLNBL2**
XS1M12NB370D	**XS512BLNBM12**
XS1M12PA370	**XS512BLPAL2**
XS1M12PA370D	**XS512BLPAM12**
XS1M12PA370L1	**XS512BLPAL5**
XS1M12PA370L2	**XS512BLPAL10**
XS1M12PA370LA	**XS612B1PAL08U78**
XS1M12PA370LD	**XS612B1PAL08M12**
XS1M12PB370	**XS512BLPBL2**
XS1M12PB370D	**XS512BLPBM12**
XS1M12PB370L1	**XS512BLPBL5**
XS1M12PB370L2	**XS512BLPBL10**
XS1M12PB370LD	**XS612B1PAM12** *(1)*
XS1N12NA340	**XS512B1NAL2**
XS1N12NA340D	**XS512B1NAM12**
XS1N12NA340L1	**XS512B1NAL5**
XS1N12NA340L2	**XS512B1NAL10**
XS1N12NB340	**XS512B1NBL2**
XS1N12NB340D	**XS512B1NBM12**
XS1N12NC410L2	**XS1N12NC410D + XZCPV1141L10**
XS1N12PA340	**XS512B1PAL2**
XS1N12PA340D	**XS512B1PAM12**
XS1N12PA340L1	**XS512B1PAL5**
XS1N12PA340L2	**XS512B1PAL10**
XS1N12PA340LD	**XS512B1PAM12** *(1)*

Old sensor	New OsiSense XS sensor
XS1N12PA340S	**XS512B1PAM12** *(2)*
XS1N12PB340	**XS512B1PBL2**
XS1N12PB340D	**XS512B1PBM12**
XS1N12PB340L1	**XS512B1PBL5**
XS1M12PA349D	**XS612B1PAM12**
XS1N12NA349	**XS112B3NAL2**
XS1N12NA349L1	**XS112B3NAL5**
XS1N12NA349D	**XS112B3NAM12**
XS1N12NB349	**XS112B3NBL2**
XS1N12NB349L1	**XS112B3NBL5**
XS1N12NB349D	**XS112B3NBM12**
XS1N12PA349	**XS112B3PAL2**
XS1N12PA349L1	**XS112B3PAL5**
XS1N12PA349D	**XS112B3PAM12**
XS1N12PB349	**XS112B3PBL2**
XS1N12PB349L1	**XS112B3PBL5**
XS1N12PB349D	**XS112B3PBM12**
XS2	
XS2M12NA370	**XS612B1NAL2**
XS2M12NA370D	**XS612B1NAM12**
XS2M12NA370L1	**XS612B1NAL5**
XS2M12NA370L2	**XS612B1NAL10**
XS2M12NB370	**XS612B1NBL2**
XS2M12NB370D	**XS612B1NBM12**
XS2M12PA370	**XS612B1PAL2**
XS2M12PA370D	**XS612B1PAM12**
XS2M12PA370L1	**XS612B1PAL5**
XS2M12PA370L2	**XS612B1PAL10**
XS2M12PA370LA	**XS612B1PAL08U78**
XS2M12PA370LD	**XS612B1PAL08M12**
XS2M12PB370	**XS612B1PBL2**
XS2M12PB370D	**XS612B1PBM12**
XS2M12PB370L1	**XS612B1PBL5**
XS2M12PB370S	**XS612B1PBM12** *(2)*
XS2N12NA340	**XS112B3NAL2**
XS2N12NA340D	**XS112B3NAM12**
XS2N12NA340L1	**XS112B3NAL5**
XS2N12NA340L2	**XS112B3NAL10**
XS2N12NB340	**XS112B3NBL2**
XS2N12NB340D	**XS112B3NBM12**
XS2N12NC410L1	**XS2N12NC410D + XZCPV1141L5**
XS2N12PA340	**XS112B3PAL2**
XS2N12PA340D	**XS112B3PAM12**
XS2N12PA340L1	**XS112B3PAL5**
XS2N12PA340L2	**XS112B3PAL10**
XS2N12PC410	**XS112B3PCL2**

Old sensor	New OsiSense XS sensor
XS2N12PC410D	**XS112B3PCM12**
XS2N12PC410L1	**XS112B3PCM12 + XZCPV1141L5**
XS2N12PC410L2	**XS112B3PCM12 + XZCPV1141L10**
XS2N12PB340	**XS112B3PBL2**
XS2N12PB340D	**XS112B3PBM12**
XS2N12PB340L1	**XS112B3PBL5**
XS3	
XS3P12NA340	**XS512B1NAL2** *(3)*
XS3P12NA340D	**XS512B1NAM12** *(3)*
XS3P12NA340L1	**XS512B1NAL5** *(3)*
XS3P12PA340	**XS512B1PAL2** *(3)*
XS3P12PA340D	**XS512B1PAM12** *(3)*
XS3P12PA340L1	**XS512B1PAL5** *(3)*
XS3P12NA370	**XS512BLNAL2** *(3)*
XS3P12NA370L1	**XS512BLNAL5** *(3)*
XS3P12PA370	**XS512BLPAL2** *(3)*
XS3P12PA370L1	**XS512BLPAL5** *(3)*
XS4	
XS4P12PC410L2	**XS4P12PC410D + XZCPV1141L10**

(1) For the new sensor an integral M12 connector replaces the remote M12 connector on a 0.80 m flying lead.
(2) For the new sensor an M12 connector replaces the M8 connector.
(3) For the new OsiSense XS sensor, the metal case replaces the plastic case.

Old sensor	New OsiSense XS sensor
Cylindrical type, DC *(continued)*	
Diameter 18 mm	
XS1	
XS1M18DA210	**XS518B1DAL2**
XS1M18DA210B	**XS518B1DAL01B** *(4)*
XS1M18DA210C	**XS518B1DAL01C** *(4)*
XS1M18DA210D	**XS518B1DAM12**
XS1M18DA210G	**XS518B1DAL01G** *(4)*
XS1M18DA210L1	**XS518B1DAL5**
XS1M18DA210L2	**XS518B1DAL10**
XS1M18DA210LD	**XS518B1DAL08M12**
XS1M18DB210	**XS518B1DBL2**
XS1M18DB210B	**XS518B1DBL01B** *(4)*
XS1M18DB210D	**XS518B1DBM12**
XS1M18DB210LD	**XS518B1DBL08M12**
XS1M18DA214D	**XS518B1CAM12**
XS1M18DA214LD	**XS518B1CAL08M12**
XS1M18NA370	**XS518BLNAL2**
XS1M18NA370A	**XS618B1NAL01U78** *(4)*
XS1M18NA370B	**XS618B1NAL01B** *(4)*
XS1M18NA370C	**XS618B1NAL01C** *(4)*
XS1M18NA370D	**XS518BLNAM12**
XS1M18NA370L1	**XS518BLNAL5**
XS1M18NA370L2	**XS518BLNAL10**
XS1M18NB370	**XS518BLNBL2**
XS1M18NB370B	**XS618B1NBL01B** *(4)*
XS1M18NB370C	**XS618B1NBL01C** *(4)*
XS1M18NB370D	**XS518BLNBM12**
XS1M18NB370L1	**XS518BLNBL5**
XS1M18NB370L2	**XS518BLNBL10**
XS1M18PA370	**XS518BLPAL2**
XS1M18PA370A	**XS618B1PAL01U78** *(4)*
XS1M18PA370B	**XS618B1PAL01B** *(4)*
XS1M18PA370C	**XS618B1PAL01C** *(4)*
XS1M18PA370D	**XS518BLPAM12**
XS1M18PA370G	**XS618B1PAL01G** *(4)*
XS1M18PA370DTQ	**XS518BLPAM12TQ**
XS1M18PA370G	**XS618B1PAL01G** *(4)*
XS1M18PA370L1	**XS518BLPAL5**
XS1M18PA370L2	**XS518BLPAL10**
XS1M18PA370LA	**XS618B1PAL08U78**
XS1M18PA370LD	**XS518BLPAM12** *(1)*
XS1M18PA370DTQ	**XS518BLPAM12TQ**
XS1M18PA370TF	**XS518BLPAL2TF**
XS1M18PB370	**XS518BLPBL2**
XS1M18PB370A	**XS618B1PBL01U78** *(4)*
XS1M18PB370B	**XS618B1PBL01B** *(4)*

Old sensor	New OsiSense XS sensor
XS1	
XS1M18PB370D	**XS518BLPBM12**
XS1M18PB370L1	**XS518BLPBL5**
XS1M18PB370L2	**XS518BLPBL10**
XS1M18PB370C	**XS618B1PBL01C** *(4)*
XS1N18NA340	**XS518B1NAL2**
XS1N18NA340D	**XS518B1NAM12**
XS1N18NA340L1	**XS518B1NAL5**
XS1N18NA340L2	**XS518B1NAL10**
XS1N18NB340	**XS518B1NBL2**
XS1N18NB340D	**XS518B1NBM12**
XS1N18NB340L2	**XS518B1NBL10**
XS1N18NC410L1	**XS1N18NC410D + XZCPV1141L5**
XS1N18PA340	**XS518B1PAL2**
XS1N18PA340D	**XS518B1PAM12**
XS1N18PA340L1	**XS518B1PAL5**
XS1N18PA340L2	**XS518B1PAL10**
XS1N18PB340	**XS518B1PBL2**
XS1N18PB340D	**XS518B1PBM12**
XS1N18PB340L2	**XS518B1PBL10**
XS2	
XS2N18NA340	**XS118B3NAL2**
XS2N18NA340D	**XS118B3NAM12**
XS2N18NA340L1	**XS118B3NAL5**
XS2N18NA340L2	**XS118B3NAL10**
XS2N18NB340	**XS118B3NBL2**
XS2N18NC410L2	**XS2N18NC410D + XZCPV1141L10**
XS2N18PC410	**XS118B3PCL2**
XS2N18PC410D	**XS118B3PCM12**
XS2N18PC410L1	**XS118B3PCM12 + XZCPV1141L5**
XS2N18NB340D	**XS118B3NBM12**
XS2N18PA340	**XS118B3PAL2**
XS2N18PA340D	**XS118B3PAM12**
XS2N18PA340L1	**XS118B3PAL5**
XS2N18PA340L2	**XS118B3PAL10**
XS2N18PB340	**XS118B3PBL2**
XS2N18PB340D	**XS118B3PBM12**
XS2M18NA370	**XS618B1NAL2**
XS2M18NA370A	**XS618B1NAL01U78** *(4)*
XS2M18NA370B	**XS618B1NAL01B** *(4)*
XS2M18NA370C	**XS618B1NAL01C** *(4)*
XS2M18NA370D	**XS618B1NAM12**
XS2M18NA370L1	**XS618B1NAL5**
XS2M18NA370L2	**XS618B1NAL10**
XS2M18NB370	**XS618B1NBL2**

Old sensor	New OsiSense XS sensor
XS2M18NB370B	**XS618B1NBL01B** *(4)*
XS2M18NB370C	**XS618B1NBL01C** *(4)*
XS2M18NB370D	**XS618B1NBM12**
XS2M18NB370L1	**XS618B1NBL5**
XS2M18NB370L2	**XS618B1NBL10**
XS2M18PA370	**XS618B1PAL2**
XS2M18PA370A	**XS618B1PAL01U78** *(4)*
XS2M18PA370B	**XS618B1PAL01B** *(4)*
XS2M18PA370C	**XS618B1PAL01C** *(4)*
XS2M18PA370D	**XS618B1PAM12**
XS2M18PA370G	**XS618B1PAL01G** *(4)*
XS2M18PA370LA	**XS618B1PAL08U78** *(4)*
XS2M18PA370L1	**XS618B1PAL5**
XS2M18PA370L2	**XS618B1PAL10**
XS2M18PB370	**XS618B1PBL2**
XS2M18PB370A	**XS618B1PBL01U78** *(4)*
XS2M18PB370B	**XS618B1PBL01B** *(4)*
XS2M18PB370C	**XS618B1PBL01C** *(4)*
XS2M18PB370D	**XS618B1PBM12**
XS2M18PB370L1	**XS618B1PBL5**
XS2M18PB370L2	**XS618B1PBL10**
XS3	
XS3P18NA340	**XS518B1NAL2** *(3)*
XS3P18NA340D	**XS518B1NAM12** *(3)*
XS3P18NA340L1	**XS518B1NAL5** *(3)*
XS3P18PA340	**XS518B1PAL2** *(3)*
XS3P18PA340D	**XS518B1PAM12** *(3)*
XS3P18PA340L1	**XS518B1PAL5** *(3)*
XS3P18NA370	**XS518BLNAL2** *(3)*
XS3P18NA370L1	**XS518BLNAL5** *(3)*
XS3P18PA370	**XS518BLPAL2** *(3)*
XS3P18PA370L1	**XS518BLPAL5** *(3)*
XS3P18PA370L2	**XS518BLPAL10** *(3)*
XS4	
XS4P18NA370B	**XS4P18NA370L01B** *(4)*
XS4P18NB370B	**XS4P18NB370L01B** *(4)*
XS4P18PA370B	**XS4P18PA370L01B** *(4)*
XS4P18PB370B	**XS4P18PB370L01B** *(4)*
XS4P18PC410L1	**XS4P18PC410D + XZCPV1141L5**

(1) For the new sensor an integral M12 connector replaces the remote M12 connector on a 0.80 m flying lead.
(3) For the new OsiSense XS sensor, the metal case replaces the plastic case.
(4) For the new sensor, connectors A, B, C and G on 0.1 m flying lead replace integral connectors A, B, C and G.

Old sensor	New OsiSense XS sensor
Cylindrical type, DC *(continued)*	
Diameter 30 mm	
XS1	
XS1M30DA210	**XS530B1DAL2**
XS1M30DA210B	**XS530B1DAL01B** *(4)*
XS1M30DA210C	**XS530B1DAL01C** *(4)*
XS1M30DA210D	**XS530B1DAM12**
XS1M30DA210G	**XS530B1DAL01G** *(4)*
XS1M30DA210L1	**XS530B1DAL5**
XS1M30DA210L2	**XS530B1DAL10**
XS1M30DA210LD	**XS530B1DAL08M12**
XS1M30DB210	**XS530B1DBL2**
XS1M30DB210B	**XS530B1DBL01B** *(4)*
XS1M30DB210D	**XS530B1DBM12**
XS1M30DB210LD	**XS530B1DBM12** *(1)*
XS1M30DA214D	**XS530B1CAM12**
XS1M30DA214LD	**XS530B1CAL08M12**
XS1M30PA349D	**XS630B1PAM12** *(5)*
XS1M30NA370	**XS530BLNAL2**
XS1M30NA370B	**XS630B1NAL01B** *(4)*
XS1M30NA370C	**XS630B1NAL01C** *(4)*
XS1M30NA370D	**XS530BLNAM12**
XS1M30NA370L1	**XS530BLNAL5**
XS1M30NA370L2	**XS530BLNAL10**
XS1M30NB370	**XS530BLNBL2**
XS1M30NB370B	**XS630B1NBL01B** *(4)*
XS1M30NB370C	**XS630B1NBL01C** *(4)*
XS1M30NB370D	**XS530BLNBM12**
XS1M30NB370L1	**XS530BLNBL5**
XS1M30NB370L2	**XS530BLNBL10**
XS1M30PA370	**XS530BLPAL2**
XS1M30PA370A	**XS630B1PAL01U78** *(4)*
XS1M30PA370B	**XS630B1PAL01B** *(4)*
XS1M30PA370C	**XS630B1PAL01C** *(4)*
XS1M30PA370D	**XS530BLPAM12**
XS1M30PA370G	**XS630B1PAL01G** *(4)*
XS1M30PA370L1	**XS530BLPAL5**
XS1M30PA370L2	**XS530BLPAL10**
XS1M30PB370	**XS530BLPBL2**
XS1M30PB370B	**XS630B1PBL01B** *(4)*
XS1M30PB370C	**XS630B1PBL01C** *(4)*
XS1M30PB370D	**XS530BLPBM12**
XS1M30PB370G	**XS630B1PBL01G** *(4)*
XS1M30PB370L1	**XS530BLPBL5**
XS1M30PB370L2	**XS530BLPBL10**

Old sensor	New OsiSense XS sensor
XS1N30NA340	**XS530B1NAL2**
XS1N30NA340D	**XS530B1NAM12**
XS1N30NA340L1	**XS530B1NAL5**
XS1N30NA340L2	**XS530B1NAL10**
XS1N30NB340	**XS530B1NBL2**
XS1N30NB340D	**XS530B1NBM12**
XS1N30PA340	**XS530B1PAL2**
XS1N30PA340D	**XS530B1PAM12**
XS1N30PA340L1	**XS530B1PAL5**
XS1N30PA340L2	**XS530B1PAL10**
XS1N30PB340	**XS530B1PBL2**
XS1N30PB340D	**XS530B1PBM12**
XS2	
XS2N30NA340	**XS130B3NAL2**
XS2N30NA340D	**XS130B3NAM12**
XS2N30NA340L1	**XS130B3NAL5**
XS2N30NA340L2	**XS130B3NAL10**
XS2N30NB340	**XS130B3NBL2**
XS2N30NC410L1	**XS2N30NC410D + XZCPV1141L5**
XS2N30PC410	**XS130B3PCL2**
XS2N30PC410D	**XS130B3PCM12**
XS2N30PC410L1	**XS130B3PCM12 + XZCPV1141L5**
XS2N30NB340D	**XS130B3NBM12**
XS2N30PA340	**XS130B3PAL2**
XS2N30PA340D	**XS130B3PAM12**
XS2N30PA340L1	**XS130B3PAL5**
XS2N30PA340L2	**XS130B3PAL10**
XS2N30PB340	**XS130B3PBL2**
XS2N30PB340D	**XS130B3PBM12**
XS2M30NA370	**XS630B1NAL2**
XS2M30NA370B	**XS630B1NAL01B** *(4)*
XS2M30NA370C	**XS630B1NAL01C** *(4)*
XS2M30NA370D	**XS630B1NAM12**
XS2M30NA370L1	**XS630B1NAL5**
XS2M30NA370L2	**XS630B1NAL10**
XS2M30NB370	**XS630B1NBL2**
XS2M30NB370B	**XS630B1NBL01B** *(4)*
XS2M30NB370C	**XS630B1NBL01C** *(4)*
XS2M30NB370D	**XS630B1NBM12**
XS2M30NB370L1	**XS630B1NBL5**
XS2M30NB370L2	**XS630B1NBL10**
XS2M30PA370	**XS630B1PAL2**
XS2M30PA370A	**XS630B1PAL01U78** *(4)*
XS2M30PA370B	**XS630B1PAL01B** *(4)*
XS2M30PA370C	**XS630B1PAL01C** *(4)*
XS2M30PA370D	**XS630B1PAM12**

Old sensor	New OsiSense XS sensor
XS2M30PA370G	**XS630B1PAL01G** *(4)*
XS2M30PA370L1	**XS630B1PAL5**
XS2M30PA370L2	**XS630B1PAL10**
XS2M30PB370	**XS630B1PBL2**
XS2M30PB370B	**XS630B1PBL01B** *(4)*
XS2M30PB370C	**XS630B1PBL01C** *(4)*
XS2M30PB370D	**XS630B1PBM12**
XS2M30PB370G	**XS630B1PBL01G** *(4)*
XS2M30PB370L1	**XS630B1PBL5**
XS2M30PB370L2	**XS630B1PBL10**
XS3	
XS3P30NA340	**XS530B1NAL2** *(3)*
XS3P30NA340D	**XS530B1NAM12** *(3)*
XS3P30NA340L1	**XS530B1NAL5** *(3)*
XS3P30PA340	**XS530B1PAL2** *(3)*
XS3P30PA340D	**XS530B1PAM12** *(3)*
XS3P30PA340L1	**XS530B1PAL5** *(3)*
XS3P30PA340L2	**XS530B1PAL10** *(3)*
XS3P30PA370	**XS530BLPAL2** *(3)*
XS3P30PA370L1	**XS530BLPAL5** *(3)*
XS3P30PA370L2	**XS530BLPAL10** *(3)*
XS3P30NA370	**XS530BLNAL2** *(3)*
XS3P30NA370L1	**XS530BLNAL5** *(3)*
XS4	
XS4P30NA370B	**XS4P30NA370L01B** *(4)*
XS4P30NB370B	**XS4P30NB370L01B** *(4)*
XS4P30NC410L2	**XS4P30NC410D + XZCPV1141L10**
XS4P30PA370B	**XS4P30PA370L01B** *(4)*
XS4P30PB370B	**XS4P30PB370L01B** *(4)*
XS4P30PC410L1	**XS4P30PC410D + XZCPV1141L5**
XS4P30PC410L2	**XS4P30PC410D + XZCPV1141L10**

(1) For the new sensor an integral M12 connector replaces the remote M12 connector on a 0.80 m flying lead.
(3) For the new OsiSense XS sensor, the metal case replaces the plastic case.
(4) For the new sensor, connectors A, B, C and G on 0.1 m flying lead replace integral connectors A, B, C and G.
(5) For the new sensor, Sn = 15 mm instead of 20 mm.

Old sensor	New OsiSense XS sensor
Cylindrical type, AC or DC	
Diameter 12 mm	
XS1	
XS1M12MA230	**XS512B1MAL2**
XS1M12MA230K	**XS512B1MAU20**
XS1M12MA230L1	**XS512B1MAL5**
XS1M12MA230L2	**XS512B1MAL10**
XS1M12MB230	**XS512B1MBL2**
XS1M12MB230K	**XS512B1MBU20**
XS1M12MB230L1	**XS512B1MBL5**
XS1M12MB230L2	**XS512B1MBL10**
XS1M12MA239	**XS612B1MAL2**
XS1M12MA239K	**XS612B1MAU20**
XS2	
XS2M12MA230	**XS612B1MAL2**
XS2M12MA230K	**XS612B1MAU20**
XS2M12MA230L1	**XS612B1MAL5**
XS2M12MA230L2	**XS612B1MAL10**
XS2M12MB230	**XS612B1MBL2**
XS2M12MB230K	**XS612B1MBU20**
XS2M12MB230L1	**XS612B1MBL5**
XS2M12MB230L2	**XS612B1MBL10**
XS3	
XS3P12MA230	**XS612B1MAL2** *(3)*
XS3P12MA230K	**XS612B1MAU20** *(3)*
XS3P12MA230L1	**XS612B1MAL5** *(3)*
XS3P12MA230L2	**XS612B1MAL10** *(3)*
XS3P12MB230	**XS612B1MBL2** *(3)*
XS3P12MB230K	**XS612B1MBU20** *(3)*
XS3P12MB230L1	**XS612B1MBL5** *(3)*
Diameter 18 mm	
XS1	
XS1M18MA230	**XS518B1MAL2**
XS1M18MA230A	**XS618B1MAL01U78** *(4)*
XS1M18MA230B	**XS618B1MAL01B** *(4)*
XS1M18MA230C	**XS618B1MAL01C** *(4)*
XS1M18MA230G	**XS618B1MAL01G** *(4)*
XS1M18MA230K	**XS518B1MAU20**
XS1M18MA230L1	**XS518B1MAL5**
XS1M18MA230L2	**XS518B1MAL10**
XS1M18MB230	**XS518B1MBL2**
XS1M18MB230A	**XS618B1MBL01U78** *(4)*
XS1M18MB230B	**XS618B1MBL01B** *(4)*
XS1M18MB230C	**XS618B1MBL01C** *(4)*
XS1M18MB230G	**XS618B1MBL01G** *(4)*
XS1M18MB230K	**XS518B1MBU20**
XS1M18MB230L1	**XS518B1MBL5**
XS1M18MB230L2	**XS518B1MBL10**
XS1M18MA239	**XS618B1MAL2** *(5)*

Old sensor	New OsiSense XS sensor
Diameter 18 mm *(continued)*	
XS1	
XS1M18MA239A	**XS1M18MA239L01A** *(4)*
XS1M18MA239K	**XS618B1MAU20** *(5)*
XS2	
XS2M18MA230	**XS618B1MAL2**
XS2M18MA230A	**XS618B1MAL01U78** *(4)*
XS2M18MA230B	**XS618B1MAL01B** *(4)*
XS2M18MA230C	**XS618B1MAL01C** *(4)*
XS2M18MA230G	**XS618B1MAL01G** *(4)*
XS2M18MA230K	**XS618B1MAU20**
XS2M18MA230L1	**XS618B1MAL5**
XS2M18MA230L2	**XS618B1MAL10**
XS2M18MB230	**XS618B1MBL2**
XS2M18MB230A	**XS618B1MBL01U78** *(4)*
XS2M18MB230B	**XS618B1MBL01B** *(4)*
XS2M18MB230C	**XS618B1MBL01C** *(4)*
XS2M18MB230G	**XS618B1MBL01G** *(4)*
XS2M18MB230K	**XS618B1MBU20**
XS2M18MB230L1	**XS618B1MBL5**
XS2M18MB230L2	**XS618B1MBL10**
XS3	
XS3P18MA230	**XS618B1MAL2** *(3)*
XS3P18MA230K	**XS618B1MAU20** *(3)*
XS3P18MA230L1	**XS618B1MAL5** *(3)*
XS3P18MA230L2	**XS618B1MAL10** *(3)*
XS3P18MB230	**XS618B1MBL2** *(3)*
XS3P18MB230A	**XS618B1MBU20** *(3)*
XS3P18MB230K	**XS618B1MBU20** *(3)*
XS3P18MB230L1	**XS618B1MBL5** *(3)*
XS4	
XS4P18MA230B	**XS4P18MA230L01B** *(4)*
XS4P18MA230C	**XS4P18MA230L01C** *(4)*
XS4P18MA230G	**XS4P18MA230L01G** *(4)*
XS4P18MB230B	**XS4P18MB230L01B** *(4)*
XS4P18MB230C	**XS4P18MB230L01C** *(4)*
Diameter 30 mm	
XS1	
XS1M30MA230	**XS530B1MAL2**
XS1M30MA230A	**XS630B1MAL01U78** *(4)*
XS1M30MA230B	**XS630B1MAL01B** *(4)*
XS1M30MA230C	**XS630B1MAL01C** *(4)*
XS1M30MA230G	**XS630B1MAL01G** *(4)*
XS1M30MA230K	**XS530B1MAU20**
XS1M30MA230L1	**XS530B1MAL5**
XS1M30MA230L2	**XS530B1MAL10**
XS1M30MB230	**XS530B1MBL2**
XS1M30MB230A	**XS630B1MBL01U78** *(4)*
XS1M30MB230B	**XS630B1MBL01B** *(4)*

Old sensor	New OsiSense XS sensor
Diameter 30 mm *(continued)*	
XS1M30MB230C	**XS630B1MBL01C** *(4)*
XS1M30MB230G	**XS630B1MBL01G** *(4)*
XS1M30MB230K	**XS530B1MBU20**
XS1M30MB230L1	**XS530B1MBL5**
XS1M30MB230L2	**XS530B1MBL10**
XS1M30MA239	**XS630B1MAL2** *(5)*
XS1M30MA239A	**XS1M30MA239L01A** *(4)*
XS2	
XS2M30MA230	**XS630B1MAL2**
XS2M30MA230A	**XS630B1MAL01U78** *(4)*
XS2M30MA230B	**XS630B1MAL01B** *(4)*
XS2M30MA230C	**XS630B1MAL01C** *(4)*
XS2M30MA230G	**XS630B1MAL01G** *(4)*
XS2M30MA230K	**XS630B1MAU20**
XS2M30MA230L1	**XS630B1MAL5**
XS2M30MA230L2	**XS630B1MAL10**
XS2M30MB230	**XS630B1MBL2**
XS2M30MB230A	**XS630B1MBL01U78** *(4)*
XS2M30MB230B	**XS630B1MBL01B** *(4)*
XS2M30MB230C	**XS630B1MBL01C** *(4)*
XS2M30MB230G	**XS630B1MBL01G** *(4)*
XS2M30MB230K	**XS630B1MBU20**
XS2M30MB230L1	**XS630B1MBL5**
XS2M30MB230L2	**XS630B1MBL10**
XS3	
XS3P30MA230	**XS630B1MAL2** *(3)*
XS3P30MA230K	**XS630B1MAU20** *(3)*
XS3P30MA230L1	**XS630B1MAL5** *(3)*
XS3P30MA230L2	**XS630B1MAL10** *(3)*
XS3P30MB230	**XS630B1MBL2** *(3)*
XS3P30MB230K	**XS630B1MBU20** *(3)*
XS3P30MB230L1	**XS630B1MBL5** *(3)*
XS4	
XS4P30MA230B	**XS4P30MA230L01B** *(4)*
XS4P30MA230C	**XS4P30MA230L01C** *(4)*
XS4P30MA230G	**XS4P30MA230L01G** *(4)*
XS4P30MB230B	**XS4P30MB230L01B** *(4)*
XS4P30MB230C	**XS4P30MB230L01C** *(4)*

(3) For the new OsiSense XS sensor, the metal case replaces the plastic case.
(4) For the new sensor, connectors A, B, C and G on 0.1 m flying lead replace integral connectors A, B, C and G.
(5) For the new sensor, Sn = 8 mm instead of 10 mm.

Old sensor	New OsiSense XS sensor
Block type	
40 x 40 x 70 mm and 40 x 40 x 117 mm	
XS7	
XS7C40DA210	**XS7C4A1DPG13**
XS7C40DA210A	**XS7C4A1DPU78**
XS7C40DA210D	**XS7C4A1DPM12**
XS7C40DA210H29	**XS7C4A1DPP20**
XS7C40DA210H7	**XS7C4A1DPN12**
XS7C40DA214D	**XS7C4A1DPM12**
XS7C40DP210	**XS7C4A1DPG13**
XS7C40DP210H29	**XS7C4A1DPP20**
XS7C40DP210H7	**XS7C4A1DPN12**
XS7C40FP260	**XS7C4A1MPG13**
XS7C40FP260A	**XS7C4A1MPU78**
XS7C40FP260H29	**XS7C4A1MPP20**
XS7C40FP260H7	**XS7C4A1MPN12**
XS7C40KPM40	**XS9C4A1PCG13**
XS7C40KPM40H29	**XS9C4A1PCP20**
XS7C40KPM40H7	**XS9C4A1PCN12**
XS7C40MP230	**XS7C4A1MPG13**
XS7C40MP230A	**XS7C4A1MPU78**
XS7C40MP230H29	**XS7C4A1MPP20**
XS7C40MP230H7	**XS7C4A1MPN12**
XS7C40NC440	**XS8C4A1NCG13**
XS7C40NC440D	**XS8C4A1NCM12**
XS7C40NC440H29	**XS8C4A1NCP20**
XS7C40NC440H7	**XS8C4A1NCN12**
XS7C40NC449	**XS8C4A1NCG13**
XS7C40NC449H29	**XS8C4A1NCP20**
XS7C40NC449H7	**XS8C4A1NCN12**
XS7C40PC440	**XS8C4A1PCG13**
XS7C40PC440D	**XS8C4A1PCM12**
XS7C40PC440H29	**XS8C4A1PCP20**
XS7C40PC440H7	**XS8C4A1PCN12**
XS7C40PC449	**XS8C4A1PCG13**
XS7C40PC449D	**XS8C4A1PCM12**
XS7C40PC449H29	**XS8C4A1PCP20**
XS7C40PC449H7	**XS8C4A1PCN12**
XS7T4DA210	**XS7C2A1DAM12 + XZCP1141L2**
XS7T4DA214LD	**XS8C2A1CAM12**
XS7T4DA214LD01	**XS8C2A1CAM12**
XS7T4DA214LD01W	**XS8C2A1CAM12 + XSZPKC2**
XS7T4DA214LDW	**XS8C2A1CAM12 + XSZPKC2**
XS7T4NC440	**XS8C2A1NCM12 + XZCP1141L2**
XS7T4NC440LD	**XS8C2A1NCM12**
XS7T4NC440LD01	**XS8C2A1NCM12**
XS7T4PC440	**XS8C2A1PCM12 + XZCP1141L2**
XS7T4PC440LD	**XS8C2A1PCM12**

Old sensor	New OsiSense XS sensor
40 x 40 x 70 mm and 40 x 40 x 117 mm *(continued)*	
XS8	
XS8C40DA210	**XS8C4A1DPG13**
XS8C40DA210H29	**XS8C4A1DPP20**
XS8C40DA214D	**XS8C4A1DPM12**
XS8C40DP210	**XS8C4A1DPG13**
XS8C40DP210H29	**XS8C4A1DPP20**
XS8C40DP210H7	**XS8C4A1DPN12**
XS8C40FP260	**XS8C4A1MPG13**
XS8C40FP260H29	**XS8C4A1MPP20**
XS8C40FP260H7	**XS8C4A1MPN12**
XS8C40MP230	**XS8C4A1MPG13**
XS8C40MP230H29	**XS8C4A1MPP20**
XS8C40MP230H7	**XS8C4A1MPN12**
XS8C40NC440	**XS8C4A1NCG13**
XS8C40NC440H29	**XS8C4A1NCP20**
XS8C40NC449	**XS8C4A4NCG13**
XS8C40NC449H29	**XS8C4A4NCP20**
XS8C40NC449H7	**XS8C4A4NCN12**
XS8C40PC440	**XS8C4A1PCG13**
XS8C40PC440D	**XS8C4A1PCM12**
XS8C40PC440H29	**XS8C4A1PCP20**
XS8C40PC440H7	**XS8C4A1PCN12**
XS8C40PC449	**XS8C4A4PCG13**
XS8C40PC449D	**XS8C4A4PCM12**
XS8C40PC449H29	**XS8C4A4PCP20**
XS8C40PC449H7	**XS8C4A4PCN12**
XS8T4NC440	**XS8C2A1NCM12 + XZCP1141L2**
XS8T4NC440LD01	**XS8C2A1NCM12**
XS8T4PC440	**XS8C2A1PCM12 + XZCP1141L2**
XS8T4PC440L1	**XS8C2A1PCM12 + XZCP1141L5**
XS8T4PC440L2	**XS8C2A1PCM12 + XZCP1141L10**
XS8T4PC440LD	**XS8C2A1PCM12**
XS8T4PC440LD01	**XS8C2A1PCM12**
40 x 40 x 117 mm	
XSCH	
XSCH203629	**XS9C4A2A2G13**
XSCH203629H7	**XS9C4A2A2N12**
XSCH207629	**XS9C4A2A1G13**
XSCH207629H7	**XS9C4A2A1N12**

4

Sommaire

4 - Capacitive proximity sensors OsiSense XT

Selection guide . . . . . *page 4/2*

■ General . . . . . *page 4/4*

OsiSense XT

■ Cylindrical, flush mountable. Metal case . . . . . *page 4/8*

■ Cylindrical, non fush mountable. Plastic case . . . . . *page 4/12*

■ 40 x 40 x 117 format. Plastic case, plug in. Turret head . . . . . *page 4/16*

4

Capacitive proximity sensors

OsiSense XT

Detection of insulated or conductive materials

Applications: detection of any object irrespective of material or conductivity, for example: metals, minerals, wood, plastic, glass, cardboard, fluids, etc.

Cylindrical sensors, flush mountable, metal case

Detection of insulated or conductive materials: presence, passage of paper, cardboard, glass, etc.

Form	**Cylindrical**	Threaded: M12 x 1	Threaded: M18 x 1	Threaded: M30 x 1.5	Plain: Ø 32
	Block, dimensions (w x h x d) in mm	–			
Case		Stainless steel	Nickel plated brass	Nickel plated brass	Nickel plated brass
Sensing distance (Sn) in mm	**Flush mountable in metal sensors**	2	5	10	15
	Non flush mountable in metal sensors	–			
Degree of protection		IP 67 IP 65 for sensors with connector			
Supply	⎓	●	●	●	–
	∿	–	●	●	●
Connection	**Pre-cabled**	●			
	Connector	●	●	●	–
	Screw terminals	–			
Type reference		**XT112S1●**	**XT118B1●**	**XT130B1●**	**XT132B1●**
Pages		4/8			

Cylindrical sensors, non flush mountable, plastic case				Block type sensors, flush mountable in support, plastic case
Detection of insulated or conductive materials Liquid level control			**Application series: Automatic feed system for livestock**	**Detection of insulated materials: presence, passage of paper, cardboard, glass, etc.**
Threaded: M18 x 1	Threaded: M30 x 1.5	Plain: Ø 32	Threaded: M30 x 1.5	–
–				40 x 40 x 117 format
Plastic				Plastic, turret head
–				15
8	15	20	15	–
IP 67, double insulation ⧈			IP 65, double insulation ⧈	IP 67
●	●	–	●	●
●			●	●
●			–	–
●	●	–	–	–
–			●	●
XT218A1●	**XT230A1●**	**XT232A1●**	**XT230A2MDB**	**XT7C40●**
4/12				4/16

4

Capacitive proximity sensors
OsiSense XT

Presentation

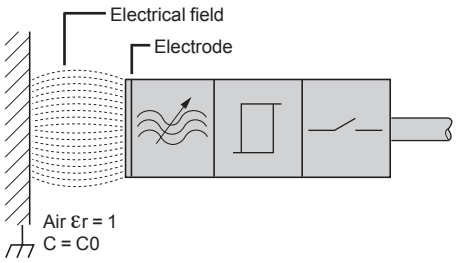
Advantages

■ No physical contact with the object to be detected.

■ High operating rates.

■ Solid-state product, no moving parts (service life not related to number of operating cycles).

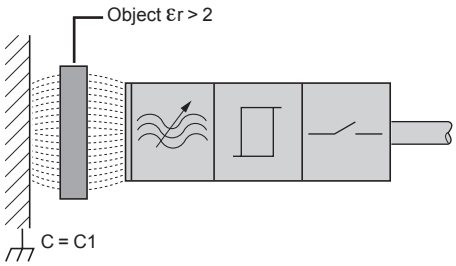
■ Detection of any object irrespective of material or conductivity, for example: metals, minerals, wood, plastic, glass, cardboard, leather, ceramic, fluids, etc.



Operating principle

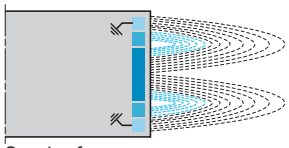
An electrical field is created between 2 electrodes on the front face of the sensor. These electrodes constitute a capacitor with a capacitance of:
C = ε0 * εr * A/d where:
ε0 = 8.854 187 pF/m (permittivity in free space)
εr: relative permittivity of the material present between the 2 electrodes
A: dimensions of electrodes
d: distance between electrodes

All materials where εr > 2 will be detected.



When an object of any material (εr > 2) passes the sensing face of the sensor, it modifies the coupling capacitance (C1).
This variation in capacitance (C1 > C0) instigates the starting of the oscillator which, in turn, causes the output driver to operate and provides an output signal.

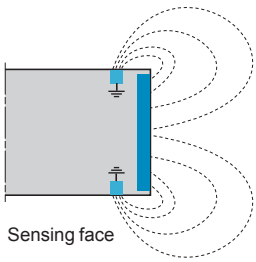
Types of sensor



Sensors flush mountable in support

The special feature of these versions is the shape of the electrical field which is rectilinear and confined within the dimensions of the product.
Cylindrical and block type models used for the detection of insulated materials (wood, plastic, cardboard, glass…), conductive materials (metal…) or liquid through an insulated partition (glass, plastic…) with a maximum thickness of 4 mm.

These products are recommended for:
- comparatively short detection distances,
- applications requiring flush mounting of the sensor,
- detection through a partition (example: detection of glass through cardboard),
- side by side mounting.

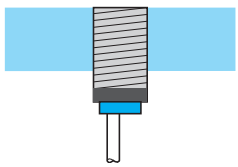


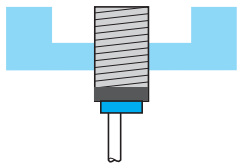
Sensors non flush mountable in support

Cylindrical models (plastic case).
The spherical shape of the electrical field enables detection of any type of material whether it be solid, liquid, granular… (metal, water, oil, plastic pellets, powder, flour…). Detection can be achieved through a partition or by direct contact (immersion) of the active surface with the object to be detected.
Distances to be adhered to around the sensing face. (See characteristics page 4/15).

Mounting precautions

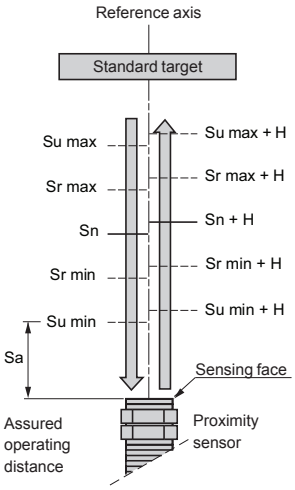
Non flush mountable models cannot be flush mounted in their support.
The non flush mountable models require a free zone around the active head.
(See page 4/15).


Flush mountable model


Non flush mountable model

Capacitive proximity sensors
OsiSense XT

Terminology



H = Differential travel

Definitions

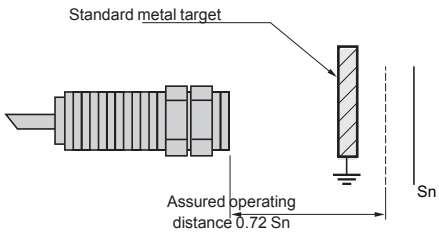
In order to ensure that customers can make reliable product comparisons and selection, the standard IEC 60947-5-2 defines various sensing distances, such as:

Nominal sensing distance (Sn)
The rated operating distance for which the sensor is designed. It does not take into account any variations (manufacturing tolerances, temperature, voltage).

Effective sensing distance (Sr)
The effective sensing distance is measured at the rated voltage (Un) and the rated ambient temperature (23 °C ±5 °C)
It must be between 90% and 110% of Sn.

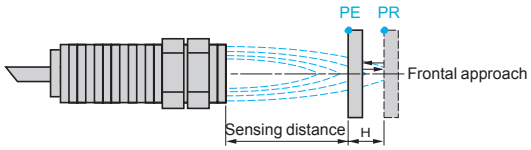
Usable sensing distance (Su)
The usable sensing distance is measured at the limits of the permissible variations in the ambient temperature and at a supply voltage equal to 85% and 110% of the rated voltage.
It must be between 80% and 120% of Sr.

Assured operating distance (Sa)
This is the operating zone of the sensor.
The assured operating distance is between 0 and 72% of Sn.



Standard metal target

The standard IEC 60947-5-2 defines the standard metal target as a square mild steel (Fe 360) plate, 1 mm thick.
The side dimension of the plate is either equal to the diameter of the circle engraved on the sensing face of the sensor or 3 times the nominal sensing distance (Sn).



PE = pick-up point, the target is detected
PR = drop-out point, the target is no longer detected

Repeat accuracy

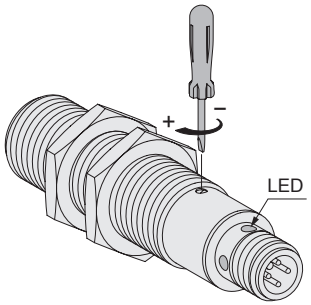
The repeat accuracy (R) is the repeatability of the sensing distance between successive operations. Readings are taken over a period of time whilst the sensor is subjected to voltage and temperature variations: 8 hours, 10 to 30 °C, Un ± 5%.
It is expressed as a percentage of the effective sensing distance Sr.

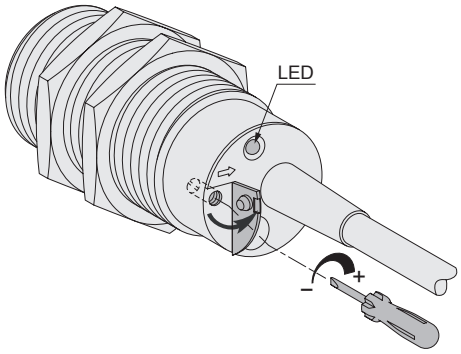
Differential travel

The differential travel (H) or hysteresis, is the distance between the operating point, as the standard metal target moves towards the sensor, and the release point, as it moves away.
This hysteresis is essential for the stable operation of the sensor.

Capacitive proximity sensors
OsiSense XT

Terminology (continued)





Sensitivity of the sensor

All our sensors incorporate a sensitivity adjustment potentiometer. This enables the sensitivity of the sensor to be adjusted to suit the type of object to be detected.

Depending on the sensor version, the sensitivity adjustment potentiometer is either mounted on the side or the rear.

The sensors are factory preset for nominal sensitivity.

Depending on the application, adjustment of the sensitivity could be necessary as follows:
- increasing the sensitivity for objects which have a weak influence (weakεr): paper, cardboard, glass, plastic,
- decreasing the sensitivity for objects which have a strong influence (strongεr): metals, liquids.

However, in the event of severe variations in the ambient conditions, do not increase the sensitivity of the sensor such that it is set to its maximum operating limits.

An increase in sensitivity causes an increase in the switching hysteresis.

Operating distances

The operating distance of the sensor is related to the dielectric constant (εr) of the object material to be detected.
The higher the value of εr, the easier the detection of the object will be.

The assured operating distance depends on the object material: Sa = Sn x Fc
Sa = assured operating distance,
Sn = nominal sensing distance of the sensor,
Fc = correction factor related to the object material.

Example: sensor XT130B1PAL2 used to detect a rubber object.
Sn = 10 mm, Fc = 0.3.
Assured operating distance Sa = 10 x 0.3 mm.

The list below indicates the dielectric constant values of the most common object materials, together with their correction factors (Fc) for the nominal sensing distance of the sensor.

Material	εr	Fc	Material	εr	Fc
Air	1	0	Petrol	2.2	0.2
Acetone	20	0.8	Plexiglass	3.2	0.3
Alcohol	24	0.85	Polyester resin	2.8…8	0.2…0.6
Ammonia	15…25	0.75…0.85	Polystyrene	3	0.3
Cement (powder)	4	0.35	Porcelain	5…7	0.4…0.5
Cereals	3…5	0.3…0.4	Powdered milk	3.5...4	0.3...0.4
Epoxy resin	4	0.36	Rubber	2.5…3	0.3
Ethylene glycol	38	0.95	Sand	3...5	0.3...0.4
Flour	2.5…3	0.2…0.3	Salt	6	0.5
Glass	3...10	0.3...0.7	Sugar	3	0.3
Marble	6...7	0.5...0.6	Teflon	2	0.2
Mica	6…7	0.5…0.6	Vaseline	2...3	0.2...0.3
Nylon	4…5	0.3…0.4	Water	80	1
Oil	2.2	0.2	Wood (damp)	10…30	0.7…0.9
Paper	2…4	0.2…0.3	Wood (dry)	2…7	0.2…0.6
Paraffin	2…2.5	0.2			

Capacitive proximity sensors
OsiSense XT

Environment

■ **Electromagnetic interference**
The sensors undergo electromagnetic interference testing in accordance with the recommendations of standard IEC 60947-5-2 (electrostatic discharges, radiated electromagnetic fields, fast transients, impulse voltages).

■ **Thermal influences**
It is advisable to remain within the values stated on the characteristic pages so as to avoid sensing distance drift and possible incorrect operation of the sensor.

■ **Chemical agents**
To ensure a long service life, it is essential that any chemicals coming into contact with the case of the sensor are non corrosive.

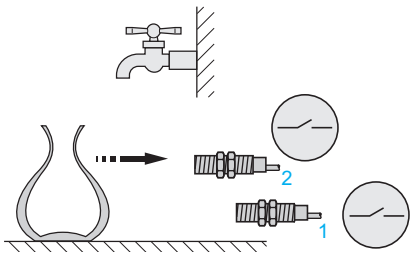
■ **Earthing**
Earthing of an object that has high conductivity increases the sensing distance.

Additional information relating to outputs

Refer to corresponding pages relating to inductive proximity sensors for:
■ Terminology.
■ Details and specific aspects of 2-wire and 3-wire type connection.
■ Connecting several sensors in series or parallel.

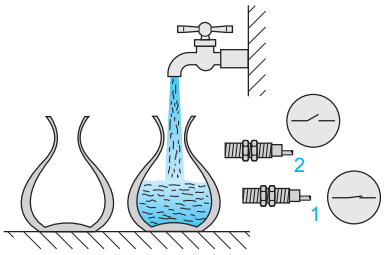
Application examples:

Bottle filling



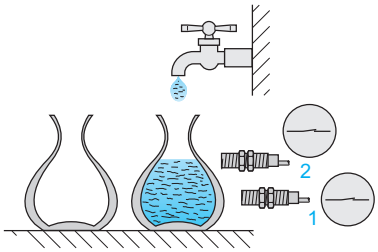
■ **Bottle arrival**

■ Bottles are fed on a conveyor for filling.
Sensors 1 and 2 are in an unoperated state.
Adjustment:
- sensor 1 is adjusted to detect the bottle,
- sensor 2 is adjusted to detect the water in the bottle.



■ **Bottle filling**

As soon as the bottle enters the detection zone of sensor 1,
the filling operation commences.
Sensor 2 remains in the unoperated state.

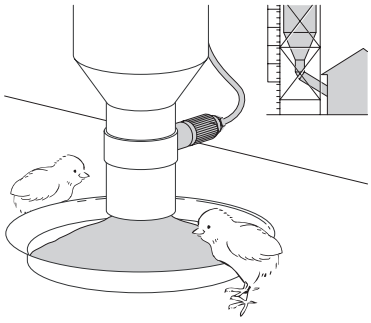


■ **Filling complete**

Sensor 2 detects that the required level has been reached and stops further filling.

Reminder: the wall of the container must be non metallic and its thickness ≤ 4 mm

Livestock feeder filling

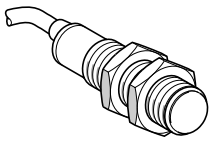


Capacitive technology is particularly suited for the detection of feed levels in automatic dispensers for livestock. Any type of feed can be detected (pellets, powders, broths, grains, pastas, etc.).
The materials used, as well as the degree of protection of the sensor, have been specially selected to tolerate the acidic and dusty environments associated with this application.

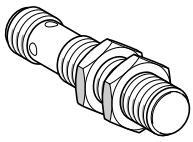
Capacitive proximity sensors

OsiSense XT

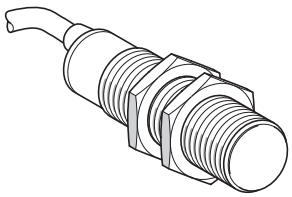
Cylindrical, flush mountable. Metal case
AC or DC supply



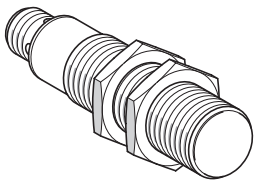
XT112S1●●L2



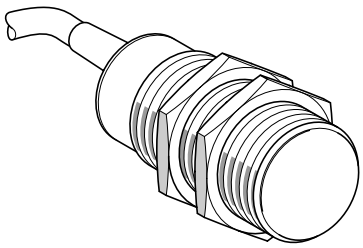
XT112S1PCM12



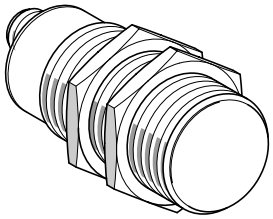
XT118B1●●L2



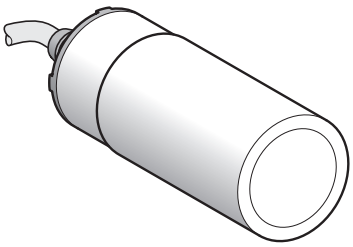
XT118B1PCM12



XT130B1●●L2



XT130B1PCM12



XT132B1F●L2

Ø 12, threaded M12 x 1, stainless steel

Sensing distance (Sn) (mm)	Function	Output	Connection	Reference	Weight kg
4-wire ⎓ 24 V					
2	NO/NC	PNP	Pre-cabled (L = 2 m)	**XT112S1PCL2**	0.070
			M12 connector	**XT112S1PCM12**	0.040
3-wire ⎓ 24 V					
2	NO	PNP	Pre-cabled (L = 2 m)	**XT112S1PAL2**	0.070
		NPN	Pre-cabled (L = 2 m)	**XT112S1NAL2**	0.070

Ø 18, threaded M18 x 1, nickel plated brass

Sensing distance (Sn) (mm)	Function	Output	Connection	Reference	Weight kg
4-wire ⎓ 24 V					
5	NO/NC	PNP	Pre-cabled (L = 2 m)	**XT118B1PCL2**	0.150
			M12 connector	**XT118B1PCM12**	0.075
3-wire ⎓ 24 V					
5	NO	PNP	Pre-cabled (L = 2 m)	**XT118B1PAL2**	0.150
		NPN	Pre-cabled (L = 2 m)	**XT118B1NAL2**	0.150
2-wire ∿ 24-240 V					
5	NO	–	Pre-cabled (L = 2 m)	**XT118B1FAL2**	0.150
	NC	–	Pre-cabled (L = 2 m)	**XT118B1FBL2**	0.150

Ø 30, threaded M30 x 1.5, nickel plated brass

Sensing distance (Sn) (mm)	Function	Output	Connection	Reference	Weight kg
4-wire ⎓ 24 V					
10	NO/NC	PNP	Pre-cabled (L = 2 m)	**XT130B1PCL2**	0.270
			M12 connector	**XT130B1PCM12**	0.150
3-wire ⎓ 24 V					
10	NO	PNP	Pre-cabled (L = 2 m)	**XT130B1PAL2**	0.270
		NPN	Pre-cabled (L = 2 m)	**XT130B1NAL2**	0.270
2-wire ∿ 24-240 V					
10	NO	–	Pre-cabled (L = 2 m)	**XT130B1FAL2**	0.270
	NC	–	Pre-cabled (L = 2 m)	**XT130B1FBL2**	0.270

Ø 32, plain, nickel plated brass *(1)*

Sensing distance (Sn) (mm)	Function	Output	Connection	Reference	Weight kg
2-wire ∿ 24-240 V					
15	NO		Pre-cabled (L = 2 m)	**XT132B1FAL2**	0.400
	NC		Pre-cabled (L = 2 m)	**XT132B1FBL2**	0.400

(1) Mounting accessory included with sensor.

Accessories

Fixing and protection accessories, fuses and fuse terminal block: see page 4/12.

Capacitive proximity sensors

OsiSense XT
Cylindrical, flush mountable. Metal case
AC or DC supply

Characteristics

Sensor type			M12 XT112●	M18 XT118●		M30 XT130●		Ø 32 XT132p
			3-wire ⎓ 4-wire ⎓	3-wire ⎓ 4-wire ⎓	2-wire ∿	3-wire ⎓ 4-wire ⎓	2-wire ∿	2-wire ∿
Product certifications			CE, cETLus					CE, cULus
Conformity to standards			IEC 60947-5-2, UL 61010-1					
Connection	Pre-cabled, length **2 m**		●	●	●	●	●	●
	Connector, **M12**		●	●	–	●	–	–
Main characteristics								
Nominal sensing distance (Sn)	Conforming to IEC 60947-5-2	**mm**	2	5		10		15
Assured operating distance Sa	Conforming to IEC 60947-5-2	**mm**	0…1.44	0…3.60	0…3.60	0…7.2	0…7.2	0…11
Adjustment zone		**mm**	0.5…5	1…8	1…5	2…20	2…15	0…20
Repeat accuracy			< 0.1 Sr					< 0.15 Sr
Differential travel			< 0.2 Sr					< 0.2 Sr
Output characteristics								
Output state indication			Yellow LED					
Switching capacity		**mA**	200	200	330	200	330	300
Maximum switching frequency		**Hz**	300	200	25	150	25	15
Protection against short-circuits			●	●	– *(1)*	●	– *(1)*	– *(1)*
Voltage drop		**V**	≤ 2	≤ 2	≤ 6	≤ 2	≤ 6	≤ 10
Residual current, open state		**mA**	< 0.1	< 0.1	< 5	< 0.1	< 5	< 5
Delays	First-up	**ms**	≤ 30	≤ 30	≤ 100	≤ 30	≤ 100	≤ 200
	Response	**ms**	≤ 5	≤ 5	≤ 20	≤ 5	≤ 20	≤ 30
	Recovery	**ms**	≤ 5	≤ 5	≤ 20	≤ 5	≤ 20	≤ 30
Supply								
Rated supply voltage		**V**	⎓ 24	⎓ 24	∿ 24 - 240 50/60 Hz	⎓ 24	∿ 24 - 240 50/60 Hz	∿ 24 - 240 50/60 Hz
Voltage limits (including ripple)		**V**	⎓ 12 - 30	⎓ 12 - 30	∿ 20 - 264 50/60 Hz	⎓ 12 - 30	∿ 20 - 264 50/60 Hz	∿ 20 - 264 50/60 Hz
Current consumption, no-load		**mA**	< 15	< 15	< 3	< 15	< 3	< 4
Protection against reverse polarity			Yes	Yes	–	Yes	–	–
Environment								
Materials	Case		Stainless steel 303	Nickel plated brass				
	Cable		PVC					
	Number and c.s.a. of wires		3 x 0.14 mm² or 4 x 0.14 mm²	3 x 0.34 mm² or 4 x 0.34 mm²	3 x 0.34 mm²	3 x 0.75 mm² or 4 x 0.5 mm²	3 x 0.75 mm²	3 x 0.34 mm²
Degree of protection	Conforming to IEC 60529 and IEC 60947-5-2		IP 67 *(2)* IP 65 for sensors **XT112S1PCM12** and **XT118B1PCM12**					IP 67
Storage and operating temperature		**°C**	- 25…+ 70					
Vibration resistance	Conforming to IEC 60068-2-6		10 gn, ± 1 mm (f = 10…55 Hz)					
Shock resistance	Conforming to IEC 60068-2-27		30 gn, 11 ms					30 gn, 6 ms
Resistance to electromagnetic interference								
Electrostatic discharges	Conforming to IEC 61000-4-2	**kV**	8 (air) / 4 (contact)					
Radiated electromagnetic fields	Conforming to IEC 61000-4-3	**V/m**	3					
Fast transients	Conforming to IEC 61000-4-4	**kV**	2					

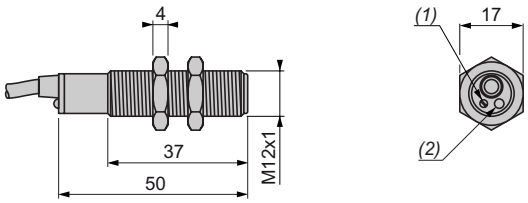
(1) These sensors do not incorporate overload or short-circuit protection and therefore, it is essential to connect a "quick-blow" fuse in series with the load (see page 4/12).
(2) With adjustment potentiometer sealing screw.

Capacitive proximity sensors

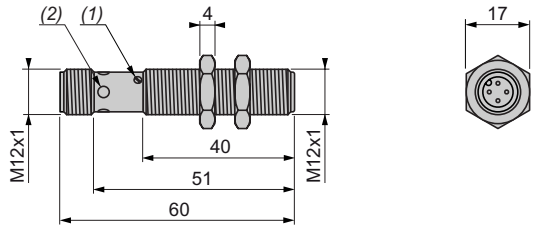
OsiSense XT
Cylindrical, flush mountable. Metal case
AC or DC supply

Dimensions

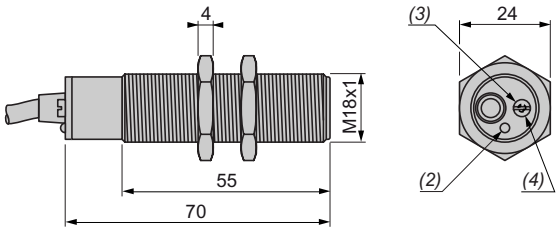
M12, pre-cabled
XT112S1●●L2



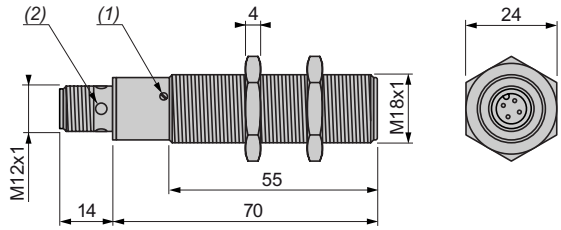
M12, M12 connector
XT112S1PCM12



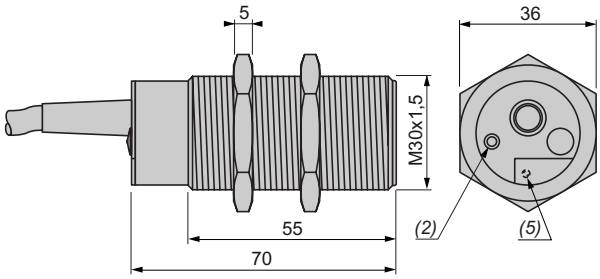
M18, pre-cabled
XT118B1●●L2



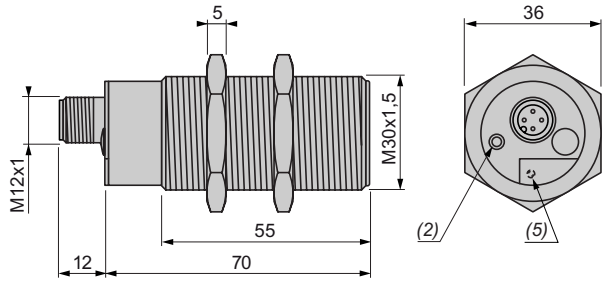
M18, M12 connector
XT118B1PCM12



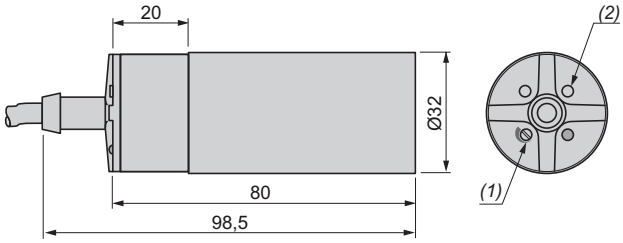
M30, pre-cabled
XT130B1●●L2



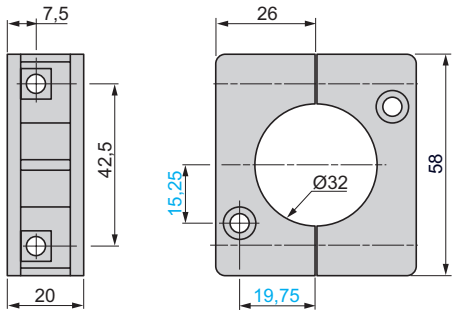
M30, M12 connector
XT130B1PCM12



Ø 32, plain, pre-cabled
XT132B1F●L2



Mounting accessory (included with sensor XT132B1F●L2)



(1) Adjustment potentiometer
(2) LED
(3) Sealing screw
(4) Potentiometer beneath sealing screw
(5) Potentiometer beneath protective flap

Telemecanique Sensors

Capacitive proximity sensors

OsiSense XT
Cylindrical, flush mountable. Metal case
AC or DC supply

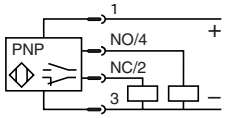
Wiring schemes

Connector version

M12 connector

4-wire ⎓, PNP
NO + NC output, M12

XT112/18/30●●●●M12



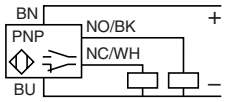
Pre-cabled version

Cable

BU: Blue
BN: Brown
BK: Black
WH: White
YE/GN: Yellow/ green

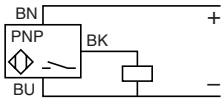
4-wire ⎓, PNP
NO + NC output, pre-cabled

XT112/18/30PC●●L2



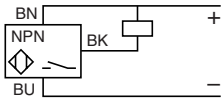
3-wire ⎓, PNP
NO output, pre-cabled

XT112/18/30PA●●L2



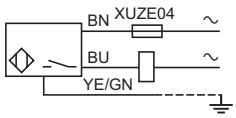
3-wire ⎓, NPN
NO output, pre-cabled

XT112/18/30NA●●L2



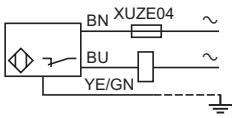
2-wire ∿
NO output

XT118/30/32B1FAL2



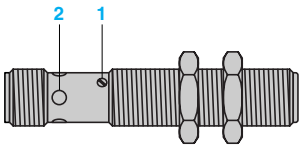
2-wire ∿
NC output

XT118/30/32B1FBL2

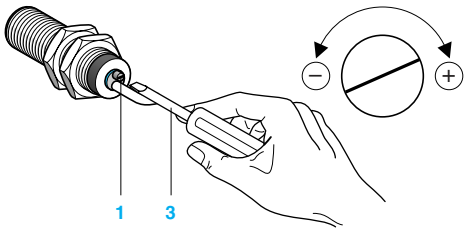


Adjustment

Sensitivity adjustment

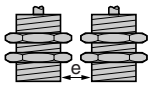
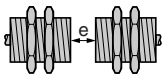
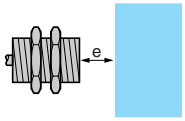
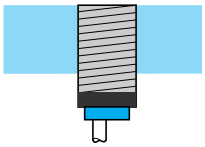


Adjustment from the side for	**XT112●●●●M12** **XT118●●●●M12**
Adjustment from the rear for	**XT1●●●●●●L2** **XT130●●●●M12**



1 Adjustment potentiometer LED
2 Adjustment using suitable
3 screwdriver (included with sensor)

Setting-up

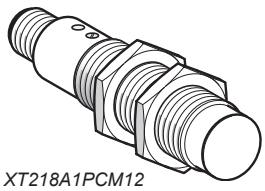
Minimum mounting distances (mm)	Side by side	Face to face	Facing a metal object	Mounted in support
				
XT1M12 flush mountable	e ⩾ 0	e ⩾ 2.2 x Sn	e ⩾ 2 x Sn	–
XT1M18 flush mountable	e ⩾ 0	e ⩾ 2.2 x Sn	e ⩾ 2 x Sn	–
XT1M30 flush mountable	e ⩾ 0	e ⩾ 2.2 x Sn	e ⩾ 2 x Sn	–

***Fixing nut tightening torque: XT112**: 10 N.m, **XT118**: 28 N.m, **XT130**: 40 N.m*

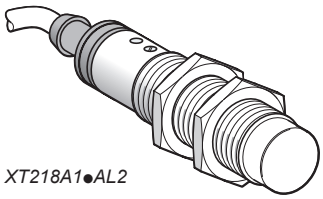
Capacitive proximity sensors

OsiSense XT

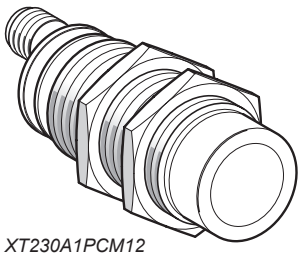
Cylindrical, non flush mountable. Plastic case
AC or DC supply



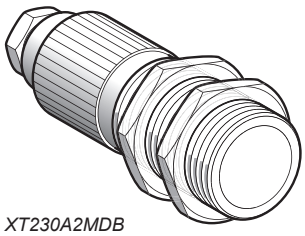
XT218A1PCM12



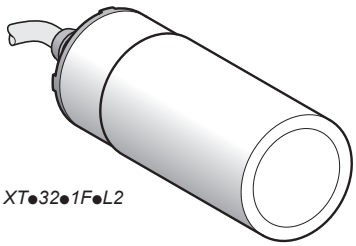
XT218A1●AL2



XT230A1PCM12



XT230A2MDB



XT●32●1F●L2

XUZA118

Ø 18, threaded M18 x 1

Sensing distance (Sn) (mm)	Function	Output	Connection	Reference	Weight kg
4-wire ⎓ 12…24 V					
8	NO/NC	PNP	M12 connector	**XT218A1PCM12**	0.060
3-wire ⎓ 12…24 V					
8	NO	PNP	Pre-cabled (L = 2 m)	**XT218A1PAL2**	0.140
		NPN	Pre-cabled (L = 2 m)	**XT218A1NAL2**	0.140
2-wire ∿ 24-240 V					
8	NO	–	Pre-cabled (L = 2 m)	**XT218A1FAL2**	0.140

Ø 30, threaded M30 x 1.5

Sensing distance (Sn) (mm)	Function	Output	Connection	Reference	Weight kg
4-wire ⎓ 12…24 V					
15	NO/NC	PNP	M12 connector	**XT230A1PCM12**	0.100
3-wire ⎓ 12…24 V					
15	NO	PNP	Pre-cabled (L = 2 m)	**XT230A1PAL2**	0.200
		NPN	Pre-cabled (L = 2 m)	**XT230A1NAL2**	0.200
2-wire ∿ 24-240 V					
15	NO	–	Pre-cabled (L = 2 m)	**XT230A1FAL2**	0.200
	NC	–	Pre-cabled (L = 2 m)	**XT230A1FBL2**	0.200

Ø 30, threaded M30 x 1.5, Application series

Sensing distance (Sn) (mm)	Function	Connection	Reference	Weight kg
2-wire ∿ 24-240 V/ ⎓ 24 V				
0...15, adjustable	NO or NC, selectable	Screw terminals	**XT230A2MDB**	0.100

Applications: sensor **XT230A2MDB** is particularly suited to automatic feed systems for livestock. It enables detection of the level of all types of feed: pellets, grains, pastas, broths and powders.

Ø 32, plain *(1)*

Sensing distance (Sn) (mm)	Function	Connection	Reference	Weight kg
2-wire ∿ 24-240 V				
20	NO	Pre-cabled (L = 2 m)	**XT232A1FAL2**	0.350
	NC	Pre-cabled (L = 2 m)	**XT232A1FBL2**	0.350

(1) Mounting accessory included with sensor.

Accessories for capacitive sensors XT1● and XT2●

Fixing accessories

Description	For use with sensor	Reference	Weight kg
90° fixing bracket	Ø 12	**XXZ12**	0.025
	Ø 18	**XUZA118**	0.045
	Ø 30	**XXZ30**	0.115

Protection accessories

Description	For use with sensor	Reference	Weight kg
Threaded sleeve	Ø 30, threaded M30 x 1.5	**XTAZ30**	0.035

Fuses (for unprotected 2-wire ∿ sensors)

Description	Type	Sold in lots of	Unit reference	Weight kg
Cartridge fuses 5 x 20	0.4 A "quick-blow"	10	**XUZE04**	0.001
	0.63 A "quick-blow"	10	**XUZE06**	0.001
	0.8 A "quick-blow"	10	**XUZE08**	0.001

Fuse terminal block

Description	Sold in lots of	Unit reference	Weight kg
Fuse terminal block for 5 x 20 fuses, grey	50	**AB1FUSE435U5X**	0.016

Capacitive proximity sensors

OsiSense XT

Cylindrical, non flush mountable. Plastic case

AC or DC supply

Characteristics

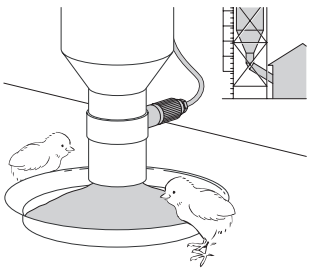
Sensor type			M18			M30				Ø 32
			XT218A1			XT230A1			XT230A2	XT232A
			4-wire ⎓	3-wire ⎓	2 -wire ∿	4-wire ⎓	3-wire ⎓	2-wire ∿	2-wire ∿	2-wire ∿
Product certifications			CE, cULus							
Conformity to standards			IEC 60947-5-2, UL 61010-1							
Connection	Pre-cabled, length **2 m**		–	●	●	–	●	●	–	●
	Connector, **M12**		●	–	–	●	–	–	–	–
	Screw terminals, 2 x M3		–	–	–	–	–	–	●	–
Main characteristics										
Nominal sensing distance (Sn)	IEC 60947-5-2	**mm**	8			15			15	20
Assured operating distance (Sa)	IEC 60947-5-2	**mm**	0…5.8			0…11			0…11	0…15
Adjustment zone		**mm**	0…12			0…17			0... 17	0…22
Repeat accuracy		**Sr**	< 5%							
Differential travel		**Sr**	< 1…20%						< 1…15%	< 1…20%
Output characteristics										
Output state indication			Yellow LED							
Switching capacity		**mA**	2 x 200	200	300	2 x 200	200	300	300	300
Maximum switching frequency		**Hz**	30	30	15	50	50	15	40	15
Protection against short-circuits			●	●	– *(1)*	●	●	– *(1)*	– *(1)*	– *(1)*
Voltage drop		**V**	< 2.5	< 2.5	< 10	< 2.5	< 2.5	< 10	< 2	< 10
Residual current, open state		**µA**	≤ 100	≤ 100	–	≤ 100	≤ 100	–	< 120	–
Delays	First-up	**ms**	< 100	< 100	< 200	< 100	< 100	< 200	< 100	< 200
	Response	**ms**	< 15	< 15	< 30	< 15	< 10	< 30	< 10	< 30
	Recovery	**ms**	< 15	< 15	< 30	< 15	< 10	< 30	< 10	< 30
Supply										
Rated supply voltage		**V**	⎓ 12…24		∿ 24…240 50/60 Hz	⎓ 12…24		∿ 24…240 50/60 Hz	∿ 24…240 50/60 Hz ⎓ 24	∿ 24…240 50/60 Hz
Voltage limits (including ripple)		**V**	⎓ 10…30		∿ 20…265	⎓ 10…30		∿ 20…265	∿ 20…265	∿ 20…265
Current consumption, no-load	24 V	**mA**	< 25	< 15	–	< 25	< 15	–	–	–
	240 V	**mA**	–	–	< 4	–	–	< 4	< 3	< 4
Protection against reverse polarity			Yes	Yes	–	Yes	Yes	–	–	–
Environment										
Materials	Case		Plastic							
	Cable		PVC						–	PVC
	Number and c.s.a. of wires (mm^2)		–	3 x 0.34	2 x 0.5	–	3 x 0.34	2 x 0.5	2 x 1 (min.) *(2)* 2 x 2.5 (max.)	2 x 0.5
Degree of protection	Conforming to IEC 60529		IP 67, double insulation ⧈						IP 65, double insulation ⧈	IP 67, double insulation ⧈
Storage temperature		**°C**	- 10…+ 60						- 40…+ 85	- 10…+ 60
Operating temperature		**°C**	- 10…+ 60						- 20…+ 70	- 10…+ 60
Vibration resistance	IEC 60068-2-6		10 gn, ± 1 mm (f = 10…55 Hz)							
Shock resistance	IEC 60068-2-27		30 gn, 11 ms							
Resistance to electromagnetic interference										
Electrostatic discharges	IEC 61000-4-2	**kV**	8 (air) / 4 (contact)							
Radiated electromagnetic fields	IEC 61000-4-3	**V/m**	3							
Fast transients	IEC 61000-4-4	**kV**	2							

(1) These sensors do not incorporate overload or short-circuit protection and therefore, it is essential to connect a "quick-blow" fuse in series with the load (see page 4/12).

(2) The supply cable can have a 14 mm maximum diameter sheath.

Application example (XT230A2MDB)

Automatic feed system for livestock



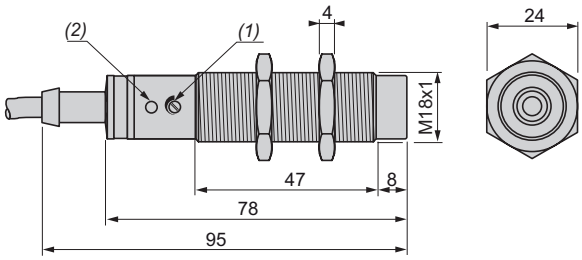
Capacitive proximity sensors

OsiSense XT
Cylindrical, non flush mountable. Plastic case
AC or DC supply

Dimensions

M18, pre-cabled

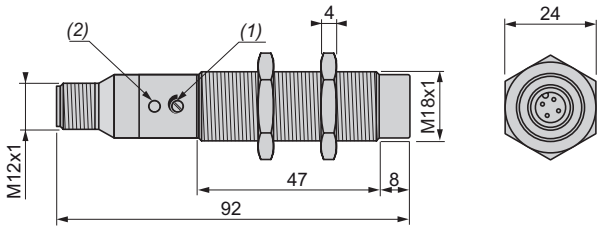
XT218A1●●L2



(1) Adjustment potentiometer.
(2) LED.

M18, M12 connector

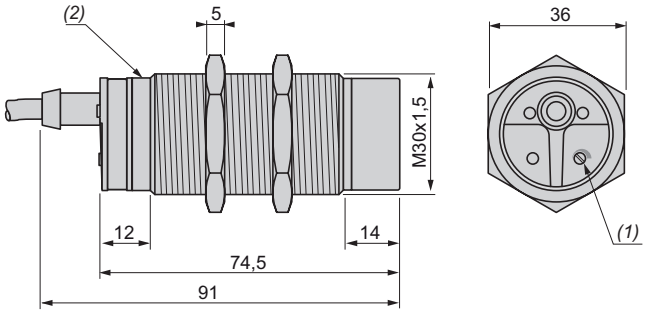
XT218A1PCM12



(1) Adjustment potentiometer.
(2) LED.

M30, pre-cabled

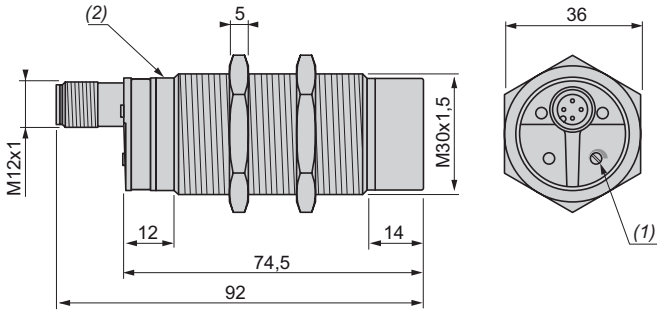
XT230A1●●L2



(1) Adjustment potentiometer.
(2) LED.

M30, M12 connector

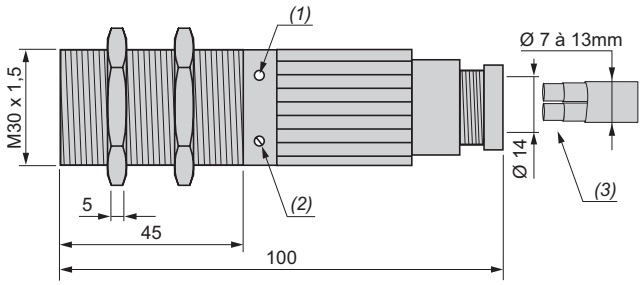
XT230A1PCM12



(1) Adjustment potentiometer.
(2) LED.

M30, screw terminals

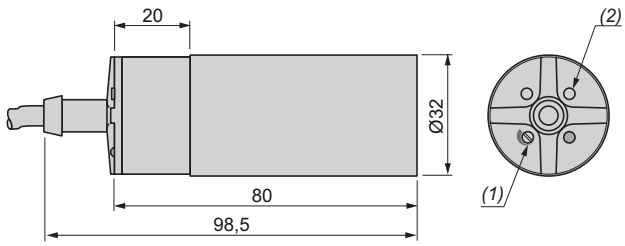
XT230A2MDB



(1) LED.
(2) Potentiometer.
(3) 2 x 1 mm² to 2.5 mm² wires max.

Ø 32, plain, pre-cabled

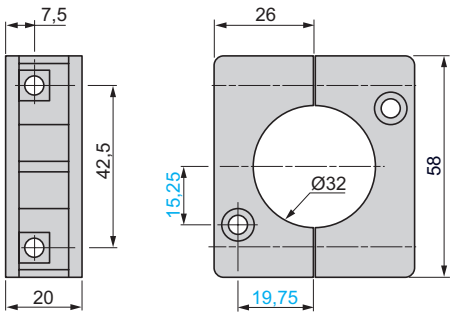
XT232A1F●L2



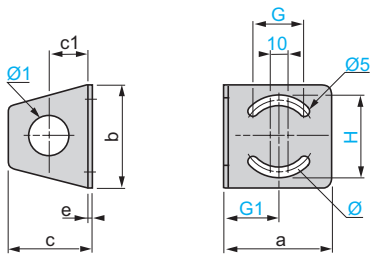
(1) Adjustment potentiometer.
(2) LED.

Accessories

Mounting accessory (included with sensor XT232A1F●L2)



XXZ12, XXZ30



XXZ	a	b	c	c1	e	H	G	G1	Ø	Ø1
12	35	40	33	18	2	31	18	18	25	13
30	67	65	52	25	3	51	35	33	50	31

Capacitive proximity sensors

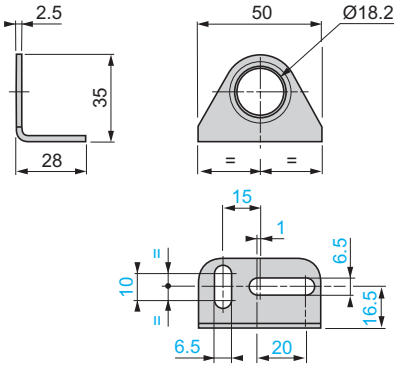
OsiSense XT

Cylindrical, non flush mountable. Plastic case

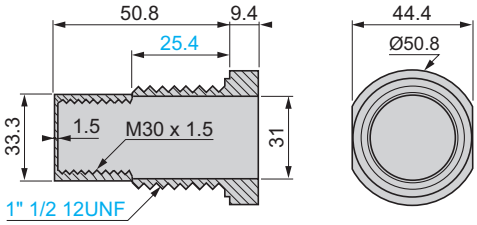
AC or DC supply

Dimensions *(continued)*

XUZA118



XTAZ30



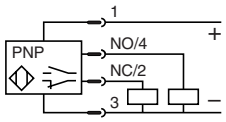
Wiring schemes

Connector version

M12 connector

4-wire ⎓, PNP
NO + NC output, M12

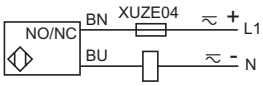
XT218/30●●●●M12



Screw terminal version

2-wire ≂
NO or NC output, selectable

XT230A2MDB



BN: Brown
BU: Blue

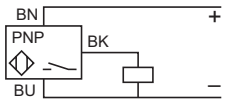
Pre-cabled version

Cable

BU: Blue
BN: Brown
BK: Black
WH: White

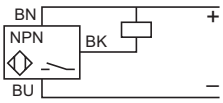
3-wire ⎓, PNP
NO output

XT218/30A1PAL2



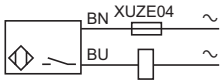
3-wire ⎓, NPN
NO output

XT218/30A1NAL2



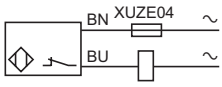
2-wire ∿
NO output

XT218/30/32A1FAL2



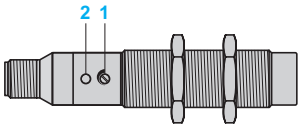
2-wire ∿
NC output

XT230/32A1FBL2

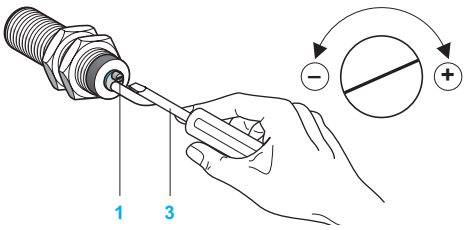


Adjustment

Sensitivity adjustment

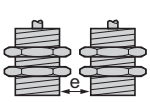
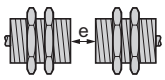
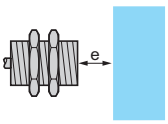
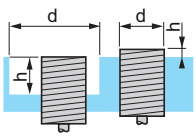


Adjustment from the side for	**XT218A1, XT230A2**
Adjustment from the rear for	**XT230A1** **XT232A1**



1 Adjustment potentiometer LED
2 Adjustment using suitable
3 screwdriver (included with sensor)

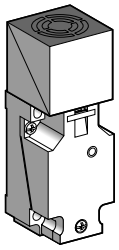
Setting-up

Minimum mounting distances (mm)	Side by side	Face to face	Facing a metal object	Mounted in support	
					
XT218A1, M18 x 1 non flush mountable	e ≥ 40	e ≥ 6 Sn	e ≥ 3 Sn	d ≥ 60	h ≥ 20
XT230A1, M30 x 1.5 non flush mountable	e ≥ 60	e ≥ 6 Sn	e ≥ 3 Sn	d ≥ 90	h ≥ 30
XT230A2, M30 x 1.5 non flush mountable	e ≥ 16	e ≥ 90 Sn	e ≥ 45 Sn	d ≥ 90	h ≥ 30
XT232A1, Ø 32 plain, non flush mountable	e ≥ 65	e ≥ 6 Sn	e ≥ 3 Sn	d ≥ 100	h ≥ 30

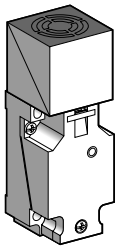
*Fixing nut tightening torque: **XT218A**: 3 N.m, **XT230A**: 8 N.m*
*Cable gland tightening torque: **XT230A2**: 4 N.m*

Capacitive proximity sensors

OsiSense XT
For detection of insulated materials
40 x 40 x 117 format.
Plastic case, plug-in. Turret head
AC or DC supply



XT7C40●C440



XT7C40●●262

Sensors flush mountable in support

3-wire ⎓ 12…48 V flush mountable

Sensing distance (Sn) mm	Function	Output	Reference	Weight kg
15	NO + NC	PNP	**XT7C40PC440**	0.220
		NPN	**XT7C40NC440**	0.220

2-wire ∿ 24…240 V (50/60 Hz) flush mountable

Sensing distance (Sn) mm	Function	Reference	Weight kg
15	NO or NC via programming	**XT7C40FP262**	0.220

Accessories

Fuses (for unprotected 2-wire ∿ sensors)

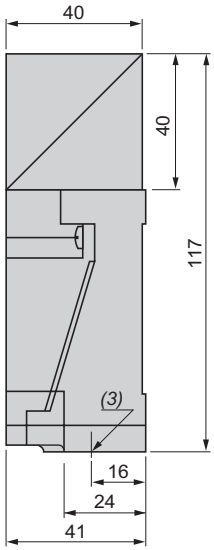
Description	Type	Sold in lots of	Unit reference	Weight kg
Cartridge fuses 5 x 20	0.4 A "quick-blow"	10	**XUZE04**	0.001
	0.63 A "quick-blow"	10	**XUZE06**	0.001
	0.8 A "quick-blow"	10	**XUZE08**	0.001

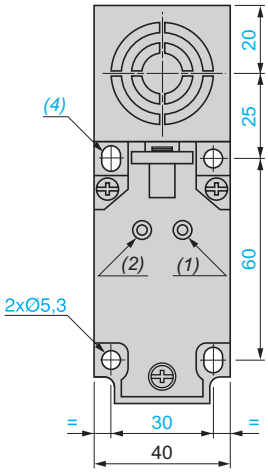
Fuse terminal block

Description	Sold in lots of	Unit reference	Weight kg
Fuse terminal block for 5 x 20 fuses, grey	50	**AB1FUSE435U5X**	0.016

Dimensions

XT7C40●●●●●





(1) Output LED
(2) Supply LED (depending on model)
(3) 1 tapped entry for 13P cable gland
(4) 2 elongated holes Ø 5.3 x 7

Capacitive proximity sensors

OsiSense XT
For detection of insulated materials
40 x 40 x 117 format.
Plastic case, plug-in. Turret head
AC or DC supply

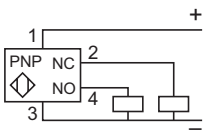
Characteristics

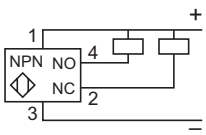
Sensor type			XT7C40●C440	XT7C40FP262
Connection			Screw terminals, clamping capacity 4 x 1.5 mm² *(1)*	Screw terminals, clamping capacity 3 x 1.5 mm² *(1)*
Degree of protection	Conforming to IEC 60529		IP 67	
Operating zone		**mm**	0…10.8	
Repeat accuracy			⩽ 0.1 Sr	
Product certifications			UL, CSA, CE	
Differential travel			⩽ 0.2 Sr	
Operating temperature		**°C**	- 25…+ 70	
Output state indication			Yellow LED: output Green LED: supply	Yellow LED: output
Rated supply voltage		**V**	⎓ 12…48	∿ 24…240 (50/60 Hz)
Voltage limits (including ripple)		**V**	⎓ 10…58	∿ 20…264
Switching capacity		**mA**	0…200 with overload and short-circuit protection	5…350 (2 A inrush) *(2)*
Voltage drop, closed state		**V**	⩽ 2	⩽ 5.5
Residual current, open state		**mA**	–	⩽ 1.5
Current consumption, no-load		**mA**	⩽ 10	–
Maximum switching frequency		**Hz**	100	25
Delays	First-up	**ms**	⩽ 30	⩽ 150
	Response	**ms**	⩽ 5	⩽ 20
	Recovery	**ms**	⩽ 5	⩽ 30

(1) Cable gland not included with sensor. Suitable 13P cable gland: XSZPE13.
(2) These sensors do not incorporate overload or short-circuit protection and therefore, it is essential to connect a "quick-blow" fuse in series with the load (see page 4/12).

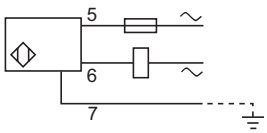
Wiring schemes

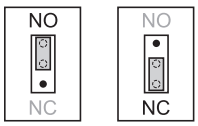
3-wire ⎓
NO + NC output





2-wire ∿ programmable
NO or NC output, depending on position of link

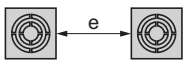


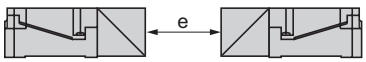


Setting-up

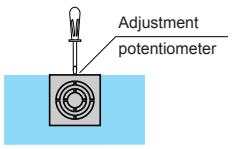
Minimum mounting distances (mm)

	Side by side	Face to face
XT7 flush mountable	e ⩾ 40	e ⩾ 120





Flush mounting



To avoid interference by the immediate surroundings, it may be necessary to reduce the sensitivity when flush mounting the sensor.

Contents

Photo-electric sensors OsiSense XU

Selection guide . . . . . *page 5/2*

- General . . . . . *page 5/14*

OsiSense XU, general purpose

- Design 18
  - Single mode function, plastic . . . . . *page 5/28*
  - Single mode function, metal . . . . . *page 5/30*
  - Multimode function, metal or plastic . . . . . *page 5/32*
- Miniature design
  - Single mode function, plastic . . . . . *page 5/34*
  - Multimode function, plastic . . . . . *page 5/38*
  - Diffuse mode with adjustable background and forground . . . . . *page 5/40*
- Compact design,50 x 50
  - Fonction monomode, plastique . . . . . *page 5/42*
  - Fonction multimode, plastique . . . . . *page 5/44*
  - Réflexion directe, avec suppression de l'arrière-plan réglable . . . . . *page 5/46*
- Design compact
  - Single mode function, plastic . . . . . *page 5/50*
  - Multimode function, plastic. . . . . *page 5/52*
  - Diffuse with adjustable background suppression . . . . . *page 5/54*

OsiSense XU Application, fork and frame form

- Fork design
  - Optical fork without adjustment . . . . . *page 5/56*
  - Optical fork with teach mode . . . . . *page 5/58*
  - Optical fork with laser transmission and with teach mode. . . . . *page 5/60*
  - Ultrasonic fork, packaging series . . . . . *page 5/62*
  - Optical fork for detection of opaque labels . . . . . *page 5/64*
  - Optical fork with teach mode, packaging series . . . . . *page 5/68*
  - Optical fork with integral amplifier, mechanical handling series . . . . . *page 5/70*
- Frame design
  - Dynamic detection of passage of objects, conveying series. . . . . *page 5/72*

OsiSense XU Application, packaging series

- Detection of contrast
  - Compact design 50 X 50 . . . . . *page 5/74*
  - Fibre design, with teach mode . . . . . *page 5/76*
  - Compact design 81 X 58 . . . . . *page 5/78*
- Luminescence sensor . . . . . *page 5/80*
- Illumination sensor. . . . . *page 5/82*
- For detection of transparent materials . . . . . *page 5/84*
- For detection of transparent materials, with teach mode . . . . . *page 5/86*
- For colour detection, sorting. . . . . *page 5/90*

OsiSense XU Application, food and beverage series

- Design 18, stainless steel, multimode function. . . . . *page 5/92*
- Design 18, stainless steel, single mode . . . . . *page 5/94*

OsiSense XU Application, assembly and conveying series

- Metal case, cylindrical, threaded M8 x 1 for assembly series . . . . . *page 5/98*
- Miniature design for conveyor system and access control series . . . . . *page 5/100*
- Miniature design with laser transmission for assembly series and conveyor system . . . . . *page 5/102*
- Compact design with laser transmission for assembly series . . . . . *page 5/104*
- Cylindrical design for detecting packages on a roller conveyor . . . . . *page 5/108*

OsiSense XU Application, materials handling series

- Design 18, laser transmission . . . . . page 5/112
- With analogue output signal 4…20 mA et 0…10 V . . . . . page 5/114
- With analogue output signal 4…20 mA . . . . . page 5/116
- Laser transmission
  with solid-state and analogue output signal 4…20 mA . . . . . page 5/118
- Thru-beam system with high “excess gain” . . . . . page 5/120
- Laser transmission
  with analogue output signal 4…20 mA et 0…10 V . . . . . page 5/122
- Laser transmission with background suppression . . . . . page 5/124
- Diffuse with 2 channels using triangulation. . . . . page 5/126

OsiSense XU Application, amplifier and fibre optics

- Amplifiers with teach mode . . . . . page 5/128
- “Plastic” fibre optics for amplifiers. . . . . page 5/130
- “Glass” fibre optics for amplifier . . . . . page 5/134
- Amplifiers for plastic or glass fibre optics . . . . . page 5/142

OsiSense XU Application, other formats

- Compact design, conveying serie . . . . . page 5/148
- Compact design for conveyor system and access control system . . . . page 5/150
- Design 18, a.c. or d.c.supply, solid-state output
  with adjustable sensitivity. . . . . page 5/152

OsiSense XU Application, tertiary sector series

- For access detection . . . . . page 5/154
- With integral buzzer . . . . . page 5/156

5

OsiSense XU

- Accessories . . . . . page 5/158
- Curves . . . . . page 5/170

OsiSense XUK8T, XUK9T

Selection guide . . . . . *page 5/176*

- Presentation. . . . . page 5/178

OsiSense XUW

Selection guide . . . . . *page 5/182*

Photo-electric sensors

OsiSense XU General purpose

Single mode or multimode function

Format		Design 18	
		Metal	Plastic

Single mode function		Type	Sensing distance (m)	Type	Sensing distance (m)
Sensing distance (m) related to system	Diffuse with adjustable sensitivity	XUB5B	0.6	XUB5A	0.6
	Diffuse	XUB4B	0.1	XUB4A	0.1
	Polarised reflex	XUB9B	2	XUB9A	2
	Reflex	XUB1B	4	XUB1A	4
	Thru-beam	XUB2B	15	XUB2A	15
Type reference		XUB●B *(1)*		XUB●A *(1)*	
Pages		5/30		5/28	

Multimode function		Type	Sensing distance (m)	Type	Sensing distance (m)
Sensing distance (m) related to system	Diffuse with background suppression	XUB0B	0.12	XUB0A	0.12
	Diffuse		0.30		0.30
	Polarised reflex		3		3
	Thru-beam		15		15
Type reference		XUB0B *(1)*		XUB0A *(1)*	
Pages		5/32		5/32	

High performance diffuse with adjustable background suppression		Type	Sensing distance (m)	Type	Sensing distance (m)
		–		–	
Type reference		–		–	
Pages		–		–	

Characteristics				
Dimensions (w x h x d) in mm			Ø 18, threaded M18 x 1 XUB●A/XUB●B: length 46 (62 for XUB5 and connector version) XUB0A/XUB0B: length 62 (pre-cabled version) or length 78 (connector version)	
Case	Materials	Plastic, PBT	–	●
		Nickel plated brass	●	–
		Stainless steel	● (XUB0S: see page 5/92)	–
Degree of protection			IP 65, IP 67 IP 69K (XUB0S, stainless steel case, see page 5/92)	IP 65, IP 67
Supply	c 3-wire (PNP/NPN)		●	●
	z 5-wire, relay output		(2-wire XU●M18, see page 5/152)	–
Function	NO		●	●
	NC		●	●
	NO/NC		–	–
	NO + NC		–	–
Connection	Pre-cabled (L = 2 m) *(2)*		●	●
	Connector	M8 (4-pin) ⎓ 3-wire	–	–
		M12	●	●
	Screw terminals		–	–
	Remote connector		M8 and M12 remote connectors available: please contact our Customer Care Centre.	

(1) Sensors also available with line of sight 90° to case axis.
(2) Cable lengths of 5 and 10 m also available, depending on model.
(3) With adjustable sensitivity.

Miniature design		Compact design, 50 x 50		Compact design, 92 x 71	
Plastic		Plastic		Plastic	
Type	**Sensing distance** (m)	**Type**	**Sensing distance** (m)	**Type**	**Sensing distance** (m)
XUM5A	1 *(3)*	XUK5A	1 *(3)*	XUX5A	2 *(3)*
–		–		–	
XUM9A	5 *(3)*	XUK9A	6	XUX9A	11 *(3)*
–		XUK1A	7	XUX1A	14 *(3)*
XUM2A	15 *(3)*	XUK2A	30	XUX2A	40 *(3)*
XUM●A		**XUK●A**		**XUX●A**	
5/34		5/42		5/50	
Type	**Sensing distance** (m)	**Type**	**Sensing distance** (m)	**Type**	**Sensing distance** (m)
XUM0A	0.10	XUK0A	0.28	XUX0A	1.3
	0.4		0.8		2
	3		4		15
	10		30		40
XUM0A		**XUK0A**		**XUX0A**	
5/38		5/44		5/52	
Type	**Sensing distance** (m)	**Type**	**Sensing distance** (m)	**Type**	**Sensing distance** (m)
XUM8	0.3	XUK8AKSN	1	XUX8	2
		XUK8ARCT	0.75		
XUM8		**XUK8AKSN, XUK8ARCT**		**XUX8**	
5/40		5/46 and 5/48		5/54	
XUM●A: 11 x 34 x 20 (pre-cabled) or 11 x 43 x 20 (M8) XUM0A: 12 x 34 x 20 (pre-cabled) or 12 x 45 x 20 (M8)		18 x 50 x 50		31 x 92 x 77	
●		●		●	
–		–		–	
–		–		–	
IP 65, IP 67		IP 65		IP 65, IP 67	
●		●		●	
–		●		●	
–		●		●	
–		●		●	
● configurable using switch and by programming (XUM0A)		● by programming (XUK0A and XUK8)		● by programming (XUX0A and XUX8)	
–		● relay output		● relay output	
●		●		–	
●		–		–	
–		●		●	
–		–		●	
M8 and M12 remote connectors available: please contact our Customer Care Centre.					

5

Photo-electric sensors

OsiSense XU Application

Fork and frame form

Recommended applications		Detection of objects on small conveyors	Detection of labels on strip. Detection of sheet feed on printing machine	Detection on vibrating rail. Detection of transparent objects	Detection of transparent labels
Format		Optical fork	Optical fork	Laser optical fork	Ultrasonic fork
Dimensions (w x h x d) in mm		Passageway: 30 to 180 Depth: 30, 60, 95	Passageway: 2 to 120 Depth: 42, 59, 95		18 x 47.3 x 92.5
Case		Metal	Metal	Metal	Metal
Sensing distance (mm) related to system	Diffuse with background suppression	–	–	–	–
	Diffuse	–	–	–	–
	Polarised reflex	–	–	–	–
	Reflex	–	–	–	–
	Thru-beam	2...180 *(2)*	2... 120 *(1) (2)*	2... 120 *(1) (2)*	3
Degree of protection		IP65, IP 67	IP 65	IP 65	IP 65
Supply	⎓	●	●	●	●
	~	–	–	–	–
	≂	–	–	–	–
Output		PNP/NPN NO/NC	PNP/NPN *(3)* NO/NC *(4)*	PNP/NPN *(3)* NO/NC *(4)*	PNP and NPN NO/NC *(4)*
Connection	Pre-cabled	●	–	–	–
	Connector	●	●	●	●
	Screw terminals	–	–	–	–
Type reference		**XUVR● XUVA●**	**XUYFNEP● XUYFANEP●**	**XUYFLNEP● XUYFALNEP●**	**XUVU06**
Pages		5/56	5/58	5/60	5/62

(1) With or without teach mode, depending on model.
(2) Depending on model.
(3) Depending on wiring.
(4) By programming.

Detection of opaque labels, of different colours		Detection of opaque labels	Detection of flags in lifts and transtockers. Integrated amplifier	Material handling: detection and counting of objects being fed to or exiting a machine
Optical fork	Optical fork	Optical fork	Optical fork	Frame design
10 x 25 x 64	20 x 26 x 90	12 x 37.5 x 80	14 x 58 x 68	15 x 50 x 108 15 x 86 x 131 25 x 230 x 205/265/335
Plastic	Metal	Metal	Plastic	Metal
–	–	–	–	–
–	–	–	–	–
–	–	–	–	–
–	–	–	–	–
3	2	3 or 5 *(2)*	3	3, 6, 12,18, 25 *(2)*
IP 65	IP 65	IP 65	IP 54	IP 65
●	●	●	●	●
–	–	–	–	–
–	–	–	–	–
PNP and NPN NO/NC *(4)*	PNP and NPN NO/NC *(4)*	PNP and NPN NO/NC *(4)*	Solid-state PNP or NPN NO	PNP and NPN NO/NC *(3)*
–	–	–	●	–
●	●	●	–	●
–	–	–	–	–
XUVE	**XUVK**	**XUYFA98●**	**XUVH** **XUVJ**	**XUVF**
5/64	5/66	5/68	5/70	5/72

5

Photo-electric sensors
OsiSense XU Application

Recommended applications		**Packaging**			
		Colour mark readers			**Luminescence sensors**
		Detection of reference marks, contrasting colours and markings on packaging, printing, labelling machines, etc.	Detection of reference marks on packaging paper, tubes	Detection of reference marks, contrasting colours and markings on packaging, printing, labelling machines, etc.	Detection of invisible reference marks, markings, adhesives, varnishes, etc. Sensitive to the bluing agents generally present in inks, adhesives, varnishes, etc.
Format		Compact design	Fibre design	Compact design	Design 18
Dimensions (w x h x d) in mm		50 x 50 x 15	13 x 72 x 30	31 x 81 x 58	Ø 18, threaded M18 x 1 L: 82
Case		Plastic	Plastic	Metal	
Sensing distance (m) related to system	Diffuse with background suppression	–	–	–	–
	Diffuse	0.019	*(1)*	0.009	0.02
	Polarised reflex	–	–	–	–
	Reflex	–	–	–	–
	Thru-beam	–	–	–	–
Degree of protection		IP 65	IP 65	IP 67	IP 67
Supply	⎓	●	●	●	●
	∼	–	–	–	–
	≂	–	–	–	–
Output		Solid-state (PNP or NPN)			Solid-state (PNP)
Connection	Pre-cabled	–	–	–	–
	Connector	●	●	●	●
	Screw terminals	–	–	–	–
Type reference		**XUKR**	**XUYDCF ●●966S**	**XURK**	**XU5M**
Pages		5/74	5/76	5/78	5/80

(1) Depending on fibres used.
(2) Depending on model.

Packaging				
Illumination sensors **Verifying operation of indicator lights**	**Detection of any transparent object** Bottles, flasks, containers, films, etc.			**For detection of colours, sorting** Recognises colours for sorting or checking parts
Fibre design	Design 18	Miniature design	Compact design, 50 x 50	Compact design
13 x 76.7 x 30	Ø 18, threaded M18 x 1 L: 64, 78 or 92	11 x 43 x 20	18 x 50 x 50	50 x 50 x 25
Plastic	Plastic or stainless steel *(2)*	Plastic	Plastic	Plastic
Sensing distance depending on fibre used	–	–	–	–
	–	–	–	0.020
	0...1.4	–	–	–
	–	0.1…2 (depending on reflector)	1.5	–
	–	–	–	–
IP 65	IP 65 IP 67	IP 67	IP 65	IP 65
●	●	●	●	●
–	–	–	–	–
–	–	–	–	–
PNP/NPN NO/NC (programmable)	Solid-state (PNP or NPN)	PNP/NPN NO/NC (programmable)	Solid-state (PNP or NPN)	
–	●	●	●	–
●	●	●	●	●
–	–	–	–	–
XUYAFL ●●966S	**XUBT**	**XUMT**	**XUKT**	**XUKC**
5/82	5/84	5/86	5/88	5/90

5

Photo-electric sensors
OsiSense XU Application

Recommended applications	Food processing	Assembly
	Stainless steel cylindrical sensor (grade 304 CU) For use in vicinity of food processing machinery	**Diameter 8 metal range**

5

Format		Design 18	Design 18	Design 8
Dimensions (w x h x d) in mm		Ø 18, threaded M18 x 1 L: 64...92	Ø 18, threaded M18 x 1 L: 62...88	Ø 8, threaded M8 x 1 L: 40
Case		Stainless steel	Stainless steel	Metal
Sensing distance related to system	Diffuse with background suppression	0.12 m	–	–
	Diffuse	0.3 m	0.10 m	0.05 m
	Polarised reflex	2 m	2 m	–
	Reflex	–	4 m	–
	Thru-beam	15 m	15 m	2 m
Degree of protection		IP 67, IP 69K	IP 67	IP 65 *(1)* IP 67 *(1)*
Supply	⎓	●	●	●
	∼	–	–	–
	≂	–	–	–
Output		Solid-state (PNP and NPN)	Solid-state (PNP and NPN)	Solid-state (PNP or NPN)
Connection	Pre-cabled	●	●	●
	Connector	●	●	●
	Screw terminals	–	–	–
Type reference		**XUB0S●**	**XU●N18**	**XUA**
Pages		5/92	5/94	5/98

(1) Depending on model.

Assembly	Conveying and assembly		
Detection of objects on conveyor and access control	**Miniature, laser with teach mode**	**Long range laser**	**Detection of objects on conveyor**
Miniature design	Miniature design	Compact design	Cylindrical design
20 x 32 x 13 10 x 40 x 13.5	12 x 32 x 20	23 x 50 x 50	250…900
Plastic	Plastic	PC Shock-resistant ABS	Aluminium and PA
0.015…0.08 m	20…60 mm 30…110 mm	5…800 mm	–
0.03…0.25 m	–	5…1200 mm	0…0.1 m
1 m	100…1000 mm	0.3…12 m	–
–	–	–	–
4 m	15 m	0…25 m	–
IP 65 IP 67	IP 67	IP 67 IP 69K	IP 50 (IP 65 on request)
●	●	●	●
–	–	–	–
–	–	–	–
PNP or NPN NO/NC *(1)*	PNP	PNP	Solid-state (PNP or NPN)
●	●	–	●
●	●	●	M8 and M12 remote connector (other connectors available on request)
–	–	–	–
XUY●●989	**XUY●●●929**	**XUK●LA●●**	**XUY●●●N●●●**
5/100	5/102	5/104	5/108

5

Photo-electric sensors
OsiSense XU Application

Recommended applications	Material handling		
	Laser	Diffuse with analogue output	Laser
		Measurement, servo control, position control, eccentricity monitoring, concentricity monitoring, etc.	Time of flight measurement

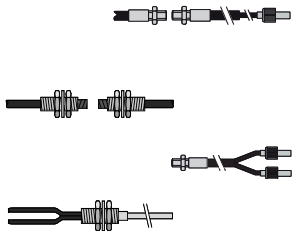
Format		Design 18	Compact design	Design 18	Design 90 x 90
Dimensions (w x h x d) in mm		Ø 18, threaded M18 x 1	27 x 85 x 61	Ø 18, threaded M18 x 1 L: 82	42 x 93 x 95
Case		Plastic or brass *(1)*	Plastic	Metal	ABS
Sensing distance (m) related to system	Diffuse with background suppression	–	–	–	–
	Diffuse	–	0.20…0.80	0.05…0.4	0.2…6
	Polarised reflex	–	–	–	0.2…30
	Reflex	–	–	–	–
	Thru-beam	0...100 with teach mode	–	–	–
Degree of protection		IP 67	IP 67	IP 67	IP 67
Supply	⎓	●	●	●	●
	∼	–	–	–	–
	≂	–	–	–	–
Output		PNP, NPN NO/NC by programming	Analogue (PNP)		Solid-state PNP (2 outputs) + analogue
Connection	Pre-cabled	●	–	–	–
	Connector	●	–	●	●
	Screw terminals	–	●	–	–
Type reference		**XUBL**	**XUJ**	**XU5M**	**XUE●AA2**
Pages		5/112	5/114	5/116	5/118

(1) Depending on model.

Material handling				Conveying
Thru-beam with high excess gain Detection of objects in harsh environments (smoke, dust, mist, etc.). Measuring opacity	**Laser transmission** Monitoring dimensions in series, monitoring roundness of a wheel	**Diffuse with background suppression, laser transmission** High precision, detection of any dark or shiny object, including small sized	**Diffuse with 2 channels using triangulation, with background suppression**	
Design 18	Compact design, 50 x 50	Compact design	Compact design	–
Ø 18, threaded M18 x 1 L: 82	17 x 50 x 50	18 x 60 x 60	18 x 60 x 60	29 x 95 x 60
Metal	Plastic	Plastic	Plastic	Plastic
–	–	Adjustable from 50 to 300 mm	Adjustable from 50 to 600 mm	–
–	0.04…0.06 0.045…0.085 0.08…0.3	–	–	1.5 or 4 *(1)*
–	–	–	–	6 or 10 *(1)*
–	–	–	–	–
50	–	–	–	●
IP 67	IP 67	IP 65	IP 65	IP 65 and IP 67
●	●	●	●	●
–	–	–	–	●
–	–	–	–	–
Solid-state (PNP) + analogue	Solid-state (PNP) + analogue	PNP and NPN NO/NC depending on wiring	PNP and NPN NO/NC programmable	PNP/NPN Relay NO/NC programmable
–	–	–	●	–
●	●	●	●	–
–	–	–	–	●
XU2M	**XUYP●●925**	**XUYPS1●**	**XUYPS2●**	**XUY● 952/954**
5/120	5/122	5/124	5/126	5/150

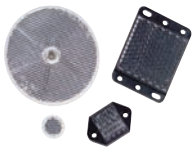
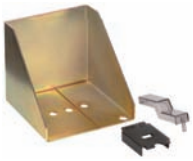
5

Photo-electric sensors
OsiSense XU Application

Recommended applications	Amplifier and fibre optics				
	Amplifier, teach mode	**Plastic fibres with end fittings**	**Glass fibres with end fittings**	**Ecofibre concept** Bare fibres and end fittings supplied separately for customer assembly	**Amplifier, teach mode or potentiometer**
					

Format		Fibre design	–	–	–	Fibre design
Dimensions (w x h x d) in mm		10 x 40 x 65 (amplifier)	Length *(1)*: 1 m, 2 m or 10 m	Length *(1)*: 0.60 m, 1 m, 1.5 m or 2 m	Length *(1)*: 1 m, 10 m or 50 m	13 x 72.2 x 30 13 x 76.7 x 30
Case		Plastic	Plastic	Glass	Plastic	Plastic
Sensing distance (m) related to system	Diffuse with background suppression	–	–	–	Sensing distance: 70 mm to 4000 mm *(1)*	Sensing distance depends on fibre used
	Diffuse	0.006 to 0.095 *(2)*	6 to 95 *(1)*	80		
	Polarised reflex	–	–	–		
	Reflex	–	–	–		
	Thru-beam	0.050 to 2 *(2)*	30 to 2500 *(1)*	80 or 200 *(1)*		
Degree of protection		IP 65 (amplifier) IP 64 (fibres)	IP 64, IP641 *(1)* IP 65, IP651 *(1)*	–	–	IP 65
Supply	⎓	●	–	–	–	●
	∼	–	–	–	–	–
	⇗	–	–	–	–	–
Output		Solid-state (PNP or NPN) *(3)* NO or NC (programmable)	–	–	–	PNP/NPN NO/NC depending on wiring or programmable depending on model
Connection	Pre-cabled	●	–	–	–	●
	Connector	●	–	–	–	●
	Screw terminals	–	–	–	–	–
Type reference		**XUDA**	**XUF**	**XUYFV●**	**XUYA●** **XUYFP●**	**XUY AF●966** **AF●946**
Pages		5/128	5/130	5/138	5/144	5/146

(1) Depending on model.
(2) Depending on fibre.
(3) Depending on wiring.
*(4) With audible signalling (buzzer): reference **XUJB** (see page 5/156).*

Building, tertiary sectors		Accessories		
2-wire AC or DC supply	**Motion detection, relay output. With audible signalling (buzzer)** *(4)*	**Reflectors**	**Fixing brackets, clamps and kits**	**Protective covers**
				
Design 18	Compact design			
Ø 18, threaded, M18 x 1 L: 82...110	18 x 50 x 50 (XUK1AR) 27 x 85 x 61 (XUJB)			
Metal	Plastic			
0.12	–			
0.4	–			
2	–			
–	7 with 50 x 50 reflector (XUK1AR) 6 (XUJB)			
15	–			
IP 67	IP 65 (XUK1AR) IP 40 (XUJB)			
–	–			
–	–			
●	●			
Solid-state	1 NO/NC programmable relay (XUK1AR) 1 NO relay (XUJB)			
●	● (XUK1AR)			
●	–			
–	● (XUJB)			
XU●M18	**XUK1AR, XUJB** *(4)*	**XUZC●, XUZB●**	**XUZA●, XUZB●, XUZE●, XUZX●, XULZ●, XUZM●**	**XUZD●●, XUJZ01**
5/152	5/154, 5/156	5/158	5/160	5/160

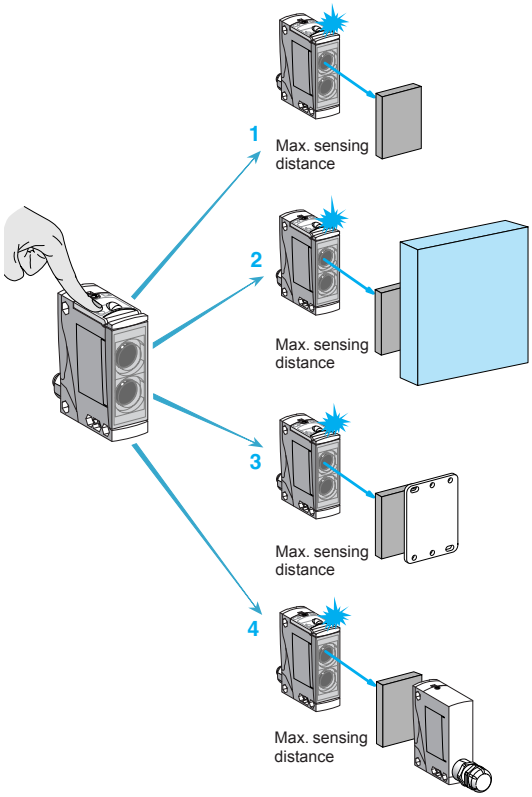
5

Photo-electric sensors

OsiSense XU

Multimode: Simplicity through innovation

Principle



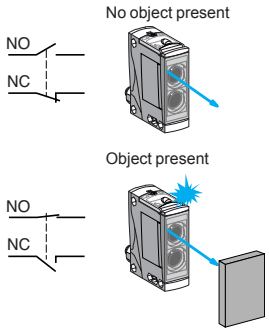
In proposing multimode products, Telemecanique Sensors offers simplicity through innovation.

■ With the multimode function, a single product meets all the requirements for optical detection.
Effectively, by simply pressing the “Teach mode” button, the sensor automatically acquires optimum configuration for the application requirements

1 Diffuse system detection of object.
2 Diffuse system, with background suppression, detection of object.
3 Reflex system (reflector accessory) detection of object.
4 Thru-beam system, on optical receiver (transmitter accessory for thru-beam use), detection of object.

■ In addition to this, a multimode sensors also means:
□ improved performance:
maximum sensing distance guaranteed and optimised for each application,
□ simplified use:
intuitive setting-up plus less and easier maintenance,
□ lower costs:
the number of references is divided by 10 and, consequently, selection and supply is simplified and storage costs significantly reduced,
□ guaranteed maximum productivity.

Straightforward NO or NC output



■ Irrespective of the detection mode used (diffuse, reflex, thru-beam, etc.), the outputs become either NO or NC *(1)*.

■ A multimode sensor means immediate and intuitive setting-up that is accessible to all.

(1) The sensor is supplied in NO configuration. NO or NC selection is performed by simply pressing the Teach mode button.

Fixing accessories

A complete range of inexpensive mounting accessories (clamps, traditional or 3D brackets, etc.) is available that provides solutions for all installation and adjustment problems

Photo-electric sensors

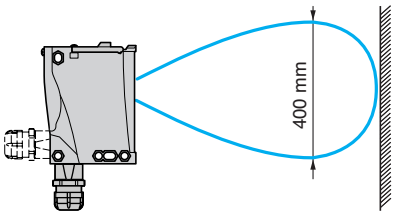
OsiSense XU

Multimode: Simplicity through innovation

Design

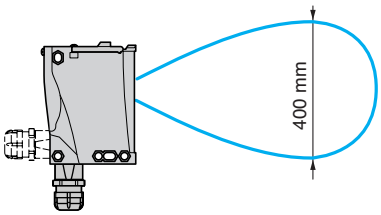
		Cylindrical 18	Miniature	Compact 50 x 50	Compact 92 x 77
Dimensions (w x h x d) in mm		M18 x 64	12 x 34 x 20	18 x 50 x 50	30 x 92 x 77
Maximum sensing distance in m	Without accessory with background suppression	0.12	0.10	0.28	1.3
	Without accessory	0.4	0.55	1.2	3
	With polarised reflector	3	4	5.7	15
	With thru-beam accessory	20	14	35	60
Supply	⎓ Solid-state output	■	■	■	■
	∿ Relay output	–	–	■	■
Connection	Pre-cabled	■	■	■	–
	Connector	■	■	■	■
	Screw terminals	–	–	–	■
Sensor type		**XUB0**	**XUM0**	**XUK0**	**XUX0**
Pages		5/32	5/38	5/44	5/52

Sensing distances (see table above)



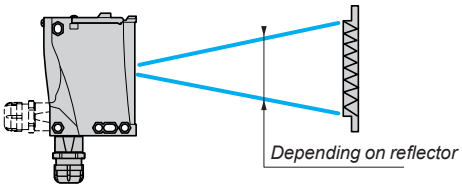
Sensing distance without accessory with background suppression

■ Without accessory, the multimode sensor detects objects irrespective of their colour or background.
■ A clean environment is recommended



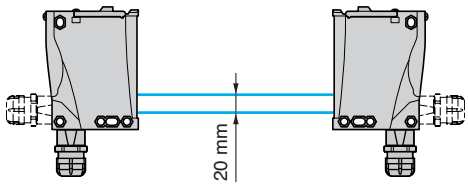
Sensing distance without accessory

■ Beyond the sensing distance with background suppression, the same multimode sensor without accessory detects objects but may be influenced by the backgrounds and colour of the objects to be detected.



Sensing distance with polarised reflector

■ By installing a reflector opposite, the same multimode sensor detects objects irrespective of their shininess and colour.
■ The size of the reflector must be smaller than that of the object to be detected.
■ The larger the area of the reflector the longer the sensing distance.

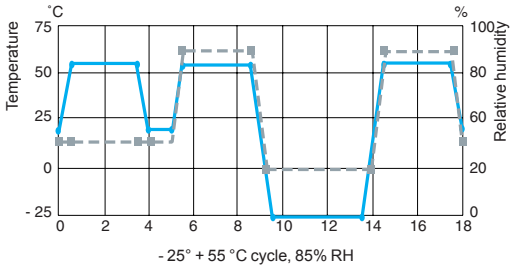


Sensing distance with thru-beam transmitter accessory

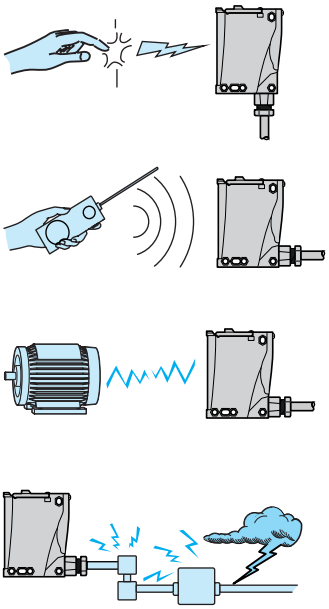
■ After setting-up and connecting a thru-beam transmitter accessory opposite, the same multimode sensor detects objects irrespective of their shininess, colour or background.
■ The detection distance is a maximum.
■ The sensor and the thru-beam transmitter must be carefully aligned.
■ Good resistance to accumulation of dirt and dust.

Photo-electric sensors
OsiSense XU

Standards and certifications
Parameters related to the environment



Temperature °C
Relative humidity %



Recommendation
The sensors detailed in this catalogue are designed for use in standard industrial applications relating to presence detection.
These sensors do not incorporate the required redundant electrical circuit enabling their usage in safety applications.
For safety applications, please refer to our “Safety solutions using Preventa” catalogue.

Quality control
Our photo-electric sensors are subject to special precautions in order to guarantee their reliability in the most arduous industrial environments.

- **Qualification**
  - The product characteristics stated in this catalogue are subject to a **qualification procedure** carried out in our laboratories.
  - In particular, the products are subjected to **climatic cycle** tests for 3000 hours whilst powered-up to verify their ability to maintain their characteristics over time.
- **Production**
  - The electrical characteristics and sensing distances at both ambient temperature and extreme temperatures are 100% checked.
  - Products are randomly selected during the course of production and subjected to **monitoring tests** relating to all their characteristics.
- **Customer returns**
  - If, in spite of all these precautions, defective products are returned to us, they are subject to **systematic analysis** and **corrective actions** are implemented to eliminate the risks of the fault recurring.

Immunity to ambient light
- OsiSense XU photo-electric sensors use the pulsed light principle. This provides a high degree of immunity to spurious light that conforms to standard **IEC 60947-5-2**.

Resistance to electromagnetic interference
The photo-electric sensors are tested in accordance with the recommendations of the standard IEC 60947-5-2

Electrostatic discharges	**IEC/EN 61000-4-2** ≂ 15 kV version, level 4 ⎓ 8 kV version, level 3
Radiated electromagnetic fields (electromagnetic waves)	**IEC/EN 61000-4-3** 10 V/metre, level 3
Fast transients in salvos (motor start/stop interference)	**IEC/EN 61000-4-4** 2 kV, level 4
Impulse voltages, lightning	**IEC 60947-5-2** ≂ 2.5 kV version ⎓ 1 kV version

Mechanical shock resistance
The sensors are tested in accordance with standard IEC 60068-2-27, 30 gn, duration 11 ms.

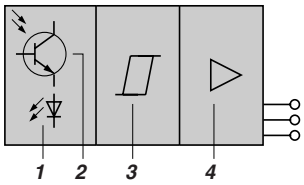
Vibration resistance
The sensors are tested in accordance with standard IEC 60068-2-6,
7 gn, amplitude ± 1.5 mm, f = 10…55 Hz.

Resistance to chemicals in the environment
- Owing to the very wide range of chemicals encountered in industry, it is very difficult to give general guidelines common to all sensors.
- To ensure lasting efficient operation, it is essential that any chemicals coming into contact with the sensors will not affect their casing and, in doing so, prevent their reliable operation (please refer to the characteristics pages for the various sensors).

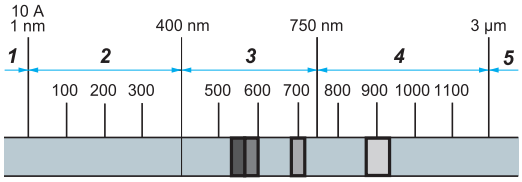
In all cases, the materials selected (see product characteristics) provide satisfactory compatibility in most industrial environments (for further information, please consult our Customer Care Centre).

Photo-electric sensors
OsiSense XU

Principle of optical detection



1 Light beam transmitter
2 Light beam receiver
3 Signal processing stage
4 Output stage



1 X rays, 2 Ultraviolet, 3 Visible light,
4 Near infrared, 5 Far infrared

Composition of a photo-electric sensor

A photo-electric sensor basically comprises a light beam transmitter (light-emitting diode) and a light-sensitive receiver (photo-transistor).
A light-emitting diode is an electronic semi-conductor component that emits light when an electric current flows through it. This light can be visible or invisible, depending on the transmission wavelength.

Detection occurs when an object enters the transmitted light beam and, in so doing, affects the intensity of the light at the receiver. As the light intensity at the receiver decreases a point is reached whereby the output of the sensor changes state.

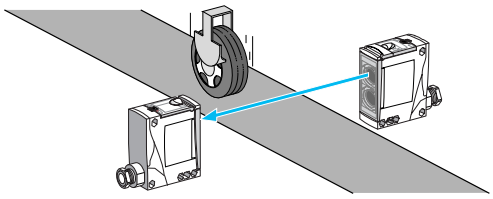
Light spectrum

Depending on the model and application requirements, the transmission beam is either non visible infrared (most common case) or ultraviolet (detection of luminescent materials). It may also be visible red or green (colour mark reading etc.) and laser red (long sensing distance and short focal length).

Modulation

The advantage of LEDs is their very fast response. To render the system insensitive to ambient light, the current flowing through the LED is modulated so as to produce a pulsed light transmission.
Only the pulsed signal will be used by the photo-transistor and processed to control the load.

Detection systems

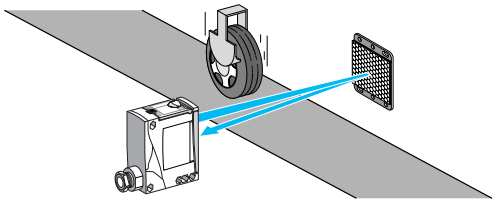


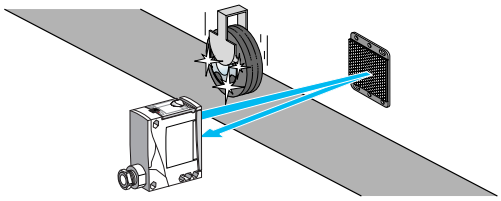
Thru-beam system or multimode with thru-beam accessory

- **Advantages**
  - Long sensing distance(up to 60 m).
  - Very precise detection, high repeat accuracy.
  - Detection not affected by colour of object.
  - Good resistance to difficult environments (dust, grime, etc.).
- **Drawbacks**
  - 2 units to be wired.
  - The object to be detected must be opaque.
  - Precise alignment required, which can be difficult since the sensor transmits in the infrared range (invisible).

- **Operating precautions**
  - When several sensors are used, care must be taken to ensure that no sensor is disrupted by another sensor (e.g. alternate mounting of transmitter/receiver etc.).

Advantages of multimode sensor with thru-beam accessory
- Easy alignment
  - The sensor transmits in the visible red range during the alignment phase.
  - 3 LEDs providing setting-up assistance.





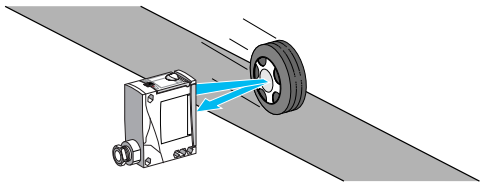
Polarised reflex system or multimode with reflector accessory

- **Advantages**
  - Medium sensing distance (up to 15 m).
  - Precise detection.
  - Only one unit to be wired.
  - Detection not affected by colour of object.
  - Visible red beam transmission.
- **Drawbacks**
  - Precise alignment required.
  - The object to be detected must be opaque and larger than the reflector.

- **Operating precautions**
  - When several sensors are used, they must be aligned in such a manner that no sensor is disrupted by another sensor.
  - For short distance detection use a reflector with large trihedrons, type XUZC24.
  - For long distance detection use a reflector XUZC50 or XUZC80.
  - To increase the sensing distance use reflector XUZC100.
  - If reflective tape is used, use rolls of tape XUZB1 or XUZB15 which are specially adapted for polarised reflex systems.

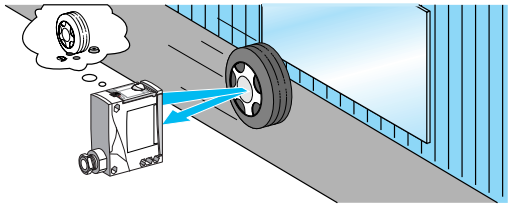
Advantages of multimode sensor with reflector accessory
- Easy alignment
  - 3 LEDs providing setting-up assistance.
  - The anti-interference function enables 2 sensors to be used without specific alignment precautions.
- Semi-transparent objects can be detected by using the teach mode function.

Detection systems (continued)



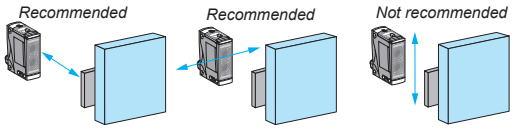
Diffuse system or multimode

■ **Advantage**
□ Only one unit to be wired.
■ **Drawbacks**
□ Short sensing distance.
□ Sensitivity to object or background colour differences.
□ Object sighting line difficult since the sensor transmits in the infrared range (invisible).
■ **Operating precautions**
□ When several sensors are used, they must be aligned in such a manner that no sensor is disrupted by another sensor.
■ **Advantages of a multimode sensor**
□ Easy alignment:
- the sensor transmits in the visible red range during the alignment phase,
- 3 LEDs providing setting-up assistance,
- the anti-interference function enables 2 sensors to be used without specific alignment precautions.
□ Refined detection: the position of the object can be detected using the teach mode.



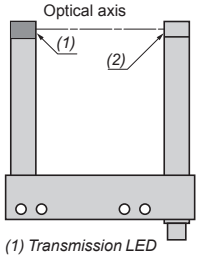
Diffuse, with or without background suppression, system or multimode

■ **Advantages**
□ Only one unit to be wired.
□ Detection not affected by colour of object or background.
■ **Drawbacks**
□ Short sensing distance.
□ Object sighting line difficult since the sensor transmits in the infrared range (invisible).
■ **Operating precautions**
□ Detection can be affected by the object's direction of movement. To overcome this phenomenon (the hat effect), it is recommended that the sensor is mounted so that the object simultaneously breaks the beam of both lenses.
□ When several sensors are used, they must be aligned in such a manner that no sensor is disrupted by another sensor.
■ **Advantages of a multimode sensor**
□ Easy alignment:
- the sensor transmits in the visible red range during the alignment phase,
- 3 LEDs providing setting-up assistance,
- the anti-interference function enables 2 sensors to be used without specific alignment precautions,
- the hat effect is minimised using the background teach mode.
□ Refined detection: the position of the object can be detected using the teach mode.



Positioning recommendations for sensor with background suppression

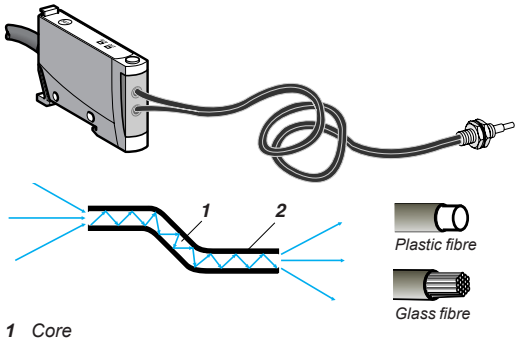
Specific systems



(1) Transmission LED
(2) Output LED

Optical forks

■ Constructed from metal, the optical fork is a robust sensor that is particularly suited to conveying and packaging applications and detection of labels.
■ Rugged optical detection device **not requiring alignment** in thru-beam mode.
■ The beam from the transmitter limb is transmitted to the receiver limb. Due to its construction, **only one connection** is required as opposed to two for a traditional thru-beam function.
■ The transmission sources are LEDs of various technologies:
□ Red for much improved efficiency during adjustment and maintenance
□ Red laser for detection of transparent materials or very small parts
□ Infrared, particularly for optical frames
□ Ultrasonic for detection of transparent labels (clear on clear)
■ The beam is adjustable or fixed depending on the version. Adjustment enables the sensitivity to be altered and, therefore, detection of small parts down to dimensions of less than tenths of millimetres (minimum size of detectable object: 0.05 mm).
■ The high switching frequency (from 4 kHz up to 25 kHz) is very useful in industrial applications involving high operating rates.



1 *Core*
2 *Sheath*

Fibre optics

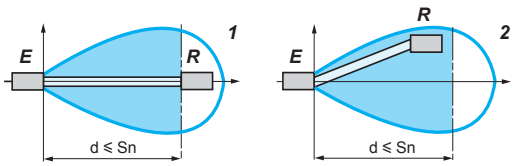
■ The fibre acts as a light conductor. Light rays entering the fibre at a certain angle are conveyed to the required location, with minimum loss.
■ Separate amplifier.
□ Size kept to minimum.
□ This system enables detection of very small objects (approximately 1 mm).
□ And, detection is very precise.

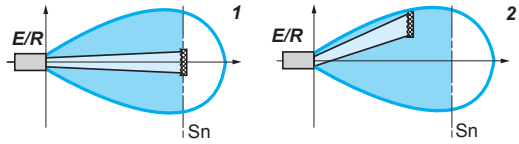
Plastic fibres
The core of the fibre is flexible plastic (PMMA). In general, there is only a single fibre of diameter 0.25 to 1 mm, depending on the model.
□ Fibres are used with amplifiers transmitting red light.
□ Minimum bend radius:
- 10 mm for fibres with 0.25 mm diameter core,
- 25 mm for fibres with 1 mm diameter core.
■ Advantages: fibres can be cut to the required length.

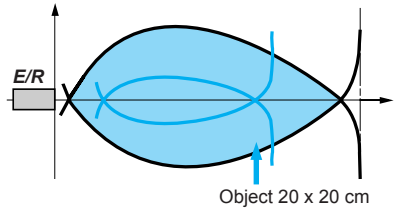
Glass fibres
□ The core of the fibre is silica. For maximum flexibility, each fibre comprises numerous strands that are approximately 50 µ in diameter.
□ Fibres are used with amplifiers transmitting infrared or red light.
□ Minimum bend radius:
- 10 mm with plastic sheath,
- 90 mm with stainless steel sheath.
■ **Advantages**
□ Fibres suitable for use at high temperatures (250 °C).
□ Fibres with stainless steel sheath provide protection against mechanical impact and crushing.

Photo-electric sensors
OsiSense XU

Detection curves







Thru-beam system

- The ▭ zone indicates the positioning tolerance of the receiver.
- The zone represents the usable sensing zone of the system. Any opaque object entering this zone breaks the beam and causes the sensor's output to change state.

1 Ideal detection
2 Acceptable detection
T = transmitter
R = receiver

Polarised reflex system

- The ▭ zone indicates the positioning tolerance of the reflector.
- The zone represents the usable sensing zone of the system. Any opaque object entering this zone breaks the beam and causes the sensor's output to change state.

1 Ideal detection
2 Acceptable detection
T = transmitter
R = receiver

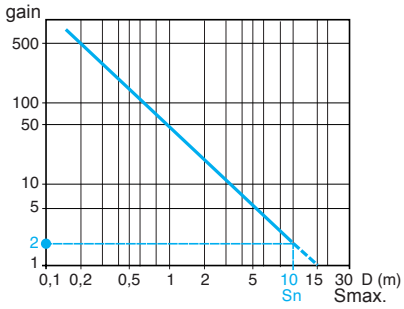
Diffuse, with or without background suppression, system

- The ▬ zone represents the sensor's sensitivity zone.
  All of this zone is usable: any object that is adequately reflective entering this zone, in the direction of the arrow, will cause the sensor's output to change state. The black line corresponds to a light colour surface and the blue line to a darker colour surface.
- A test using the object to be detected will determine the zone of sensitivity in relation to its reflection coefficient.

——— White 90% object
——— Grey 18% object

For specific aspects of diffuse systems see page 5/18.
T = transmitter
R = receiver

Excess gain



Operating margin

To ensure correct operation of a sensor in spite of environmental constraints, the sensors feature an operating margin.
This margin can be expressed in terms of excess gain, which is the ratio:
Excess gain = Signal level received/Signal required for switching.

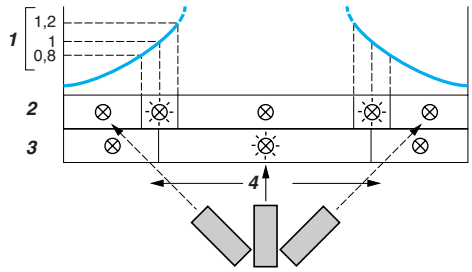
For all OsiSense XU sensors

- The **nominal sensing distance Sn** is defined as the sensing distance with an **excess gain of 2**, i.e. the sensing distance for which the sensor receives twice as much light energy as it strictly needs to switch it.
- The **maximum sensing distance** is defined as the sensing distance with an **excess gain of 1**. It corresponds to the maximum detection value.

The use of the sensor at the nominal sensing distance ensures the sensor's correct operation in normal operating conditions.

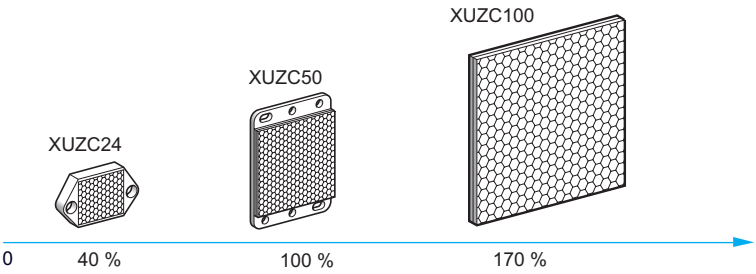
In extreme conditions, refer to the following setting-up recommendations:
- clean environment: work at nominal sensing distance Sn,
- slightly polluted environment: work at sensing distance Sn/2,
- moderately polluted environment: work at sensing distance Sn/4,
- heavily polluted environment: preferably use multimode sensors with thru-beam accessory (or the thru-beam system) with a sensing distance Sn/10.

Optical alignment aid



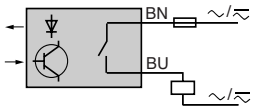
A red LED assists setting-up by illuminating when optimum alignment of the sensor is achieved.
1 Signal level
2 Red LED, on ☼, off ⊗
3 Green LED, on ☼, off ⊗
4 Optimum alignment

Detection distance using reflector



Detection distance depending on reflector size.

Outputs

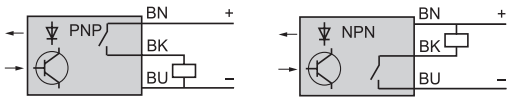


2-wire technique ∿ or ⎓

■ **Specific aspects**
These sensors are wired in series with the load to be switched.
As a consequence, they are subject to:
□ A residual current in the open state (current flowing through the sensor in the "open" state),
□ A voltage drop in the closed state (voltage drop across the sensor's terminals in the "closed" state).

■ **Advantages**
□ Only 2 wires to be connected. They can be wired in series in the same way as mechanical limit switches.
□ For use on 2-wire ⎓, they can be connected to either positive (PNP) or negative (NPN) logic PLC inputs.
□ No risk of incorrect connections.

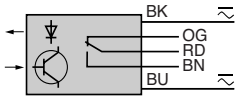
■ **Operating precautions**
□ Check the possible effects of residual current and voltage drop on the actuator or input connected.
□ These sensors do not incorporate overload or short-circuit protection and therefore, it is essential to connect a 0.4 A "quick-blow" fuse in series with the load.



3-wire technique ⎓

■ **Specific aspects**
□ These sensors comprise 2 wires for the DC supply and a 3rd wire for the output signal.
□ PNP type: switching the positive side to the load.
□ NPN type: switching the negative side to the load.

■ **Advantages**
□ No residual current, low voltage drop.



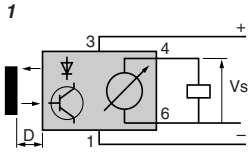
5-wire technique ∿ or ⎓, relay output

■ **Specific aspects**
□ Sensors incorporating output relay. The supply and output circuits are electrically separate.

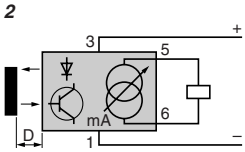
■ **Advantages**
□ ∿ or ⎓ supply with a wide voltage range.
□ High breaking capacity (approximately 3 A).
□ Direct control of a simple automation system.
□ Availability of a NC (normally closed) contact and a NO (normally open) contact.
□ The sensor/relay contact galvanic isolation is 1500 to 2500 V, depending on the model.

■ **Operating precautions**
□ Low switching frequency. Check that it is suitable for the application.
□ Limited service life of relay. Check that it is suitable for the application.

1



2



Analogue technique

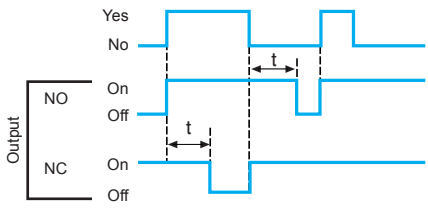
■ **Specific aspects**
There are two output configurations:
□ Voltage output: the output voltage varies in proportion to the distance between the sensor and the object to be detected.
□ Current output: the output current varies in proportion to the distance between the sensor and the object to be detected.

■ **Advantage**
□ Availability of a physical item of data proportional to the distance between the sensor and the object to be detected.

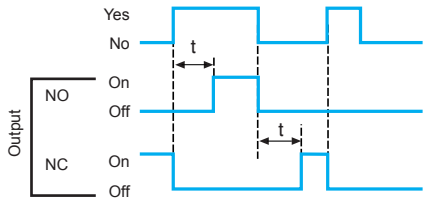
■ **Operating precautions**
□ Refer to the detailed descriptions of the sensor to assess the relative influence of the colour of the object to be detected.

1 *Voltage output*
2 *Current output*

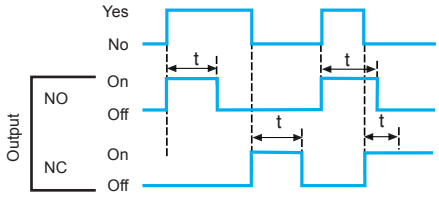
Outputs *(continued)*



Time delay on beam break



Monostable

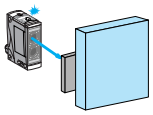
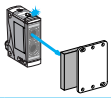
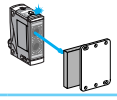
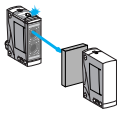
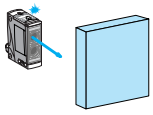
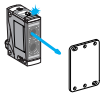
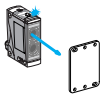
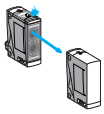


Output functions

In the past, the output functions of photo-electric sensors were always governed by the "light/dark" principle, i.e. the output would be activated on light being received for "light" switching and the output would be activated on light not being received for "dark" switching.
This called for fastidious programming specific to each detection mode.

Now, the output functions of the OsiSense XU range of photo-electric sensors are in phase with the language of the automation system engineer, i.e. NO (normally open) or NC (normally closed).

- **Advantages**
  - NO output (or NO programming for multimode sensors): irrespective of the detection mode, the output of the sensor is activated when the object to be detected is present.
  - NC output (or NC programming for multimode sensors): irrespective of the detection mode, the output of the sensor is activated when the object to be detected is not present.
- **Advantages of multimode sensors**
  By default, the output is NO programmed, i.e. the output of the sensor is activated when the object to be detected is present.
  - By pressing the teach button, the output can programmed to NC, i.e. the output of the sensor is activated when the object to be detected is not present.

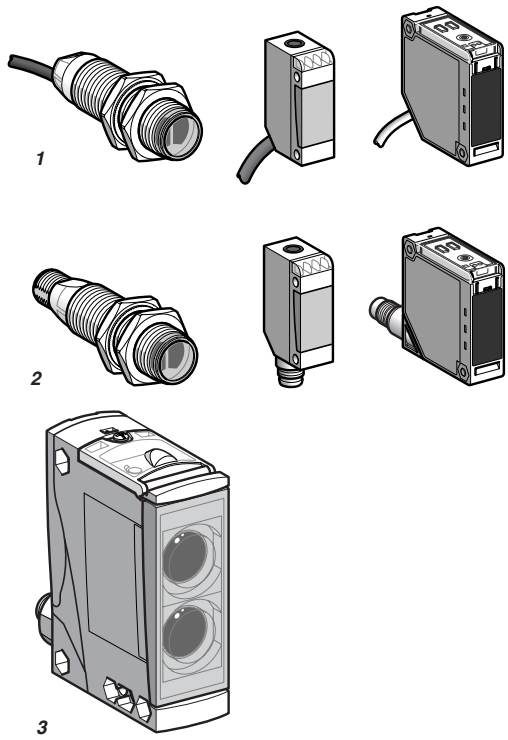
System		NO output or NO programming	Yellow LED	NC output or NC programming	Yellow LED
	Object present				
Diffuse		Activated	On	Not activated	Off
Diffuse with background suppression		Activated	On	Not activated	Off
Reflex		Activated	On	Not activated	Off
Polarised reflex		Activated	On	Not activated	Off
Thru-beam		Activated	On	Not activated	Off
	No object present				
Diffuse		Not activated	Off	Activated	On
Diffuse with background suppression		Not activated	Off	Activated	On
Reflex		Not activated	Off	Activated	On
Polarised reflex		Not activated	Off	Activated	On
Thru-beam		Not activated	Off	Activated	On

Output signal time delay

- Certain sensor models (XUK, XUX and XUD) incorporate a time delay output.
- These time delays enable simple automation systems to be established.
- There are three types of time delay:
  - Time delay on beam make (ON delay).
  - Time delay on beam break (OFF delay).
  - Monostable (one shot).

Photo-electric sensors
OsiSense XU

Connections



All our sensors are available either in pre-cabled version (except XUX; screw terminal with cable gland version) or connector version.
The connectors used are:

M12 (4-pin)

M8 (4-pin)

1/2" 20UNF (3-pin)

■ **Types of connection**

1 *Factory fitted moulded cable: good protection against splashing liquids.*
2 *Connector: easy installation and maintenance.*
3 *Screw terminals: flexibility, cable runs to required length.*

■ **Wiring advice**

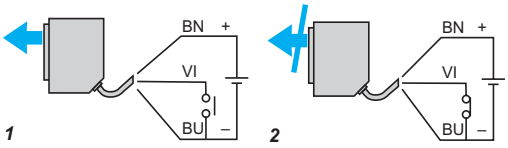
□ Length of cable: no limitation up to 200 m or up to a line capacitance of < 0.1 µF (characteristics of sensors remain unaffected). In this case, it is important to take into account the voltage drop on the line.

□ Separation of control and power circuit wiring: the sensors are immune to electrical interference encountered in normal industrial conditions. Where extreme conditions of electrical "noise" could occur (motors etc.), it is advisable to protect against transients in the normal way:
- suppress interference at source and filter the power supply,
- separate power and control wiring from each other,
- ensure the HF equipotentiality of the site,
- limit the length of cable,
- connect the sensor with supply switched off.

□ Dust and damp protection of connections: the level of dust and damp protection depends on how carefully the cable glands or connectors are tightened. To efficiently protect the sensors from dust and damp, select the correct diameter cable for the cable gland used.

Cable gland	Diameter of cable	
	Minimum	Maximum
9P	6	8
11P	8	10
13P	10	12
ISO 16	7	10
ISO 20	10	12

Complementary functions



Diagnostics, beam break test

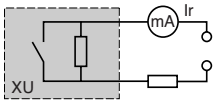
A test input enables the transmitted beam to be broken in order to verify that the output of the sensor changes state.
Fault diagnostics regarding correct operation of the sensor can therefore be carried out.

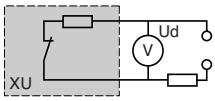
1 *Beam made*
2 *Beam broken*
VI: test input for breaking transmitted beam.

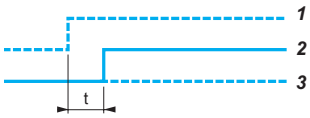
Verification of correct operation

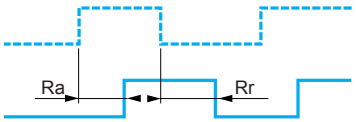
In the event of dirty lenses (reflectors), an excessively polluted atmosphere or a slight disturbance of optical alignment (mechanical impact on support), the level of light energy received by the sensor will decrease until it ceases to operate.
To overcome this problem, all our products incorporate:
- a red alarm LED,
- an alarm output, for connection in the automation system, to warn the operator that the operation of the sensor is stable but close to its limits (applies to sensors XUK, XUX, XUD).

Specific aspects of electronic sensors









Terminology

Residual current (Ir)
- The residual current (Ir) corresponds to the current flowing through the sensor when in the "open" state.
- Characteristic of 2-wire type sensors.

Voltage drop (Ud)
- The voltage drop (Ud) corresponds to the voltage drop at the sensor's terminals when in the "closed" state (value measured at nominal current rating of sensor).
- Characteristic of 2-wire type proximity sensors.

First-up delay
The first-up delay corresponds to the time (t) between the connection of the power supply to the sensor and its fully operational state.
1 *Supply voltage U on*
2 *Sensor operational at state 1*
3 *Sensor at state 0*

Response time
- Response time (Ra): the time delay between the object to be detected entering the sensor's operating zone and the subsequent change of output state. This parameter limits the speed and size of the object.
- Recovery time (Rr): the time delay between an object to be detected leaving the sensor's operating zone and the subsequent change of output state. This parameter limits the interval between successive objects.

Power supplies

Sensors for AC circuits (∿ and ≂ models)
Check that the voltage limits of the sensor are compatible with the nominal voltage of the AC supply used.

Sensors for DC circuits (⎓ models)
- DC source: check that the voltage limits of the sensor and the acceptable level of ripple are compatible with the supply used.
- AC source (comprising transformer, rectifier, smoothing capacitor): the supply voltage must be within the operating limits specified for the sensor.
- Where the voltage is derived from a single-phase AC supply, the voltage must be rectified and smoothed to ensure that:

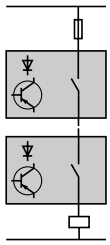
- the peak voltage of the DC supply is lower than the maximum voltage rating of the sensor.
Peak voltage = nominal voltage x $\sqrt{2}$
- the minimum voltage of the supply is greater than the minimum voltage rating of the sensor, given that:
$\Delta V = (I \times t)/C$
ΔV = max. ripple: 10% (V),
I = anticipated load current (mA),
t = period of 1 cycle (10 ms full-wave rectified for a 50 Hz supply frequency),
C = capacitance (µF).

- As a general rule, use a transformer with a lower secondary voltage (Ue) than the required DC voltage (U).

Example: ∿ 18 V to obtain ⎓ 24 V, ∿ 36 V to obtain ⎓ 48 V. Fit a smoothing capacitor of 400 µF minimum per sensor, or 2000 µF minimum per Ampere required.

Photo-electric sensors
OsiSense XU

Setting-up

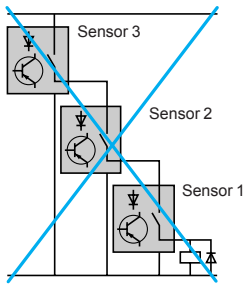


Connection in series

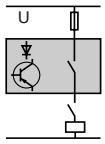
2-wire type sensors
- The following points should be taken into account:
- Series wiring is only possible using sensors with wide voltage limits.
  Based on the assumption that each sensor has the same residual current value, each sensor, in the open state, will share the supply voltage, i.e.

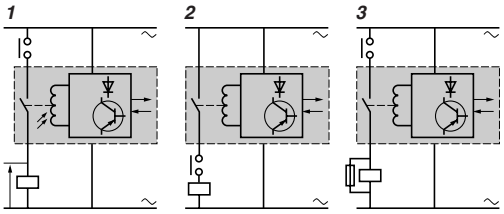
$$U\ sensor = \frac{U\ supply}{n\ sensors}.$$

U sensor and U supply must remain within the sensor's voltage limits.
- If only one sensor in the circuit is in the open state, it will be supplied at a voltage almost equal to the supply voltage.
- When in the closed state, a small voltage drop is present across each sensor. The resultant loss of voltage at the load will be the sum of the individual voltage drops and therefore, the load voltage should be selected accordingly.



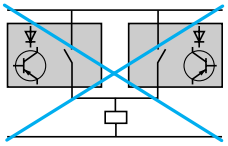
3-wire type sensors
This connection method is not recommended.
- Correct operation of the sensors cannot be assured and, if this method is used, tests should be made before installation.
- The following points should be taken into account:
- The first sensor carries the load current in addition to the no-load current consumption values of the other sensors connected in series. For certain models, this connection method is not possible unless a current limiting resistor is used.
- When in the closed state, a small voltage drop is present across each sensor. The load should therefore be selected accordingly.
- As sensor 1 closes, sensor 2 does not operate until a certain time (t) has elapsed (corresponding to the first-up delay) and likewise for the following sensors in the sequence.
- The use of "flywheel" diodes is recommended when an inductive load is being switched.



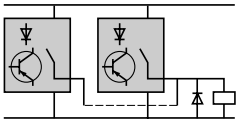


Wiring sensors to devices with mechanical contact
2 and 3-wire type sensors
- The following points should be taken into account:
- When the mechanical contact is open, the sensor is not supplied.
- When the contact closes, the sensor does not operate until a certain time (t) has elapsed (corresponding to the first-up delay).
- In scheme ***1***, as the external contact opens, the voltage transient caused by the breaking of the inductive load will appear inside the sensor and, if greater than the recommended max. insulation voltage, may cause a "flashover" within the sensor.
- The return path of this voltage will be back to one line of the supply, through the sensor, and should "flashover" occur anywhere on the printed circuit board, severe damage could occur.
- It is therefore recommended to use schemes ***2*** or ***3***.

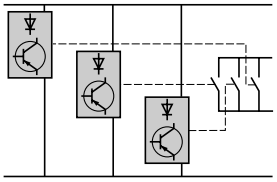
Connection in parallel



2-wire type sensors
This connection method is not recommended.
- Should one of the sensors be in the closed state, the sensor in parallel will be "shorted-out" and no longer supplied. As the first sensor passes into the open state, the second sensor will become energised and will be subject to its first-up delay.
- This configuration is only permissible where the sensors will be working alternately.
- This method of connection can lead to irreversible damage of the units.

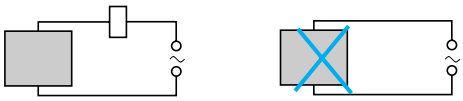


3-wire type sensors
- No specific restrictions. The use of "flywheel" diodes is recommended when an inductive load (relay) is being switched.



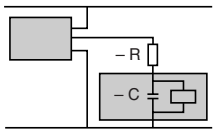
Wiring sensors to devices with mechanical contact
2 and 3-wire type sensors
- No specific restrictions.
- For these sensors, the supply and output circuits are electrically separate.
- The sensor/relay contact galvanic isolation is 1500 to 2500 V, depending on the model.
- The maximum voltage, depending on the model, across each contact is ∼ 250 V.

Setting-up precautions *(continued)*



AC supply

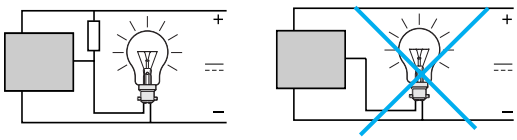
- **2-wire type sensors cannot be connected directly to an AC supply.**
- This would result in immediate destruction of the sensor and considerable danger to the user.
- An appropriate load (refer to the instruction sheet supplied with the sensor) must always be connected in series with the sensor.



Capacitive load (C > 0.1 µF)

- On power-up, it is necessary to limit (by resistor) the charging current of the capacitive load C.
- The voltage drop in the sensor can also be taken into account by subtracting it from the supply voltage for the calculation of R.

$$R = \frac{U\ (\text{supply})}{I\ \text{max. (sensor)}}$$



Load comprising an incandescent lamp

- If the load comprises an incandescent lamp, the cold state resistance can be 10 times lower than the hot state resistance. This can cause very high current levels on switching. Fit a pre-heat resistor in parallel with the sensor.

$$R = \frac{U^2}{P} \times 10$$, U = supply voltage and P = lamp power

Fast trouble shooting guide

Problem	Possible causes	Remedy
The sensor's output will not change state when an object enters the operating zone	On multimode sensor: setting-up error (detection mode programming)	■ Use the detection mode display option. After a RESET, follow the environment teach mode procedure.
	Output stage faulty or complete failure of the sensor (in either case, the sensor must be replaced), or the short-circuit protection has tripped.	■ Check that the sensor is compatible with the supply being used. ■ Check the load current characteristics: □ if load current I ≥ maximum switching capacity, an auxiliary relay, of the CAD N type for example, should be interposed between the sensor and the load. □ if I ≤ maximum switching capacity, check or wiring faults (short-circuit). ■ In all cases, a 0.4 A "quick-blow" fuse should be fitted in series with the sensor.
	Wiring error	■ Check that the wiring conforms to the wiring shown on the sensor label or instruction sheet.
	Supply fault	■ Check that the sensor is compatible with the supply (∿ or ⎓). ■ Check that the supply voltage is within the voltage limits of the sensor. Remember that with a rectified, smoothed supply, ■ (U peak = U nominal x $\sqrt{2}$ with a ripple voltage of ≤ 10%).
	With a reflex system: incorrect use or poor state of reflector	■ The reflex system must operate in conjunction with a reflector. Adhere to the operating distances and check the alignment between the sensor and the reflector. ■ Replace the reflector if it has been damaged. ■ Clean the reflector and sensor lenses.
	Influence of ambient light	■ Make sure that the sensor is not dazzled by stray light (neon, sun, oven, etc.). ■ Fit a lens hood or turn the sensor.
False or erratic operation, with or without the presence of an object in the operating zone	On multimode sensor: setting-up error (detection mode programming)	■ Use the detection mode display option. After a RESET, follow the environment teach mode procedure.
	Influence of background or surface condition of the object to be detected (stray reflections)	■ Refer to the instruction sheet supplied with the sensor. For sensors with adjustable sensitivity, reduce or increase the sensing distance.
	Operating distance poorly defined for the reflector or object to be detected	■ Apply the correction coefficients. ■ Realign the system. ■ Clean the sensor lenses and reflector, or, if damaged, replace it.
	Influence of immediate environment	■ Check the cleanliness of the lenses and reflector. ■ Fit a lens hood, where required.
	Influence of transient interference on the supply lines	■ Ensure that any DC supplies, when derived from rectified AC, are correctly smoothed (C > 400 µF). ■ Separate AC power cables from low-level DC cables (⎓ 24 V low level). ■ Where very long distances are involved, use suitable cable: screened and twisted pairs of the correct cross-sectional area.
	Equipment prone to emitting electromagnetic interference	■ Position the sensors as far away as possible from any sources of interference.
	Response time of the sensor too slow for the particular object being detected	■ Check the suitability of the sensor for the position or shape of the object to be detected. ■ If necessary, select a sensor with a higher switching frequency.
	Influence of high temperature	■ Eliminate sources of radiated heat or protect the sensor casing with a heat shield. ■ Realign, having adjusted the temperature around the fixing support.
	Influence of ambient light	■ Make sure that the sensor is not disrupted by a intermittent source of light (flashing light, rotating mirror beacon, hinged mirror, reflective door, etc.). ■ Fit a lens hood or turn the sensor.

Fast troubleshooting guide *(continued)*

Problem	Possible causes	Remedy
No detection following a period of service	Vibration, shock	■ Realign the system ■ Replace the support or protect the sensor.
	Deterioration of relay contact	■ On an inductive load, use an RC suppressor connected in parallel with the load. ■ To eliminate contact contamination, the minimum current recommended is 15 mA. ■ Relay output models are not recommended for fast counting of objects since their service life is too short. Use models with a solid-state output.
	Dusty atmosphere	■ Clean the lenses and reflector with a soft cloth.

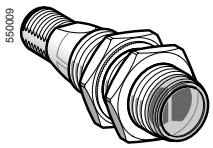
Notes:

- **Sensors with a test input** enable automatic verification of their correct operation.
- **Sensors with an alarm output** enable the operator to be informed, for preventive maintenance purposes, that the operating limits of sensors have been reached (dirty etc.).

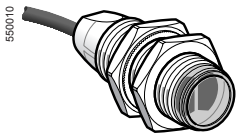
Photo-electric sensors

OsiSense XU, single mode function

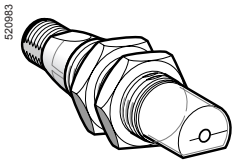
Design 18, plastic
Three-wire DC, solid-state output


550009

XUB●A●●NM12


550010

XUB●A●●NL2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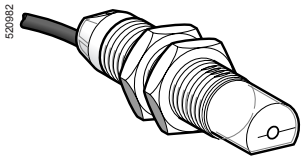
XUB●A●●WM12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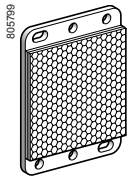
XUB●A●●WL2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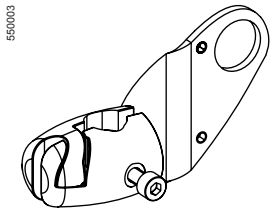
XUZC50

520312

XUZ2001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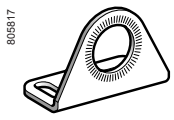
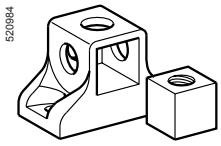
XUZB2003


805817

XUZA118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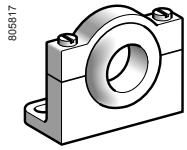
XUZ2003


805817

XUZA218

Connector

Sensing distance (Sn) m	Function	Output	Line of sight	Reference	Weight kg
Diffuse system					
0.1	NO	PNP	Along case axis	**XUB4APANM12**	0.040
			90° to case axis	**XUB4APAWM12**	0.040
		NPN	Along case axis	**XUB4ANANM12**	0.040
			90° to case axis	**XUB4ANAWM12**	0.040
	NC	PNP	Along case axis	**XUB4APBNM12**	0.040
			90° to case axis	**XUB4APBWM12**	0.040
		NPN	Along case axis	**XUB4ANBNM12**	0.040
			90° to case axis	**XUB4ANBWM12**	0.040
Diffuse system with adjustable sensitivity					
0.6	NO	PNP	Along case axis	**XUB5APANM12**	0.045
			90° to case axis	**XUB5APAWM12**	0.050
		NPN	Along case axis	**XUB5ANANM12**	0.045
			90° to case axis	**XUB5ANAWM12**	0.050
	NC	PNP	Along case axis	**XUB5APBNM12**	0.045
			90° to case axis	**XUB5APBWM12**	0.050
		NPN	Along case axis	**XUB5ANBNM12**	0.045
			90° to case axis	**XUB5ANBWM12**	0.050
Polarised reflex system					
2	NO	PNP	Along case axis	**XUB9APANM12**	0.040
			90° to case axis	**XUB9APAWM12**	0.040
		NPN	Along case axis	**XUB9ANANM12**	0.040
			90° to case axis	**XUB9ANAWM12**	0.040
	NC	PNP	Along case axis	**XUB9APBNM12**	0.040
			90° to case axis	**XUB9APBWM12**	0.040
		NPN	Along case axis	**XUB9ANBNM12**	0.040
			90° to case axis	**XUB9ANBWM12**	0.040
Reflector 50 x 50 mm	–	–	–	**XUZC50**	0.020
Reflex system					
4	NO	PNP	Along case axis	**XUB1APANM12**	0.040
			90° to case axis	**XUB1APAWM12**	0.040
		NPN	Along case axis	**XUB1ANANM12**	0.040
			90° to case axis	**XUB1ANAWM12**	0.040
	NC	PNP	Along case axis	**XUB1APBNM12**	0.040
			90° to case axis	**XUB1APBWM12**	0.040
		NPN	Along case axis	**XUB1ANBNM12**	0.040
			90° to case axis	**XUB1ANBWM12**	0.040
Reflector 50 x 50 mm	–	–	–	**XUZC50**	0.020
Thru-beam system					
Transmitter **15**	–	–	Along case axis	**XUB2AKSNM12T**	0.040
			90° to case axis	**XUB2AKSWM12T**	0.040
Receiver **15**	NO	PNP	Along case axis	**XUB2APANM12R**	0.040
			90° to case axis	**XUB2APAWM12R**	0.040
		NPN	Along case axis	**XUB2ANANM12R**	0.040
			90° to case axis	**XUB2ANAWM12R**	0.040
	NC	PNP	Along case axis	**XUB2APBNM12R**	0.040
			90° to case axis	**XUB2APBWM12R**	0.040
		NPN	Along case axis	**XUB2ANBNM12R**	0.040
			90° to case axis	**XUB2ANBWM12R**	0.040

Fixing accessories *(1)*

Description	Reference	Weight kg
3D fixing kit for use on M12 rod, for XUB or XUZC50	**XUZB2003**	0.170
M12 rod	**XUZ2001**	0.050
Support for M12 rod	**XUZ2003**	0.150
Stainless steel fixing bracket	**XUZA118**	0.045
Plastic fixing bracket with adjustable ball-joint	**XUZA218**	0.035

Pre-cabled

For a pre-cabled sensor, replace **M12** by **L2** for a 2 m long cable, or by **L5** for a 5 m long cable.
Example: **XUB1APANM12** becomes **XUB1APANL2** for a 2 m long cable and **XUB1APANL5** for a 5 m long cable.
For availability, please consult our Customer Care Centre.

(1) For further information, see page 5/158.

Photo-electric sensors

OsiSense XU, single mode function

Design 18, plastic
Three-wire DC, solid-state output

Characteristics

Sensor type			XUB1, XUB2, XUB4, XUB5, XUB9	XUB1, XUB2, XUB4, XUB5, XUB9
Product certifications			UL, CSA, CE	
Connection	Connector		M12	–
	Pre-cabled		–	Length: 2 m
Sensing distance nominal Sn / (excess gain = 2)	**maximum** (excess gain = 1)	m	**0.1 / 0.15 diffuse**	
		m	**0.6 / 0.8 diffuse with adjustable sensitivity**	
		m	**2 / 3 polarised reflex**	
		m	**4 / 5.5 reflex**	
		m	**15 / 20 thru-beam**	
Type of transmission			Infrared, except polarised reflex (red)	
Degree of protection	Conforming to IEC 60529		IP 65, IP 67, double insulation ⧈	
	Conforming to DIN 40050		IP 69K for connector versions	
Storage temperature		°C	- 40…+ 70	
Operating temperature		°C	- 25…+ 55	
Materials	Case		PBT	
	Lens		PMMA	
	Cable		–	PvR
Vibration resistance	Conforming to IEC 60068-2-6		7 gn, amplitude ± 1.5 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27		30 gn, duration 11 ms	
Indicator lights	Output state		Yellow LED (except for **XUB2●●●●●●T**)	
	Supply on		Green LED (only for **XUB2●●●●●●T**)	
Rated supply voltage		V	⎓ 12…24 with protection against reverse polarity	
Voltage limits (including ripple)		V	⎓ 10…36	
Current consumption, no-load		mA	35	
Switching capacity		mA	≤ 100 with overload and short-circuit protection	
Voltage drop, closed state		V	1.5	
Maximum switching frequency		Hz	500	
Delays	First-up	ms	< 15	
	Response	ms	< 1	
	Recovery	ms	< 1	

Wiring schemes

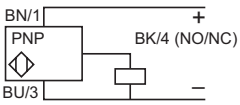
M12 connector

3 (-)
1 (+)
4 OUT/Output
2 Beam break input *(1)*

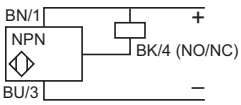
Pre-cabled

(-) BU (Blue)
(+) BN (Brown)
(OUT/Output) BK (Black)
Beam break input *(1)*
VI (Violet)

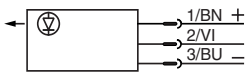
PNP



NPN



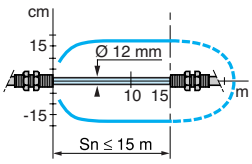
Transmitter



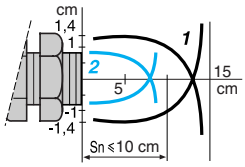
Input 2/VI:
- not connected: *beam made*
- connected to –: *beam broken*

Detection curves

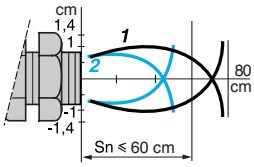
Thru-beam system



Diffuse system

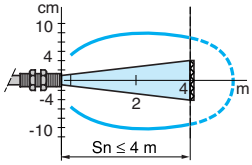


Diffuse system with adjustable sensitivity



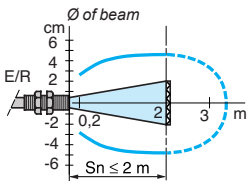
*Object 10 x 10 cm; **1** White 90%; **2** Grey 18%*

Reflex system



With reflector XUZC50

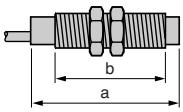
Polarised reflex system



With reflector XUZC50

Dimensions

XUB



	Pre-cabled (mm) a	Pre-cabled (mm) b	Connector (mm) a	Connector (mm) b
Ø 18, line of sight along case axis	46 (2)	28	60 *(1)*	28
Ø 18, line of sight 90° to case axis	62	28	76	28
Ø 18, line of sight along case axis **XUB5**	62	44	76	44
Ø 18, line of sight 90° to case axis **XUB5**	78	44	92	44

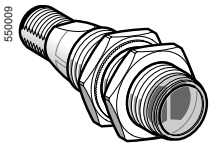
(1) Beam break input on thru-beam transmitter only.
*(2) For **XUB9●●●●●●** (polarised reflex) 46 becomes 48 mm and 60 becomes 62 mm.*

Photo-electric sensors

OsiSense XU, single mode function

Design 18, metal

Three-wire DC, solid-state output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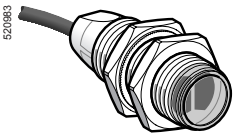
XUB●B●●NM12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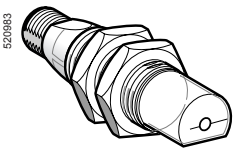
XUB●B●●NL2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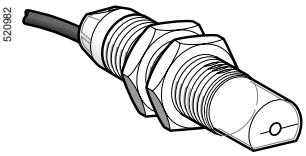
XUB●B●●WM12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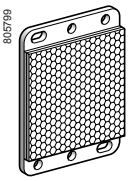
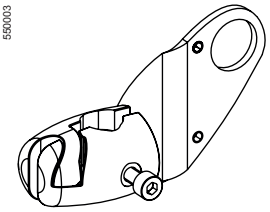
XUB●B●●WL2


805799

XUZC50

520312

XUZ2001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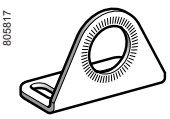
XUZB2003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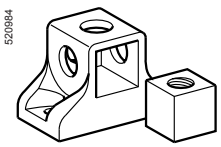
XUZA118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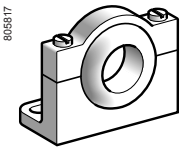
XUZ2003


805817

XUZA218

Connector

Sensing distance (Sn) m	Function	Output	Line of sight	Reference	Weight kg
Diffuse system					
0.1	NO	PNP	Along case axis	**XUB4BPANM12**	0.050
			90° to case axis	**XUB4BPAWM12**	0.050
		NPN	Along case axis	**XUB4BNANM12**	0.050
			90° to case axis	**XUB4BNAWM12**	0.050
	NC	PNP	Along case axis	**XUB4BPBNM12**	0.050
			90° to case axis	**XUB4BPBWM12**	0.050
		NPN	Along case axis	**XUB4BNBNM12**	0.050
			90° to case axis	**XUB4BNBWM12**	0.050
Diffuse system with adjustable sensitivity					
0.6	NO	PNP	Along case axis	**XUB5BPANM12**	0.055
			90° to case axis	**XUB5BPAWM12**	0.060
		NPN	Along case axis	**XUB5BNANM12**	0.055
			90° to case axis	**XUB5BNAWM12**	0.060
	NC	PNP	Along case axis	**XUB5BPBNM12**	0.055
			90° to case axis	**XUB5BPBWM12**	0.060
		NPN	Along case axis	**XUB5BNBNM12**	0.055
			90° to case axis	**XUB5BNBWM12**	0.060
Polarised reflex system					
2	NO	PNP	Along case axis	**XUB9BPANM12**	0.050
			90° to case axis	**XUB9BPAWM12**	0.050
		NPN	Along case axis	**XUB9BNANM12**	0.050
			90° to case axis	**XUB9BNAWM12**	0.050
	NC	PNP	Along case axis	**XUB9BPBNM12**	0.050
			90° to case axis	**XUB9BPBWM12**	0.050
		NPN	Along case axis	**XUB9BNBNM12**	0.050
			90° to case axis	**XUB9BNBWM12**	0.050
Reflector 50 x 50 mm	–	–	–	**XUZC50**	0.020
Reflex system					
4	NO	PNP	Along case axis	**XUB1BPANM12**	0.050
			90° to case axis	**XUB1BPAWM12**	0.050
		NPN	Along case axis	**XUB1BNANM12**	0.050
			90° to case axis	**XUB1BNAWM12**	0.050
	NC	PNP	Along case axis	**XUB1BPBNM12**	0.050
			90° to case axis	**XUB1BPBWM12**	0.050
		NPN	Along case axis	**XUB1BNBNM12**	0.050
			90° to case axis	**XUB1BNBWM12**	0.050
Reflector 50 x 50 mm	–	–	–	**XUZC50**	0.020
Thru-beam system					
Transmitter 15	–	–	Along case axis	**XUB2BKSNM12T**	0.050
			90° to case axis	**XUB2BKSWM12T**	0.050
Receiver 15	NO	PNP	Along case axis	**XUB2BPANM12R**	0.050
			90° to case axis	**XUB2BPAWM12R**	0.050
		NPN	Along case axis	**XUB2BNANM12R**	0.050
			90° to case axis	**XUB2BNAWM12R**	0.050
	NC	PNP	Along case axis	**XUB2BPBNM12R**	0.050
			90° to case axis	**XUB2BPBWM12R**	0.050
		NPN	Along case axis	**XUB2BNBNM12R**	0.050
			90° to case axis	**XUB2BNBWM12R**	0.050

Fixing accessories *(1)*

Description	Reference	Weight kg
3D fixing kit for use on M12 rod, for XUB or XUZC50	**XUZB2003**	0.170
M12 rod	**XUZ2001**	0.050
Support for M12 rod	**XUZ2003**	0.150
Stainless steel fixing bracket	**XUZA118**	0.045
Plastic fixing bracket with adjustable ball-joint	**XUZA218**	0.035

Pre-cabled

For a pre-cabled sensor, replace **M12** by **L2** for a 2 m long cable, or by **L5** for a 5 m long cable.
Example: **XUB1BPANM12** becomes **XUB1BPANL2** for a 2 m long cable and **XUB1BPANL5** for a 5 m long cable.
For availability, please consult our Customer Care Centre.

(1) For further information, see page 5/158.

Photo-electric sensors

OsiSense XU, single mode function

Design 18, metal
Three-wire DC, solid-state output

Characteristics

Sensor type			XUB1, XUB2, XUB4, XUB5, XUB9	XUB1, XUB2, XUB4, XUB5, XUB9
Product certifications			UL, CSA, CE	
Connection	Connector		M12	–
	Pre-cabled		–	Length: 2 m
Sensing distance nominal Sn / maximum (excess gain = 2) (excess gain = 1)		m	**0.1 / 0.15 diffuse**	
		m	**0.6 / 0.8 diffuse with adjustable sensitivity**	
		m	**2 / 3 polarised reflex**	
		m	**4 / 5.5 reflex**	
		m	**15 / 20 thru-beam**	
Type of transmission			Infrared, except polarised reflex (red)	
Degree of protection	Conforming to IEC 60529		IP 65, IP 67, double insulation ⧈	
	Conforming to DIN 40050		IP 69K for connector versions	
Storage temperature		°C	- 40…+ 70	
Operating temperature		°C	- 25…+ 55	
Materials	Case		Nickel plated brass	
	Lens		PMMA	
	Cable		–	PvR
Vibration resistance	Conforming to IEC 60068-2-6		7 gn, amplitude ± 1.5 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27		30 gn, duration 11 ms	
Indicator lights	Output state		Yellow LED (except for **XUB2●●●●●●T**)	
	Supply on		Green LED (only for **XUB2●●●●●●T**)	
Rated supply voltage		V	⎓ 12…24 with protection against reverse polarity	
Voltage limits (including ripple)		V	⎓ 10…36	
Current consumption, no-load		mA	35	
Switching capacity		mA	≤ 100 with overload and short-circuit protection	
Voltage drop, closed state		V	1.5	
Maximum switching frequency		Hz	500	
Delays	First-up	ms	< 15	
	Response	ms	< 1	
	Recovery	ms	< 1	

Wiring schemes

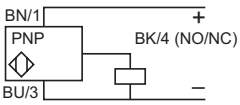
M12 connector

3 (-)
1 (+)
4 OUT/Output
2 Beam break input *(1)*

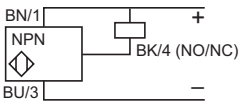
Pre-cabled

(-) BU (Blue)
(+) BN (Brown)
(OUT/Output) BK (Black)
Beam break input *(1)*
VI (Violet)

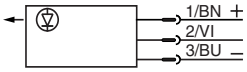
PNP



NPN



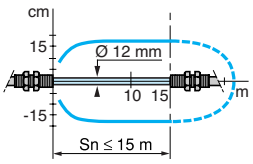
Transmitter



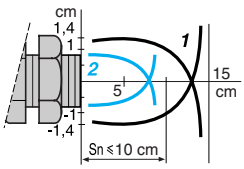
Input 2/VI:
- not connected: *beam made*
- connected to –: *beam broken*

Detection curves

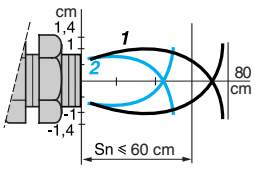
Thru-beam system



Diffuse system

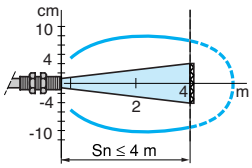


Diffuse system with adjustable sensitivity



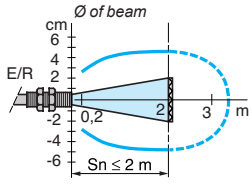
*Object 10 x 10 cm; **1** White 90%; **2** Grey 18%*

Reflex system



With reflector XUZC50

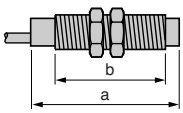
Polarised reflex system



With reflector XUZC50

Dimensions

XUB



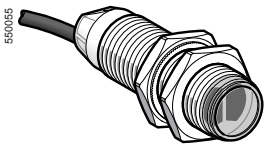
	Pre-cabled (mm) a	Pre-cabled (mm) b	Connector (mm) a	Connector (mm) b
Ø 18, line of sight along case axis	46 (2)	28	60 *(1)*	28
Ø 18, line of sight 90° to case axis	62	28	76	28
Ø 18, line of sight along case axis **XUB5**	62	44	76	44
Ø 18, line of sight 90° to case axis **XUB5**	78	44	92	44

(1) Beam break input on thru-beam transmitter only.
*(2) For **XUB9●●●●●●** (polarised reflex) 46 becomes 48 mm and 60 becomes 62 mm.*

Photo-electric sensors

OsiSense XU multimode

Design 18, metal or plastic
Three-wire DC, solid-state output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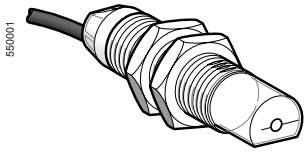
XUB0●●●NL2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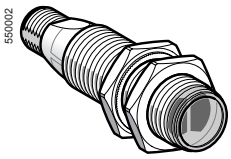
XUB0●●●WL2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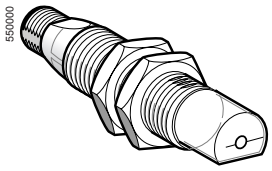
XUB0●●●NM12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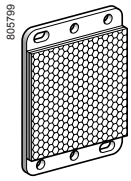
XUB0●●●WM12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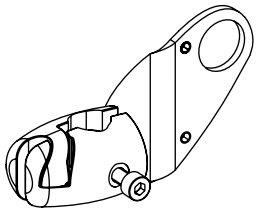
XUZC50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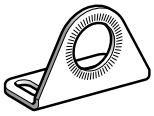
XUZB2003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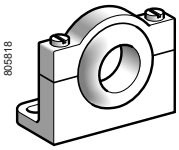
XUZA118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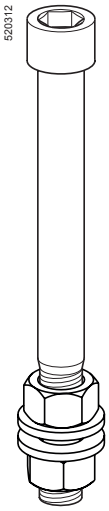
XUZA218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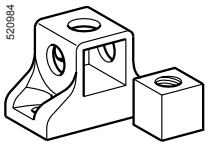
XUZ2001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XUZ2003

Ø 18 metal

Pre-cabled *(1)*

Sensing distance (Sn) *(2)* m	Function	Output	Line of sight	Reference	Weight kg
0...20 depending on whether accessories are used	NO or NC, by programming	PNP	Along case axis	**XUB0BPSNL2**	0.105
			90° to case axis	**XUB0BPSWL2** *(3)*	0.110
		NPN	Along case axis	**XUB0BNSNL2**	0.105
			90° to case axis	**XUB0BNSWL2** *(3)*	0.110

M12 connector

0...20 depending on whether accessories are used	NO or NC, by programming	PNP	Along case axis	**XUB0BPSNM12**	0.055
			90° to case axis	**XUB0BPSWM12** *(3)*	0.060
		NPN	Along case axis	**XUB0BNSNM12**	0.055
			90° to case axis	**XUB0BNSWM12** *(3)*	0.060

Accessories

Description	Connection	Line of sight	Reference	Weight kg
Thru-beam transmitter	Pre-cabled *(1)*	Along case axis	**XUB0BKSNL2T**	0.105
		90° to case axis	**XUB0BKSWL2T** *(3)*	0.110
	M12 connector	Along case axis	**XUB0BKSNM12T**	0.055
		90° to case axis	**XUB0BKSWM12T** *(3)*	0.060
Reflector 50 x 50 mm	–	–	**XUZC50**	0.020

Ø 18 plastic

Pre-cabled *(1)*

Sensing distance (Sn) (3) m	Function	Output	Line of sight	Reference	Weight kg
0...20 depending on whether accessories are used	NO or NC, by programming	PNP	Along case axis	**XUB0APSNL2**	0.095
			90° to case axis	**XUB0APSWL2** *(3)*	0.100
		NPN	Along case axis	**XUB0ANSNL2**	0.095
			90° to case axis	**XUB0ANSWL2** *(3)*	0.100

M12 connector

0...20 depending on whether accessories are used	NO or NC, by programming	PNP	Along case axis	**XUB0APSNM12**	0.045
			90° to case axis	**XUB0APSWM12** *(3)*	0.050
		NPN	Along case axis	**XUB0ANSNM12**	0.045
			90° to case axis	**XUB0ANSWM12** *(3)*	0.050

Accessories

Description	Connection	Line of sight	Reference	Weight kg
Thru-beam transmitter	Pre-cabled *(1)*	Along case axis	**XUB0AKSNL2T**	0.095
		90° to case axis	**XUB0AKSWL2T** *(3)*	0.100
	M12 connector	Along case axis	**XUB0AKSNM12T**	0.045
		90° to case axis	**XUB0AKSWM12T** *(3)*	0.050
Reflector 50 x 50 mm	–	–	**XUZC50**	0.020

Fixing accessories *(4)*

Description	Reference	Weight kg
3D fixing kit for use on M12 rod, for XUB or XUZC50	**XUZB2003**	0.170
M12 rod	**XUZ2001**	0.050
Support for M12 rod	**XUZ2003**	0.150
Stainless steel fixing bracket	**XUZA118**	0.045
Plastic fixing bracket with adjustable ball-joint	**XUZA218**	0.035

*(1) For a 5 m long cable, replace L2 by **L5**.*
*Example: XUB0BPSNL2 becomes **XUB0BPSNL5**.*
For availability, please consult our Customer Care Centre.
(2) For further information, see page 5/33.
(3) For line of sight 90° to case axis versions, see sensing distances on page 5/33.
(4) For further information, see page 5/158.

Photo-electric sensors

OsiSense XU multimode

Design 18, metal or plastic
Three-wire DC, solid-state output

Characteristics

Sensor type			XUB0●●●●M12, XUB0●●●●M12T		XUB0●●●●L2, XUB0●●●●L2T
Product certifications			UL, CSA, CE		
Connection	Connector		M12		–
	Pre-cabled		–		Length: 2 m
Sensing distance nominal Sn / (excess gain = 2)	**maximum** (excess gain = 1)		**Line of sight along case axis**	**Line of sight 90° to case axis**	**Accessory**
		m	**0.12 / 0.12**	**0.11 / 0.11**	**Without (diffuse with background suppression)**
		m	**0.3 / 0.4**	**0.2 / 0.3**	**Without (diffuse)**
		m	**3 / 4**	**1.5 / 2**	**With reflector (polarised reflex)**
		m	**20 / 30**	**7 / 10**	**With thru-beam transmitter (thru-beam)**
Type of transmission			Infrared, except for polarised reflex (red)		
Degree of protection	Conforming to IEC 60529		IP 65, IP 67, double insulation ⧈		
	Conforming to DIN 40050		IP 69K for **XUB0●●●●M12** and **XUB0●●●●M12T**		
Storage temperature		°C	- 40…+ 70		
Operating temperature		°C	- 25…+ 55		
Materials			Case: nickel plated brass for XUB0B or PBT for XUB0A; Lens: PMMA; Cable: PvR		
Vibration resistance	Conforming to IEC 60068-2-6		7 gn, amplitude ± 1.5 mm (f = 10 to 55 Hz)		
Shock resistance	Conforming to IEC 60068-2-27		30 gn, duration 11 ms		
Indicator lights	Output state		Yellow LED (transmission present for **XUB0●●●●●●T**)		
	Supply on		Green LED		
	Optical alignment aid/dirty		Red LED (except for **XUB0●●●●●●T**)		
Rated supply voltage		V	⎓ 12…24 with protection against reverse polarity		
Voltage limits (including ripple)		V	⎓ 10…36		
Current consumption, no-load		mA	35 (20 for **XUB0●●●●●●T**)		
Switching capacity		mA	≤ 100 with overload and short-circuit protection		
Voltage drop, closed state		V	< 1.5		
Maximum switching frequency		Hz	250 (200 for diffuse with background suppression)		
Delays	First-up	ms	< 200		
	Response	ms	< 2 (< 2.5 for diffuse with background suppression)		
	Recovery	ms	< 2 (< 2.5 for diffuse with background suppression)		

Wiring schemes

M12 connector

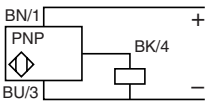
3 (-)
1 (+)
4 OUT/Output
2 Beam break input *(1)*

Pre-cabled

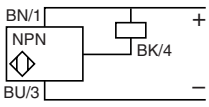
(-) BU (Blue)
(+) BN (Brown)
OUT/Output BK (Black)
Beam break input *(1)*
VI (Violet)

See connection on page 30210/2.

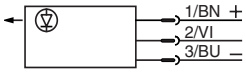
Receiver, PNP output



Receiver, NPN output



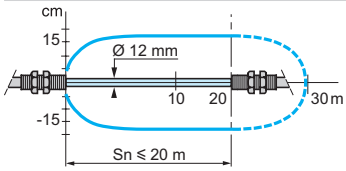
Thru-beam transmitter



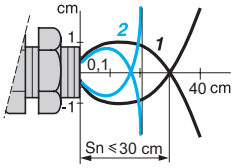
Input 2/VI:
- not connected: *beam made*
- connected to –: *beam broken*

Detection curves (line of sight along case axis)

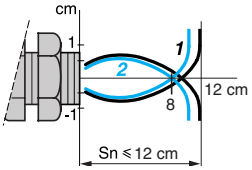
With thru-beam accessory (thru-beam)



Without accessory (diffuse)

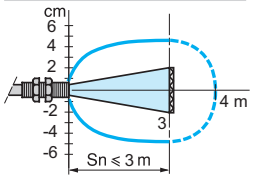


Without accessory (diffuse with background suppression)



*Object: 10 x 10 cm, **1**: white 90%, **2** : grey 18%*

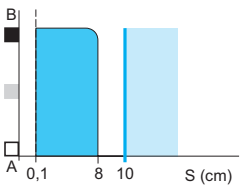
With reflector (polarised reflex)



With reflector XUZC50

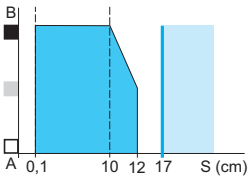
Variation of usable sensing distance Su (without accessory, with adjustable background suppression)

Teach mode at minimum.



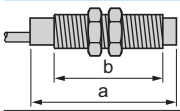
A-B: *object reflection coefficient*
- *Black 6%*
- *Grey 18%*
- *White 90%*
- *Sensing range*
- *Non sensing zone (matt surfaces)*

Teach mode at maximum.



Dimensions

XUB



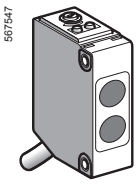
	Pre-cabled (mm)		Connector (mm)	
	a	b	a	b
Ø 18, line of sight along case axis	64 *(2)*	44	78 *(2)*	44
Ø 18, line of sight 90° to case axis	78	44	92	44

(1) Beam break input on thru-beam transmitter only.
*(2) For **XUB0●●●●●●T**, 64 becomes 62 mm and 78 becomes 76 mm.*

Photo-electric sensors

OsiSense XU, general purpose, single mode function

Miniature design, plastic
Three-wire DC, solid-state output
NO/NC configuration switch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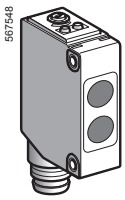
XUM5A●CNL2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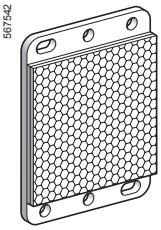
XUM5A●CNM8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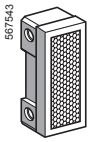
XUZC50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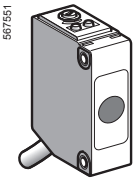
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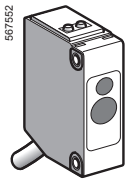
XUM2AKCNL2T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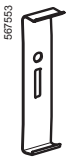
XUM2A●CNL2R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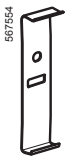
XUZMSV●●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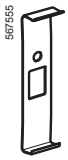
XUZMSH●●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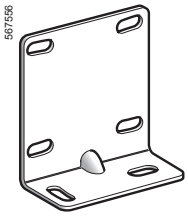
XUZMU01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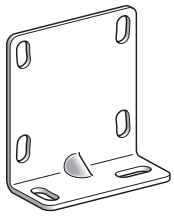
XUZAM01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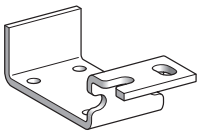
XUZAM04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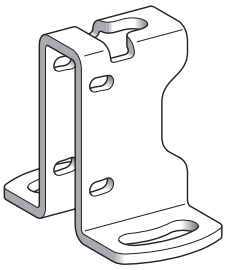
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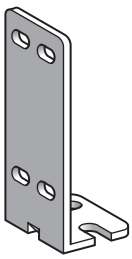
XUZAM02


DF601729
XUZA50

Sensing distance (Sn)	Function	Output	Connection	Reference	Weight kg
Diffuse system with adjustable sensitivity					
1 m	NO/NC, configuration by switch	PNP	Pre-cabled (L = 2 m)	**XUM5APCNL2**	0.063
			M8 connector	**XUM5APCNM8**	0.010
		NPN	Pre-cabled (L = 2 m)	**XUM5ANCNL2**	0.063
			M8 connector	**XUM5ANCNM8**	0.010
Polarised reflex system with adjustable sensitivity					
5 m with reflector XUZC50 **2 m** with reflector XUZC08	NO/NC, configuration by switch	PNP	Pre-cabled (L = 2 m)	**XUM9APCNL2**	0.063
			M8 connector	**XUM9APCNM8**	0.010
	NO/NC, configuration by switch	NPN	Pre-cabled (L = 2 m)	**XUM9ANCNL2**	0.063
			M8 connector	**XUM9ANCNM8**	0.010
Reflectors					
Universal reflector 50 x 50 mm		–	–	**XUZC50**	0.020
Lateral reflector 8.6 x 29.5 mm		–	–	**XUZC08**	0.006
Thru-beam system (transmitter + receiver) with adjustable sensitivity					
15 m	NO/NC, configuration by switch	PNP	Pre-cabled (L = 2 m)	**XUM2APCNL2**	0.119
			M8 connector	**XUM2APCNM8**	0.019
		NPN	Pre-cabled (L = 2 m)	**XUM2ANCNL2**	0.119
			M8 connector	**XUM2ANCNM8**	0.019
Transmitter only					
15 m			Pre-cabled (L = 2 m)	**XUM2AKCNL2T**	0.063
			M8 connector	**XUM2AKCNM8T**	0.010
Receiver only					
15 m	NO/NC, configuration by switch	PNP	Pre-cabled (L = 2 m)	**XUM2APCNL2R**	0.063
			M8 connector	**XUM2APCNM8R**	0.010
		NPN	Pre-cabled (L = 2 m)	**XUM2ANCNL2R**	0.063
			M8 connector	**XUM2ANCNM8R**	0.010

Accessories for thru-beam system

Description	Dimensions mm	Sensing distance m	Reference	Weight kg
Vertical diaphragm Sold in lots of 2	0.5 x 6.4	1.2	**XUZMSV05**	0.002
	1 x 6.4	3	**XUZMSV10**	0.002
	1.5 x 6.4	4	**XUZMSV15**	0.002
	2 x 6.4	5	**XUZMSV20**	0.002
Horizontal diaphragm Sold in lots of 2	0.5 x 6.4	1.2	**XUZMSH05**	0.002
	1 x 6.4	3	**XUZMSH10**	0.002
	1.5 x 6.4	4	**XUZMSH15**	0.002
	2 x 6.4	5	**XUZMSH20**	0.002
Anti-interference filter Sold in lots of 4	–	7	**XUZMU01**	0.006

Fixing accessories

Description	Reference	Weight kg
Base mounting fixing bracket	**XUZAM01**	0.017
Side mounting fixing bracket	**XUZAM04**	0.026
Vertical fixing bracket with protective cover *(1)*	**XUZAM02**	0.062
Horizontal fixing bracket with protective cover *(1)*	**XUZAM03**	0.026
Metal fixing bracket	**XUZA50**	0.025

(1) For pre-cabled version

Photo-electric sensors

OsiSense XU, general purpose, single mode function

Miniature design, plastic
Three-wire DC, solid-state output
NO/NC configuration switch

Characteristics

Sensor type			XUM●A●●●M8	XUM●A●●●L2
Product certifications			CE, cULus, CTick	
Connection	Connector		M8	–
	Pre-cabled		–	Length: 2 m
Nominal sensing distance Sn (excess gain = 2)		m	**1 diffuse with adjustable sensitivity**	
		m	**5 polarised reflex with adjustable sensitivity**	
		m	**15 thru-beam with adjustable sensitivity**	
Type of transmission			Red, except diffuse system (Infrared)	
Degree of protection	Conforming to IEC 60529		IP 65, IP 67	
Storage temperature		°C	- 40…+ 70	
Operating temperature		°C	- 30…+ 60	
Materials	Case		PBT	
	Lens		PMMA	
	Cable		–	PVC (black for transmitter, grey for other versions)
Vibration resistance	Conforming to IEC 60068-2-6		10 to 55 Hz, amplitude ± 1.5 mm, 2 hours in each direction X, Y and Z	
Shock resistance	Conforming to IEC 60068-2-27		500 m/s² 10 x in each direction X, Y and Z	
Indicator lights	Output state		Orange LED (excluding transmitter)	
	Stability		Green LED	
	Transmitter		Orange LED: supply on	
	Receiver		Red LED: light received; green LED: supply on	
Rated supply voltage		V	⎓ 12...24 with protection against reverse polarity	
Voltage limits (including ripple)		V	⎓ 10…30	
Current consumption, no-load		mA	16 for **XUM5**; 13 for **XUM9**; 11 for transmitter **XUM2**; 13 for receiver **XUM2**	
Switching capacity		mA	≤ 100 with overload and short-circuit protection	
Voltage drop, closed state		V	≤ √3	
Maximum switching frequency		Hz	1000	
Delays	First-up	ms	< 100	
	Response	ms	0.5	
	Recovery	ms	0.5	

Wiring schemes

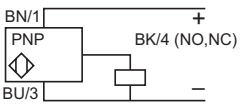
M8 connector

3 (-)
1 (+)
4 OUT/Output

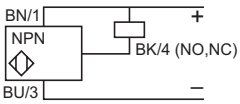
Pre-cabled

(-) BU (Blue)
(+) BN (Brown)
OUT/Output BK (Black)

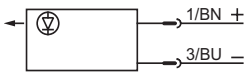
PNP



NPN

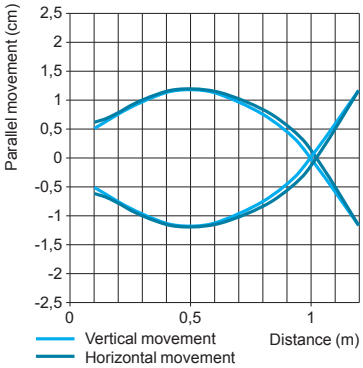


Transmitter ⎓

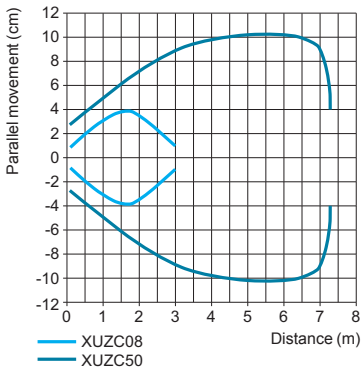


Curves

Diffuse



Polarised reflex



Thru-beam

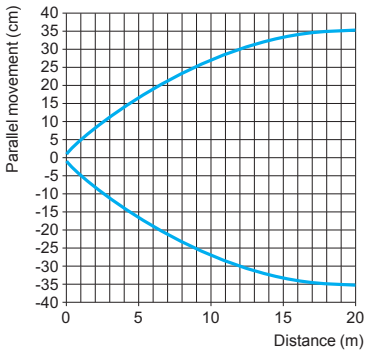


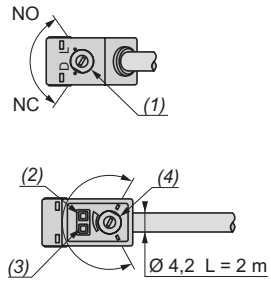
Photo-electric sensors

OsiSense XU, general purpose, single mode function
Miniature design, plastic
Three-wire DC, solid-state output
NO/NC configuration switch

Diffuse system, polarised reflex system

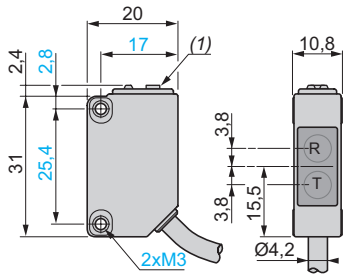
Pre-cabled version

Description - XUM5A●CNL2, XUM9A●CNL2



(1) Configuration switch.
(2) Output state LED.
(3) Stability and power on LED.
(4) Adjustment potentiometer.

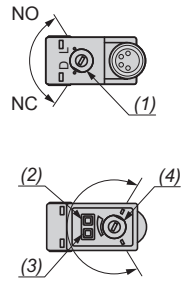
Dimensions - XUM5A●CNL2, XUM9A●CNL2



R: Reception, T: Transmission.
(1) Potentiometer.

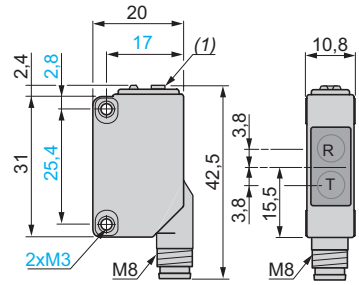
Connector version

Description - XUM5A●CNM8, XUM9A●CNM8



(1) Configuration switch.
(2) Output state LED.
(3) Stability and power on LED.
(4) Adjustment potentiometer.

Dimensions - XUM5A●CNM8, XUM9A●CNM8

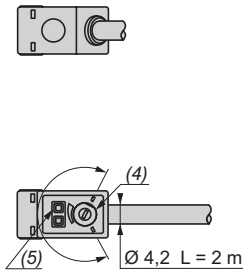


R: Reception, T: Transmission.
(1) Potentiometer.

Thru-beam system

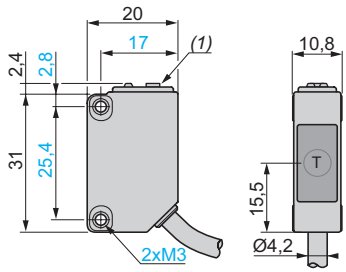
Pre-cabled version

Description - XUM2AKCNL2T



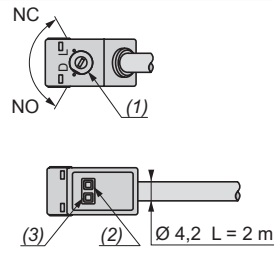
(4) Adjustment potentiometer.
(5) Power on LED.

Dimensions - XUM2AKCNL2T



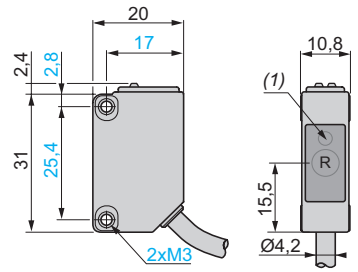
T: Transmission.
(1) Potentiometer.

Description - XUM2A●CNL2R



(1) Configuration switch.
(2) Output state LED.
(3) Stability and power on LED.

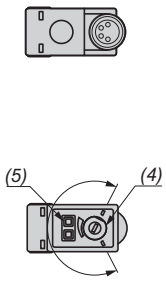
Dimensions - XUM2A●CNL2R



R: Reception.
(1) Output state LED on front face.

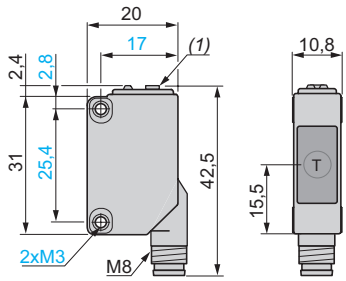
Connector version

Description - XUM2AKCNM8T



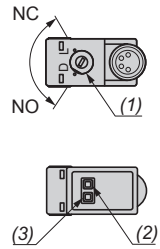
(4) Adjustment potentiometer.
(5) Power on LED.

Dimensions - XUM2AKCNM8T



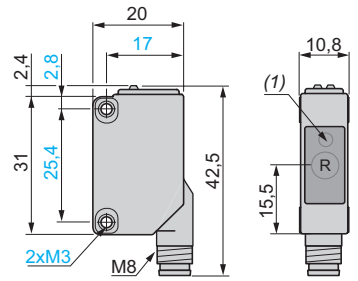
T: Transmission.
(1) Potentiometer.

Description - XUM2A●CNM8R



(1) Configuration switch.
(2) Output state LED.
(3) Stability and power on LED.

Dimensions - XUM2A●CNM8R

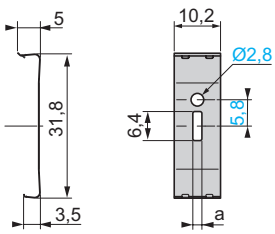


R: Reception.
(1) Output state LED on front face.

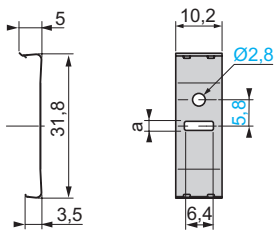
Accessories

Diaphragms

XUZMSV●●



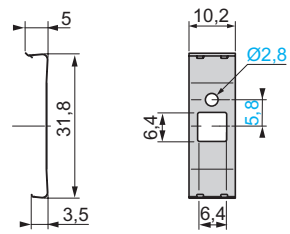
XUZMSH●●



XUZ	a
MSV05	0.5
MSV10	1
MSV15	1.5
MSV20	2
MSH05	0.5
MSH10	1
MSH15	1.5
MSH20	2

Filter

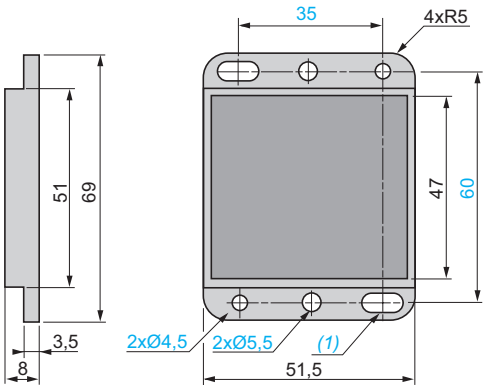
XUZMU01



Accessories

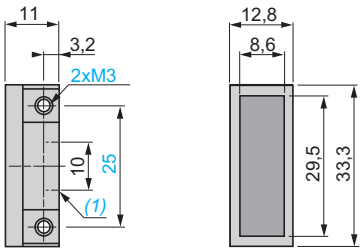
Reflectors

XUZC50



(1) 2 elongated holes Ø 4.5 x 8

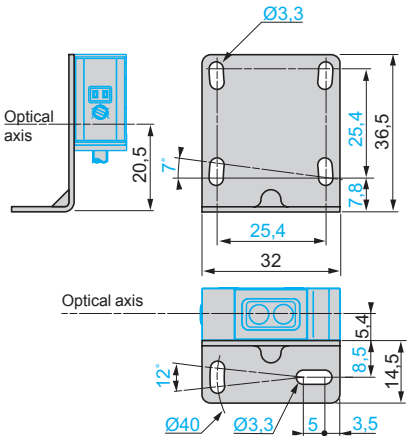
XUZC08



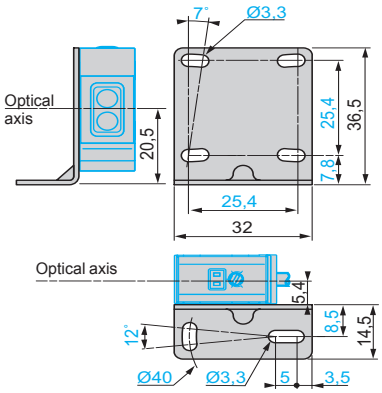
(1) 2 x M3

Fixing brackets

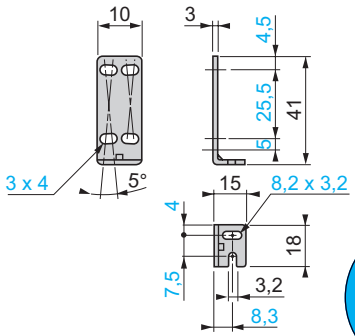
XUZAM04



XUZAM01

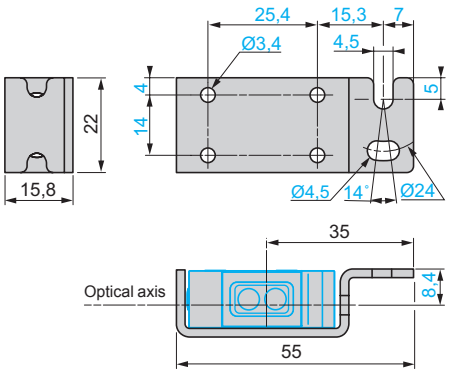


XUZA50



Fixing bracket with protective cover

XUZAM03



XUZAM02

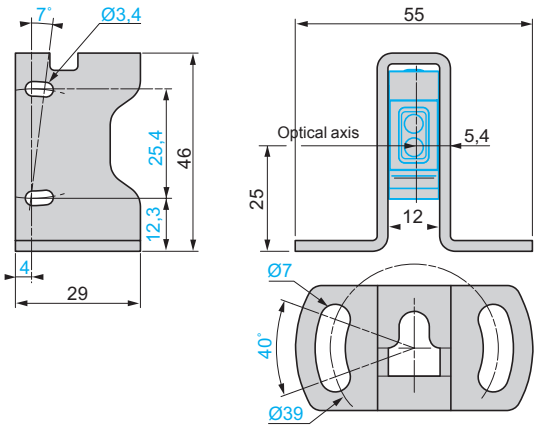
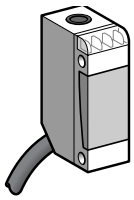


Photo-electric sensors

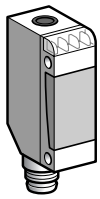
OsiSense XU, general purpose
Multimode function
Miniature design
Three-wire DC, solid-state output

501542_1

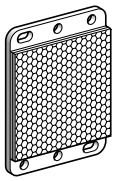


XUM0A●●●L2

501543_1

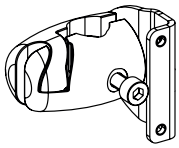


XUM0A●●●M8



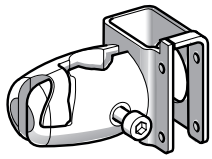
XUZC50

550014



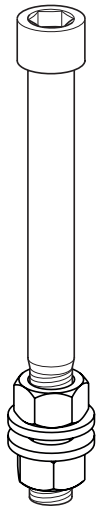
XUZM2003

562213



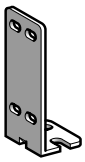
XUZM2004

520312



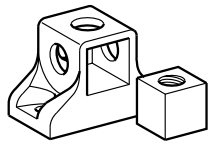
XUZ2001

520960



XUZA50

520984



XUZ2003

Miniature design, DC

Sensing distance (Sn) m	Function	Output	Connection	Reference	Weight kg
0…10 depending on whether accessories are used	NO or NC, by programming	PNP	Pre-cabled (L = 2 m) *(1)*	**XUM0APSAL2**	0.050
			M8 connector	**XUM0APSAM8**	0.035
		NPN	Pre-cabled (L = 2 m) *(1)*	**XUM0ANSAL2**	0.050
			M8 connector	**XUM0ANSAM8**	0.035

Accessories

Description	Connection	Reference	Weight kg
Thru-beam transmitter	Pre-cabled (L = 2 m) *(1)*	**XUM0AKSAL2T**	0.050
	M8 connector	**XUM0AKSAM8T**	0.035
Reflector 50 x 50 mm	–	**XUZC50**	0.020

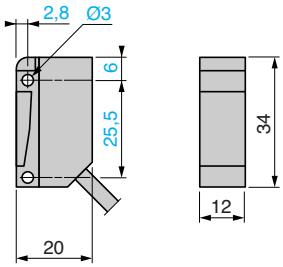
Fixing accessories *(2)*

Description	Reference	Weight kg
3D fixing kit for use on M12 rod, for XUM or XUZC50	**XUZM2003**	0.140
3D fixing kit for use on M12 rod and with protective cover for XUM	**XUZM2004**	0.155
M12 rod	**XUZ2001**	0.050
Support for M12 rod	**XUZ2003**	0.150
Fixing bracket	**XUZA50**	0.025

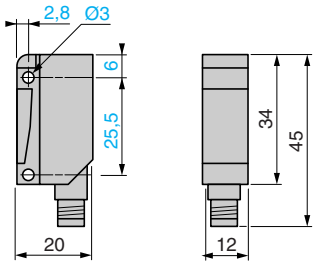
*(1) For a 5 m long cable, replace L2 by **L5**.*
*Example: XUM0APSAL2 becomes **XUM0APSAL5**.*
(2) For further information, see page 5/158.

Dimensions (mm)

XUM0A●●●L2



XUM0A●●●M8



Possible orientation of elbowed connector

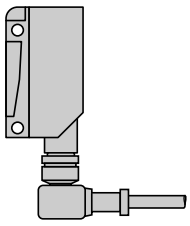


Photo-electric sensors

OsiSense XU, general purpose
Multimode function
Miniature design
Three-wire DC, solid-state output

Characteristics

Sensor type			XUM●●●●●M8	XUM●●●●●L2
Product certifications			UL, CSA, CE	
Connection	Connector		M8	–
	Pre-cabled		–	Length: 2 m
Nominal sensing distance Sn (excess gain = 2)		m	**0.11 / 0.11 without accessory (diffuse with background suppression)**	
		m	**0.4 / 0.55 without accessory (diffuse)**	
		m	**3 / 4 with reflector (polarised reflex)**	
		m	**10 / 14 with transmitter for thru-beam function (thru-beam)**	
Type of transmission			Infrared, except polarised reflex (red)	
Degree of protection	Conforming to IEC 60529		IP 65, IP 67	IP 65, IP 67, double insulation ⧈
Storage temperature		°C	- 40…+ 70	
Operating temperature		°C	- 25…+ 55	
Materials	Case		PBT	
	Lens		PMMA	
	Cable		–	PvR
Vibration resistance	Conforming to IEC 60068-2-6		7 gn, amplitude ± 1.5 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27		30 gn, duration 11 ms	
Indicator lights	Output state		Yellow LED (transmission present for **XUM0●●●●●●T**)	
	Supply on		Green LED	
	Optical alignment aid/dirty		Red LED (except for **XUM0●●●●●●T**)	
Rated supply voltage		V	⎓ 12…24 with protection against reverse polarity	
Voltage limits (including ripple)		V	⎓ 10…30	
Current consumption, no-load		mA	35 (20 for **XUM0●●●●●●T**)	
Switching capacity		mA	≤ 100 with overload and short-circuit protection	
Voltage drop, closed state		V	≤ 1.5	
Maximum switching frequency		Hz	250 (200 for diffuse with background suppression)	
Delays	First-up	ms	< 200	
	Response	ms	< 2 (< 2.5 for diffuse with background suppression)	
	Recovery	ms	< 2 (< 2.5 for diffuse with background suppression)	

Wiring schemes

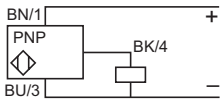
M8 connector

3 (-)
1 (+)
4 OUT/Output
2 Beam break input *(1)*

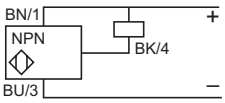
Pre-cabled

(-) BU (Blue)
(+) BN (Brown)
OUT/Output BK (Black)
Beam break input VI (Violet) *(1)*

Receiver, PNP output

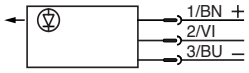


Receiver, NPN output



Thru-beam function transmitter

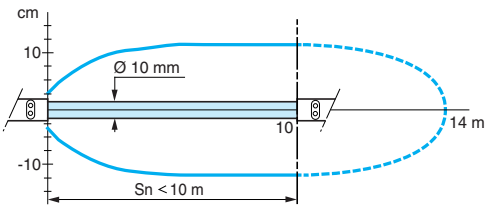
Transmitter



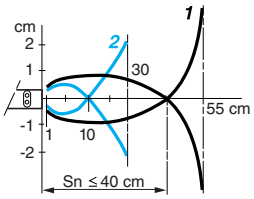
Input 2/VI:
- not connected: *beam made*
- connected to –: *beam broken*

Detection curves

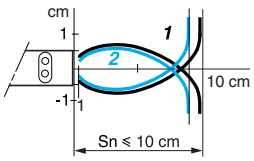
With thru-beam accessory (thru-beam)



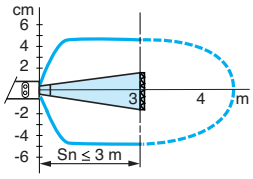
Without accessory (diffuse)



Without accessory (diffuse with background suppression)



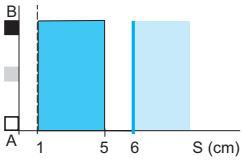
With reflector (polarised reflex)



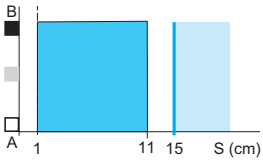
*Object: 10 x 10 cm, **1**: white 90%, **2**: grey 18%*

Variation of usable sensing distance Su (without accessory, with adjustable background suppression)

Teach mode at minimum.



Teach mode at maximum.



A-B: *object reflection coefficient*
- *Black 6%*
- *Grey 18%*
- *White 90%*
- *Sensing range*
- *Non sensing zone (matt surfaces)*

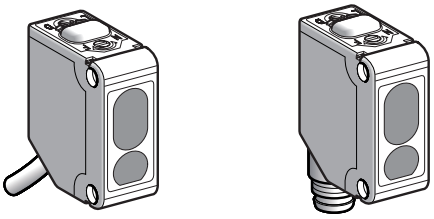
(1) Beam break input on thru-beam transmitter only.

Photo-electric sensors

OsiSense XU, general purpose

With adjustable background and foreground suppression
DC supply. Solid-state output

Compact design



System	**Diffuse with adjustable background and foreground suppression, long sensing distance with high accuracy**
Type of transmission	Red
Nominal sensing distance (Sn)	**20…300 mm**
Differential travel	5% or less of the sensing distance
Adjustment	Potentiometer with 5 turns

References

3-wire	NO or NC programmable function	PNP	NPN	PNP	NPN	PNP
		XUM8APCNL2	**XUM8ANCNL2**	**XUM8APCNM8**	**XUM8ANCNM8**	**XUM8APCNL03M12**
Weight (kg)		0.065	0.065	0.020	0.020	0.035

Characteristics

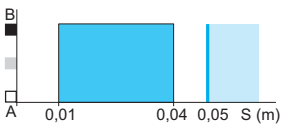
Product certifications		CE, cURus		
Ambient air temperature		For operation: - 25…+ 55°C For storage: - 30…+ 70°C		
Vibration resistance	Conforming to IEC 60068-2-8	20 gn max, amplitude: 3 mm, frequency: 10… 500 Hz		
Shock resistance	Conforming to IEC 60068-2-27	50 gn		
Degree of protection	Conforming to IEC 60529	IP 67		
Material		Case: PBT Lenses: polycarbonate		
Indicator lights	Output state	Orange LED		
	Power on, help with setting	Green LED		
Connection		2 m cable Conductor c.s.a.: 0.2 mm²	M8 4-pin connector	Remote M12 connector, 0.3 m cable Conductor c.s.a.: 0.2 mm²
Rated supply voltage		**12…24 V ⎓ with protection against reverse polarity**		
Voltage limits		10…30 V ⎓ (including ripple)		
Switching capacity		**≤ 100 mA with overload and short-circuit protection**		
Immunity to ambient light	Natural light	3000 lux		
	Incandescent bulb	3000 lux		
Voltage drop, closed state		< 2 V		
Current consumption		≤ 20 mA		
Response time		≤ 1 ms		

Function table	Function	Diffuse system	
		No object present in the beam	**Object present in the beam**
State of output (PNP or NPN) and orange LED (illuminated when sensor output is ON)	NO (position L)		
	NC (position D)		

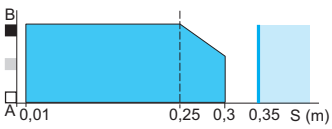
Detection curves

Variation of usable sensing distance

Minimum setting



Maximum setting



A-B: Object reflection coefficient

- Black 6%
- Grey 18%
- White 90%

- Sensing range
- Non sensing zone (Matt surfaces)

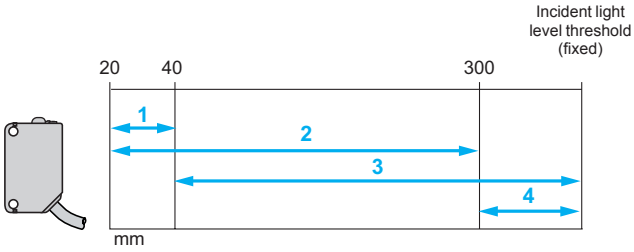
Photo-electric sensors

OsiSense XU, general purpose

With adjustable background and foreground suppression
DC supply. Solid-state output

Detection curves

Adjustment ranges in background or foreground suppression mode



1 Background suppression (on minimum setting)
2 Background suppression (on maximum setting)
3 Foreground suppression (on minimum setting)
4 Foreground suppression (on maximum setting)

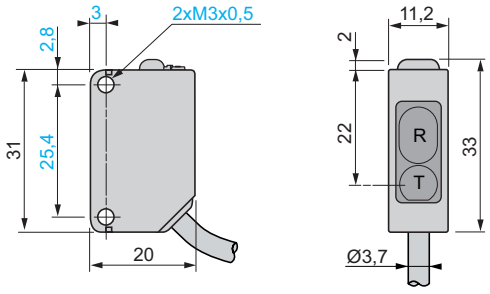
Adjustment in background or foreground suppression mode

Cabling of pink wire determines the detection mode:
- Background detection mode, pink wire not connected to 0 V (blue wire)
- Foreground detection mode, pink wire connected to +V (brown wire)

Function	Cabling	Application
Background suppression	Pink wire to 0 V	To detect the object when it is detached from the background.
Foreground suppression	Pink wire to +V	To detect the object when it is in contact with the background or to suppress a foreground.

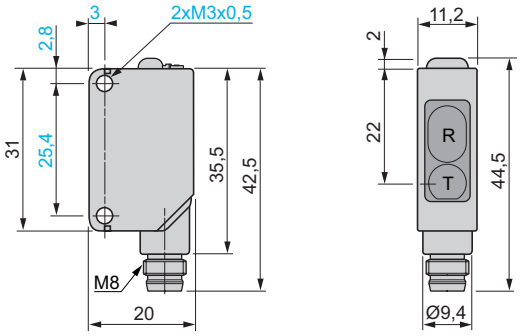
Dimensions

XUM8APCNL2, XUM8ANCNL2 and XUM8APCNL03M12

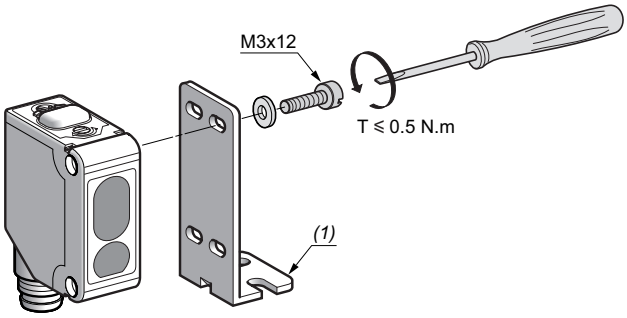


R: Reception, T: Transmission

XUM8APCNM8 and XUM8ANCNM8

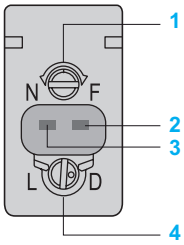


Mounting



*(1) **XUZA50**, **XUZAM02** or **XUZAM03** metal bracket (see pages 5/34 and 5/38).*

Functions

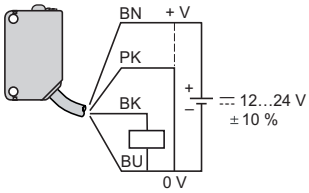


1 Remote adjustment potentiometer (5 turns).
2 Operation indicator (orange)
The LED is lit when the detection output has been activated.
3 Power ON and stability indicator (green)
The LED is lit in stable light or dark conditions.
4 NO/NC operating mode selector switch.

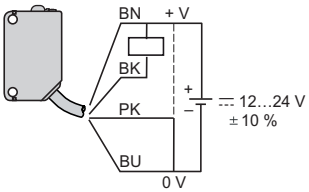
Selector switch	Function	Description
L D	NO (position L)	The NO output is activated when the selector switch is turned fully clockwise.
L D	NC (position D)	The NC output is activated when the selector switch is turned fully anticlockwise.

Wiring schemes (3-wire ⎓)

PNP output



NPN output



***Note**: These schemes are represented in "background suppression" mode, cabling of pink (PK) wire to 0 V.*

Cable connections

XUM8A●CNL2

(–) BU (Blue)
(+) BN (Brown)
(OUT) BK (Black)
(MODE) PK (Pink)

Connector schemes

XUM8A●CNM8

M8 connector

3 (–)
1 (+)
4 Output
2 Mode/Input

XUM8APCNL03M12

M12 connector

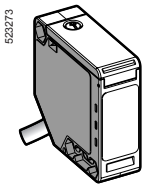
3 (–)
1 (+)
4 Output
2 Mode/Input

Please refer to our "Cabling accessories OsiSense XZ" catalogue.

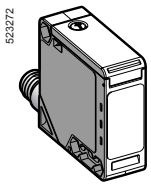
Photo-electric sensors

OsiSense XU, general purpose, single mode function

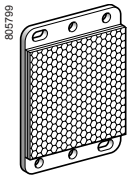
Compact design, 50 x 50
Five-wire AC or DC, 1 CO relay output
Three-wire DC, solid-state output


523273

XUK●A●●●L2


523272

XUK●A●●●M12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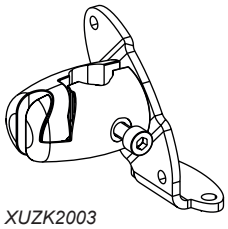
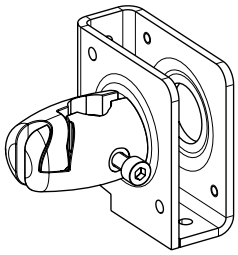
XUZC50

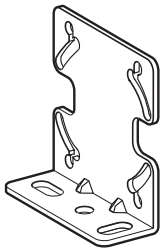


XUZK2003

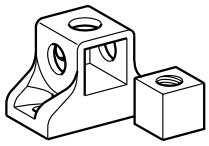


XUZK2004

XUZ2001



XUZA51



XUZ2003

Sensing distance (Sn) m	Function	Output	Connection	Reference	Weight kg
Diffuse system with adjustable sensitivity					
DC					
1	NO	PNP	Pre-cabled (L = 2 m) *(1)*	**XUK5APANL2**	0.190
			M12 connector	**XUK5APANM12**	0.070
		NPN	Pre-cabled (L = 2 m) *(1)*	**XUK5ANANL2**	0.190
			M12 connector	**XUK5ANANM12**	0.070
	NC	PNP	Pre-cabled (L = 2 m) *(1)*	**XUK5APBNL2**	0.190
			M12 connector	**XUK5APBNM12**	0.070
		NPN	Pre-cabled (L = 2 m) *(1)*	**XUK5ANBNL2**	0.190
			M12 connector	**XUK5ANBNM12**	0.070
AC or DC					
1	NO + NC	Relay	Pre-cabled (L = 2 m) *(1)*	**XUK5ARCNL2**	0.190
Polarised reflex system					
DC					
6	NO	PNP	Pre-cabled (L = 2 m) *(1)*	**XUK9APANL2**	0.190
			M12 connector	**XUK9APANM12**	0.070
		NPN	Pre-cabled (L = 2 m) *(1)*	**XUK9ANANL2**	0.190
			M12 connector	**XUK9ANANM12**	0.070
	NC	PNP	Pre-cabled (L = 2 m) *(1)*	**XUK9APBNL2**	0.190
			M12 connector	**XUK9APBNM12**	0.070
		NPN	Pre-cabled (L = 2 m) *(1)*	**XUK9ANBNL2**	0.190
			M12 connector	**XUK9ANBNM12**	0.070
DC or **AC**					
6	NO + NC	Relay	Pre-cabled (L = 2 m) *(1)*	**XUK9ARCNL2**	0.190
Reflector 50 x 50 mm *(2)*		–	–	**XUZC50**	0.020
Reflex system					
DC					
7	NO	PNP	Pre-cabled (L = 2 m) *(1)*	**XUK1APANL2**	0.070
			M12 connector	**XUK1APANM12**	0.070
		NPN	Pre-cabled (L = 2 m) *(1)*	**XUK1ANANL2**	0.070
			M12 connector	**XUK1ANANM12**	0.070
	NC	PNP	Pre-cabled (L = 2 m) *(1)*	**XUK1APBNL2**	0.070
			M12 connector	**XUK1APBNM12**	0.070
		NPN	Pre-cabled (L = 2 m) *(1)*	**XUK1ANBNL2**	0.070
			M12 connector	**XUK1ANBNM12**	0.070
AC or DC					
7	NO + NC	Relay	Pre-cabled (L = 2 m) *(1)*	**XUK1ARCNL2**	0.175
Reflector 50 x 50 mm *(2)*		–	–	**XUZC50**	0.020
Thru-beam system					
DC					
Transmitter 30	–	–	Pre-cabled (L = 2 m) *(1)*	**XUK2AKSNL2T**	0.190
	–	–	M12 connector	**XUK2AKSNM12T**	0.070
Receiver 30	NO	PNP	Pre-cabled (L = 2 m) *(1)*	**XUK2APANL2R**	0.140
			M12 connector	**XUK2APANM12R**	0.075
		NPN	Pre-cabled (L = 2 m) *(1)*	**XUK2ANANL2R**	0.140
			M12 connector	**XUK2ANANM12R**	0.075
	NC	PNP	Pre-cabled (L = 2 m) *(1)*	**XUK2APBNL2R**	0.140
			M12 connector	**XUK2APBNM12R**	0.075
		NPN	Pre-cabled (L = 2 m) *(1)*	**XUK2ANBNL2R**	0.140
			M12 connector	**XUK2ANBNM12R**	0.075
AC or DC					
Transmitter, 30	–	–	Pre-cabled (L = 2 m) *(1)*	**XUK2ARCNL2T**	0.140
Receiver, 30	NO + NC	Relay	Pre-cabled (L = 2 m) *(1)*	**XUK2ARCNL2R**	0.070

Fixing accessories *(2)*

Description	Reference	Weight kg
3D fixing kit for use on M12 rod, for XUK or XUZC50	**XUZK2003**	0.170
3D fixing kit for use on M12 rod, with protective cover for XUK	**XUZK2004**	0.270
M12 rod	**XUZ2001**	0.050
Support for M12 rod	**XUZ2003**	0.150
Fixing bracket	**XUZA51**	0.050

*(1) For a 5 m long cable replace L2 by **L5**; for a 10 m long cable replace L2 by **L10**. Example: XUK5APANL2 becomes **XUK5APANL5** or **XUK5APANL10.***
For availability, please consult our Customer Care Centre.
(2) For further information, see page 5/158.

Photo-electric sensors

OsiSense XU, general purpose, single mode function

Compact design, 50 x 50
Five-wire AC or DC, 1 CO relay output
Three-wire DC, solid-state output

Characteristics

Sensor type			XUK●●●●●M12	XUK●●●●●L2
Product certifications			UL, CSA, CE	
Connection			M12 connector	Pre-cabled, length: 2 m
Sensing distance nominal Sn / maximum (excess gain = 2) (excess gain = 1)		m	PNP/NPN or relay output **1 / 1.5 diffuse**	
		m	PNP/NPN or relay output **6 / 8 polarised reflex**	
		m	PNP/NPN or relay output **7 / 10 reflex**	
		m	PNP/NPN or relay output **30 / 45 thru-beam**	
Type of transmission			Infrared, except polarised reflex (red)	
Degree of protection	Conforming to IEC 60529		IP 65, double insulation ⧈	
Storage temperature		°C	- 40…+ 70	
Operating temperature		°C	- 25…+ 55	
Materials	Case		PBT	
	Lens		PMMA	
	Cable		–	PVC
Vibration resistance	Conforming to IEC 60068-2-6		7 gn, amplitude ± 1.5 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27		30 gn, duration 11 ms	
Indicator lights	Output state		Yellow LED (except for **XUK2●●●●●●T**)	
	Supply on		Green LED (only for **XUK2●●●●●●T)**	
Rated supply voltage	PNP/NPN	V	12…24 with protection against reverse polarity	
	Relay output	V	–	≂ 24…240
Voltage limits (including ripple)	PNP/NPN	V	⎓ 10…36	
	Relay output	V	–	≂ 20…264
Current consumption, no-load	PNP/NPN	mA	≤ 35	
Power consumption	Relay output	W	–	≂ 2
Switching capacity	PNP/NPN	mA	≤ 100 with overload and short-circuit protection	
	Relay output	A	–	≂ 3
Voltage drop, closed state		V	≤ 1.5	
Maximum switching frequency	PNP/NPN	Hz	250	
	Relay output	Hz	–	20
Delays	First-up	ms	< 15 (PNP/NPN); < 60 (relay output)	
	Response	ms	< 2 (PNP/NPN); < 25 (relay output)	
	Recovery	ms	< 2 (PNP/NPN); < 25 (relay output)	

Wiring schemes

M12 connector

3 (-)
1 (+)
4 OUT/Output
2 Beam break input *(1)*

(1) Beam break input on thru-beam transmitter only.

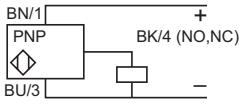
Pre-cabled, PNP/NPN

(-) BU (Blue)
(+) BN (Brown)
OUT/Output BK (Black)
Beam break input *(1)* VI (Violet)

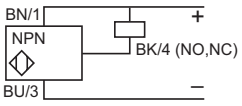
Pre-cabled, relay output

(≂) BU (Blue), (≂) BN (Brown)
Relay common/GY (Grey)
NO BK (Black)
NC WH (White)

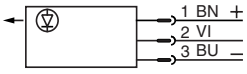
Receiver, PNP output



Receiver, NPN output

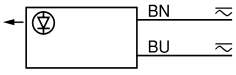


Thru-beam transmitter ⎓

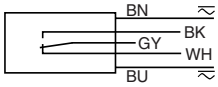


Input 2/VI:
- not connected: *beam made*
- connected to –: *beam broken*

Thru-beam transmitter ≂

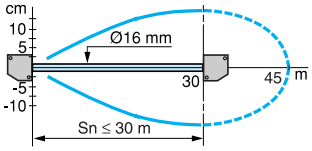


Relay output

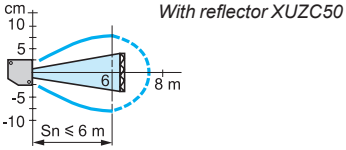


Detection curves

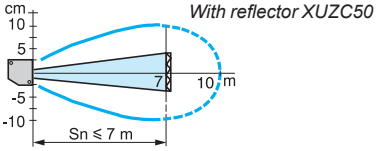
Thru-beam system



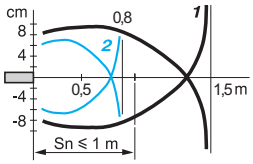
Polarised reflex system



Reflex system



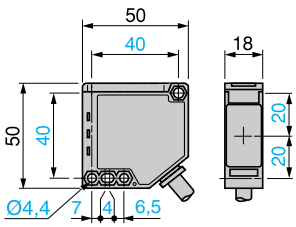
Diffuse system



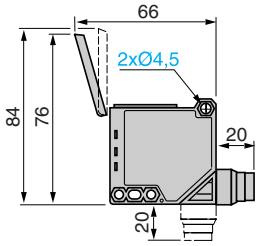
Object: 10 x 10 cm,
***1**: white 90%, **2**: grey 18%*

Dimensions

XUK●●●●●L2



XUK●●●●●M12



Possible orientation of elbowed connector

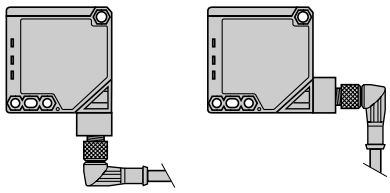


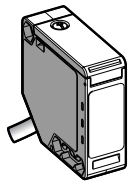
Photo-electric sensors

OsiSense XU, general purpose, multimode function. Compact design 50 x 50

Five-wire AC or DC, 1 CO relay output

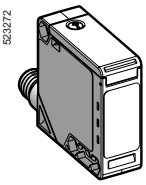
Three-wire DC, solid-state output

523273



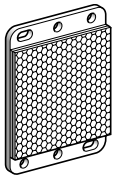
XUK0AKSAL2

523272



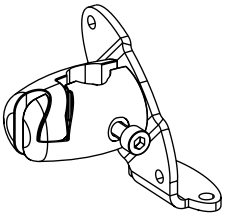
XUK0AKSAM12

805799



XUZC50

550028

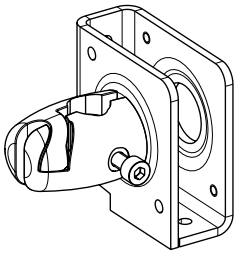


XUZK2003

520312

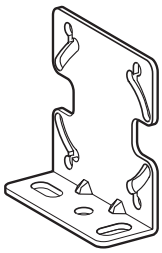
XUZ2001

550029



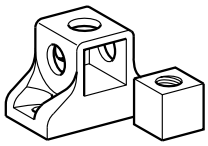
XUZK2004

550030



XUZA51

520984



XUZ2003

References

DC

Sensing distance (Sn) m	Function	Output	Connection	Reference	Weight kg
0…30 depending on whether accessories are used	NO or NC, by programming	Time delay output	Pre-cabled (L = 2 m) *(1)*	**XUK0AKSAL2**	0.175
			M12 connector	**XUK0AKSAM12**	0.090

Accessories

Description	Connection	Reference	Weight kg
Transmitter for thru-beam function	Pre-cabled (L = 2 m) *(1)*	**XUK0AKSAL2T**	0.140
	M12 connector	**XUK0AKSAM12T**	0.090
Reflector 50 x 50 mm *(2)*	–	**XUZC50**	0.020

AC or DC

Sensing distance (Sn) m	Function	Output	Connection	Reference	Weight kg
0…30 depending on whether accessories are used	NO or NC, by programming	Time delay relay	Pre-cabled (L = 2 m) *(1)*	**XUK0ARCTL2**	0.175

Accessories

Description	Connection	Reference	Weight kg
Transmitter for thru-beam function	Pre-cabled (L = 2 m) *(1)*	**XUK0ARCTL2T**	0.140
Reflector 50 x 50 mm *(2)*	–	**XUZC50**	0.020

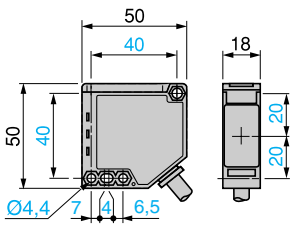
Fixing accessories *(2)*

Description	Reference	Weight kg
3D fixing kit for use on M12 rod, for XUK or XUZC50	**XUZK2003**	0.170
3D fixing kit for use on M12 rod, with protective cover for XUK	**XUZK2004**	0.270
M12 rod	**XUZ2001**	0.050
Support for M12 rod	**XUZ2003**	0.150
Fixing bracket	**XUZA51**	0.050

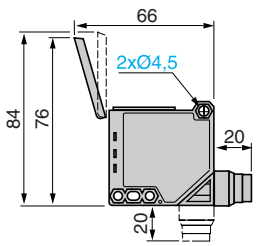
*(1) For a 5 m long cable replace L2 by **L5**; for a 10 m long cable replace L2 by **L10**.*
*Example: XUK0AKSAL2 becomes **XUK0AKSAL5** or **XUK0AKSAL10.***
(2) For further information, see page 5/158.

Dimensions (mm)

XUK0A●●●L2



XUK0A●●●M12



Possible orientation of elbowed connector

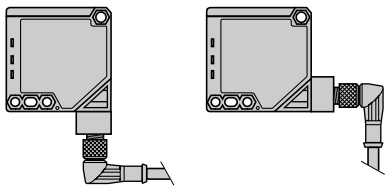


Photo-electric sensors

OsiSense XU, general purpose, multimode function. Compact design 50 x 50

Five-wire AC or DC, 1 CO relay output

Three-wire DC, solid state output

Characteristics

Sensor type			XUK●●●●●M12	XUK●●●●●L2
Product certifications			UL, CSA, CE	
Connection			M12 connector	Pre-cabled, length: 2 m
Sensing distance nominal Sn / maximum (excess gain = 2) (excess gain = 1)		m	**0.28 / 0.28 without accessory (diffuse with background suppression)**	
		m	**0.8 / 1.2 without accessory (diffuse)**	
		m	**4 / 5.7 with reflector (polarised reflex)**	
		m	**30 / 35 with transmitter for thru-beam function (thru-beam)**	
Type of transmission			Infrared, except polarised reflex (red)	
Degree of protection	Conforming to IEC 60529		IP 65, double insulation ⧈	
Storage temperature		°C	- 40…+ 70	
Operating temperature		°C	- 25…+ 55	
Materials	Case		PBT	
	Lens		PMMA	
	Cable		–	PvR
Vibration resistance	Conforming to IEC 60068-2-6		7 gn, amplitude ± 1.5 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27		30 gn, duration 11 ms	
Indicator lights	Output state		Yellow LED (transmission present for **XUK0●●●●●●T**)	
	Supply on		Green LED	
	Optical alignment aid/dirty		Red LED (except for **XUK0●●●●●●T**)	
Alarm output		mA	≤ 50 with overload and short-circuit protection (except XUK0ARCT●)	
Rated supply voltage	PNP/NPN	V	12…24 ⎓ with protection against reverse polarity	
	Relay output	V	–	≂ 24…240
Voltage limits (including ripple)	PNP/NPN	V	10…36 ⎓	
	Relay output	V	–	≂ 20…264
Current consumption, no-load	PNP/NPN	mA	≤ 35; 20 for **XUK0AK●●●●T**	
Power consumption	Relay output	W	–	3 ∿ or ⎓
Switching capacity	PNP/NPN	mA	≤ 100 with overload and short-circuit protection	
	Relay output	A	–	3 ∿ or ⎓
Voltage drop, closed state		V	≤ 1.5	
Time delay		s	0…10 on-delay, off-delay, monostable	
Maximum switching frequency	PNP/NPN	Hz	250 (200 for diffuse with background suppression)	
	Relay output	Hz	–	20
Delays	First-up	ms	< 200 (PNP/NPN); < 300 (relay output)	
	Response	ms	< 2 (PNP/NPN); < 25 (relay output) (< 2.5 for diffuse with background suppression)	
	Recovery	ms	< 2 (PNP/NPN); < 25 (relay output) (< 2.5 for diffuse with background suppression)	

Wiring schemes

M12 connector

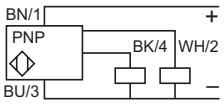
3 (-)
1 (+)
4 OUT/Output
2 Alarm or beam break input *(1)*

(1) Beam break input on thru-beam transmitter only.

Pre-cabled

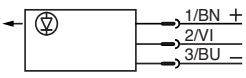
(-) BU (Blue)
(+) BN (Brown)
OUT/Output BK (Black)
Alarm/WH (White)
Beam break input *(1)*VI (Violet)

Receiver, PNP output



Thru-beam transmitter ⎓

Transmitter

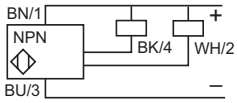


Input 2/VI:
- not connected: *beam made*
- connected to –: *beam broken*

Pre-cabled, relay output

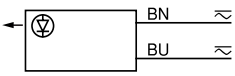
(≂) BU (Blue)
(≂) BN (Brown)
Relay common/GY (Grey)
NO BK (Black)
NC WH (White)

Receiver, NPN output

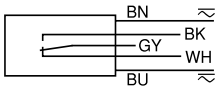


Thru-beam transmitter ∿

Transmitter

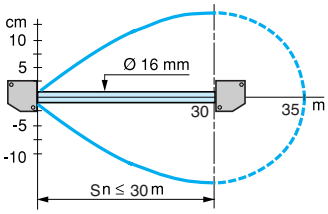


Relay output

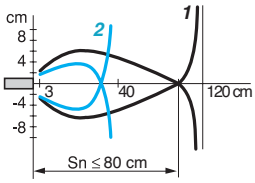


Detection curves

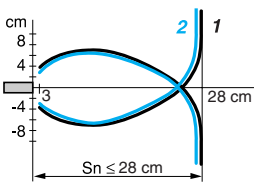
With thru-beam accessory (thru-beam)



Without accessory (diffuse)

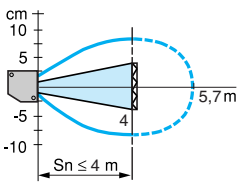


Without accessory (diffuse with background suppression)



*Object 10 x 10 cm; **1** White 90%; **2** Grey 18%*

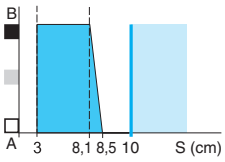
With reflector (polarised reflex)



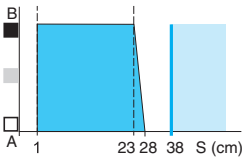
With reflector XUZC50

Variation of usable sensing distance Su (without accessory, with adjustable background suppression)

Teach mode at minimum



Teach mode at maximum



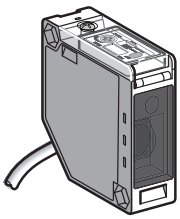
A-B: *object reflection coefficient*
- *Black 6%*
- *Grey 18%*
- *White 90%*
- *Sensing range*
- *Non sensing zone (matt surfaces)*

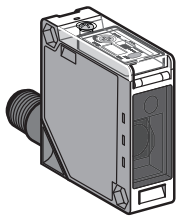
Photo-electric sensors

OsiSense XU, general purpose

With adjustable background suppression
Mechanical display of setting
DC supply. Solid-state output

Compact design





System	**Diffuse with adjustable background suppression, long sensing distance with high accuracy** (size of object ≥ 2 mm)
Type of transmission	Infrared
Nominal sensing distance (Sn)	**1 m**

References

3-wire, PNP or NPN programmable	NO or NC programmable function	**XUK8AKSNL2**	**XUK8AKSNM12**
Weight (kg)		0.190	0.070

Characteristics

Product certifications		CE, UL, CSA	
Ambient air temperature		For operation: - 25…+ 55°C. For storage: - 30…+ 70°C	
Vibration resistance	Conforming to IEC 60068-2-6	7 gn (f = 10…55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27	10 gn, duration 11 ms	
Degree of protection	Conforming to IEC 60529	IP 65 (IP 30 with cover open). NEMA 4X indoor use, 12 and 13 double insulation	
Materials		Case: PC, lenses: PMMA, cable: PVC	
Connection *(1)*		Pre-cabled, diameter 6 mm, length 2 m, wire c.s.a.: 5 x 0.34 mm²	M12 male connector, 4-pin, can be set at 2 positions (suitable female connectors, including pre-wired versions, see page 5/28)
Rated supply voltage		**12…24 V ⎓ with protection against reverse polarity**	
Voltage limits		10…36 V ⎓ (including ripple)	
Switching capacity (sealed)		**≤ 100 mA with overload and short-circuit protection**	
Voltage drop, closed state		≤ 1.5 V	
Current consumption, no-load		35 mA	
Maximum switching frequency		250 Hz	
Delays		First-up: ≤ 80 ms; response: ≤ 2 ms; recovery: ≤ 2 ms	

Function table	**Function**	**Diffuse system**			
		No object present in the beam		**Object present in the beam**	
Output state (PNP or NPN) indicator: yellow LED (illuminated when sensor output is ON)	NO				
	NC				

*(1) For a 10 m long cable replace L2 by **L10**.*

Photo-electric sensors

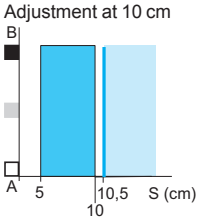
OsiSense XU, general purpose

With adjustable background suppression
Mechanical display of setting
DC supply. Solid-state output

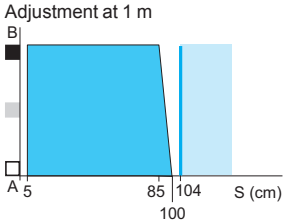
Detection curves

Variation of usable sensing distance Su

Adjustment at 10 cm



Adjustment at 1 m

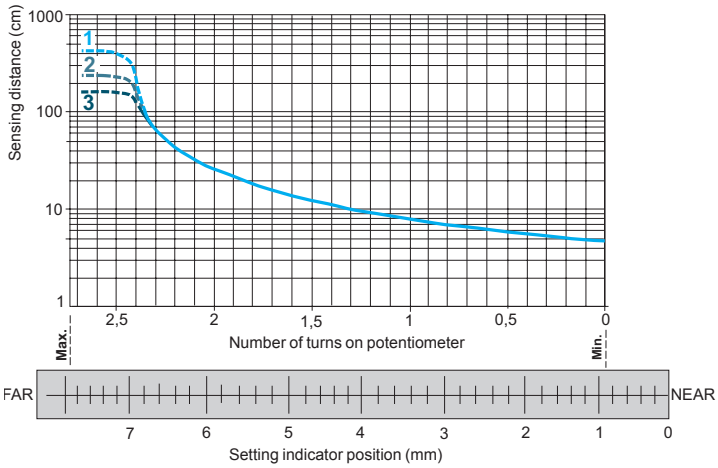


A-B: Object reflection coefficient

- Black 6%
- Grey 18%
- White 90%

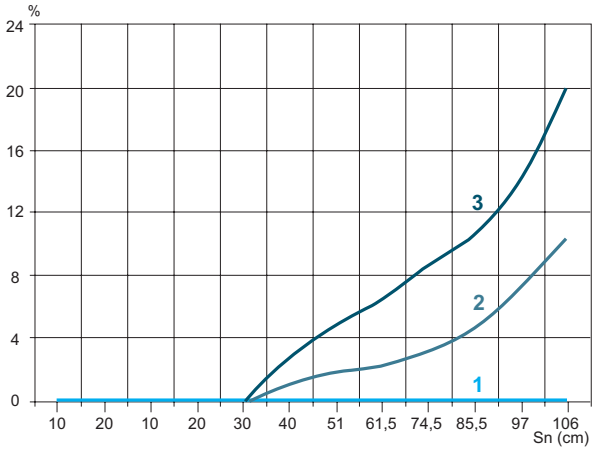
- Sensing range
- Non sensing zone (matt surfaces)

Sensing distance adjustment



1 White 90%
2 Grey 18%
3 Black 6%

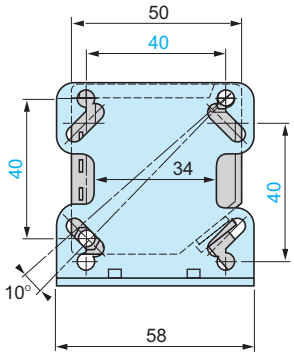
Relative difference in sensing distances according to object colour

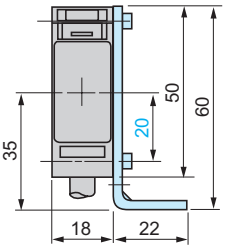


1 White 90%
2 Grey 18%
3 Black 6%

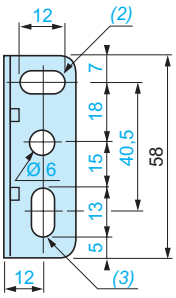
Dimensions

XUK8AKSNL2 *(1)*





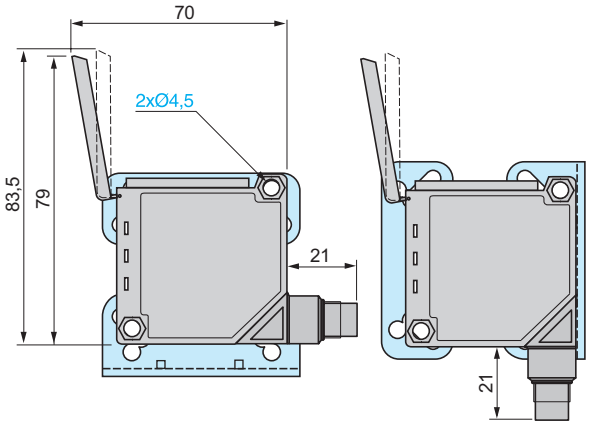
Bracket fixing *(1)*



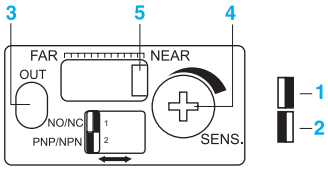
*(1) The bracket **XUZA51** is included with the sensor.*

(2) 1 elongated hole Ø 6 x 12.
(3) 1 elongated hole Ø 6 x 13.

XUK8AKSNM12 with cover open *(1)*



Functions



Switches

1 NO/NC programming
2 PNP or NPN output

LED

3 Yellow LED, output

Potentiometer

4 Sensing distance adjustment

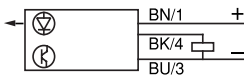
Setting indicator

5 Potentiometer setting indication

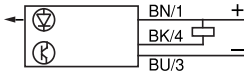
Wiring schemes (3-wire ⎓)

NO/NC programming

PNP output



NPN output



NO: detection of object presence
NC: detection of object absence

Cable connections

XUK8AKSNL2

(-)	BU (Blue)
(+)	BN (Brown)
(OUT)	BK (Black)

Connector schemes

XUK8AKSNM12

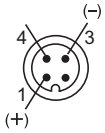
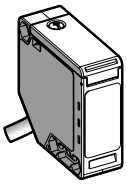


Photo-electric sensors

OsiSense XU, general purpose

With adjustable background suppression
Compact design, 50 x 50
Five-wire AC or DC, 1 “C/O” relay output

Compact design



System		**Diffuse with adjustable background suppression**
Type of transmission		Infrared
Nominal sensing distance (Sn)		**0.75 m**

References

3-wire, PNP or NPN programmable	NO or NC programmable function	**XUK8ARCTL2**
Weight (kg)		0.190

Characteristics

Product certifications		CE, UL, CSA
Ambient air temperature		For operation: - 25…+ 55°C. For storage: - 30…+ 70°C
Vibration resistance	Conforming to IEC 60068-2-6	7 gn (f = 10…55 Hz)
Shock resistance	Conforming to IEC 60068-2-27	10 gn, duration 11 ms
Degree of protection	Conforming to IEC 60529	IP 65 double insulation ⧈ (IP 30 with cover open)
Materials		Case: PBT Lenses: PMMA Cable: PVC
Indicator lights	Output state	Yellow LED
	Supply on	Green LED
	Optical alignment aid/dirty	Red LED
Connection		Pre-cabled, diameter 6 mm, length 2 m, wire c.s.a.: 5 x 0.34 mm^2
Rated supply voltage		24…240 V ∿ or ⎓
Voltage limits		20…264 V ∿ or ⎓ (including ripple)
Switching capacity		3 A: cos φ = 1 0.5 A: cos φ = 0.4
Voltage drop, closed state		⩽ 1.5 V
Power consumption		3 W (∿ or ⎓)
Maximum switching frequency		200 Hz (⎓); 20 Hz (∿)
Time delay		0…15 s: on-delay, off-delay, monostable
Delays		First-up: ⩽ 300 ms; response: ⩽ 2 ms; recovery: ⩽ 2 ms

Function table	**Function**	**Diffuse system**			
		No object present in the beam		**Object present in the beam**	
Output state (PNP or NPN) indicator: yellow LED (illuminated when sensor output is ON)	NO				
	NC				

Photo-electric sensors

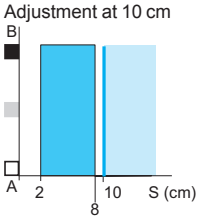
OsiSense XU, general purpose

With adjustable background suppression
Compact design, 50 x 50
Five-wire AC or DC, 1“C/O” relay output

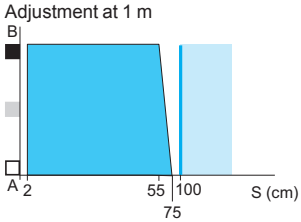
Detection curves

Variation of usable sensing distance Su

Adjustment at 10 cm



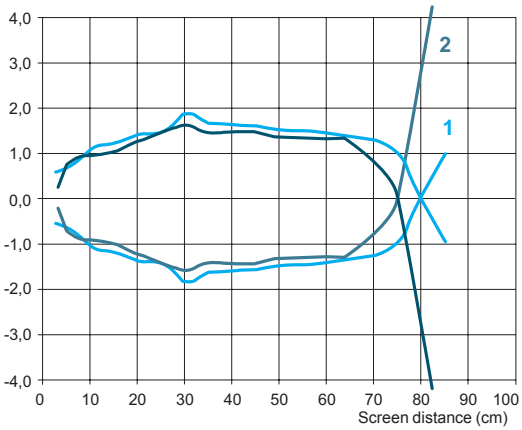
Adjustment at 1 m



A-B: Object reflection coefficient

- Black 6%
- Grey 18%
- White 90%
- Sensing range
- Non sensing zone (Matt surfaces)

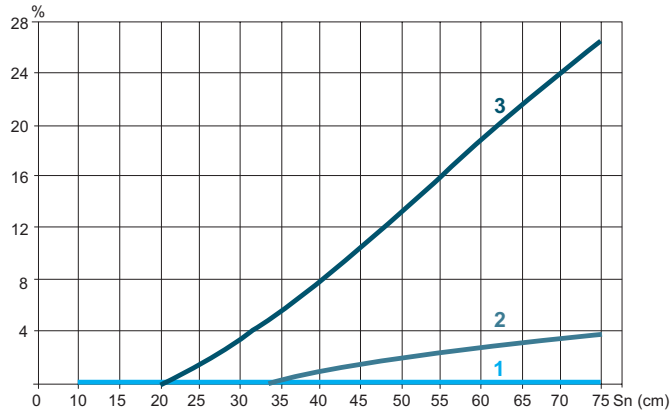
Detection curves



Screen: 20 x 20 cm

1 White 90%
2 Grey 18%

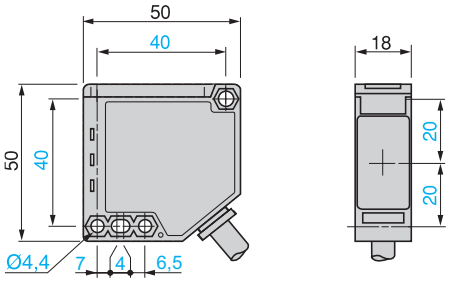
Relative difference in sensing distances according to object colour



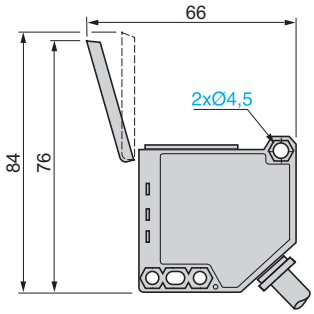
1 White 90%
2 Grey 18%
3 Black 6%

Dimensions

XUK8ARCTL2



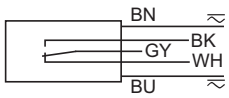
XUK8ARCTL2 with cover open



Connections

Wiring scheme

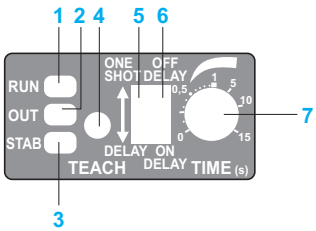
Cable connection, relay output



≂ : BU (Blue)
≂ : BN (Brown)
Relay common: GY (Grey)
NO: BK (Black), detection of object
NC: WH (White), detection of object absence

Description

Indicators and settings



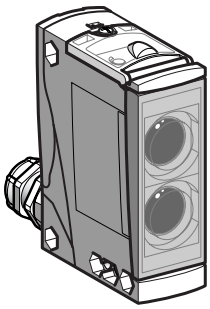
1 RUN (Supply on): Green LED
2 OUT (Output state): Yellow LED
3 STAB (Optical alignment aid/dirty): Red LED
4 TEACH: Teach mode button
5 ONE SHOT or DELAY (monostable or time delay)
6 ON DELAY, OFF DELAY (on-delay, off-delay)
7 Time delay potentiometer (0..15 s)

Photo-electric sensors

OsiSense XU, general purpose, single mode function. Compact design

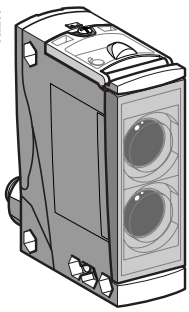
Five-wire AC or DC, 1 CO relay output
Three-wire DC, solid-state output

562268



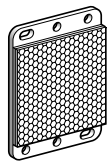
XUX●A●●●T16

562269



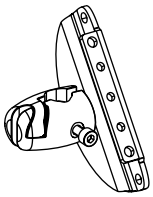
XUX●A●●●M12

562073



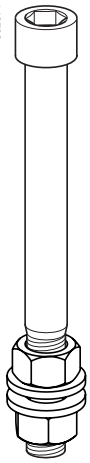
XUZC50

601231



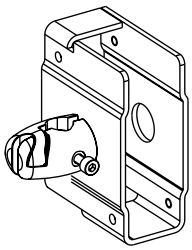
XUZX2003

562071



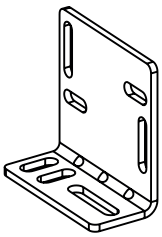
XUZ2001

562069



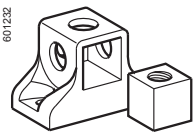
XUZX2004

562072



XUZX2000

601232



XUZ2003

Sensing distance (Sn) m	Function	Output	Connection	Reference	Weight kg
Diffuse system *(1)*					
DC					
2.1	NO	PNP	Screw terminals *(3)*	**XUX5APANT16**	0.200
			M12 connector	**XUX5APANM12**	0.200
		NPN	Screw terminals *(3)*	**XUX5ANANT16**	0.200
			M12 connector	**XUX5ANANM12**	0.200
	NC	PNP	Screw terminals *(3)*	**XUX5APBNT16**	0.200
			M12 connector	**XUX5APBNM12**	0.200
		NPN	Screw terminals *(3)*	**XUX5ANBNT16**	0.200
			M12 connector	**XUX5ANBNM12**	0.200
AC or DC					
2.1	NO + NC	Relay	Screw terminals *(3)*	**XUX5ARCNT16**	0.200
Polarised reflex system *(1)*					
DC					
11	NO	PNP	Screw terminals *(3)*	**XUX9APANT16**	0.200
			M12 connector	**XUX9APANM12**	0.200
		NPN	Screw terminals *(3)*	**XUX9ANANT16**	0.200
			M12 connector	**XUX9ANANM12**	0.200
	NC	PNP	Screw terminals *(3)*	**XUX9APBNT16**	0.200
			M12 connector	**XUX9APBNM12**	0.200
		NPN	Screw terminals *(3)*	**XUX9ANBNT16**	0.200
			M12 connector	**XUX9ANBNM12**	0.200
AC or DC					
11	NO + NC	Relay	Screw terminals *(3)*	**XUX9ARCNT16**	0.200
Reflector 50 x 50 mm *(2)*		–	–	**XUZC50**	0.020
Reflex system *(1)*					
DC					
14	NO	PNP	Screw terminals *(3)*	**XUX1APANT16**	0.200
			M12 connector	**XUX1APANM12**	0.200
		NPN	Screw terminals *(3)*	**XUX1ANANT16**	0.200
			M12 connector	**XUX1ANANM12**	0.200
	NC	PNP	Screw terminals *(3)*	**XUX1APBNT16**	0.200
			M12 connector	**XUX1APBNM12**	0.200
		NPN	Screw terminals *(3)*	**XUX1ANBNT16**	0.200
			M12 connector	**XUX1ANBNM12**	0.200
AC or DC					
14	NO + NC	Relay	Screw terminals *(3)*	**XUX1ARCNT16**	0.200
Reflector 50 x 50 mm *(2)*		–	–	**XUZC50**	0.020
Thru-beam system *(1)*					
DC					
Transmitter 40			Screw terminals *(3)*	**XUX0AKSAT16T**	0.200
			M12 connector	**XUX0AKSAM12T**	0.200
Receiver 40	NO	PNP	Screw terminals *(3)*	**XUX2APANT16R**	0.200
			M12 connector	**XUX2APANM12R**	0.200
		NPN	Screw terminals *(3)*	**XUX2ANANT16R**	0.200
			M12 connector	**XUX2ANANM12R**	0.200
	NC	PNP	Screw terminals *(3)*	**XUX2APBNT16R**	0.200
			M12 connector	**XUX2APBNM12R**	0.200
		NPN	Screw terminals *(3)*	**XUX2ANBNT16R**	0.200
			M12 connector	**XUX2ANBNM12R**	0.200
AC or DC					
Transmitter 40			Screw terminals *(3)*	**XUX0ARCTT16T**	0.200
Receiver 40	NO + NC	Relay	Screw terminals *(3)*	**XUX2ARCNT16R**	0.200

Fixing accessories *(2)*

Description	Reference	Weight kg
3D fixing kit for use on M12 rod, for XUX or XUZC50	**XUZX2003**	0.220
3D fixing kit for use on M12 rod, with protective cover for XUX	**XUZX2004**	0.420
M12 rod	**XUZ2001**	0.050
Support for M12 rod	**XUZ2003**	0.150
Fixing bracket	**XUZX2000**	0.120

(1) With adjustable sensitivity.
(2) For further information, see page 5/158.
(3) Screw terminals with ISO 16 cable gland for cable Ø 7 to 10 mm.

Photo-electric sensors

OsiSense XU, general purpose, single mode function. Compact design

Five-wire AC or DC, 1 CO relay output
Three-wire DC, solid-state output

Characteristics

Sensor type			XUX●●●●●M12	XUX●AN●NT16, ●AP●NT16	XUX●ARC●T16
Product certifications			UL, CSA, CE		
Connection			M12 connector	Screw terminals, ISO 16 cable gland	
Sensing distance nominal Sn / maximum (excess gain = 2) (excess gain = 1)		m	**2.1 / 3 diffuse with adjustable sensitivity**		
		m	**11 / 15 polarised reflex with adjustable sensitivity** (with reflector XUZC50)		
		m	**14 / 19 reflex with adjustable sensitivity**		
		m	**40 / 60 thru-beam with adjustable sensitivity**		
Type of transmission			Infrared, except polarised reflex (red)		
Degree of protection	Conforming to IEC 60529		IP 65, IP 67, double insulation ⧈		
Storage temperature		°C	- 40…+ 70		
Operating temperature		°C	- 25…+ 55		
Materials	Case		PBT		
	Lens		PMMA		
Vibration resistance	Conforming to IEC 60068-2-6		7 gn, amplitude ± 1.5 mm (f = 10 to 55 Hz)		
Shock resistance	Conforming to IEC 60068-2-27		30 gn, duration 11 ms		
Indicator lights	Output state		Yellow LED (transmission present for **XUX0●●●●●●●T** ⎓)		
	Supply on		Green LED		
	Instability		Red LED (for **XUX9ARCNT16**)		
Rated supply voltage	PNP/NPN	V	12…24 with protection against reverse polarity		
	Relay output	V	–		24…240 ∼ or ⎓
Voltage limits (including ripple)	PNP/NPN	V			
	Relay output	V	–		20…264 ∼ or ⎓
Current consumption, no-load	PNP/NPN	mA	≤ 35 (20 for **XUX0●●●●●●●T**)		
Power consumption	Relay output	W	–		2 ∼ or ⎓
Switching capacity	PNP/NPN	mA	≤ 100 with overload and short-circuit protection		
	Relay output	A	–		500 000 operating cycles 3 A: cos φ = 1/0.5 A: cos φ = 0.4
Voltage drop, closed state		V	≤ 1.5		
Maximum switching frequency	PNP/NPN	Hz	250		
	Relay output	Hz	–		20
Delays	First-up	ms	< 15 (PNP/NPN); < 60 (relay output)		
	Response	ms	< 2 (PNP/NPN); < 25 (relay output)		
	Recovery	ms	< 2 (PNP/NPN); < 25 (relay output)		

Wiring schemes

M12 connector

Relay output ∼

Terminals	
1	∼
2	∼
3	NO
4	Relay common
5	NC

PNP/NPN ⎓

M12		Terminals	
1	●	1	+
3	●	2	-
4	●	3	Output

Transmitter ⎓

M12		Terminals	
1	●	1	+
3	●	2	-
2	●	3	Beam break input *(1)*

(1) Input not connected: beam made.
Input connected to –: beam broken.

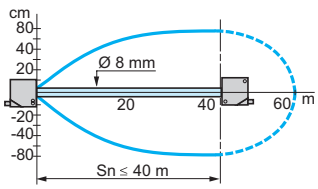
Transmitter ∼

Terminals	
1	∼
2	∼

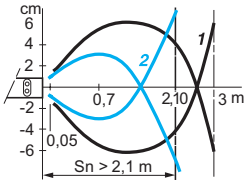
Maximum permissible conductor c.s.a.: 1 x 1.5 mm² or 1 x 0.75 mm² with cable end.

Detection curves

Thru-beam system

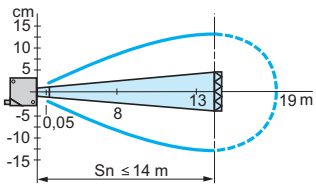


Diffuse system



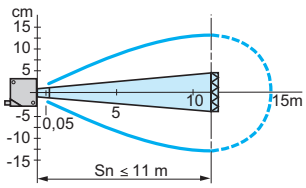
*Object 10 x 10 cm; **1** White 90%; **2** Grey 18%*

Reflex system



With reflector XUZC50

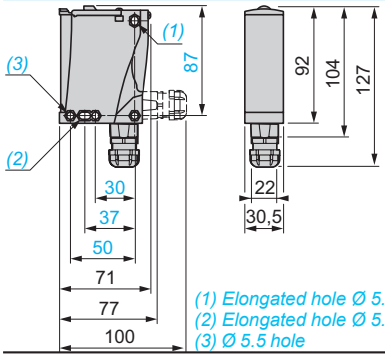
Polarised reflex system



With reflector XUZC50

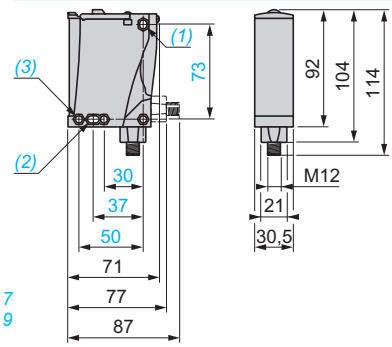
Dimensions

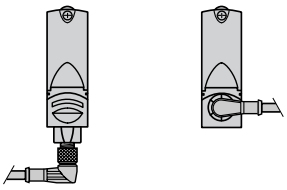
XUX●●●●●T16



(1) Elongated hole Ø 5.5 x 7
(2) Elongated hole Ø 5.5 x 9
(3) Ø 5.5 hole

XUX●●●●●M12





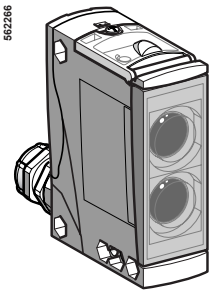
Possible orientation of elbowed connector
(rear view)

Photo-electric sensors

OsiSense XU, general purpose, multimode function *(1)*

Compact design

Five-wire AC or DC, 1 CO relay output
Three-wire DC, solid-state output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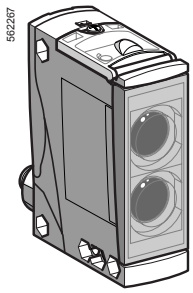
XUX0ARCTT16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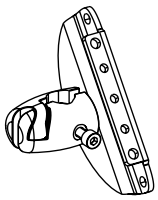
XUX0AKSAM12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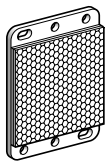
XUZX2003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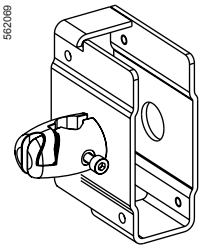
XUZC50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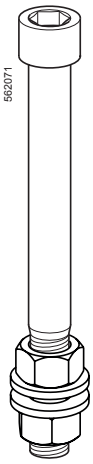
XUZX2004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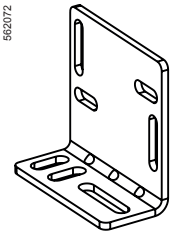
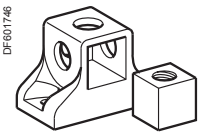
XUZ2001


562072

XUZX2000

562074

XUZX2001


DF601746

XUZ2003

References

DC

Sensing distance (Sn) m	Function	Output	Connection	Reference	Weight kg
0…40 depending on whether accessories are used	NO or NC, by programming	PNP/NPN	Screw terminals, ISO 16 cable gland *(3)*	**XUX0AKSAT16**	0.200
			M12 connector	**XUX0AKSAM12**	0.200

Accessories

Description	Connection	Reference	Weight kg
Transmitter for thru-beam function	Screw terminals, ISO 16 cable gland *(3)*	**XUX0AKSAT16T**	0.200
	M12 connector	**XUX0AKSAM12T**	0.200
Reflector 50 x 50 mm	– –	**XUZC50**	0.020

AC or DC

Sensing distance (Sn) m	Function	Output	Connection	Reference	Weight kg
0…40 depending on whether accessories are used	NO or NC, by programming	Time delay relay	Screw terminals, ISO 16 cable gland *(3)*	**XUX0ARCTT16**	0.200

Accessories

Description	Connection	Reference	Weight kg
Transmitter for thru-beam function	Screw terminals, ISO 16 cable gland *(3)*	**XUX0ARCTT16T**	0.200
Reflector 50 x 50 mm		**XUZC50**	0.020

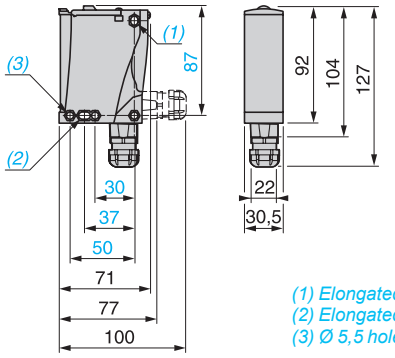
Fixing accessories *(2)*

Description	Reference	Weight kg
3D fixing kit for use on M12 rod, for XUX or XUZC50	**XUZX2003**	0.220
3D fixing kit for use on M12 rod, with protective cover for XUX	**XUZX2004**	0.420
M12 rod	**XUZ2001**	0.050
Support for M12 rod	**XUZ2003**	0.150
Fixing bracket	**XUZX2000**	0.120
Adaptor, ISO 16 - 1/2" NPT	**XUZX2001**	0.050
Adaptor, ISO 16 - ISO 20	**XUZX2002**	0.050

*(1) For further information on **the multimode function**, see page 5/14.*
(2) For further information, see page 5/158.
(3) For Ø 7 to 10 mm cable.

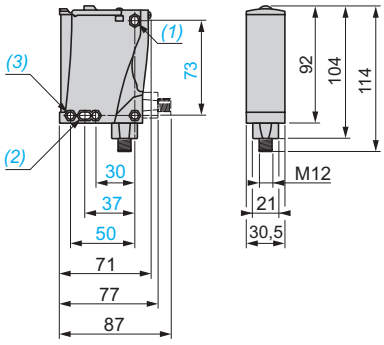
Dimensions

XUX●●●●●T16



(1) Elongated hole Ø 5.5 x 7
(2) Elongated hole Ø 5.5 x 9
(3) Ø 5,5 hole

XUX●●●●●M12



Possible orientation of elbowed connector (rear view)

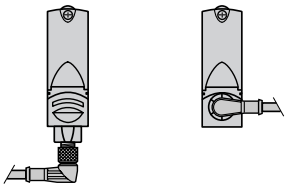


Photo-electric sensors

OsiSense XU, general purpose, multimode function
Compact design
Five-wire AC or DC, 1 CO relay output
Three-wire DC, solid-state output

Characteristics

Sensor type			XUX●●●●●M12	XUX●●●●●T16
Product certifications			UL, CSA, CE	
Connection			M12 connector	Screw terminals, ISO 16 cable gland
Sensing distance nominal Sn / maximum (excess gain = 2) (excess gain = 1)		m	**1.3 / 1.3 without accessory (diffuse with background suppression)**	
		m	**2 / 3 without accessory (diffuse)**	
		m	**15 / 18 with reflector (polarised reflex)**	
		m	**40 / 60 with transmitter for thru-beam function (thru-beam)**	
Type of transmission			Infrared, except for polarised reflex (red)	
Degree of protection	Conforming to IEC 60529		IP 65, IP 67, double insulation ⧈	
Storage temperature		°C	- 40…+ 70	
Operating temperature		°C	- 25…+ 55	
Materials	Case		PBT	
	Lens		PMMA	
Vibration resistance	Conforming to IEC 60068-2-6		7 gn, amplitude ± 1.5 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60067-2-27		30 gn, duration 11 ms	
Indicator lights	Output state		Yellow LED (transmission present for **XUX0●●●●●●●T**)	
	Supply on		Green LED	
	Stability		Red LED (except for **XUX0●●●●●●●T**)	
Rated supply voltage	PNP/NPN	V	⎓ 12…24 with protection against reverse polarity	
	Relay output	V	–	24…240 ∿ or ⎓
Voltage limits (including ripple)	PNP/NPN	V	⎓ 10...36	
	Relay output	V	–	20…264 ∿ or ⎓
Current consumption, no-load	PNP/NPN	mA	≤ 35 (20 for **XUX0●●●●●●●T**)	
Power consumption	Relay output	W	–	2 ∿ or ⎓
Alarm output		mA	≤ 100 with overload and short-circuit protection	
Switching capacity	PNP/NPN	mA	≤ 100 with overload and short-circuit protection	
	Relay output	A	–	500 000 operating cycles 3 A: cos φ = 1/0.5 A: cos φ = 0.4
Voltage drop, closed state		V	≤ 1.5	
Maximum switching frequency	PNP/NPN	Hz	240	
	Relay output	Hz	–	20
Time delay	Relay output	s	–	0.02…15 on-delay, off-delay, monostable
Delays	First-up	ms	< 200	
	Response	ms	< 2 (PNP/NPN); < 25 (relay output)	
	Recovery	ms	< 2 (PNP/NPN); < 25 (relay output)	

Wiring schemes

M12 connector

Relay output ∿

Terminals	
1	∿
2	∿
3	NO
4	Relay common
5	NC

PNP/NPN ⎓

M12		Terminals	
1	●	1	+
3	●	2	-
4	●	3	Output
2	●	4	Alarm

Transmitter ⎓

M12		Terminals	
1	●	1	+
3	●	2	-
2	●	3	Beam break input *(1)*

(1) Input not connected: beam made.
Input connected to –: beam broken.

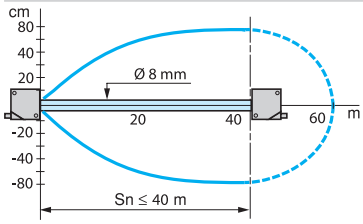
Transmitter ∿

Terminals	
1	∿
2	∿

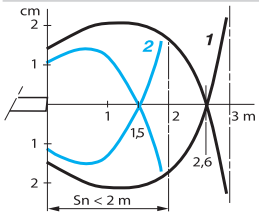
Maximum permissible conductor c.s.a.: 1 x 1.5 mm² or 1 x 0.75 mm² with cable end.

Detection curves

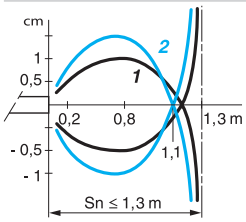
With thru-beam accessory (thru-beam)



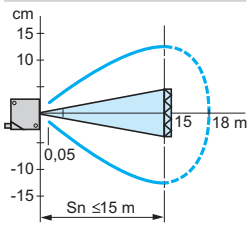
Without accessory (diffuse)



Without accessory(diffuse with background suppression)



With reflector (polarised reflex)

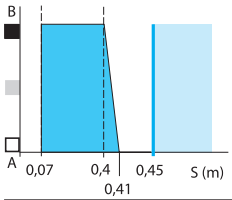


*Object: 10 x 10 cm, **1**: white 90%, **2**: grey 18%*

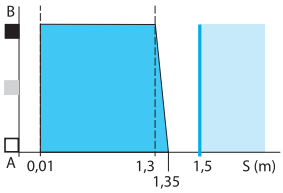
With reflector XUZC50

Variation of usable sensing distance Su (without accessory, with adjustable background suppression)

Teach mode at minimum.



Teach mode at maximum.



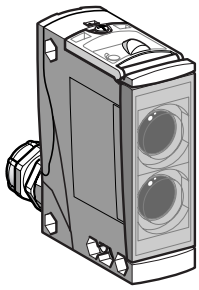
A-B: *object reflection coefficient*
- *Black 6%*
- *Grey 18%*
- *White 90%*
- *Sensing range*
- *Non sensing zone (matt surfaces)*

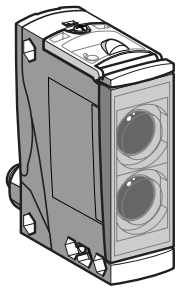
Photo-electric sensors

OsiSense XU, general purpose

With adjustable background suppression
Five-wire AC or DC, 1 CO relay output
Three-wire DC, solid-state output

Compact design





System		**Diffuse with adjustable background suppression, long sensing distance with high accuracy**		
Type of transmission		Infrared		
Nominal sensing distance (Sn)		**2 m**		

References

5-wire, AC/DC with terminal connections and ISO 16 cable gland	NO or NC programmable function	**XUX8ARCTT16**	**–**	
3-wire, PNP or NPN programmable	NO or NC programmable function	**–**	**XUX8AKSAT16**	**XUX8AKSAM12**
Weight (kg)		0.200	0.200	0.200

Characteristics

Product certifications		CE, UL, CSA		
Ambient air temperature		For operation: - 25…+ 55 °C. For storage: - 40…+ 70 °C		
Vibration resistance	Conforming to IEC 60068-2-6	7 gn (f = 10…55 Hz)		
Shock resistance	Conforming to IEC 60068-2-27	10 gn, duration 11 ms		
Degree of protection	Conforming to IEC 60529	IP 65, IP 67, double insulation (IP 30 with cover open)		
Materials		Case: PC, lenses: PMMA		
Connection		Terminal connections via ISO 16 cable gland (7 to 10 mm cable)		M12 male connector, 4-pin, can be set at 2 positions
Rated supply voltage		**∼ or ⎓ 24…240 V**	**⎓ 12…24 V with protection against reverse polarity**	
Voltage limits		∼ or ⎓ 20…264 V (including ripple)	⎓ 10…0.36V (including ripple)	
Switching capacity (sealed)	Relay output	500 000 operating cycles; 3A Cos φ = 1; 0.5 A Cos φ = 0.4		
	PNP/NPN	–	⩽ 100 mA with overload and short-circuit protection	
Indicator light	Output state	Yellow LED		
	Supply on	Green LED		
	Stability	Red LED		
Voltage drop, closed state		⩽ 1.5 V		
Current consumption, no-load		35 mA		
Maximum switching frequency	Relay output	20 Hz	–	
	PNP/NPN	–	150 Hz	
Time delay	Relay output	0.02...15 s monostable, on delay or off-delay		
Delays	Relay output	First-up: ⩽ 200 ms; response: ⩽ 25 ms; recovery: ⩽ 25 ms		
	PNP/NPN	–		First-up: ⩽ 200 ms; response: ⩽ 3.5 ms; recovery: ⩽ 2.5 ms

Function table	**Function**	**Diffuse system**			
		No object present in the beam		**Object present in the beam**	
Output state (PNP or NPN) indicator: yellow LED (illuminated when sensor output is ON)	NO				
	NC				

Photo-electric sensors

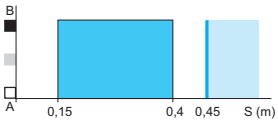
OsiSense XU, general purpose

With adjustable background suppression
Five-wire AC or DC, 1 CO relay output
Three-wire DC, solid-state output

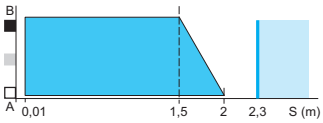
Detection curves

Variation of usable sensing distance Su

Teach mode at minimum



Teach mode at maximum

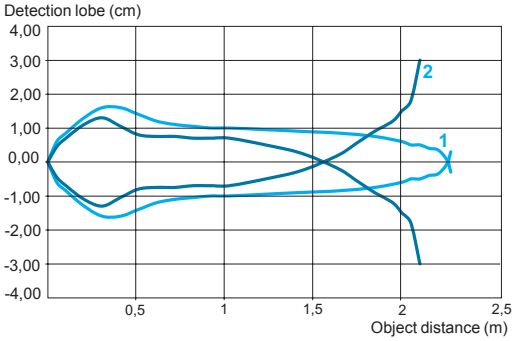


A-B: Object reflection coefficient

- Black 6%
- Grey 18%
- White 90%

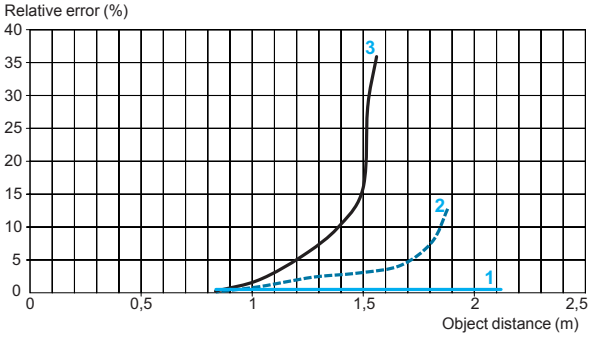
- Sensing range
- Non sensing zone (Matt surfaces)

Detection curves



Object: 10 x 10 cm
1 white 90%
2 grey 18%

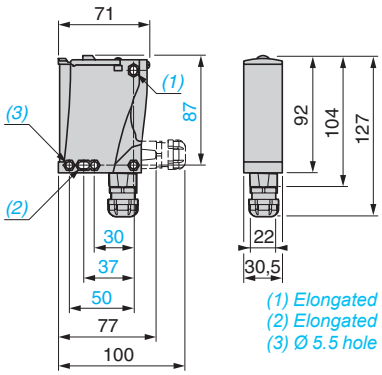
Relative difference in sensing distances according to object colour



Object: 10 x 10 cm
1 white 90%
2 grey 18%
3 black 6%

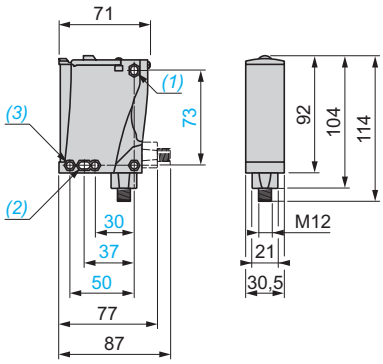
Dimensions

XUX●●●●●T16

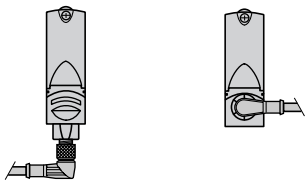


(1) Elongated hole Ø 5.5 x 7
(2) Elongated hole Ø 5.5 x 9
(3) Ø 5.5 hole

XUX●●●●●M12



Possible orientation of elbowed connector (rear view)



Wiring schemes

M12 connector

Relay output ≂

Terminals		
1	⊘	≂
2	⊘	≂
3	⊘	NO
4	⊘	Relay common
5	⊘	NC

PNP/NPN ⎓

M12		Terminals		
1	●	1	⊘	+
3	●	2	⊘	-
4	●	3	⊘	Output
2	●	4	⊘	Alarm inactive

Maximum permissible conductor c.s.a.: 1 x 1.5 mm²
or 1 x 0.75 mm² with cable end.

Typical application

Wrapping system/outer wrapping

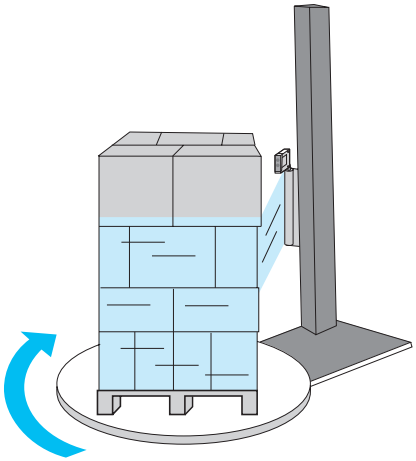
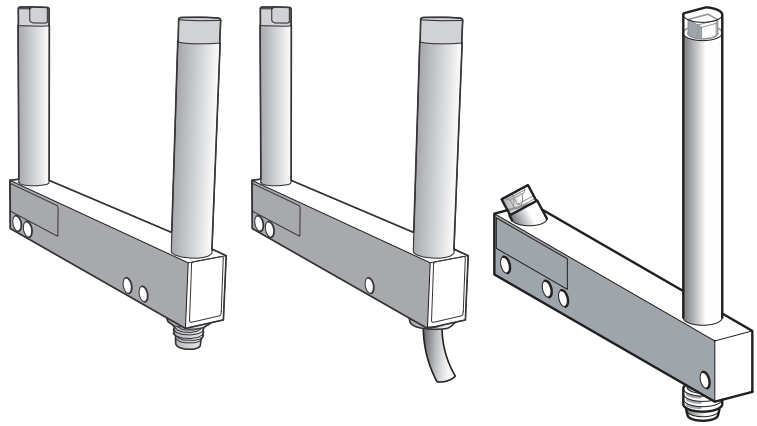


Photo-electric sensors

OsiSense XU

Optical fork without adjustment
DC supply. Solid-state output

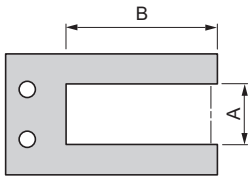
Optical fork without adjustment	Connector	Pre-cabled	Angular fork



System		**Thru-beam**	
Type of transmission		Red LED, modulated	
Nominal sensing distance (Sn)		**2…180 mm**	
Minimum size of object detected	Passageway 2…120 mm	**0.8 mm**	**1.2 mm**
	Passageway ≥ 150 mm	**1 mm**	**1.5 mm**
Fork type		**XUVR●**	**XUVA●**

References of forks type XUVR●

3-wire
NO or NC function
PNP or NPN output

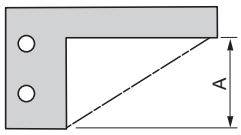


A = Passageway
B = Depth

Passageway (A)	Function	Output	Pre-cabled, length 2 m. Depth (B): 40 mm
30 mm	NO	PNP	**XUVR0303PANL2**
Passageway (A)	**Function**	**Output**	**M8 connector, 3-pin. Depth (B): 60 mm**
50 mm	NO	PNP	**XUVR0605PANM8**
		NPN	**XUVR0605NANM8**
	NC	PNP	**XUVR0605PBNM8**
		NPN	**XUVR0605NBNM8**
80 mm	NO	PNP	**XUVR0608PANM8**
		NPN	**XUVR0608NANM8**
	NC	PNP	**XUVR0608PBNM8**
		NPN	**XUVR0608NBNM8**
Passageway (A)	**Function**	**Output**	**M8 connector, 3-pin. Depth (B): 120 mm**
120 mm	NO	PNP	**XUVR1212PANM8**
		NPN	**XUVR1212NANM8**
	NC	PNP	**XUVR1212PBNM8**
		NPN	**XUVR1212NBNM8**
180 mm	NO	PNP	**XUVR1218PANM8**
		NPN	**XUVR1218NANM8**
	NC	PNP	**XUVR1218PBNM8**
		NPN	**XUVR1218NBNM8**
Weight (kg)			0.080 to 0.190 depending on model

References of forks type XUVA●

3-wire
NO function, PNP output



A = Passageway

Type	Function	Output	M8 connector, 3-pin
50 mm	NO	PNP	**XUVA0505PANM8**
80 mm	NO	PNP	**XUVA0808PANM8**
120 mm	NO	PNP	**XUVA1212PANM8**
150 mm	NO	PNP	**XUVA1515PANM8**
Weight (kg)			0.100 to 0.195 depending on model

Other versions: please consult our Customer Care Centre.

Applications: detection on conveyor, detection on vibrating rail.

Accessories

Description	Details	Length of cable	Reference	Weight kg
Pre-wired M8 connector	Straight	2 m	**XZCP0566L2**	0.060
	Elbowed (90°)	2 m	**XZCP0666L2**	0.060
	Straight	5 m	**XZCP0566L5**	0.120
	Elbowed (90°)	5 m	**XZCP0666L5**	0.120

Photo-electric sensors

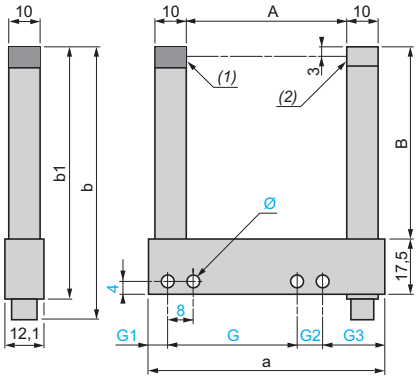
OsiSense XU

Optical fork without adjustment
DC supply. Solid-state output

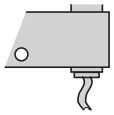
Characteristics		XUVR●	XUVA
Product certifications		CE, UL, CSA	CE
Ambient air temperature	For operation	- 10…+ 60 °C	
	For storage	- 40…+ 80 °C	
Degree of protection	Conforming to IEC 60529	IP 65 and IP 67	
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 0.75 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms	
Materials	Case	Painted aluminium and polyamide	
Rated supply voltage		⎓ **12…24 V with protection against reverse polarity**	
Voltage limits (including ripple)		⎓ **10…30 V**	
Immunity to ambient light	Natural light	10 000 lux	
	Incandescent bulb	5000 lux	
Switching capacity		**100 mA with overload and short-circuit protection**	
Voltage drop, closed state		< 1.5 V	
Current consumption, no-load		< 20 mA	
Maximum switching frequency		**4000 Hz**	
Delays	First-up	140 ms max.	
	Stability	± 15 µs	
Indicator lights	Yellow LED	Output signal	

Dimensions

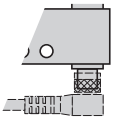
XUVR●



XUVR0303● (pre-cabled version detail)

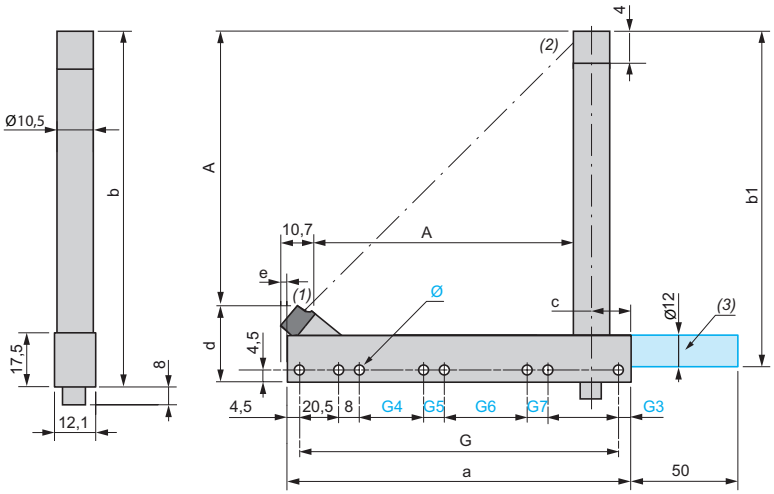


Orientation of elbowed connector



(1) Transmission LED - (2) Yellow LED: output signal

XUVA●



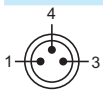
(1) Transmission LED
(2) Yellow LED: output signal
(3) Optional fixing rod available on request. Please consult our Customer Care Centre.

Type XUVR	Passageway A	Depth B	a	b	b1	G	G1	G2	G3	Ø
XUVR0303●●●●●	30	40	54	65.7	57.5	30	17	–	–	4 x 4.3
XUVR0605●●●●●	50	60	74	85.7	77.5	40	6.5	8	19.5	4 x 4.3
XUVR0608●●●●●	80	60	104	85.7	77.5	70	6.5	8	19.5	4 x 4.3
XUVR01212●●●●●	120	124.3	144	150.2	142	100	17	10	17	4 x 4.3
XUVR01218●●●●●	180	124.3	204	150.2	142	152	22	8	22	4 x 4.3

Type XUVA	Type	Depth A	a	b	b1	G	G1	G2	G3	Ø	G4	G5	G6	G7	c
XUVA0505●●●●●	50	44.3	75	83	75	66	–	–	4.5	4 x 4.3	–	–	–	–	14.75
XUVA0808●●●●●	80	74.3	105	113	105	96	–	–	4.5	4 x 4.3	–	–	–	–	14.75
XUVA1212●●●●●	120	112.3	145	154	146	136	–	–	4.5	4 x 4.3	–	–	–	–	19.75
XUVA1515●●●●●	150	142.3	175	184	176	166	–	–	4.5	8 x 4.3	24	8	60	8	19.75

Wiring schemes

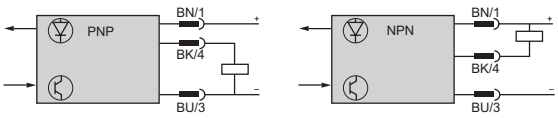
M8 connector



Pin n° - colour

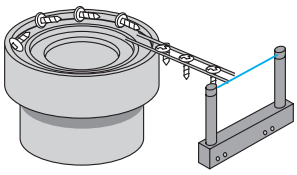
1 BN
3 BU
4 BK

Cabling

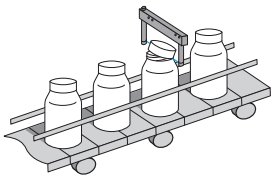


Application examples

Vibrating bowl



Monitoring height of objects passing on a conveyor



Detecting position of object on a conveyor

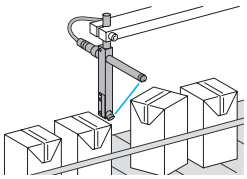
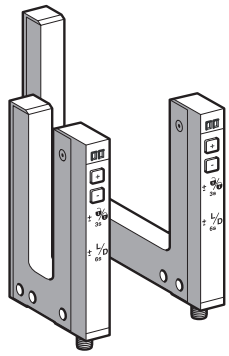


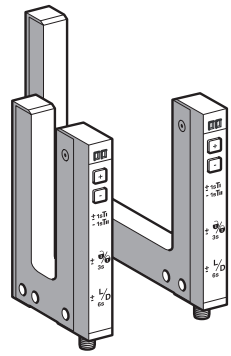
Photo-electric sensors

OsiSense XU Application

Optical fork with teach mode
DC supply. Solid-state output

Optical fork with teach mode	+/- numeric potentiometer mode Green keypad	Teach mode Yellow keypad

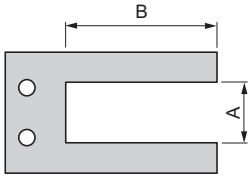




System		**Thru-beam**	
Type of transmission		Infrared LED, modulated	
Nominal sensing distance (Sn)		**2…120 mm**	
Minimum size of object detected	Passageway 2…120 mm	**0.2 mm**	
Fork type		**XUYFNEP●**	**XUYFANEP●**

References

4-wire, PNP/NPN independent outputs — NO/NC function, selectable



A = Passageway
B = Depth

Passageway (A)	Depth (B)			Depth (B)		
mm	42	59	95	42	59	95
2	**XUY FNEP40002**	**XUY FNEP60002**	**XUY FNEP100002**	**XUY FANEP40002**	**XUY FANEP60002**	**XUY FANEP100002**
5	**XUY FNEP40005**	**XUY FNEP60005**	**XUY FNEP100005**	**XUY FANEP40005**	**XUY FANEP60005**	**XUY FANEP100005**
15	**XUY FNEP40015**	**XUY FNEP60015**	**XUY FNEP100015**	**XUY FANEP40015**	**XUY FANEP60015**	**XUY FANEP100015**
30	**XUY FNEP40030**	**XUY FNEP60030**	**XUY FNEP100030**	**XUY FANEP40030**	**XUY FANEP60030**	**XUY FANEP100030**
50	**XUY FNEP40050**	**XUY FNEP60050**	**XUY FNEP100050**	**XUY FANEP40050**	**XUY FANEP60050**	**XUY FANEP100050**
80	**XUY FNEP40080**	**XUY FNEP60080**	**XUY FNEP100080**	**XUY FANEP40080**	**XUY FANEP60080**	**XUY FANEP100080**
120	**XUY FNEP40120**	**XUY FNEP60120**	**XUY FNEP100120**	**XUY FANEP40120**	**XUY FANEP60120**	**XUY FANEP100120**
Weight (kg)	0.055 to 0.128 depending on model					

Characteristics

Product certifications		CE, cULus. This product is UL Listed if supplied by a class II or isolated supply delivering c 30 V max. (isolated transformer for example) and protected by a UL fuse rated at 3 A max.
Ambient air temperature	For operation	- 20…+ 60 °C
	For storage	- 30…+ 80 °C
Degree of protection	Conforming to IEC 60529	IP 65
Connection		M8, 4-pin male connector (for 3-pin version please consult our Customer Care Centre)
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 0.75 mm (f = 10 to 55 Hz)
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms
Materials	Case	Painted aluminium and polyamide/glass
Rated supply voltage		⎓ **12…24 V with protection against reverse polarity**
Voltage limits (including ripple)		⎓ **10…30 V**
Immunity to ambient light	Natural light	10 000 lux
	Incandescent bulb	5000 lux
Outputs	PNP and NPN	By independent wire
	NO/NC	By programming
Switching capacity		**100 mA with overload and short-circuit protection**
Voltage drop, closed state		< 2 V
Current consumption, no-load		40 mA
Permissible capacitive load		330 nF
Maximum switching frequency		**10 kHz**
Response time	Stability	+/- 20 µs
Indicator lights	Yellow LED	Output signal
	Red LED	Adjustment mode and keypad locking

Application: Detection of labels, detection of double sheet, detection of reference marks, detection on conveyor, detection on vibrating rail.

Accessories

Description	Details	Length of cable (m)	References	Weight kg
Pre-wired M8 connector	Straight	2	**XZCP0941L2**	0.080
	Elbowed (90°)	2	**XZCP1041L2**	0.080
	Straight	5	**XZCP0941L5**	0.180
	Elbowed (90°)	5	**XZCP1041L5**	0.180

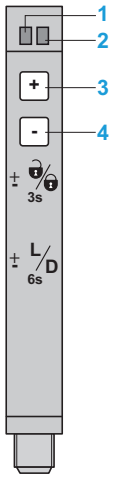
Photo-electric sensors

OsiSense XU Application

Optical fork with teach mode
DC supply. Solid-state output

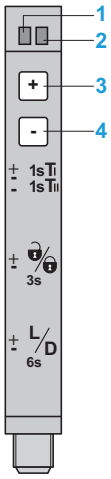
Presentation

XUYFNEP●●●



1	Yellow LED "ON": Output activated
2	Red LED "ON": Adjustments and keypad locking
3, 4	Sensitivity adjustment
3 + 4	Keypad locking (3 s ≤ press time < 6 s)
3 + 4	NO/NC (press time ≥ 6 s)

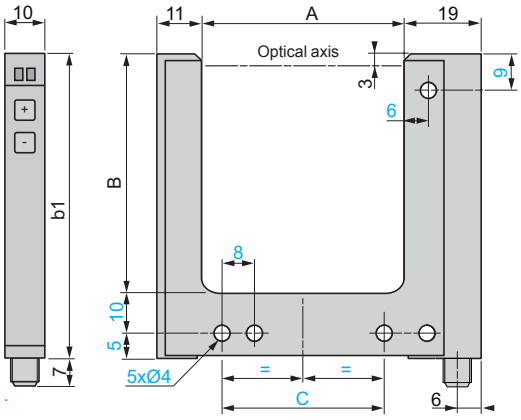
XUYFANEP●●●



1	Yellow LED "ON": Output activated
2	Red LED "ON": Adjustments and keypad locking
3, 4	Sensitivity adjustment
3 + 4	Teach mode and automatic adjustment of sensitivity (press time < 3 seconds)
3 + 4	Keypad locking (3 s ≤ press time < 6 s)
3 + 4	NO/NC (press time ≥ 6 s)

Dimensions

XUYFNEP●●● / XUYFANEP●●●



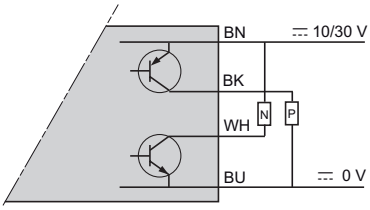
XUY	Passageway A	Depth B	b1	C
FNEP/FANEP●002	2	42, 59, 95	57, 74, 110	14
FNEP/FANEP●005	5	42, 59, 95	57, 74, 110	14
FNEP/FANEP●015	15	42, 59, 95	57, 74, 110	27
FNEP/FANEP●030	30	42, 59, 95	57, 74, 110	42
FNEP/FANEP●050	50	42, 59, 95	57, 74, 110	40
FNEP/FANEP●080	80	42, 59, 95	57, 74, 110	70
FNEP/FANEP●120	120	42, 59, 95	57, 74, 110	110

Wiring schemes

Cabling

Pin n° - colour
1 BN: Brown
2 WH: White
3 BU: Blue
4 BK: Black

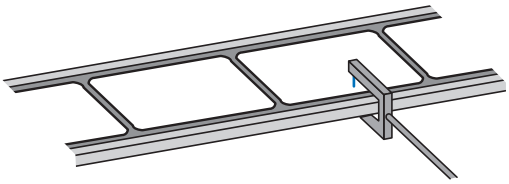
M8 connector



Application examples

Green keypad: Potentiometer mode

Detection of labels on belt



Yellow keypad: Teach mode

Detection of sheet feed on printing machine

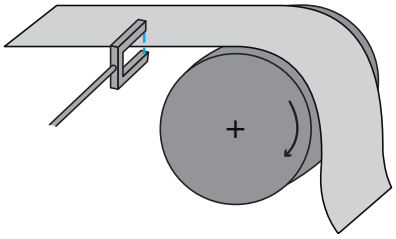
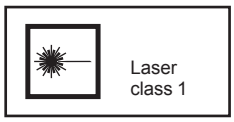


Photo-electric sensors

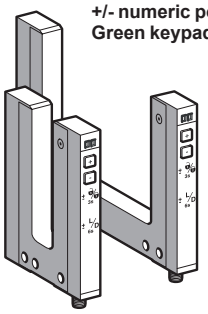
OsiSense XU Application

Optical fork with laser transmission, with teach mode
DC supply. Solid-state output

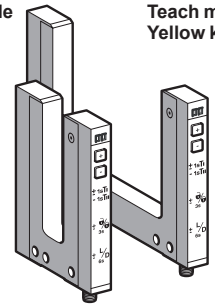
High sensitivity fork range



Laser class 1, conforming to IEC 60825-1



+/- numeric potentiometer mode
Green keypad

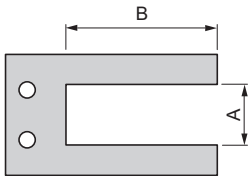


Teach mode
Yellow keypad

System		**Thru-beam**	
Type of transmission		**Red laser, modulated, class 1,** wavelength: 670 m	
Nominal sensing distance (Sn)		**2...120 mm**	
Minimum size of object detected	Passageway 2…120 mm	**0.05 mm** (repeat accuracy 0.01 mm)	
Fork type		**XUYFLNEP●**	**XUYFALNEP●**

References

4-wire, PNP/NPN independent outputs NO/NC function, selectable



A = Passageway
B = Depth

Passageway (A)	Depth (B)			Depth (B)		
mm	42	59	95	42	59	95
2	**XUY FLNEP40002**	**XUY FLNEP60002**	**XUY FLNEP100002**	**XUY FALNEP40002**	**XUY FALNEP60002**	**XUY FALNEP100002**
5	**XUY FLNEP40005**	**XUY FLNEP60005**	**XUY FLNEP100005**	**XUY FALNEP40005**	**XUY FALNEP60005**	**XUY FALNEP100005**
15	**XUY FLNEP40015**	**XUY FLNEP60015**	**XUY FLNEP100015**	**XUY FALNEP40015**	**XUY FALNEP60015**	**XUY FALNEP100015**
30	**XUY FLNEP40030**	**XUY FLNEP60030**	**XUY FLNEP100030**	**XUY FALNEP40030**	**XUY FALNEP60030**	**XUY FALNEP100030**
50	**XUY FLNEP40050**	**XUY FLNEP60050**	**XUY FLNEP100050**	**XUY FALNEP40050**	**XUY FALNEP60050**	**XUY FALNEP100050**
80	**XUY FLNEP40080**	**XUY FLNEP60080**	**XUY FLNEP100080**	**XUY FALNEP40080**	**XUY FALNEP60080**	**XUY FALNEP100080**
120	**XUY FLNEP40120**	**XUY FLNEP60120**	**XUY FLNEP100120**	**XUY FALNEP40120**	**XUY FALNEP60120**	**XUY FALNEP100120**
Weight (kg)	0.055 to 0.128 depending on model					

Characteristics

Product certifications		CE,cULus. This product is UL Listed if supplied by a class II or isolated supply delivering c 30 V max. (isolated transformer for example) and protected by a UL fuse rated at 3 A max.
Ambient air temperature	For operation	- 20…+ 50 °C
	For storage	- 30…+ 80 °C
Degree of protection	Conforming to IEC 60529	IP 65
Connection		M8, 4-pin male connector
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 0.75 mm (f = 10 to 55 Hz)
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms
Materials	Case	Painted aluminium and polyamide/glass
Rated supply voltage		⎓ **12…24 V with protection against reverse polarity**
Voltage limits (including ripple)		⎓ **10…30 V**
Immunity to ambient light	Natural light	10 000 lux
	Incandescent bulb	5000 lux
Outputs	PNP/NPN	By wiring
	NO/NC	Using teach mode
Switching capacity		**100 mA with overload and short-circuit protection**
Voltage drop, closed state		< 2 V
Current consumption, no-load		< 40 mA
Permissible capacitive load		330 nF
Maximum switching frequency		**10 kHz**
Response time		+/- 20 µs
Indicator lights		Yellow LED: output signal; red LED: keypad locking and adjustments

■ Applications: Detection of reference marks, detection on conveyor, detection on vibrating rail, detection of transparent object.

Accessories

Description	Details	Length of cable (m)	References	Weight kg
Pre-wired M8 connector	Straight	2	**XZCP0941L2**	0.080
	Elbowed (90°)	2	**XZCP1041L2**	0.080
	Straight	5	**XZCP0941L5**	0.180
	Elbowed (90°)	5	**XZCP1041L5**	0.180

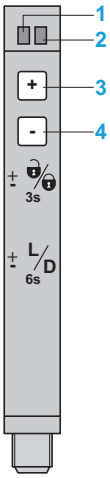
Photo-electric sensors

OsiSense XU Application

Optical fork with laser transmission, with teach mode
DC supply. Solid-state output

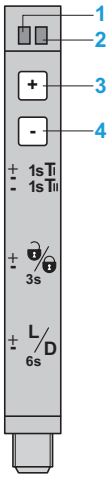
Presentation

XUYFLNEP●



1	Yellow LED "ON": Output activated
2	Red LED "ON": Adjustments and keypad locking
3, 4	Sensitivity adjustment
3 + 4	Keypad locking (3 s ≤ press time < 6 s)
3 + 4	NO/NC (press time ≥ 6 s)

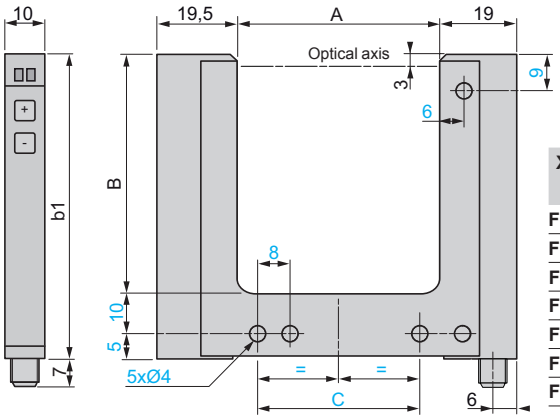
XUYFALNEP●



1	Yellow LED "ON": Output activated
2	Red LED "ON": Adjustments and keypad locking
3, 4	Sensitivity adjustment
3 + 4	Teach mode and automatic adjustment of sensitivity (press time < 3 seconds)
3 + 4	Keypad locking (3 s ≤ press time < 6 s)
3 + 4	NO/NC (press time ≥ 6 s)

Dimensions

XUYFLNEP●/XUYFALNEP●



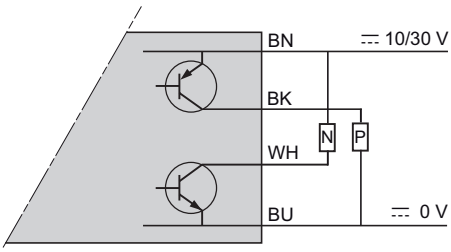
XUY	Passageway Depth A	B	b1	C
FLNEP/FALNEP●2	2	42, 59, 95	57, 74, 110	14
FLNEP/FALNEP●5	5	42, 59, 95	57, 74, 110	14
FLNEP/FALNEP●15	15	42, 59, 95	57, 74, 110	27
FLNEP/FALNEP●30	30	42, 59, 95	57, 74, 110	42
FLNEP/FALNEP●50	50	42, 59, 95	57, 74, 110	40
FLNEP/FALNEP●80	80	42, 59, 95	57, 74, 110	70
FLNEP/FALNEP●120	120	42, 59, 95	57, 74, 110	110

Wiring schemes

Cabling

Pin n° - colour
1 BN: Brown
2 WH: White
3 BU: Blue
4 BK: Black

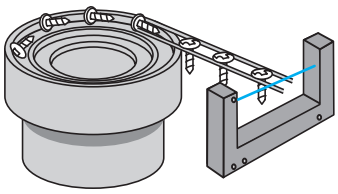
M8 connector



Application examples

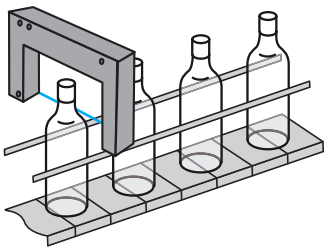
Green keypad: Potentiometer mode

Detection of an object exiting a vibrating bowl



Yellow keypad: Teach mode

Detection of transparent bottles (glass, PET…)

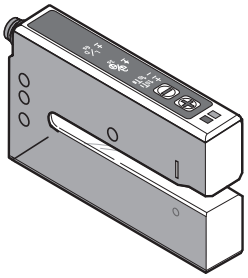


Ultrasonic sensors

OsiSense XU Application, packaging series

For detection of transparent labels
DC supply. Solid-state output

Fork design



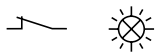
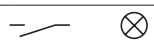
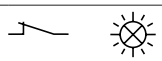
System	Thru-beam
Type of transmission	Ultrasonic
Nominal sensing distance (Sn)	3 mm
Depth	69 mm

References

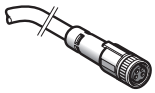
4-wire	**XUVU06M3KSNM8**	**XUVU06M3PSNM8**	**XUVU06M3NSNM8**
NC or NO programmable function	PNP/NPN	PNP	NPN
Remote adjustment	No	Yes	
Adjustment	By numeric potentiometer (+/- buttons), static and dynamic teach modes.		
Protection of settings	By locking keypad		
Weight (kg)	0.130		

Characteristics

Product certifications		CE, IEC 60947-5-2
Materials		Aluminium case
Connection		M8, 4-pin connector
Detection performance	Minimum length of label	2 mm
	Minimum distance between 2 labels	2 mm
	Maximum flow rate	180 m/min
	Detection accuracy	+/- 0.20 mm at 120 m/min
Supply	Rated supply voltage	**⎓ 12…24 V with protection against reverse polarity**
	Voltage limits	**⎓ 10…30 V (including ripple)**
	Current consumption, no-load	45 mA
	Residual voltage	
	At 100 mA	< 2 V
	At 10 mA	< 1 V
Output	Maximum rated current	100 mA with overload and short-circuit protection
	Maximum switching frequency	**1500 Hz**
	Indicator light	
	Output state	Yellow LED
	Adjustment and keypad locking	Red LED
Delay		300 µs, response and recovery
Environment	Operating temperature	+ 5….+ 55° C
	Storage temperature	- 20° C..+ 70° C
	Degree of protection	IP 65

Function table	**Function**	**Thru-beam system**	
		No label present in the beam (output inactive)	**Label present in the beam (output active)**
Output state (PNP or NPN) indicator: yellow LED (illuminated when sensor output is ON)	NC		
	NO		

References of pre-wired connectors



XZCP0941L●

XZCP1041L●

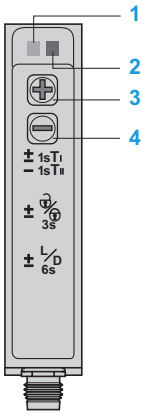
Type of connector	For use with forks	Type	Cable length (m)	Reference	Weight kg
Female, M8, 4 pins	XUVU06M3KSNM8, XUVU06M3PSNM8, XUVU06M3NSNM8.	Straight	2	**XZCP0941L2**	0.080
			5	**XZCP0941L5**	0.180
		Elbowed	2	**XZCP1041L2**	0.080
			5	**XZCP1041L5**	0.180

Ultrasonic sensors

OsiSense XU Application, packaging series

For detection of transparent labels
DC supply. Solid-state output

Presentation (adjustment and indicators)



1	Yellow LED "ON": Output activated
2	Red LED "ON": Adjustments and keypad locking
3, 4	Sensitivity adjustment
3 + 4	Teach mode and automatic adjustment of sensitivity (press time < 3 seconds)
3 + 4	Keypad locking (3 s ≤ press time < 6 s)
3 + 4	NO/NC (press time ≥ 6 s)

Connections

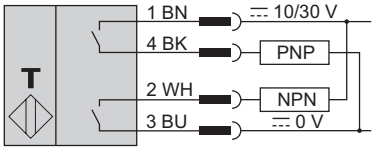
Connector

Pin no. - colour

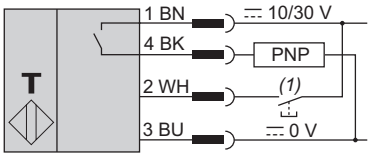
1 BN: Brown
2 WH: White (remote teaching)
3 BU: Blue
4 BK: Black

Wiring schemes

PNP/NPN: XUVU06M3KSNM8

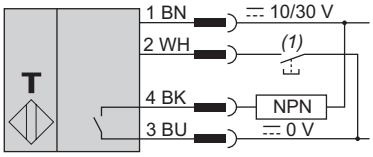


PNP: XUVU06M3PSNM8



(1) Remote teaching.

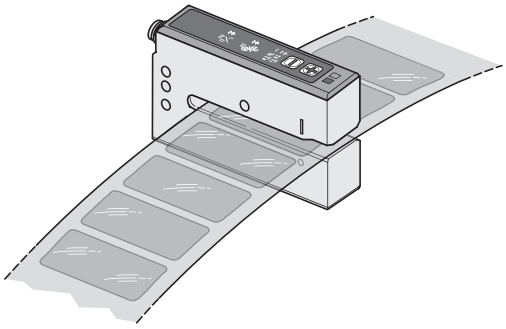
NPN: XUVU06M3NSNM8



(1) Remote teaching.

Application example

Detection of transparent labels on opaque or transparent strip



Dimensions (in mm)

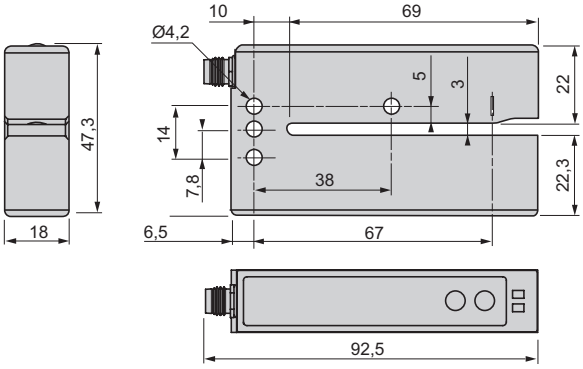
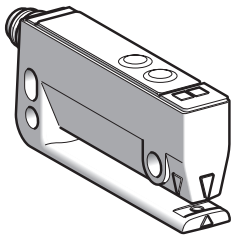


Photo-electric sensors

OsiSense XUVE Application, packaging series

Optical fork for detection of opaque labels
DC supply. Solid-state output

Fork design



System	Thru-beam
Type of transmission	Infrared
Nominal sensing distance (Sn)	3 mm
Depth	40 mm

References

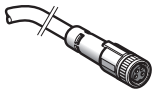
4-wire		**XUVE04M3KSNM8**	**XUVE04M3PSNM8**	**XUVE04M3NSNM8**
	NO or NC programmable function	PNP/NPN	PNP	NPN
Remote adjustment		No	Yes	
Adjustment		By numeric potentiometer (+/- buttons) and red LED		
Protection of settings		By locking keypad		
Weight (kg)		0.035		

Characteristics

Product certifications		CE, cULus
Material		Thermoplastic case (PA12)
Connection		M8, 4-pin connector
Detection performance	Minimum length of label	2 mm
	Minimum distance between 2 labels	2 mm
	Maximum flow rate	200 m/min
	Detection accuracy	**+/- 50 m at 150 m/min**
Supply	Rated supply voltage	12…24 V with protection against reverse polarity
	Voltage limits	10…30 V ⎓ (including ripple)
	Current consumption, no-load	35 mA
	Residual voltage at 100 mA	< 2 V
Output	Maximum rated current	100 mA with overload and short-circuit protection
	Maximum switching frequency	**10 kHz**
	Indicator lights	
	Output state	Yellow LED
	Adjustment and keypad locking	Red LED
	Delay (response and recovery)	50 µs
Environment	Operating temperature	- 20…+ 60°C
	Storage temperature	- 30…+ 80°C
	Degree of protection	IP 65

Function table	**Function**	**Thru-beam system**	
		No label present in the beam (output inactive)	**Label present in the beam (output active)**
Output state (PNP or NPN) indicator: yellow LED (illuminated when sensor output is ON)	NC		
	NO		

References of pre-wired connectors



XZCP0941L●

XZCP1041L●

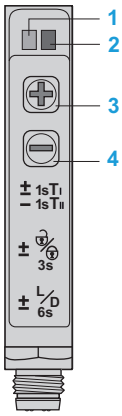
Type of connector	For use with forks	Type	Cable length (m)	Reference	Weight kg
Female, M8, 4 pins	XUVE04M3KSNM8, XUVE04M3PSNM8, XUVE04M3NSNM8.	Straight	2	**XZCP0941L2**	0,080
			5	**XZCP0941L5**	0,180
		Elbowed	2	**XZCP1041L2**	0,080
			5	**XZCP1041L5**	0,180

Photo-electric sensors

OsiSense XUVE Application, packaging series

Optical fork for detection of opaque labels
DC supply. Solid-state output

Presentation (adjustment and indicators)



1	Yellow LED "ON": Output activated
2	Red LED "ON": Adjustments and keypad locking
3, 4	Sensitivity adjustment
3 + 4	Teach mode and automatic adjustment of sensitivity (press time < 3 seconds)
3 + 4	Keypad locking (3 s ≤ press time < 6 s)
3 + 4	NO/NC (press time ≥ 6 s)

Connections

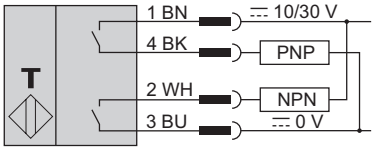
Connector

Pin no. - colour

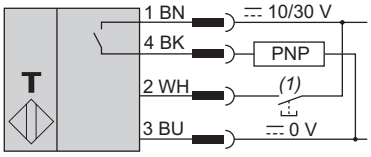
1 BN: Brown
2 WH: White (remote teaching)
3 BU: Blue
4 BK: Black

Wiring schemes

PNP/NPN: XUVE04M3KSNM8

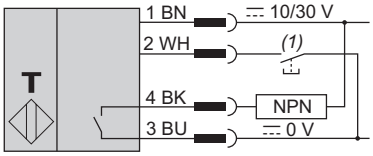


PNP: XUVE04M3PSNM8



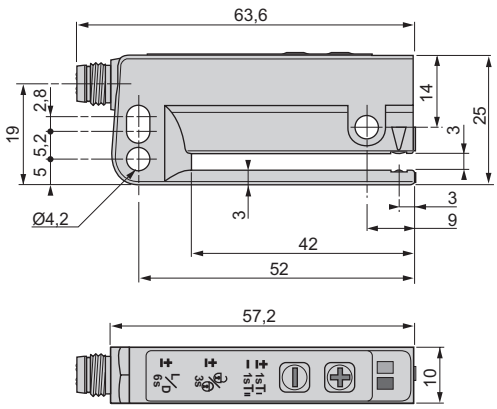
(1) Remote teaching.

NPN: XUVE04M3NSNM8



(1) Remote teaching.

Dimensions



Application example

Detection of opaque labels before application to a package

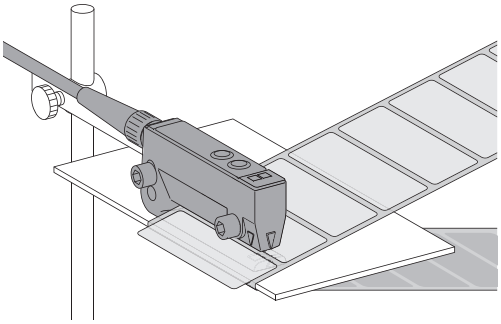
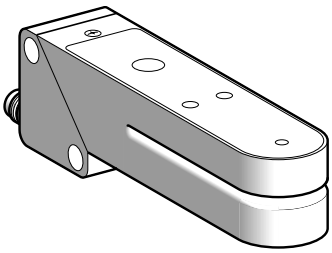


Photo-electric sensors

OsiSense XU Application, packaging series

For detection of labels *(1)*
DC supply. Solid-state output

Fork design



System		Thru-beam	
Type of transmission		Infrared	Red/green
Nominal sensing distance (Sn)		2 mm	

References

3-wire, PNP and NPN	NO or NC programmable function *(2)*	**XUVK0252S**	**XUVK0252VS**
Weight (kg)		0.120	

Characteristics

Product certifications		CE
Ambient air temperature		For operation: 0…+ 55 °C. For storage: - 20…+ 70 °C
Vibration resistance	Conforming to IEC 60068-2-6	Amplitude ±1.5 mm up to 55 Hz, 7 gn (f = 10…55 Hz)
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms
Degree of protection	Conforming to IEC 60529	IP 65
Connection		M8 connector (suitable female connectors, see page 5/28)
Materials		Case: zinc alloy; lenses: glass
Rated supply voltage		**⎓ 12…24 V with protection against reverse polarity**
Voltage limits		⎓ 10…30 V (including ripple)
Switching capacity (sealed)		**⩽ 100 mA with overload and short-circuit protection**
Voltage drop, closed state		⩽ 1.5 V
Output clamping resistor		10 kΩ
Current consumption, no-load		⩽ 50 mA
Maximum switching frequency		25 kHz
Delays		First-up: ⩽ 30 ms; response < 100 µs; recovery < 100 µs
Indicator lights	Output state	Yellow LED
	Sensor ready	Green LED
	Read error	Red LED

Function table	**Function**	**Thru-beam system**	
		No label present in the beam	**Label present in the beam**
Output state (PNP or NPN) indicator: yellow LED (illuminated when sensor output is ON)	NC		
	NO		

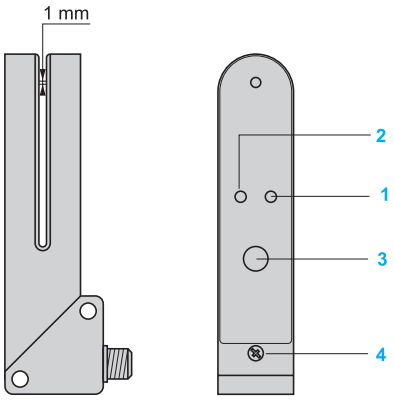
*(1) Applications: the infrared transmission beam sensor **XUVK0252S** is suitable for the detection of all types of opaque labels; the red/green transmission sensor **XUVK0252VS** is suitable for the detection of all types of labels of different colours.*
(2) This sensor is adjustable using teach mode: the NC or NO function is selected when performing the first stage of teaching for setting-up the sensor (see programming using teach mode, page 5/67).

Photo-electric sensors

OsiSense XU Application, packaging series

For detection of labels
DC supply. Solid-state output

Presentation

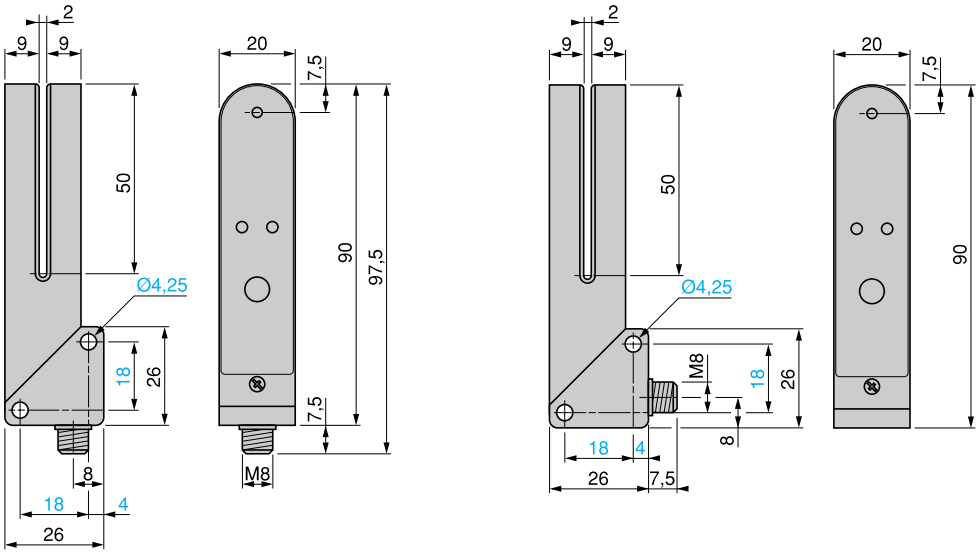


Programming using teach mode

- Place the label to be detected in the beam of the optical fork. Press the SET button and hold down until the green LED 2 goes out,
- When the green LED 2 flashes, the detector has “learnt” the label. Following this, place the backing to which the label is affixed in the beam of the optical fork. Press the SET button and hold down until the green LED 2 goes out,
- When the green LED 2 illuminates as a steady light teaching is completed and the sensor is ready for operation.

1 Yellow LED, output state indicator
2 Dual colour green/red LED, Ready/Error
3 Teach mode programming SET button
4 Locking screw

Dimensions



Connector scheme (sensor connector pin view)

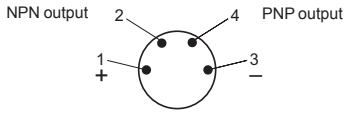
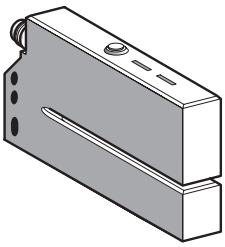


Photo-electric sensors

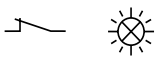
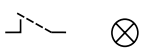
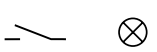
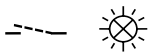
OsiSense XU Application, packaging series

Optical fork with teach mode
For detection of labels
DC supply. Solid-state output

Fork design



System		Thru-beam	
Type of transmission		Infrared, continuous	
Nominal sensing distance (Sn)	(Passageway)	3 mm	5 mm
References			
4-wire, PNP and NPN	NO or NC programmable function *(1)* Automatic adjustment using teach mode	**XUYFA983003COS**	**XUYFA983005COS**
Weight (kg)		0.07	0.07
Characteristics			
Product certifications		CE, cULus	
Ambient air temperature	For operation	- 20…+ 60 °C	
	For storage	- 30…+ 80 °C	
Degree of protection	Conforming to IEC 60529	IP 65	
Connection		M8, 4-pin connector (for pre-cabled version please consult our Customer Care Centre)	
Materials		Anodised aluminium	
Rated supply voltage		**⎓ 12…24 V with protection against reverse polarity**	
Voltage limits (including ripple)		**⎓ 10…30 V**	
Switching capacity (sealed)		**≤ 100 mA with overload and short-circuit protection**	
Immunity to ambient light	Natural light	3000 lux	
	Incandescent bulb	3000 lux	
Voltage drop, closed state		< 2 V	
Current consumption, no-load		40 mA	
Maximum switching frequency		**10 kHz**	
Delays		Response: 50 µs; recovery: 50 µs	
Indicator lights		Green LED: no object present Red LED: keypad locking and adjustments.	

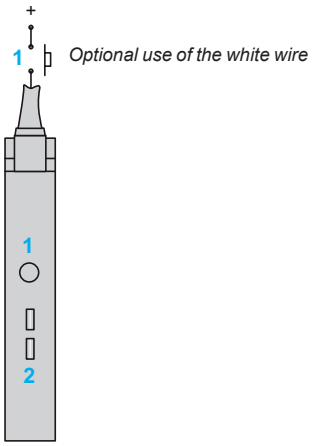
Function table	**Function**	**Thru-beam system**	
		No label present in the beam	**Label present in the beam**
Output state (PNP or NPN) indicator: green LED (illuminated when sensor output is ON)	NC		
	NO		

(1) By reversing supply connections.

Photo-electric sensors

OsiSense XU Application, packaging series
Optical fork with teach mode
For detection of labels
DC supply. Solid-state output

Presentation (adjustment and indicators)



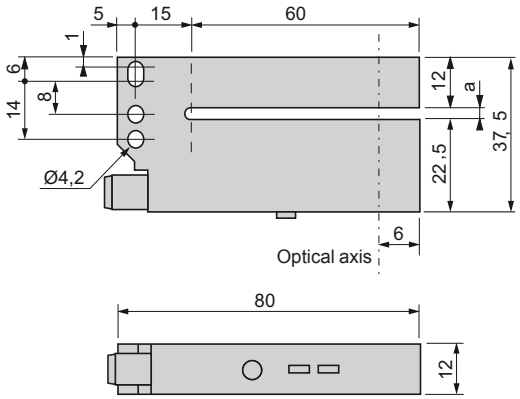
Teaching is performed on the item to which the label is affixed

1 Teach mode button

- 1 press: standard teaching (red LED flashes for 2 s)
- 2 presses: fine teaching (green LED flashes for 2 s)
- 1 prolonged press: keypad locking (red LED on)

2 Red LED and green LED flash: short-circuit or object too opaque.

Dimensions

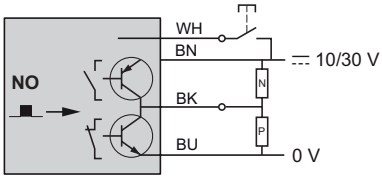


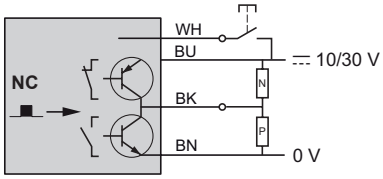
Reference	a (passageway)
XUYFA98●●●3COS	3
XUYFA98●●●5COS	5

Wiring schemes (sensor connector pin view)

Connector

Pin n° - colour	
1 BN:	Brown
2 WH:	White (input)
3 BU:	Blue
4 BK:	Black (PNP and NPN outputs)

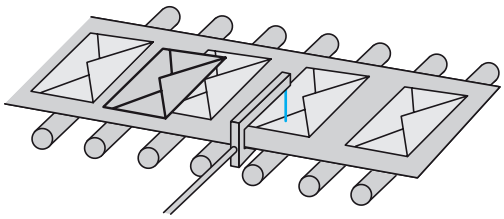




Object detected
If the white wire is not used, connect to 0 V.

Application examples

Detection of overlapping envelopes



Detection of labels on belt

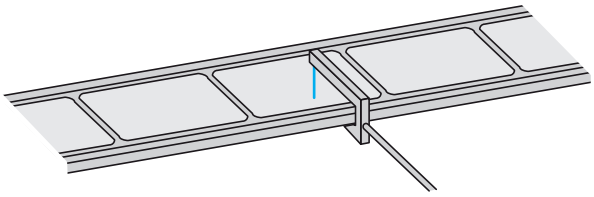
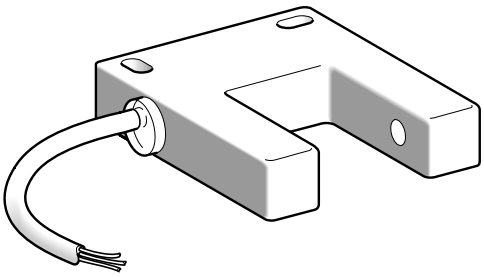


Photo-electric sensors

OsiSense XU Application, material handling series

Optical fork with integrated amplifier
DC supply. Solid-state output

Fork design



System		**Thru-beam**
Type of transmission		Infrared
Nominal sensing distance (Sn)		**30 mm**

References

3-wire, PNP	NO function	**XUVH0312**
3-wire, NPN	NO function	**XUVJ0312**
Weight (kg)		0.130

Characteristics

Product certifications		CE
Ambient air temperature	For operation	- 5…+ 55 °C
	For storage	- 20…+ 70 °C
Vibration resistance	Conforming to IEC 60068-2-6	Amplitude ±1 mm up to 42 Hz, 7 gn (f = 10…42 Hz)
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms
Degree of protection	Conforming to IEC 60529	IP 54
Connection		Pre-cabled: diameter 5 mm, length 2 m, wire c.s.a.: 3 x 0.34 mm²
Materials	Case	PC/ABS
	Lenses	PMMA
	Cable	PvR
Rated supply voltage		**⎓ 24 V with protection against reverse polarity**
Voltage limits		⎓ 19…38 V (including ripple)
Switching capacity (sealed)		**⩽ 150 mA with overload and short-circuit protection**
Voltage drop, closed state		⩽ 1.5 V
Current consumption, no-load		⩽ 20 mA
Maximum switching frequency		1000 Hz
Delays	First-up	⩽ 30 ms
	Response	500 µs
	Recovery	500 µs

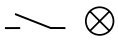
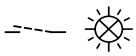
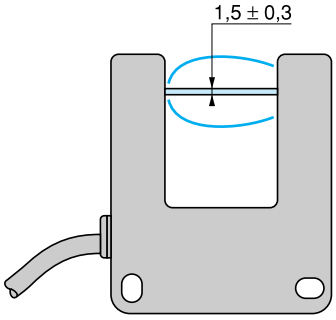
Function table **NO function**	**Function**	**Thru-beam system** **No object present in the beam**	**Object present in the beam**
Output state (PNP or NPN) indicator: red LED (illuminated when sensor output is ON)	NO		

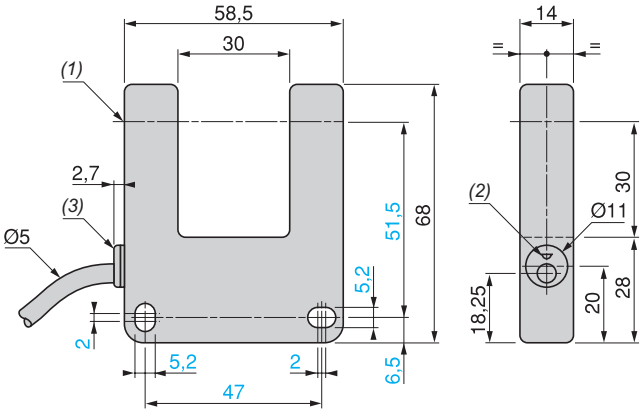
Photo-electric sensors

OsiSense XU Application, material handling series
Optical fork with integrated amplifier
DC supply. Solid-state output

Detection curve



Dimensions

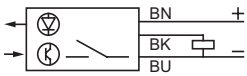


(1) Optical axis
(2) Red LED
(3) Diffuser
Max. tightening torque of fixing screws: 3 N.m

Wiring schemes (3-wire ⎓)

NO function

PNP output



NPN output

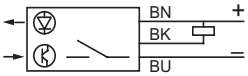
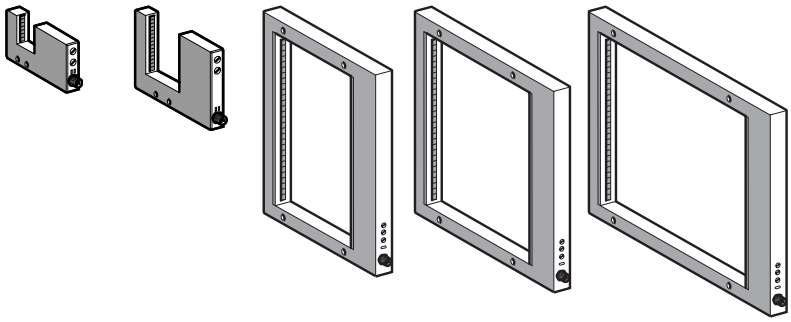


Photo-electric sensors

OsiSense XU Application, conveying series

Dynamic/static detection of passage of objects *(1)*
For detecting and counting parts
DC supply. Solid-state output



System			**Thru-beam**				
Type of transmission			**Infrared**				
Passageway dimensions			**30 x 30 mm**	**60 x 60 mm**	**200 x 120 mm**	**200 x 180 mm**	**200 x 250 mm**
References							
4-wire, PNP or NPN NO or NC programmable function	Minimum size of object detected						
	Dynamic mode	Static mode					
	Ø 2 mm	–	**XUVF30M8**	**XUVF60M8**	–	–	–
	Ø 4 mm	Ø 6 mm	–	–	**XUVF120M12**	**XUVF180M12**	**XUVF250M12**
	Ø 10 mm	Ø 15 mm	–	–	**XUYFRS120S**	**XUYFRS180S**	**XUYFRS250S**
Weight (kg)			0.080	0.140	0.860	1.000	1.120

References of U shape frames

Open (U shape) frames for sizes 120, 180 and 250 mm are also available.
To order an open frame, add the letter **U** to the end of the reference. Example: XUVF120M12 becomes **XUVF120M12U**.

Characteristics

Product certifications		CE, cULus	
Ambient air temperature		For operation: 0…+ 60°C. For storage: - 20…+ 80°C	
Vibration resistance		7 gn, amplitude ± 1 mm (f = 10…55 Hz), conforming to IEC 60068-2-6	
Shock resistance		30 gn, duration 11 ms, conforming to IEC 60068-2-27	
Degree of protection	Conforming to IEC 60529	IP 65	
Connection		M8 connector (suitable female connectors, including pre-wired versions, refer to our "OsiSense XZ" catalogue)	M12 connector (suitable female connectors, including pre-wired versions, please refer to our "Cabling accessories OsiSense XZ" catalogue)
Materials	Case	Painted aluminium	
	Lenses	Polycarbonate	Altuglass
Immunity to ambient light		Sunlight: 4000 lux max. Incandescent light: 400 lux max.	Sunlight: 10,000 lux max. Incandescent light: 3000 lux max.
Passing speed of object		Min.: 10 cm/s, max.: 15 m/s (Ø 2 mm object)	Min *(2)*: 10 cm/s, max.: 15 m/s (Ø 4 mm object) or max.: 70 m/s (Ø 10 mm object)
Rated supply voltage		**24 V ⎓ with protection against reverse polarity**	
Voltage limits		18…30 V ⎓ (including ripple)	
Switching capacity (sealed)		**≤ 100 mA with overload and short-circuit protection**	
Voltage drop, closed state		< 2 V	
Current consumption, no-load		≤ 120 mA	≤ 150 mA
Maximum switching frequency		500 Hz	5000 Hz
Delays		Response: < 1 ms Recovery: < 1 ms	Response: < 0.1 ms Recovery: < 0.1 ms
Time delay		Off-delay (reset): adjustable between 0 and 5 seconds	

Function table	**Function**	**Thru-beam system**	
		No object present in the beam	**Passage of object through the beam**
Output state (PNP or NPN) and orange LED: illuminated when sensor output is ON.	NC		
	NO		

(1) XUVF●● sensors are suitable for detecting the passage of all types of objects (both metal and plastic), of any shape and colour.
XUVF120M12, XUVF180M12 and XUVF250M12 frames can be used:
- In dynamic mode for counting parts or monitoring the passing of parts on injection moulding machines.
- In static mode for detecting bar or cable type moving or non-moving parts, entering machines (maintain the signal).
(2) The min. value only applies to dynamic mode.

Photo-electric sensors

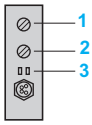
OsiSense XU Application, conveying series

Dynamic/static detection of passage of objects
For detecting and counting parts
DC supply. Solid-state output

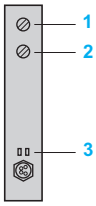
Presentation

1 Sensitivity adjustment potentiometer
2 Time delay adjustment potentiometer (XUV only)
3 Indicators:
■ Orange LED:
□ For XUVF30M8 and XUVF60M8: object in the beam
□ For XUVF120M12, XUVF180M12, XUVF250M12, XUVFRS120S, XUVFRS180S and XUVFRS250S: closed state of the contact
■ Red LED: solid state output overload or short-circuit (flashing)
Notes concerning XUVF30M8 and XUVF60M8:
- In the event of a supply malfunction, the red LED flashes
- In the event of a short-circuit on the output, both the red and orange LEDs flash
4 Dynamic mode (NO or NC) or static mode (NO or NC) selector switch

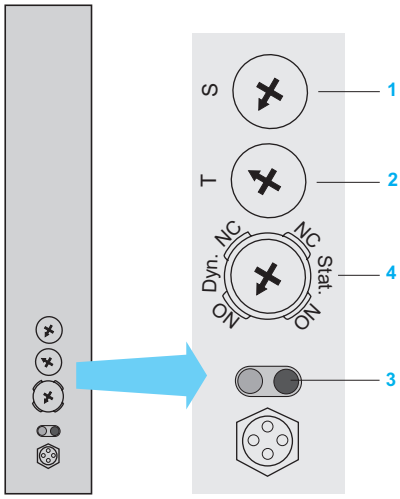
XUVF30M8



XUVF60M8

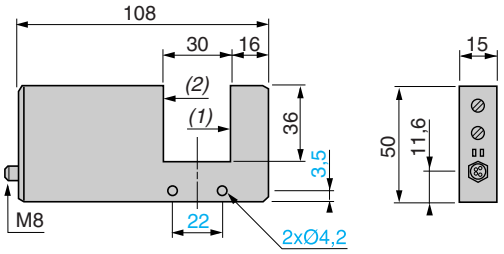


XUVF●●0M12, XUYFRS●●0S

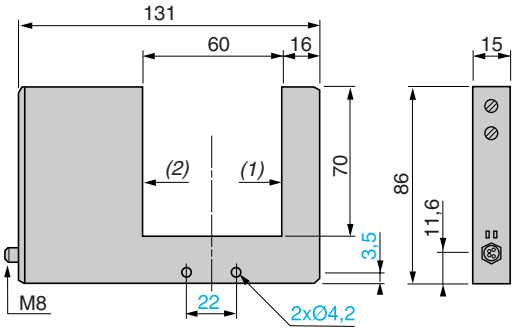


Dimensions

XUVF30M8

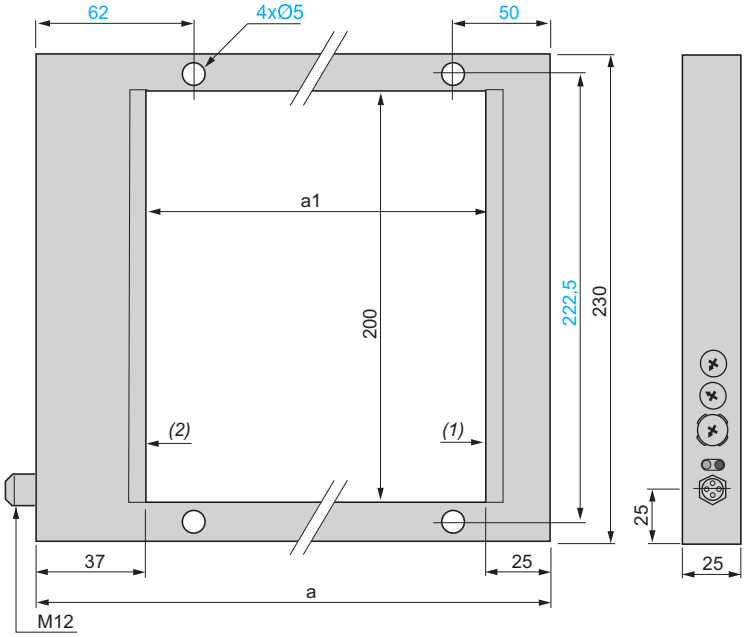


XUVF60M8



(1) Transmitting face
(2) Reception face

XUVF●●0M12, XUYFRS●●0S

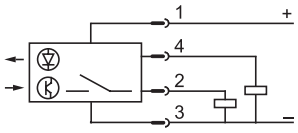


Reference	Reference	a	a1
XUVF120M12	XUVFRS120S	182	120
XUVF180M12	XUVFRS180S	242	180
XUVF250M12	XUVFRS250S	312	250

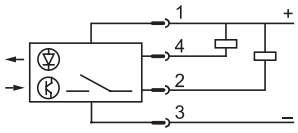
Connections

Wiring schemes (4-wire ⎓)

PNP output

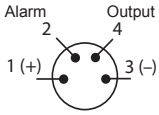


NPN output

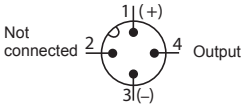


Connector scheme (sensor connector pin view)

XUVF30M8 and **XUVF60M8**



XUVF120M12, XUYFRS120S, XUVF180M12, XUYFRS180S, XUVF250M12 and **XUYFRS250S**



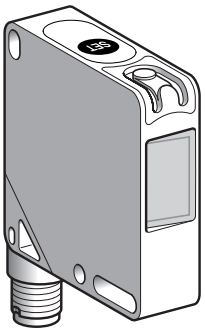
Note: *For XUVF30M8 and XUVF60M8 only, the alarm (2) triggers in the event of an object stopping within the beam.*
For XUVF30M8 and XUVF60M8, the NC output is gained by connecting terminal 3 to (+) and terminal 1 to (-).

Photo-electric sensors

OsiSense XU Application, packaging series

Compact design, 50 x 50
Colour mark readers (1)
DC supply. Solid-state output

Compact design, 50 x 50



System	**Diffuse**
Type of transmission	White LED (400-700 nm)
Nominal sensing distance (Sn)	**19 mm**

References

Description		Reference
3-wire, PNP or NPN	PNP output	**XUKR1PSMM12**
	NPN output	**XUKR1NSMM12**
Weight (kg)		0.045

Characteristics

Product certifications		CE, cULus
Ambient air temperature	For operation	- 10…+ 55 °C
	For storage	- 20…+ 70 °C
Vibration resistance	Conforming to IEC 60068-2-6	Amplitude ± 0.5 mm, f = 10...55 Hz for each axis
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms, 6 shocks on each axis
Degree of protection	Conforming to IEC 60529	IP 67
Connection		M12, 4-pin connector; can be set at 90°
Materials	Case	ABS
	Lenses	Glass (window tilted, anti-reflective glass)
Spot diameter		At 19 mm: Ø 3.5 mm
Resolution		0.5 mm
Depth of field		± 2 mm
Adjustment		Teach mode using button or remotely using “remote” wire
Indicator lights	Output	Yellow LED
	Stability	Green LED: Ready Flashing green/red: error
Rated supply voltage		**⎓ 12…24 V**
Voltage limits		⎓ 10…30 V (including ripple)
Switching capacity (sealed)		**⩽ 100 mA with protection against reverse polarity, overload and short-circuit**
Voltage drop, closed state (saturation voltage)		⩽ 2 V
Current consumption, no-load		⩽ 30 mA
Maximum linear speed of mark		2.5 m/s for 1 mm wide mark
Maximum switching frequency		5 kHz
Delay		100 µs for response and recovery
Time delay	Time delay function	Minimum time output active: 20 ms
	Auxiliary functions	Remote teaching via “remote” wire; teach mode button locking
	Operating mode	Standard teaching: output activated on dark mark

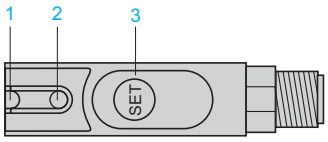
(1) Applications: detection of contrasting colours on reflective, matt or embossed surfaces. Colour mark and index mark reading function on automated packaging and filling systems and on labelling, heat sealing, thermo-forming and printing machines, etc.

Photo-electric sensors

OsiSense XU Application, packaging series
Compact design, 50 x 50
Colour mark readers
DC supply. Solid-state output

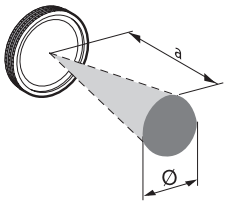
Presentation

Description



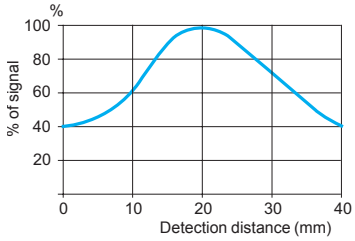
1 Output LED
2 Dual colour stability LED
3 SET button

Detection zone and spot size



	a (mm)	Ø (mm)
XUKR1●SMM12	19	3.5

Detection curve

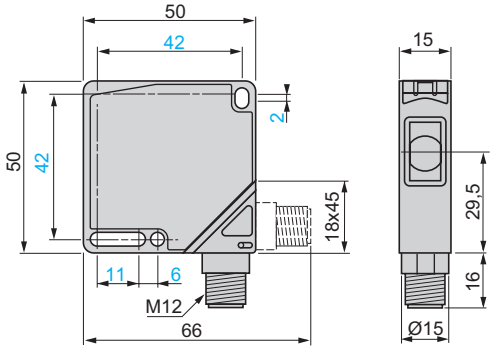


Fixing accessories

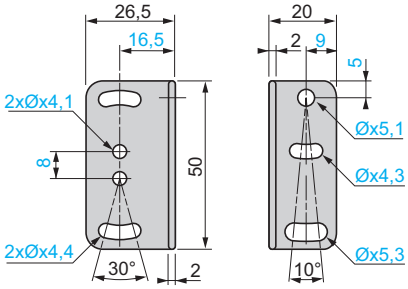
Description	Reference	Weight kg
Metal fixing bracket (2 screws, 2 nuts and 2 washers included)	**XUZK2000**	0.040
Metal fixing bracket (2 screws, 2 nuts, 2 washers and 1 screwdriver included)	**XUZA51**	0.050

Dimensions

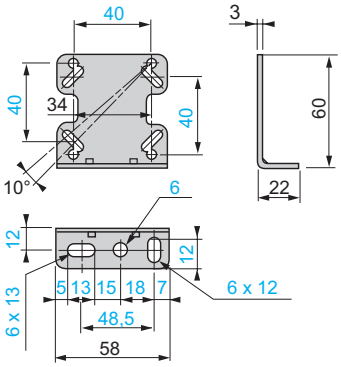
XUKR1●SMM12



Fixing bracket XUZK2000



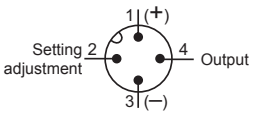
Fixing bracket XUZA51



Schemes

Connector scheme

Sensor connector pin view



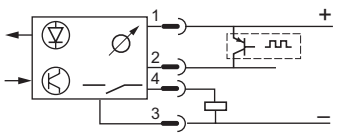
Pin N°	Type	Colour
1	⎓ 10...30 V	Brown
2	Adjustment input *(1)*	White
3	0 V	Blue
4	Output	Black

(1) Connecting the "Remote" adjustment input to + V DC is equivalent to pressing the SET button.

Wiring schemes

Automatic NC or NO selection depending on chronological order of teaching for the mark and the background.

PNP output



NPN output

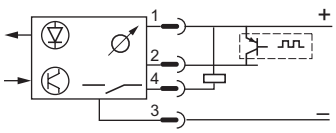


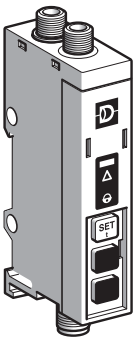
Photo-electric sensors

OsiSense XU Application, packaging series

Colour mark readers
With teach mode
DC supply. Solid-state output

Colour mark reading using plastic fibre optic

Remote reading by coaxial fibre optic



System	**Diffuse**
Type of transmission	White LED (450 - 650 nm)
Nominal sensing distance (Sn)	**18 mm with fibre optic XUYFPDC61/101** **4 mm with fibre optic XUYFPDCM861/M8101**

References

4-wire, PNP/NPN output	NO/NC function	**XUYDCFCO966S** *(1)*
Weight (kg)		0.047

Characteristics

Product certifications		CE
Ambient air temperature	For operation	0…+ 40 °C
	For storage	- 20…+ 80 °C
Degree of protection	Conforming to IEC 60529	IP 65
Connection		M8 male connector
Materials	Case	Polyamide
	Lens	Polyamide
Rated supply voltage		⎓ **24 V**
Spot diameter		1.5 mm
Modulation frequency		40 kHz
Depth of field		FPDC: + 7/- 5 mm Black/White, + 1/- 3 mm Grey/White FPDCM8: ± 1 mm
Adjustment		By teaching background and mark
Voltage limits (including ripple)		⎓ **10…30 V with protection against reverse polarity**
Immunity to ambient light	Incandescent bulb	10 000 lux
	Natural light	20 000 lux
Switching capacity		**100 mA with overload and short-circuit protection**
Voltage drop, closed state		< 2 V
Current consumption, no-load		50 mA
Maximum switching frequency		**20 kHz**
Delays	Response and recovery	25 µs
Output state indication		LED

Accessories

(1) Sensor XUYDCFCO966S only operates with fibres XUYFPDC●●●● and XUYFPDCM8●●●, to be ordered separately.

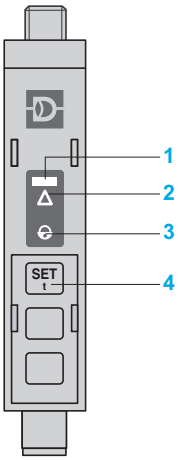
Description	Details	Length of fibre	Length of cable	References	Weight
		mm	m		kg
Integrated fibre optic *to be ordered at the same time as the amplifier*	M18	600	–	**XUYFPDC61**	0.100
		1000	–	**XUYFPDC101**	0.115
	M8	600	–	**XUYFPDCM861**	0.060
		1000	–	**XUYFPDCM8101**	0.075
Pre-wired M8 connector	Straight	–	2	**XZCP0941L2**	0.080
	Elbowed (90°)	–	2	**XZCP1041L2**	0.080
	Straight	–	5	**XZCP0941L5**	0.180
	Elbowed (90°)	–	5	**XZCP1041L5**	0.180

Photo-electric sensors

OsiSense XU Application, packaging series

Colour mark readers
With teach mode
DC supply. Solid-state output

Presentation



1 Detection of the lightest shade

2 Programming assistance

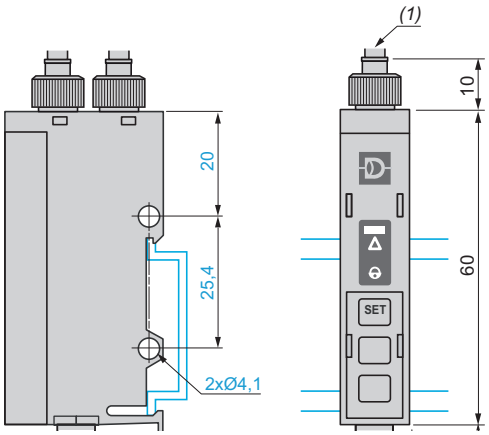
3 Alarm/press button

4 Programming button

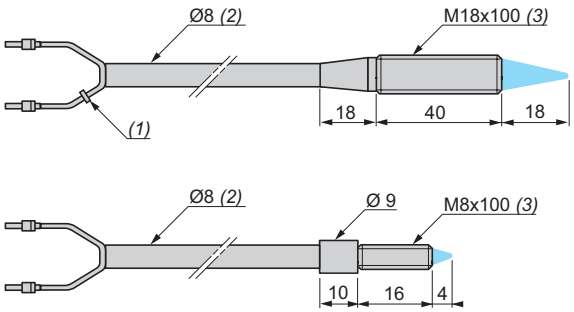
Dimensions

XUYDCFCO966S

Mounting on 35 mm ⊔ rail



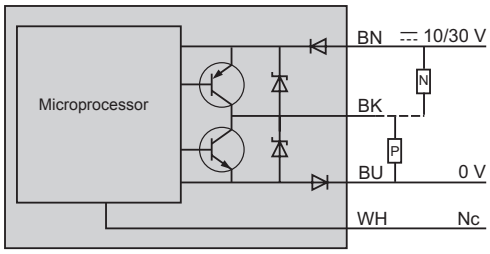
XUYFPDC●●●●●



(1) The ring indicates that the fibre is transmitting.
(2) Bend radius: 15 mm.
(3) 2 nuts included with fibre optic.

Wiring schemes

Cabling



(1) High level on first shade "taught".
Nc: Not connected

M8 connector

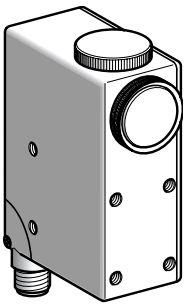
Pin n° - colour
1 BN: Brown
2 WH: White
3 BU: Blue
4 BK: Black

Photo-electric sensors

OsiSense XU Application, packaging series

Colour mark readers *(1)*
DC supply. Solid-state output

Compact design



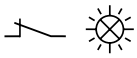
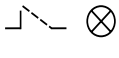
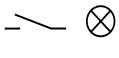
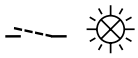
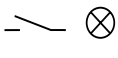
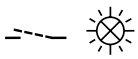
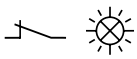
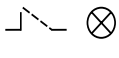
System	**Diffuse**
Type of transmission (line of sight along case axis or at 90° depending on position of lens)	Red or green, automatically selected when using teach mode
Nominal sensing distance (Sn)	**9 mm (7 mm with XURZ02 or 18 mm with XURZ01)** *(2)*
Sensitivity adjustment	Automatic when using teach mode

References

3-wire, PNP or NPN programmable	NO or NC programmable function *(3)*	**XURK1KSMM12**
Weight (kg)		0.550

Characteristics

Product certifications		CE
Ambient air temperature		For operation: - 10…+ 55 °C. For storage: - 20…+ 70 °C
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 0.6 mm (f = 10…55 Hz)
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms
Degree of protection	Conforming to IEC 60529	IP 67
Connection		M12 connector, can be set at 3 positions
		(suitable female connectors, including pre-wired versions, refer to page 5/28
Materials		Case: zinc alloy; lenses: glass
Spot dimensions		At 9 mm: 1.5 x 5 mm (with lens **XURZ0●** see table on page 5/79)
Minimum detectable width of mark		0.5 mm
Maximum vertical inclination of reader		20°
Maximum linear speed of mark		10 m/s (for 1 mm wide mark)
Rated supply voltage		**⎓ 12…24 V with protection against reverse polarity**
Voltage limits		⎓ 10…30 V (including ripple)
Switching capacity (sealed)		**⩽ 200 mA with overload and short-circuit protection**
Voltage drop, closed state		⩽ 1 V (NPN); ⩽ 2 V (PNP)
Current consumption, no-load		⩽ 80 mA
Maximum switching frequency		10 kHz
Delays		First-up: ⩽ 100 ms; response: ⩽ 50 µs; recovery: ⩽ 50 µs
Time delay		"OFF delay": 20 ms, activated/deactivated by internal switch
Analogue output		⎓ 0…5.5 V (voltage proportional to light reflected by the object)

Function table	**Function**	**Detection of dark mark on light background**		**Function**	**Detection of light mark on dark background**	
		No mark present in the beam	**Mark present in the beam**		**No mark present in the beam**	**Mark present in the beam**
Output state (PNP or NPN) indicator: red LED (illuminated when sensor output is ON)	NC			NO		
	NO			NC		

(1) Applications: detection of contrasting colours on reflective, matt or embossed surfaces. Colour mark and index mark reading function on automated packaging and filling systems and on labelling, heat sealing, thermo-forming and printing machines, etc.
(2) Lenses for reduction or magnification of spot (see page 5/161 and spot size table on page 5/79).
(3) Automatic programming depending on chronological order of teaching for the mark and the background.

Accessories :
page 5/158

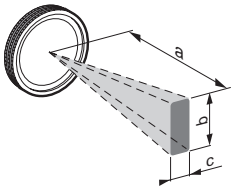
Photo-electric sensors

OsiSense XU Application, packaging series

Colour mark readers
DC supply. Solid-state output

XURK1KSMM12

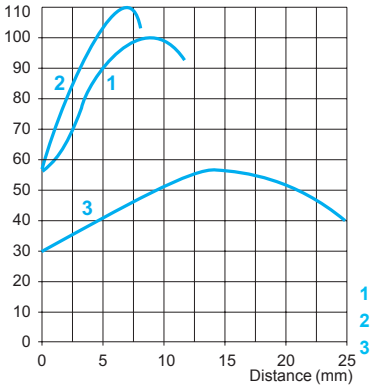
Detection zone and spot size (mm)



XUR	a	b	c
K●●●●●●●	9	5	1.5
K●●●●●●● + XURZ01	18	7	2
K●●●●●●● + XURZ02	7	4	1

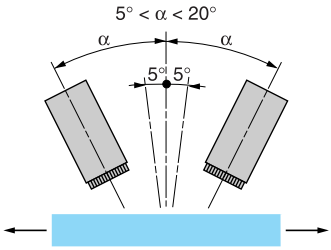
Lenses **XURZ0●**, see page 5/161

Detection curve



1 **XURK●●●●●●●●**
2 **XURK●●●●●●● + XURZ02**
3 **XURK●●●●●●● + XURZ01**

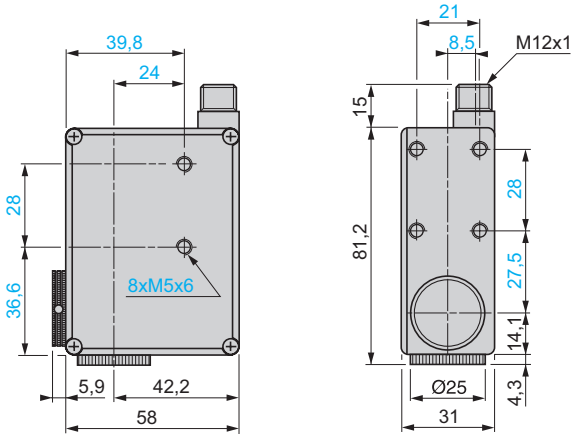
Vertical inclination



An angle of 5 to 10° from vertical is recommended for reflective or transparent surfaces.
Maximum vertical inclination: 20°.

Dimensions

XURK1KSMM12

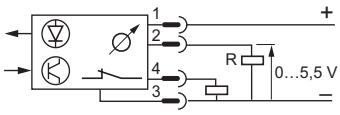


Wiring schemes (3-wire ⎓)

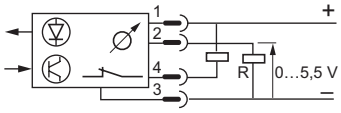
XURK1KSMM12

Automatic NC or NO selection depending on chronological order of teaching for the mark and the background

PNP output



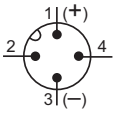
NPN output



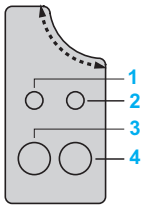
R = 2.2 kΩ

Connector scheme

(sensor connector pin view)



Functions



PNP/NPN programming
and time delay by internal switches

1 Green LED, sensor in teach mode
2 Red LED, output state
3 Teach mode button for mark
Teach mode button for
4 background

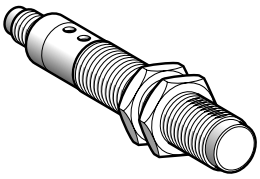
Accessories :
page 5/158

Photo-electric sensors

OsiSense XU Application, packaging series

Luminescence sensor *(1)*
DC supply. Solid-state output

Design 18



System		**Diffuse**
Type of transmission		Ultraviolet (370 nm)
Nominal sensing distance (Sn)		**20 mm** for colour mark reading, **0...80 mm** in diffuse mode
Sensitivity adjustment		By potentiometer

References

3-wire, PNP	NO function *(2)*	**XU5M18U1D**
Weight (kg)		0.075

Characteristics

Product certifications		CE, CSA, UL
Ambient air temperature	For operation	- 25…+ 55 °C
	For storage	- 40…+ 70 °C
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 0.6 mm (f = 10…55 Hz)
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms
Degree of protection	Conforming to IEC 60529	IP 67
Connection		M12 connector (suitable female connectors, including pre-wired versions, see page 5/28)
Materials	Case	Nickel plated brass
	Lenses	PMMA
Spot diameter		At 20 mm: Ø 3 x 1 mm
Auxiliary functions		External synchronisation, locking
Indicator lights	Output state	Green LED
	Teach mode	–
Rated supply voltage		**⎓ 12…24 V with protection against reverse polarity**
Voltage limits		⎓ 10…30 V (including ripple)
Switching capacity (sealed)		**≤ 100 mA** **with protection against reverse polarity, overload and short-circuit**
Voltage drop, closed state		≤ 1.5 V (PNP)
Current consumption, no-load		≤ 20 mA
Maximum switching frequency		1 kHz
Delays	First-up	≤ 100 ms
	Response	≤ 500 µs
	Recovery	≤ 500 µs
Time delay		"OFF delay": 20 ms, activated/deactivated by cabling method

(1) Applications: detection of invisible reference marks, markings, glues or varnishes containing bluing agents.
(2) Output activated when a blued mark on a non blued background is present.

Accessories :
page 5/158

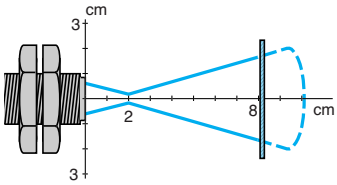
Photo-electric sensors

OsiSense XU Application, packaging series
Luminescence sensor *(1)*
DC supply. Solid-state output

Curves

XU5M18U1D

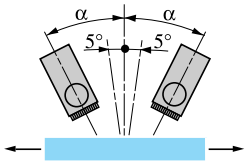
Detection curves



Object 5 x 5 cm, white 90%
Spot size at 20 mm: oval, Ø 3 x 1 mm

Vertical inclination

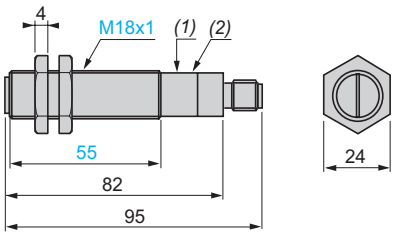
5°< α < 20°



An angle of 5 to 10° from vertical is recommended for reflective or transparent surfaces
Maximum vertical inclination: 20°

Dimensions

XU5M18U1D



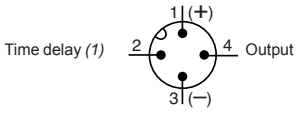
(1) Potentiometer
(2) Green LED
Fixing nut tightening torque: 15 N.m.

Wiring schemes

XU5M18U1D

Connector scheme

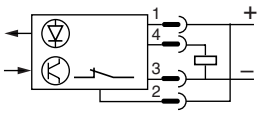
(Sensor connector pin view)



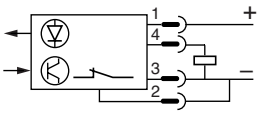
(1) "OFF delay" of output signal:
- no time delay: connect contact 2 to (+)
- 20 ms time delay: connect contact 2 to (-)

Wiring schemes (3-wire ⎓)

PNP output
Without output signal time delay



With output signal time delay (20 ms)



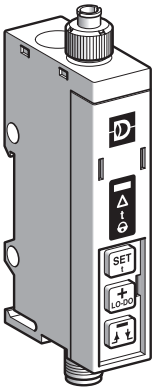
Accessories :
page 5/158

Photo-electric sensors

OsiSense XU Application, packaging series

Detection of illumination using plastic fibre optic and teach mode
Four-wire DC. Solid-state output

Fibre design



Nominal sensing distance (Sn)		**Depending on fibre optic used**

References

4-wire, PNP/NPN output	NO/NC programmable function	**XUYAFLCO966S**
Weight (kg)		0.054

Characteristics

Product certifications		CE
Ambient air temperature	For operation	0…+ 60 °C
	For storage	- 20…+ 80 °C
Degree of protection	Conforming to IEC 60529	IP 65
Connection		M8, 4-pin male connector
Materials	Case	Polycarbonate
Rated supply voltage		**⎓ 12…24 V with protection against reverse polarity**
Voltage limits (including ripple)		**⎓ 10…30 V**
Switching capacity		**100 mA with overload and short-circuit protection**
Voltage drop, closed state		2 V
Current consumption, no-load		< 40 mA
Maximum switching frequency		**< 5 Hz**
External input	Active	< 1.4 V
	Inactive	> 3 V
Delays	Response and recovery	< 100 ms
Output time delay	Range	0…5 s in 11 adjustment increments
	Duration of each increment	First increment 40 ms then 500 ms for each press
Indicator lights	Output signal	Green LED
	Limit of detection	Red LED
	Time delay active	Red LED
Sensitivity adjustment		Using teach (fine mode or standard mode) Adjustment possible using +/- button Remote teaching using external input (fine mode)

■ Applications
□ Verifying operation of indicator lights on electrical appliances
□ Testing car headlights on production line

Accessories

Description	Details	Length of cable	References	Weight
		m		kg
Plastic fibre optic *(1)*	Ø 2.2 mm	1	**XUYA005**	0.007
Pre-wired M8 connector	Straight	2	**XZCP0941L2**	0.080
	Elbowed (90°)	2	**XZCP1041L2**	0.080
	Straight	5	**XZCP0941L5**	0.180
	Elbowed (90°)	5	**XZCP1041L5**	0.180

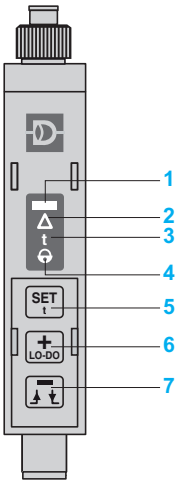
(1) End fitting, see page5/144.

Photo-electric sensors

OsiSense XU Application, packaging series

Detection of illumination using plastic fibre optic and teach mode
Four-wire DC. Solid-state output

Presentation



1 Output signal

2 Limit of detection
Positioning assistance

3 Time delay active

4 Action keypad
Keypad locking

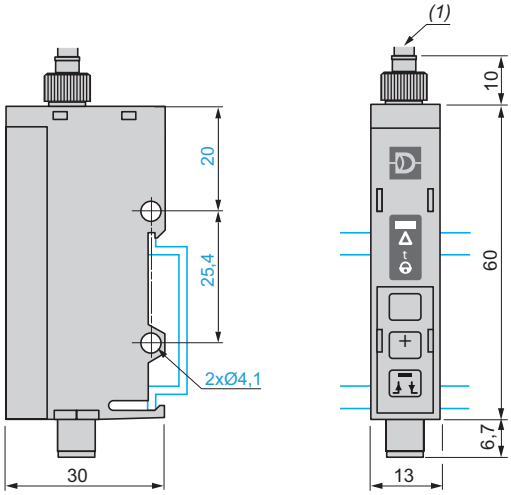
5 Automatic adjustment of threshold
Access to special functions

6 Sensitivity increase
NO/NC output
Time delay increase

7 Sensitivity decrease
On-delay, Off-delay inversion
Time delay decrease

Dimensions

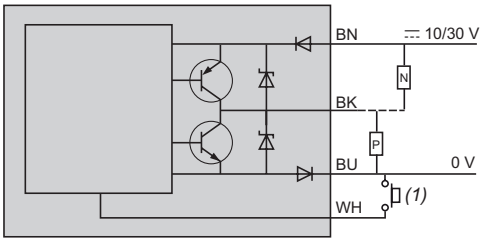
Mounting on 35 mm ⊥⊥ rail



(1) Ø 2.2 mm plastic fibre optic.

Wiring schemes

Scheme



M8 connector

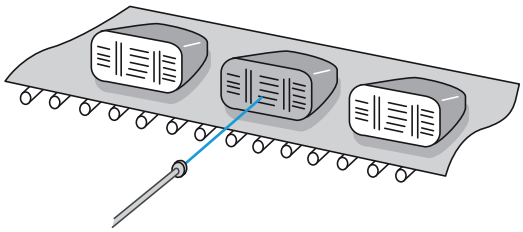
Pin n° - colour

1 BN: Brown
2 WH: White
3 BU: Blue
4 BK: Black

(1) Remote teaching. If not used: connect to +.

Application examples

Verifying operation of car headlights on an assembly line



Verifying operation of indicator lights on electrical appliances

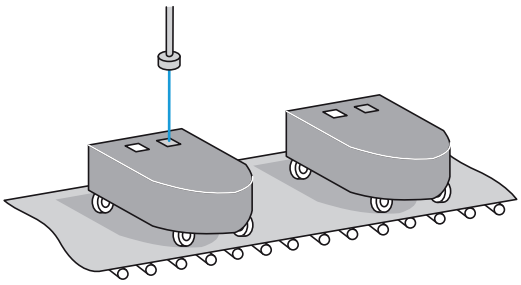
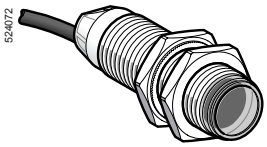


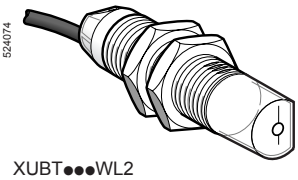
Photo-electric sensors

OsiSense XU Application, packaging series

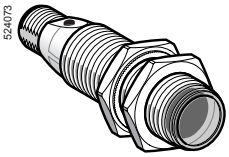
For detection of transparent materials
Design 18, plastic or stainless steel
Three-wire DC, solid-state output


524072

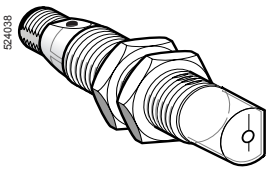
XUBT●●●NL2


524074

XUBT●●●WL2


524073

XUBT●●●NM12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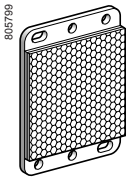
XUBT●●●WM12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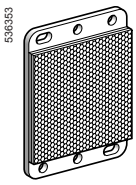
XUZC50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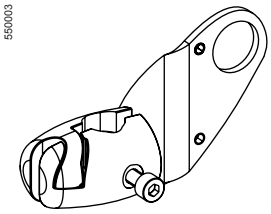
XUZC50HP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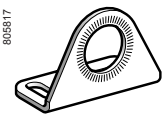
XUZB2003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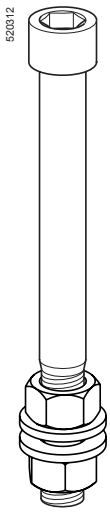
XUZA118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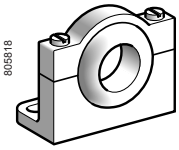
XUZ2001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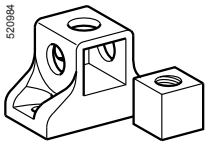
XUZA218


520984

XUZ2003

Ø 18 plastic, coaxial polarised reflex with teach mode

Sensing distance (Sn) m	Function	Line of sight	Output	Reference	Weight kg
Pre-cabled *(2)*					
0…1.4 With reflector XUZC50/C50HP	NO or NC, by programming	Along case axis	PNP	**XUBTAPSNL2** *(1)*	0.110
			NPN	**XUBTANSNL2** *(1)*	0.110
0…0.8 With reflector XUZC50/C50HP	NO or NC, by programming	90° to case axis	PNP	**XUBTAPSWL2** *(1)*	0.113
			NPN	**XUBTANSWL2** *(1)*	0.113
M12 connector					
0…1.4 With reflector XUZC50/C50HP	NO or NC, by programming	Along case axis	PNP	**XUBTAPSNM12** *(1)*	0.045
			NPN	**XUBTANSNM12** *(1)*	0.045
0...0.8 With reflector XUZC50/C50HP	NO or NC, by programming	90° to case axis	PNP	**XUBTAPSWM12** *(1)*	0.048
			NPN	**XUBTANSWM12** *(1)*	0.048

Ø 18 stainless steel, coaxial polarised reflex with teach mode

Sensing distance (Sn) m	Function	Line of sight	Output	Reference	Weight kg
Pre-cabled *(2)*					
0…1.4 With reflector XUZC50/C50HP	NO or NC, by programming	Along case axis	PNP	**XUBTSPSNL2** *(1)*	0.135
			NPN	**XUBTSNSNL2** *(1)*	0.135
0...0.8 With reflector XUZC50/C50HP	NO or NC, by programming	90° to case axis	PNP	**XUBTSPSWL2** *(1)*	0.138
			NPN	**XUBTSNSWL2** *(1)*	0.138
M12 connector					
0…1.4 With reflector XUZC50/C50HP	NO or NC, by programming	Along case axis	PNP	**XUBTSPSNM12** *(1)*	0.070
			NPN	**XUBTSNSNM12** *(1)*	0.070
0...0.8 With reflector XUZC50/C50HP	NO or NC, by programming	90° to case axis	PNP	**XUBTSPSWM12** *(1)*	0.073
			NPN	**XUBTSNSWM12** *(1)*	0.073

Ø 18 plastic, reflex with teach mode

Sensing distance (Sn) m	Function	Line of sight	Output	Reference	Weight kg
Pre-cabled *(2)*					
0.1…0.8 With reflector XUZC50	NO or NC, by programming	Along case axis	PNP	**XUBT1PSNL2**	0.103
			NPN	**XUBT1NSNL2**	0.103
M12 connector					
0.1…0.8 With reflector XUZC50	NO or NC, by programming	Along case axis	PNP	**XUBT1PSNM12**	0.045
			NPN	**XUBT1NSNM12**	0.045

Accessories for XUBT●●●●● *(3)*

Description	Dimensions	Reference	Weight kg
Universal reflector	50 x 50 mm	**XUZC50**	0.020
Application reflector (accuracy, detection sensitivity)	50 x 50 mm	**XUZC50HP**	0.020

Fixing accessories *(4)*

Description	Reference	Weight kg
3D fixing kit for use on M12 rod, for XUBT or XUZC50/C50HP	**XUZB2003**	0.170
M12 rod	**XUZ2001**	0.050
Support for M12 rod	**XUZ2003**	0.150
Stainless steel fixing bracket	**XUZA118**	0.045
Plastic fixing bracket with adjustable ball-joint	**XUZA218**	0.035

*(1) **Application reflector XUZC50HP included with sensor**.*
(2) For a 5 m long cable, replace L2 by ***L5***.
*Example: XUBTAPSNL2 becomes **XUBTAPSNL5**.*
(3) For further information, see page 5/159.
(4) For further information, see page 5/158.

Photo-electric sensors

OsiSense XU Application, packaging series

For detection of transparent materials
Design 18, plastic or stainless steel
Three-wire DC, solid-state output

Characteristics

Sensor type			XUBT●●●●M12/XUBT●●●●L2	XUBT1●●●●M12/XUBT1●●●●L2
Product certifications			UL, CSA, CE	
Connection	Connector		M12 (male)	
	Pre-cabled		Length: 2 m, wire c.s.a.: 3 x 0.34 mm²	
Nominal sensing distance Sn	Line of sight along case axis	**m**	0 to 1.4 with reflector XUZC50/C50HP	0.1 to 0.8 with reflector XUZC50
	Line of sight 90° to case axis	**m**	0 to 0.8 with reflector XUZC50/C50HP	–
Beam divergence			1.5° (Ø 37mm spot at 1.4 m)	
Blind zone		**m**	0	0.1
Preferred object approach direction			Any	Lenses on horizontal plane for horizontal passage of object
Type of transmission			Coaxial polarised red	Dual lens red
Degree of protection	Conforming to IEC 60529		IP 65, IP 67, double insulation ⧈ IP 69K for connector version **XUBT●●●●M12** *(1)*	
Temperature	Storage	**°C**	- 40…+ 70	
	Operation	**°C**	0…+ 55	
Materials	Case		**XUBTA and XUBT1 ●●●●●**: plastic PBT **XUBTS●●●●●**: stainless steel (grade 304Cu)	
	Lens		PMMA	
	Cable		PvR	
Vibration resistance	Conforming to IEC 60068-2-6		7 gn, amplitude ± 1 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27		30 gn, duration 11 ms	
Indicator lights	Output state		Yellow LED	
	Supply on		Green LED	
	Stability		Red LED	Red LED for alignment only
Rated supply voltage		**V**	⎓ 12…24 with protection against reverse polarity	
Voltage limits (including ripple)		**V**	⎓ 10…32	
Current consumption, no-load		**mA**	45	30
Switching capacity		**mA**	≤ 100 with overload and short-circuit protection	
Voltage drop, closed state		**V**	≤ 1.5	
Maximum switching frequency		**Hz**	1000	250
Delays	First-up	**ms**	< 200	< 200
	Response and recovery	**µs**	< 500	< 2000

(1) IP69K also available with PVC cable, please consult our Customer Care Center for specific adaptation.

Wiring schemes

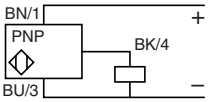
M12 connector

3 (-)
1 (+)
4 OUT/Output
2 Not connected

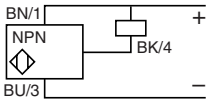
Pre-cabled

(-) BU (Blue)
(+) BN (Brown)
OUT/Output BK (Black)

PNP



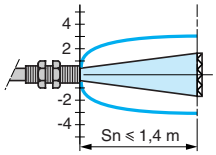
NPN



Detection curves

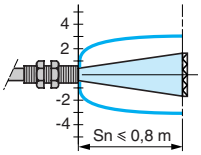
With reflector XUZC50●●

Line of sight along case axis



Sn ≤ 1.4 m (**XUBT**)
Sn ≤ 0. m (**XUBT1**)

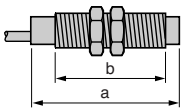
Line of sight 90° to case axis



Sn ≤ 0,8 m (**XUBT** only)

Dimensions

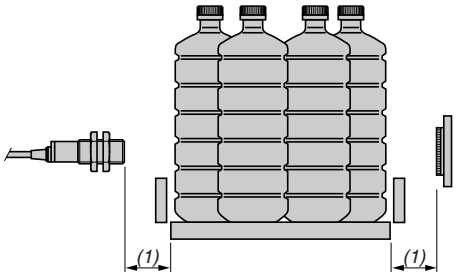
XUBT●●●●



	Pre-cabled (mm)		Connector (mm)	
	a	b	a	b
Ø 18, line of sight along case axis	64	44	78	44
Ø 18, line of sight 90° to case axis	78	44	92	44

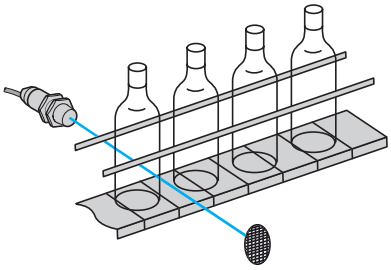
Setting-up

Recommended distances and application restraints

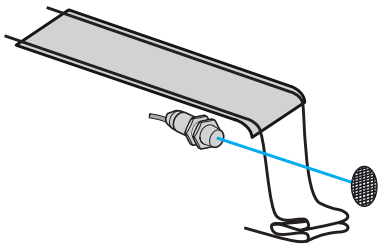


(1) Blind zone

Application examples



Detection of transparent bottles



Detection of plastic film

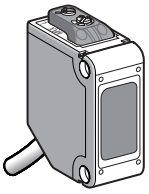
For precise detection or magnifying glass effect cases, it is advisable to use XUBT●●●●M12/L2.

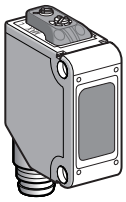
Photo-electric sensors

OsiSense XU, Application, packaging series

For detection of transparent materials
DC supply. Solid-state output

Compact design





System	**Reflex**
Type of transmission	Infra-red
Nominal sensing distance (Sn)	**0.1…1 m with reflector XUZC50CR** *(1)* **0.8…2 m with reflector XUZC50** *(1)*
Adjustment	270° potentiometer

References

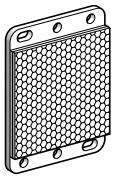
3-wire	NO or NC programmable function	PNP **XUMTAPCNL2**	NPN **XUMTANCNL2**	PNP **XUMTAPCNM8**	NPN **XUMTANCNM8**	PNP **XUMTAPCNL03M12**
Weight (kg)		0.155	0.155	0.055	0.055	0.055

Characteristics

Product certifications		CE, cURus		
Ambient air temperature		For operation: - 25…+ 55°C. For storage: - 30…+ 70°C		
Vibration resistance	Conforming to IEC 60068-2-8	20 gn max., amplitude: 3 mm, frequency: 10…500 Hz		
Shock resistance	Conforming to IEC 60068-2-27	50 gn		
Degree of protection	Conforming to IEC 60529	IP 67		
Material		Case: PBT Lenses: polycarbonate		
Indicator lights	Output state	Orange LED		
	Power on, help with setting	Green LED		
Connection		2 m cable Conductor c.s.a.: 0.2 mm²	M8 4-pin connector	Remote M12 connector 0.3 m cable Conductor c.s.a.: 0.2 mm²
Rated supply voltage		**12…24 V ⎓ with protection against reverse polarity**		
Voltage limits		10…30 V ⎓ (including ripple)		
Switching capacity		**≤ 100 mA with overload and short-circuit protection**		
Immunity to ambient light	Natural light	3000 lux		
	Incandescent bulb	3000 lux		
Voltage drop, closed state		< 2 V		
Current consumption		≤ 10 mA		
Response time		≤ 1 ms		

Function table	**Function**	**Diffuse system**	
		No object present in the beam	**Object present in the beam**
State of output (PNP or NPN) and orange LED (illuminated when sensor output is ON)	NO (position D)		
	NC (position L)		

Accessories



XUZC50
XUZC50CR

Description	Dimensions	Reference	Weight kg
Standard reflector Reflector distance from the product: 0.8 to 2 m	50 x 50 mm	**XUZC50**	0.020
Application reflector Reflector distance from the product: 0.2 to 1 m	50 x 50 mm	**XUZC50CR**	0.020

(1) Reflector to be ordered separately.

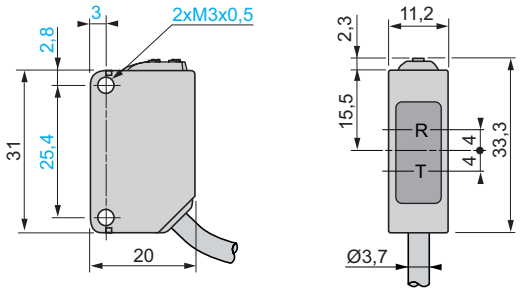
Photo-electric sensors

OsiSense XU, Application, packaging series

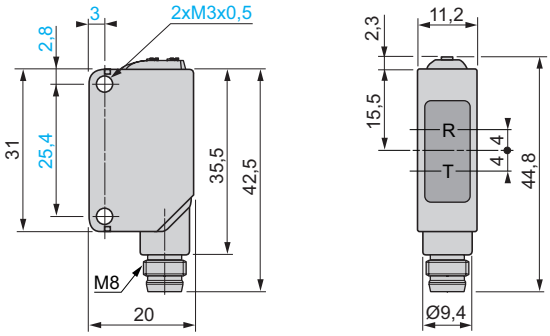
For detection of transparent materials
DC supply. Solid-state output

Dimensions

XUMTAPCNL2, **XUMTANCNL2** and **XUMTAPCNL03M12**

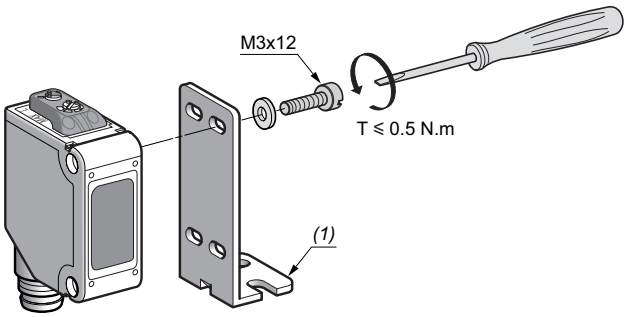


XUMTAPCNM8 and **XUMTANCNM8**



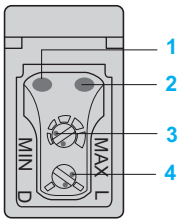
R: Reception, T: Transmission

Mounting



(1) ***XUZA50***, ***XUZAM02*** *or* ***XUZAM03*** *metal bracket (see pages 5/34 and 5/38).*

Functions



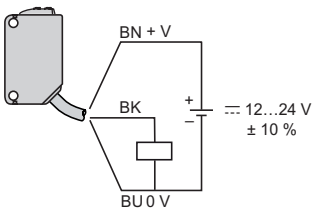
1. Stability indicator (green). LED on in stable detection conditions (NO or NC).
2. Change indicator (orange). LED lit when the detection output has been activated.
3. Sensitivity adjustment potentiometer.
4. NO/NC operating mode selector switch.

NO/NC selector switch	Function	Details
L D	NC (position L)	NC mode is obtained when the selector switch slot is fully turned to position L.
L D	NO (position D)	NO mode is obtained when the selector switch slot is fully turned to position D.

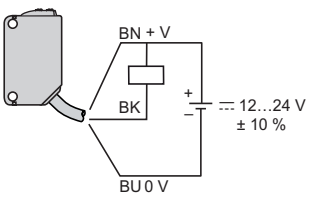
Connections

Wiring schemes (3-wire ⎓)

PNP output



NPN output



Cable connections

XUMTA●CNL2

(–) BU (Blue)
(+) BN (Brown)
(OUT) BK (Black)

Connector schemes

XUMTA●CNM8

M8 connector

3 (–)
1 (+)
4 Output
2 Not connected

XUMTAPCNL03M12

M12 connector

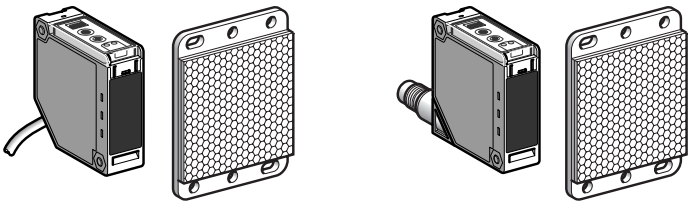
3 (–)
1 (+)
4 Output
2 Not connected

Photo-electric sensors

OsiSense XU Application, packaging series

For detection of transparent materials, with teach mode and automatic compensation for accumulation of dirt *(1)*
Solid-state output

Compact design



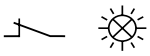
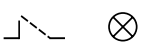
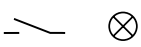
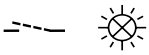
System		**Reflex**	
Type of transmission		Red	
Nominal sensing distance (Sn)		**1.5 m** (with 50 x 50 mm reflector)	

References

3-wire, PNP or NPN	NO or NC programmable function	**XUKT1KSML2** *(2)*	**XUKT1KSMM12** *(2)*
Weight (kg)		0.280	0.120

Characteristics

Product certifications		CE, UL, CSA	
Ambient air temperature	For operation	- 25…+ 55 °C	
	For storage	- 30…+ 70 °C	
Vibration resistance	Conforming to IEC 60068-2-6	7 gn (f = 10…55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27	10 gn, duration 11 ms	
Degree of protection	Conforming to IEC 60529	IP 65	
Materials	Case	PC	
	Lenses	PMMA	
	Cable	PVC	
Connection		Pre-cabled, diameter 6 mm, length 2 m, wire c.s.a.: 4 x 0.34 mm^2	M12 male connector, can be set at 2 positions (suitable female connectors, including pre-wired versions, see page 5/28)
Rated supply voltage		⎓ **12…24 V with protection against reverse polarity**	
Voltage limits		⎓ 10…30 V (including ripple)	
Switching capacity (sealed)		⩽ **100 mA with overload and short-circuit protection**	
Voltage drop, closed state		⩽ 2 V	
Current consumption, no-load		⩽ 35 mA	
Maximum switching frequency		1500 Hz	
Delays	First-up	⩽ 80 ms	
	Response	⩽ 0.3 ms	
	Recovery	⩽ 0.3 ms	
Time delay		Monostable, on-delay or off-delay (programmable) adjustable from 0.1 to 5 seconds	

Function table	**Function**	**Reflex system**	**Reflex system**
		No object present in the beam	**Object present in the beam**
Output state (PNP or NPN) indicator: yellow LED (illuminated when sensor output is ON)	NC		
	NO		

(1) Sensor memorises, in teach mode, the environmental conditions in which the object is to be detected and adapts to any variations.
*(2) 50 x 50 mm reflector **XUZC50** included with the sensor.*

Accessories :
page 5/158

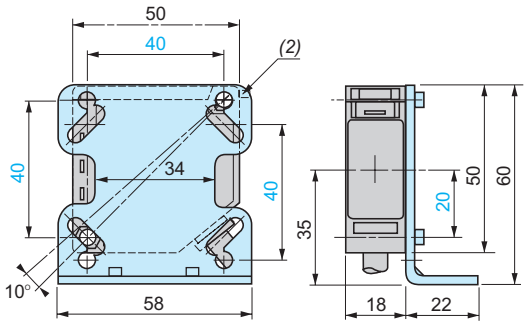
Photo-electric sensors

OsiSense XU Application, packaging series

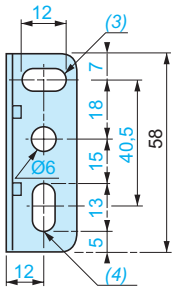
For detection of transparent materials, with teach mode and automatic compensation for accumulation of dirt
Solid-state output

Dimensions

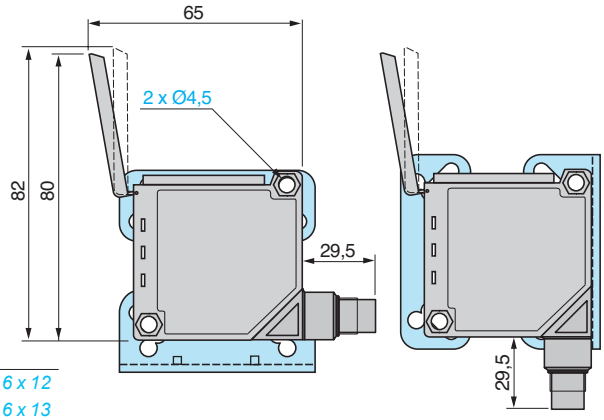
XUKT1KSML2 *(1)*



Bracket fixing *(1)*



XUKT1KSMM12 with cover open
Fixing bracket mounting according to position of connector *(1)*

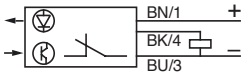


*(1) The bracket **XUZA51** is included with the sensor.*
(2) Cover locking tongue
(3) 1 elongated hole Ø 6 x 12
(4) 1 elongated hole Ø 6 x 13

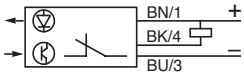
Wiring schemes (3-wire ⎓)

NC programmed

PNP programmed output

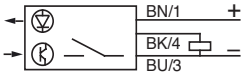


NPN programmed output

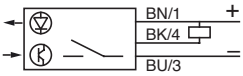


NO programmed

PNP programmed output

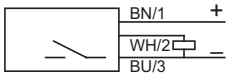


NPN programmed output

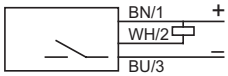


Alarm output

PNP programmed



NPN programmed



Connection

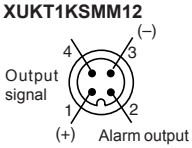
Cable connections

XUKT1KSML2

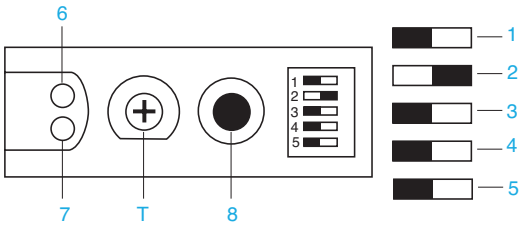
(–)	BU	(Blue)
(+)	BN	(Brown)
(OUT)	BK	(Black)
Alarm	WH	(White)

Connector scheme

XUKT1KSMM12



Functions



Switches

1 NC/NO programming
2 Time delay activated or deactivated
3 Normal time delay or monostable
4 Normal time delay "On-delay" or "Off-delay"
5 PNP or NPN output

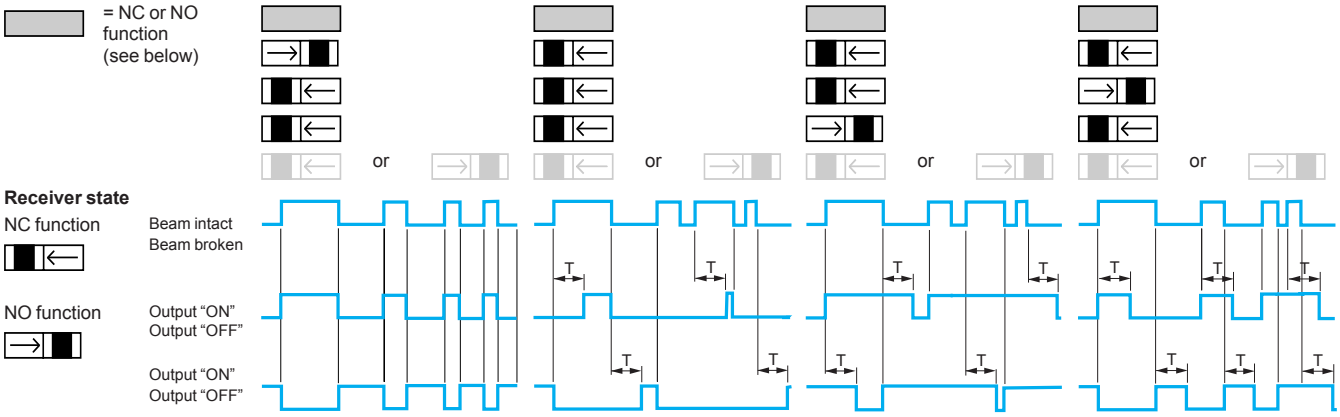
LED

6 Yellow LED: output and teach mode aid
7 Red LED: alignment aid and alarm indicator

Potentiometer and button

T Time delay adjustment
8 Teach mode button

Time delays



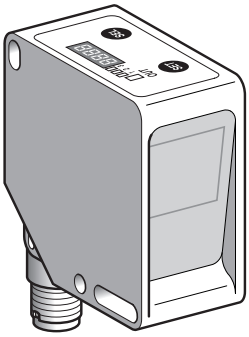
Accessories :
page 5/158

Photo-electric sensors

OsiSense XU Application, packaging series

Compact design, 50 x 50
For colour detection (1)
DC supply. Solid-state output

Compact design, 50 x 50



System		**Diffuse**
Type of transmission		White LED (400-700 nm)
Type of colour processing		RGB
Nominal sensing distance (Sn)		**20 mm** (Operational distance, see curve on page 5/91)

References

3-wire, PNP + 1 synchro input	NO function	**XUKC1PSMM12**
3-wire, NPN + 1 synchro input	NO function	**XUKC1NSMM12**
Weight (kg)		0.085

Characteristics

Product certifications		CE, cULus
Ambient air temperature	For operation	- 10…+ 55 °C
	For storage	- 20…+ 70 °C
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 0.5 mm (f = 10...55 Hz for each axis)
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms, 6 shocks on each axis
Degree of protection	Conforming to IEC 60529	IP 65
Connection		M12, 8-pin connector; can be set at 90°
Materials	Case	ABS
	Lenses	Glass (window tilted, anti-reflective glass)
Spot diameter		At 20 mm: Ø 4 mm
Adjustment	Teach mode	Teaching using SET (adjustment) and SEL (Selection) buttons
	Operating mode	C (colour) or C+I (colour + intensity), independent for each channel
	Tolerance level	Selectable tolerance for varying shades of colour from TOL 0 to TOL 9
Auxiliary functions		External synchronisation, locking
Indicator lights and display	Display	4-digit
	Output active	3 green LEDs: output 1, 2 or 3
	Output state "OUT"	Yellow LED if one output (1, 2 or 3) activated
Rated supply voltage		⎓ **12…24 V**
Voltage limits		⎓ 10…30 V (including ripple)
Switching capacity (sealed)		**≤ 100 mA with protection against reverse polarity, overload and short-circuit**
Voltage drop, closed state		≤ 2 V
Current consumption, no-load		≤ 60 mA
Maximum switching frequency		1.5 kHz
Delay		335 µs for response and recovery
Time delay		Selectable (5, 10, 20, 30 or 40 ms)

Function table for each channel (3 channels) NO function	**Colour recognised by sensor**	**Colour not recognised by sensor**
Output state (PNP or NPN) indicator (illuminated when sensor output is ON)		

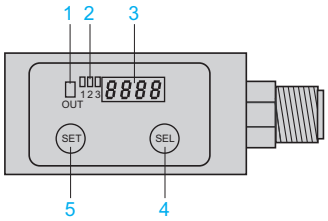
(1) Applications: OsiSense XU "Full colour" is a colour sensor that can recognise up to 3 colours. It can be used to sort objects by colour or to monitor colours, and is insensitive to surface finishes (matt or reflective), as well as ambient lighting. The sensor is suitable for use in many industrial sectors, such as packaging machines, printing machines, etc.

Photo-electric sensors

OsiSense XU Application, packaging series
Compact design, 50 x 50
For colour detection
DC supply. Solid-state output

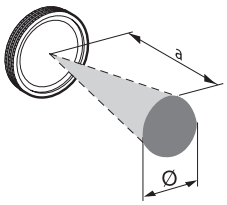
Presentation

Description



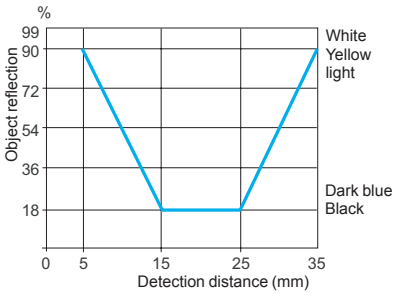
1 Output LED
2 OUT1, OUT2 and OUT3 LEDs
3 Display (green, 4-digit)
4 SEL button (adjustment)
5 SET button

Detection zone and spot size



	a (mm)	Ø (mm)
XUKC1●SMM12	20	4

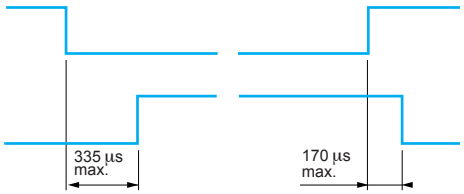
Detection curve



Detection distance related to object's degree of reflection

Diagram

SYNC passive = VDC, SYNC active = 0 V

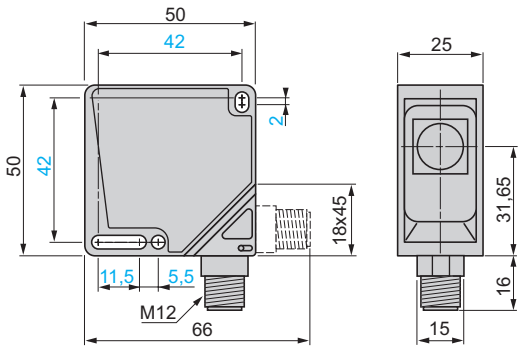


Accessories

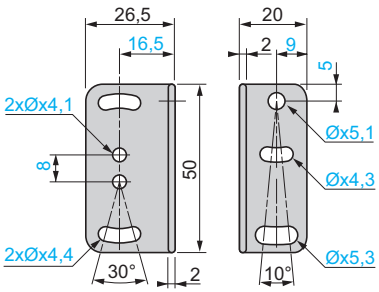
Description	Diameter mm	Length m	Reference	Weight kg
Pre-wired M12, 8-pin connectors, shielded cable *(1)*	6.5	3	**XSZMCR03**	0.230
		10	**XSZMCR10**	0.715
Metal fixing bracket (2 screws, 2 nuts and 2 washers included)	–	–	**XUZK2000**	0.040
Metal fixing bracket (2 screws, 2 nuts, 2 washers and 1 screwdriver included)	–	–	**XUZA51**	0.050

Dimensions

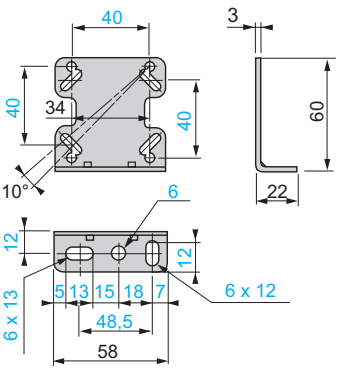
XUKC1●SMM12



Fixing bracket XUZK2000



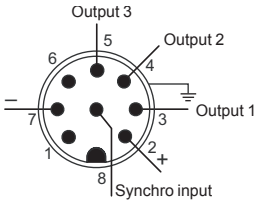
Fixing bracket XUZA51



Wiring schemes

Pre-wired connector XSZMCR●●

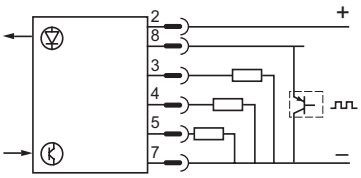
Sensor connector pin view



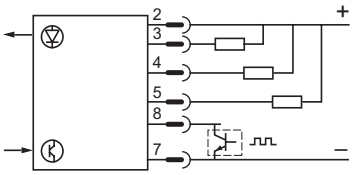
Pin N°	Type	Colour *(2)*
1	–	WH (white)
2	⎓ 10...30 V	BN (brown)
3	Output 1	TAN (tan)
4	Output 2	YE (yellow)
5	Output 3	GY (grey)
6	–	PK (pink)
7	0 V	VT (violet)
8	Synchro	RD (red)
–	Screening	TR (transparent)

Wiring schemes

PNP output + synchro input



NPN output + synchro input

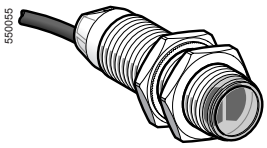


(1) The use of shielded cable is recommended in order ensure correct operation of the sensor, especially in environments subject to electromagnetic interference.
(2) With pre-wired connector XSZMCR●●.

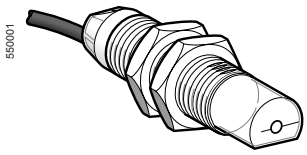
Photo-electric sensors

OsiSense XU Application, multimode food and beverage processing series

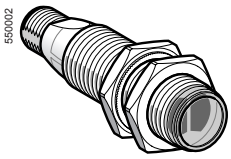
Design 18, metal, stainless steel
Three-wire DC, solid-state output



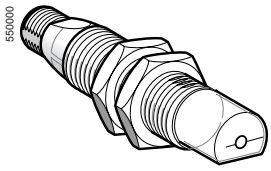
XUB0●●●NL2



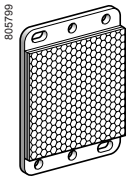
XUB0●●●WL2



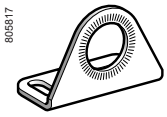
XUB0●●●NM12



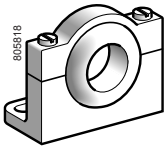
XUB0●●●WM12



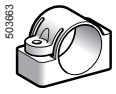
XUZC50



XUZA118



XUZA218



XUZB2005

Ø 18 stainless steel

Pre-cabled *(1)*

Sensing distance (Sn) *(2)* m	Function	Output	Line of sight	Reference	Weight kg
0…20 depending on whether accessories are used	NO or NC, by programming	PNP	Along case axis	**XUB0SPSNL2**	0.105
			90° to case axis	**XUB0SPSWL2** *(3)*	0.110
		NPN	Along case axis	**XUB0SNSNL2**	0.105
			90° to case axis	**XUB0SNSWL2** *(3)*	0.110

M12 connector

0…20 depending on whether accessories are used	NO or NC, by programming	PNP	Along case axis	**XUB0SPSNM12**	0.055
			90° to case axis	**XUB0SPSWM12** *(3)*	0.060
		NPN	Along case axis	**XUB0SNSNM12**	0.055
			90° to case axis	**XUB0SNSWM12** *(3)*	0.060

Accessories

Description	Connection	Line of sight	Reference	Weight kg
Thru-beam accessories (transmitter)	Pre-cabled *(1)*	Along case axis	**XUB0SKSNL2T**	0.105
		90° to case axis	**XUB0SKSWL2T** *(3)*	0.110
	M12 connector	Along case axis	**XUB0SKSNM12T**	0.055
		90° to case axis	**XUB0SKSWM12T** *(3)*	0.060
Reflector 50 x 50 mm	–	–	**XUZC50**	0.020

Fixing accessories *(4)*

Description	Reference	Weight kg
Stainless steel fixing bracket	**XUZA118**	0.045
Plastic fixing bracket with adjustable ball-joint	**XUZA218**	0.035
Plastic fixing clamp, 24.1 mm centres with locking screw	**XUZB2005**	0.007

*(1) For a 5 m long cable, replace L2 by **L5**.*
*Example: XUB0SPSNL2 becomes **XUB0SPSNL5**.*
(2) For further information, see page 5/32.
(3) For line of sight 90° to case axis versions, see sensing distances on page 5/32.
(4) For further information, see page 5/158.

Photo-electric sensors

OsiSense XU Application, multimode food and beverage processing series

Design 18, metal, stainless steel
Three-wire DC, solid-state output

Characteristics

Sensor type			XUB0●●●●M12, XUB0●●●●M12T		XUB0●●●●L2, XUB0●●●●L2T
Product certifications			UL, CSA, CE		
Connection	Connector		M12		–
	Pre-cabled		–		Length: 2 m
Sensing distance			**Line of sight along case axis**	**Line of sight 90° to case axis**	**Accessory**
nominal Sn / maximum (excess gain = 2) (excess gain = 1)		**m**	**0.12 / 0.12**	**0.11 / 0.11**	**Without (diffuse with background suppression)**
		m	**0.3 / 0.4**	**0.2 / 0.3**	**Without (diffuse)**
		m	**3 / 4.5**	**1.5 / 2**	**With reflector (polarised reflex)**
		m	**20 / 30**	**10 / 14**	**With thru-beam accessory (thru-beam)**
Type of transmission			Infrared, except polarised reflex (red)		
Degree of protection			IP 65, IP 67 conforming to IEC 60529; IP 69K conforming to DIN 40050; double insulation ⧈		
Storage temperature		**°C**	- 40…+ 70		
Operating temperature		**°C**	- 25…+ 55		
Materials			Case: stainless steel, grade 304CU; Lens: PMMA; Cable: PvR		
Vibration resistance	Conforming to IEC 60068-2-6		7 gn, amplitude ± 1.5 mm (f = 10 to 55 Hz)		
Shock resistance	Conforming to IEC 60068-2-27		30 gn, duration 11 ms		
Indicator lights	Output state		Yellow LED (transmission present for **XUB0●●●●●●T**)		
	Supply on		Green LED		
	Optical alignment aid / dirty		Red LED (except for **XUB0●●●●●●T**)		
Rated supply voltage		**V**	⎓ 12…24 with protection against reverse polarity		
Voltage limits (including ripple)		**V**	⎓ 10…36		
Current consumption, no-load		**mA**	35 (20 for **XUB0●●●●●●T**)		
Switching capacity		**mA**	≤ 100 with overload and short-circuit protection		
Voltage drop, closed state		**V**	1.5		
Maximum switching frequency		**Hz**	250 (200 for diffuse with background suppression)		
Delays	First-up	**ms**	< 200		
	Response	**ms**	< 2 (< 2.5 for diffuse with background suppression)		
	Recovery	**ms**	< 2 (< 2.5 for diffuse with background suppression)		

Wiring schemes

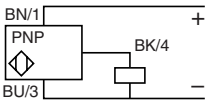
M12 connector

3 (-)
1 (+)
4 OUT/Output
2 Beam break input *(1)*

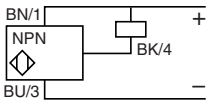
Pre-cabled

(-) BU (Blue)
(+) BN (Brown)
OUT/Output BK (Black)
Beam break input *(1)*
VI (Violet)

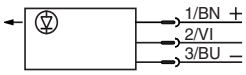
PNP



NPN



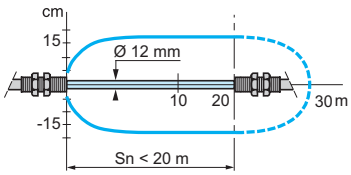
Thru-beam accessory



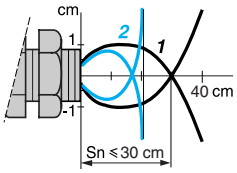
Input 2/VI:
- not connected: *beam made*
- connected to –: *beam broken*

Detection curves (line of sight along case axis)

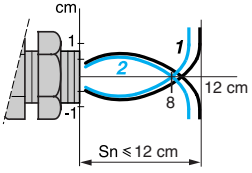
With thru-beam accessory (thru-beam)



Without accessory (diffuse)

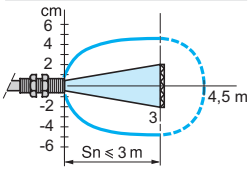


Without accessory (diffuse with bckgrnd. suppression



*Object: 10 x 10 cm, **1**: white 90%, **2**: grey 18%*

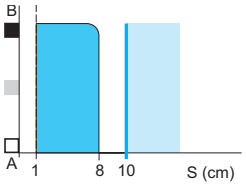
With reflector (polarised reflex)



With reflector XUZC50

Variation of usable sensing distance Su (without accessory, with adjustable background suppression)

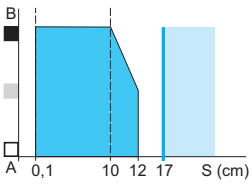
Teach mode at minimum



A-B: *object reflection coefficient*
- *Black 6%*
- *Grey 18%*
- *White 90%*
- *Sensing range*
- *Non sensing zone*

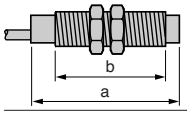
(matt surfaces)

Teach mode at maximum



Dimensions

XUB



	Pre-cabled (mm)		Connector (mm)	
	a	b	a	b
Ø 18, line of sight along case axis	64 *(2)*	44	78 *(2)*	44
Ø 18, line of sight 90° to case axis	78	44	92	44

(1) Beam break input on thru-beam transmitter only.
*(2) For **XUB0●●●●●●T**, 64 becomes 62 mm and 78 becomes 76 mm.*

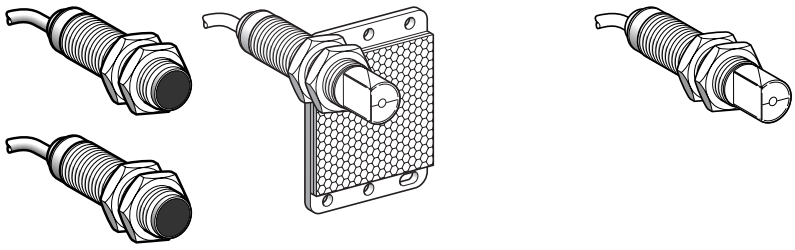
Photo-electric sensors

OsiSense XU Application, single mode

food and beverage processing series
Stainless steel case M18 x 1
DC. Solid-state output

Design 18

1 2 3



System		Thru-beam 1	Reflex 2	Polarised reflex 2	Diffuse 3
Type of transmission		Infrared	Infrared	Red	Infrared
Sensing distance	Nominal Sn (excess gain = 2)	15 m	4 m	2 m	0.10 m
	Maximum (excess gain = 1)	20 m	5.5 m (with 50 x 50 mm reflector)	3 m (with 50 x 50 mm reflector)	0.15 m

References of pre-cabled versions *(1)*

3-wire, PNP NO or NC programmable function	Line of sight along case axis	**XU2N18PP341** *(2)*	**XU1N18PP341** *(3)*	**XU9N18PP341** *(3)*	**XU5N18PP341**
	Line of sight 90° to case axis	**XU2N18PP341W** *(2)*	**XU1N18PP341W** *(3)*	**XU9N18PP341W** *(3)*	**XU5N18PP341W**
3-wire, NPN NO or NC programmable function	Line of sight along case axis	**XU2N18NP341** *(2)*	**XU1N18NP341** *(3)*	**XU9N18NP341** *(3)*	**XU5N18NP341**
	Line of sight 90° to case axis	**XU2N18NP341W** *(2)*	**XU1N18NP341W** *(3)*	**XU9N18NP341W** *(3)*	**XU5N18NP341W**
Weight (kg)		0.270	0.155	0.155	0.135

References of connector versions

3-wire, PNP NO or NC programmable function	Line of sight along case axis	**XU2N18PP341D** *(2)*	**XU1N18PP341D** *(3)*	**XU9N18PP341D** *(3)*	**XU5N18PP341D**
	Line of sight 90° to case axis	**XU2N18PP341WD** *(2)*	**XU1N18PP341WD** *(3)*	**XU9N18PP341WD** *(3)*	**XU5N18PP341WD**
3-wire, NPN NO or NC programmable function	Line of sight along case axis	**XU2N18NP341D** *(2)*	**XU1N18NP341D** *(3)*	**XU9N18NP341D** *(3)*	**XU5N18NP341D**
	Line of sight 90° to case axis	**XU2N18NP341WD** *(2)*	**XU1N18NP341WD** *(3)*	**XU9N18NP341WD** *(3)*	**XU5N18NP341WD**
Weight (kg)		0.130	0.085	0.085	0.065

Fixing accessories *(4)*

Description	Reference	Weight kg
Stainless steel fixing bracket	**XUZA118**	0.045
Plastic fixing bracket	**XUZA218**	0.035
Set of 2 stainless steel nuts	**XSZE318**	0.020
Set of 2 plastic nuts	**XSZE218**	0.004

*(1) Sensors available with 5 m long cable: To order, add **L5** to the end of the reference selected from above.*
*Example: sensor **XU1N18PP341** with 5 m cable becomes **XU1N18PP341L5**.*
(2) Reference for both transmitter and receiver for thru-beam system sensors.
(3) 50 x 50 mm reflector included with reflex system sensors.
(4) For further information, see page 5/160.

Accessories:
page 5/158

Photo-electric sensors

OsiSense XU Application, single mode

food and beverage processing series
Stainless steel case M18 x 1
DC. Solid-state output

Characteristics

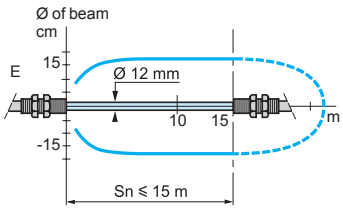
Product certifications		CE, UL, CSA
Ambient air temperature		For operation: - 25...0…+ 55 °C. For storage: - 40...+ 70 °C
Vibration resistance	Conforming to IEC 60068-2-6	25 gn, amplitude ± 1.5 mm (f = 10…55 Hz)
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms
Degree of protection	Conforming to IEC 60529	IP 67
Connection	Pre-cabled	Pre-cabled, diameter 4.2 mm, length 2 m (3), wire c.s.a.: 4 x 0.34 mm²
	Connector	M12 male connector, 4-pin (suitable female connectors, including pre-wired versions, see page 5/28)
Materials	Case	Food and beverage processing stainless steel, grade 304 Cu
	Lenses	PMMA
	Cable	PvR
Rated supply voltage		⎓ 12…24 with protection against reverse polarity
Voltage limits		⎓ 10…30 V (including ripple)
Switching capacity (sealed)		≤100 mA with overload and short-circuit protection
Voltage drop, closed state		≤ 1.5 V
Current consumption, no-load		≤ 30 mA (reflex and diffuse), ≤ 50 mA (thru-beam)
Maximum switching frequency		500 Hz
Delays	First-up	≤ 15 ms
	Response	≤ 1 ms
	Recovery	≤ 1 ms
Indicator lights	Supply on	Green LED, on transmitter only
	Output state	Yellow LED, on receiver only

*(1) Sensors available with 5 m long cable: To order, add **L5** to the end of the reference selected from above.*
*Example: sensor **XU1N18PP341** with 5 m cable becomes **XU1N18PP341L5**.*

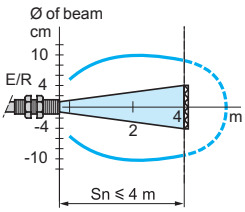
Curves

Detection curves

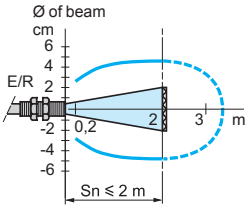
Thru-beam system



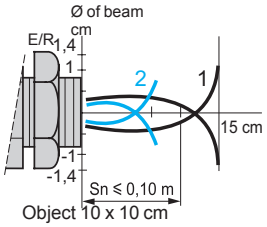
Reflex system with reflector XUZC50



Polarised reflex system with reflector XUZC50



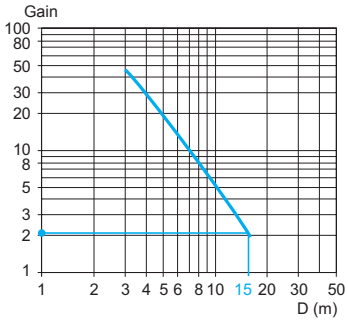
Diffuse system



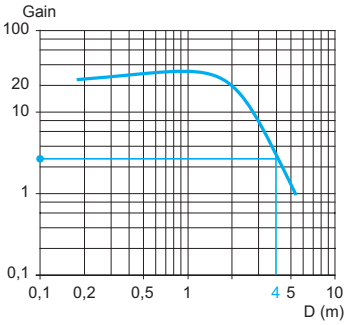
Object 10 x 10 cm
1 White 90% **2** Grey 18%

Excess gain curves (ambient temperature: + 25 °C)

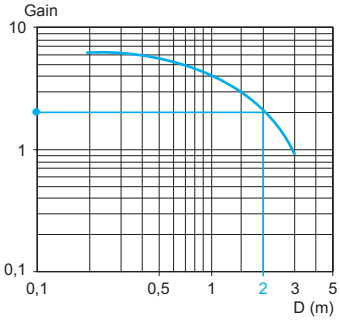
Thru-beam system



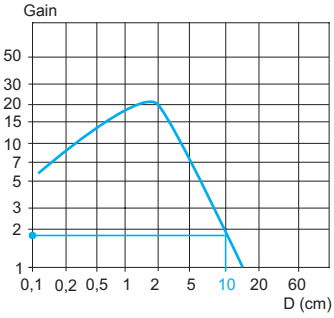
Reflex system with reflector XUZC50



Polarised reflex system with reflector XUZC50



Diffuse system



Object 10 x 10 cm
White 90%

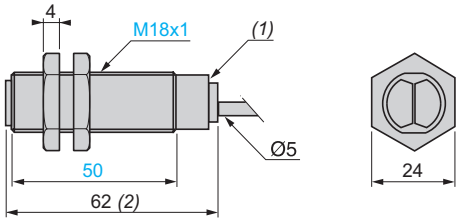
Accessories:
page 5/158

Photo-electric sensors

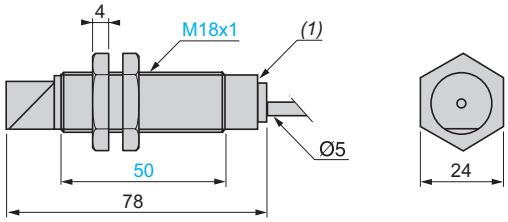
OsiSense XU Application, single mode
food and beverage processing series
Stainless steel case M18 x 1
DC. Solid-state output

Dimensions

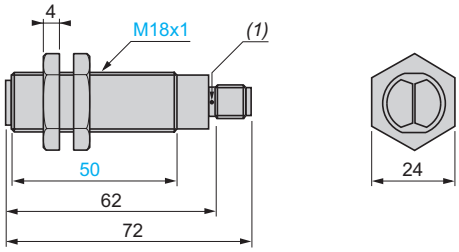
XU●N18●●341



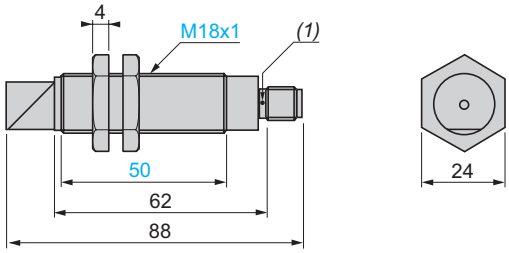
XU●N18●●341W



XU●N18●●341D



XU●N18●●341WD



(1) LED
*(2) 64 for **XU9N18●●341***
Fixing nut tightening torque: < 15 N.m
Connector tightening torque: 2 N.m

5

Accessories:
page 5/158

Photo-electric sensors

OsiSense XU Application, single mode
food and beverage processing series
Stainless steel case M18 x 1
DC. Solid-state output

Wiring schemes

M12 connector

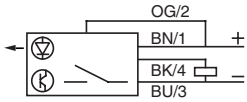
3 (–)
1 (+)
4 OUT/Output
2 Prog (or beam break input for thru-beam transmitter only)

Pre-cabled

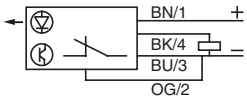
(–) BU (Blue)
(+) BN (Brown)
(Out/Output) BK (Black)
(Prog) OG (Orange)
(Beam break input) VI (Violet) on thru-beam transmitter only

Wiring schemes - diffuse

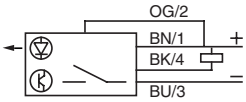
PNP NO



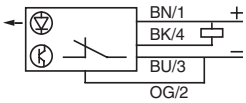
PNP NC



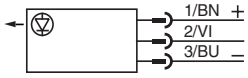
NPN NO



NPN NC

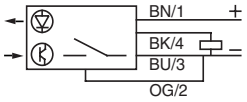


Transmitter

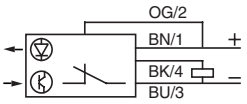


Wiring schemes - reflex and thru-beam

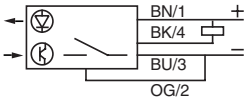
PNP NO



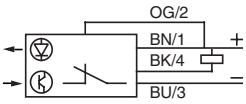
PNP NC



NPN NO

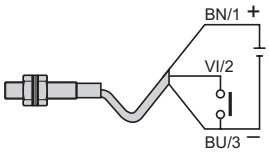


NPN NC

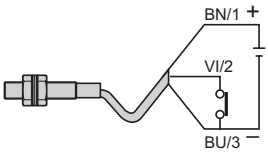


Beam break input on thru-beam transmitter only

Beam made



Beam broken



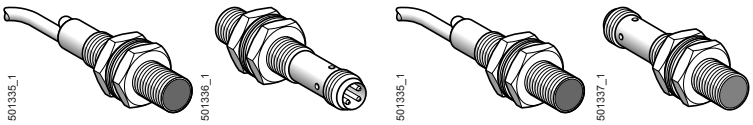
Accessories:
page 5/158

Photo-electric sensors

OsiSense XU Application, assembly series

Metal case, cylindrical, threaded M8 x 1
DC supply. Solid-state output

Design 8



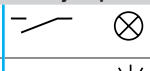
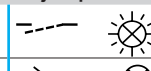
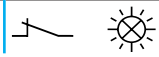
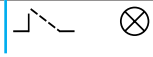
Connection	Pre-cabled	■	–	■	–
	Connector	–	■	–	■
System		Thru-beam	Thru-beam	Diffuse	Diffuse
Type of transmission		Infrared	Infrared	Infrared	Infrared
Nominal sensing distance (Sn)		2 m	2 m	0.05 m	0.05 m

References

3-wire, PNP	NO function	**XUAH0214**	**XUAH0214S**	**XUAH0515**	**XUAH0515S**
	NC function	**XUAH0224**	**XUAH0224S**	**XUAH0525**	**XUAH0525S**
3-wire, NPN	NO function	**XUAJ0214**	**XUAJ0214S**	**XUAJ0515**	**XUAJ0515S**
	NC function	**XUAJ0224**	**XUAJ0224S**	**XUAJ0525**	**XUAJ0525S**
Transmitter		**XUAH0203**	**XUAH0203S**	–	–
Weight (kg)		0.050	0.015	0.50	0.015

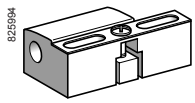
Characteristics

Product certifications		CE, cULus			
Ambient air temperature	For operation	- 25…+ 55 °C			
	For storage	- 30…+ 70 °C			
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 1 mm (f = 10…55 Hz)			
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms			
Degree of protection	Conforming to IEC 60529	IP 67 - IP 65	IP 65	IP 67 - IP 65	IP 65
Connection	Pre-cabled	Ø 3.5 mm, length 2 m, wire c.s.a.: 3 x 0.14 mm²			
	Connector	M8 female connectors, 3-pin, see page 5/28			
Materials	Case	Nickel plated brass			
	Cable	PvR	–	PvR	–
	Lenses	PMMA			
Rated supply voltage		**⎓ 12…24 V with protection against reverse polarity**			
Voltage limits (including ripple)		⎓ 10…30 V			
Switching capacity (sealed)		**≤ 100 mA with overload and short-circuit protection**			
Voltage drop, closed state		≤ 1 V			
Current consumption, no-load	Transmitter	≤ 15 mA			
	Receiver	≤ 10 mA			
	Diffuse	≤ 25 mA			
Maximum switching frequency		2000 Hz		1000 Hz	
Delays	First-up	≤ 20 ms			
	Response and recovery	≤ 0.25 ms		≤ 0.5 ms	

Function table	**Function**	**Diffuse or through beam system**	
		No object present in the beam	**Object present in the beam**
Output state (PNP or NPN) indicator: yellow LED (illuminated when sensor output is ON)	NO		
	NC		

Fixing accessories *(1)*

XSAZ108



XSZB108

Description	Reference	Weight kg
Plastic fixing clamp with locking screw	**XSAZ108**	0.007
Plastic fixing clamp for sensor replacement without adjustment	**XSZB108**	0.006

(1) For further information, see page 5/160.

Accessories :
page 5/158

Photo-electric sensors

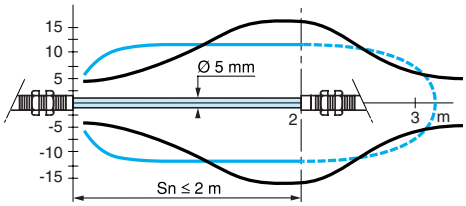
OsiSense XU Application, assembly series

Metal case, cylindrical, threaded M8 x 1
DC supply. Solid-state output

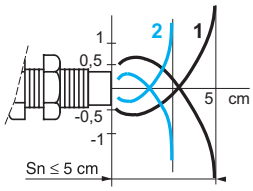
Curves

Detection curves

Thru-beam system



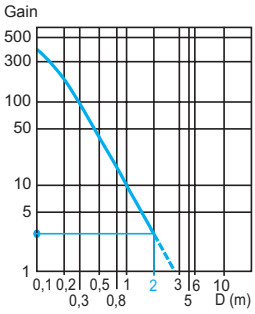
Diffuse system



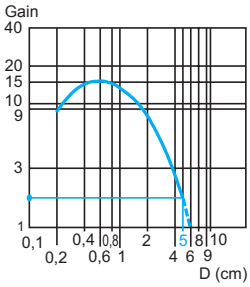
*Object 5 x 5 cm; **1** White 90%; **2** Grey 18%*

Excess gain curves (ambient temperature: ± 25 °C)

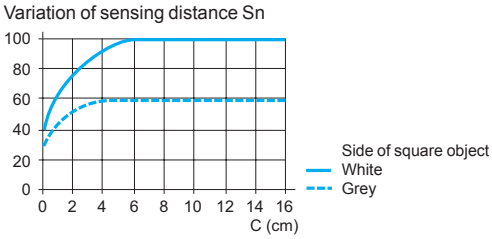
Thru-beam system



Diffuse system



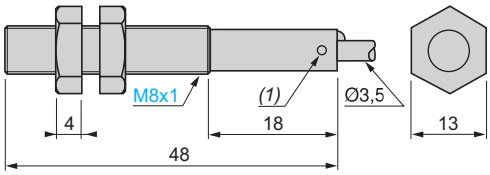
Object 5 x 5 cm, White 90%



Detection differential (H) when object approaches from the front: H ≤ 25% of Sn

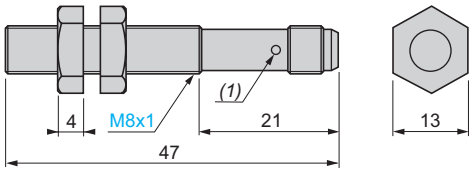
Dimensions

XUA



(1) LED, 4 viewing ports at 90°.

XUA●●●●●S



(1) LED, 4 viewing ports at 90°.

M8 connector

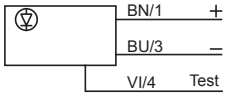
1 +
3 -
4 OUT or test

***Note:** fixing nut tightening torque: < 2 N.m*

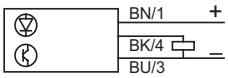
Wiring schemes (3-wire ⎓)

XUA

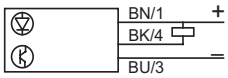
Transmitter



PNP

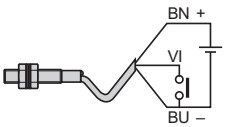


NPN

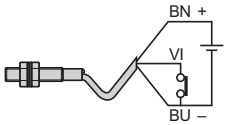


Beam break test

For thru-beam transmitter XUAH0203 only

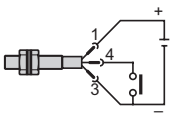


Beam made
LED on (steady light)

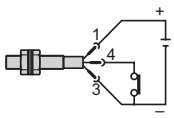


Beam broken
LED flashing

For thru-beam transmitter XUAH0203S only



Beam made
LED on (steady light)



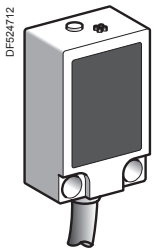
Beam broken
LED flashing

Accessories :
page 5/158

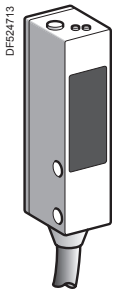
Photo-electric sensors

OsiSense XU Application

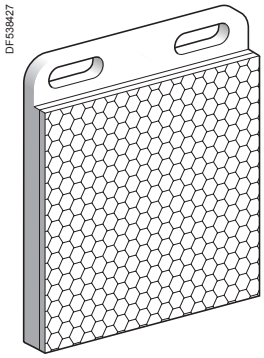
Conveying and access control series
Miniature design
Four-wire DC, solid-state output



XUYPS989S●



XUYB989S●



XUY1111

Diffuse system with background suppression

Sensing dist. (Sn) m	Function	Output	Connection	Reference	Weight kg
0.015…0.08	NO/NC depending on wiring	PNP	Pre-cabled (L = 2 m)	**XUYPS989SP**	0.075
			M8 connector	**XUYPSCO989SP**	0.044
		NPN	Pre-cabled (L = 2 m)	**XUYPS989SN**	0.075
			M8 connector	**XUYPSCO989SN**	0.044

Diffuse system with adjustable sensitivity

Sensing dist. (Sn) m	Function	Output	Connection	Reference	Weight kg
0.03…0.25	NO/NC depending on wiring	PNP	Pre-cabled (L = 2 m)	**XUYP989SP**	0.075
			M8 connector	**XUYPCO989SP**	0.044
		NPN	Pre-cabled (L = 2 m)	**XUYP989SN**	0.075
			M8 connector	**XUYPCO989SN**	0.044

Polarised reflex system

Sensing dist. (Sn) m	Function	Output	Connection	Reference	Weight kg
1 with 50 x 50 mm reflector	NO/NC depending on wiring	PNP	Pre-cabled (L = 2 m)	**XUYB989SP** *(1)*	0.093
			M8 connector	**XUYBCO989SP** *(1)*	0.061
		NPN	Pre-cabled (L = 2 m)	**XUYB989SN** *(1)*	0.093
			M8 connector	**XUYBCO989SN** *(1)*	0.061

(1) 50 x 50 mm reflector (XUY1111) and multi-adjustment fixing bracket included with sensor.

Accessory	For use with		
Reflector, 50 x 50 mm	**XUYB989S●**	**XUY1111**	0.018

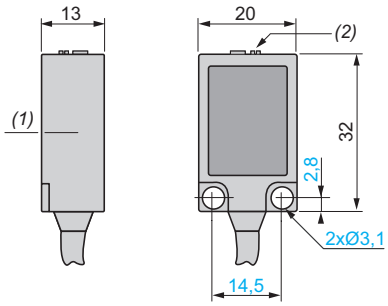
Thru-beam system

Sensing dist. (Sn) m	Function	Output	Connection	Reference	Weight kg
4 (Transmitter)		–	Pre-cabled (L = 2 m)	**XUYE989**	0.075
			M8 connector	**XUYECO989**	0.044
4 (Receiver)	NO/NC depending on wiring	PNP	Pre-cabled (L = 2 m)	**XUYR989SP**	0.075
			M8 connector	**XUYRCO989SP**	0.044
		NPN	Pre-cabled (L = 2 m)	**XUYR989SN**	0.075
			M8 connector	**XUYRCO989SN**	0.044

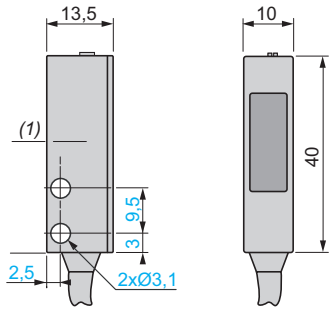
■ Applications:
□ Monitoring position or presence of parts, with background suppression
□ Detection of height of objects on a conveyor
□ Detection of product, pellet, powder levels.

Dimensions

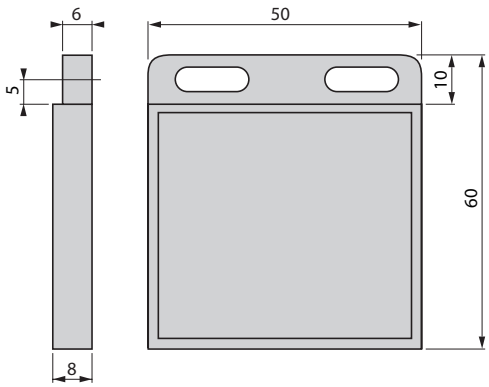
XUYPS989S●



XUYE989 and XUYR989●●

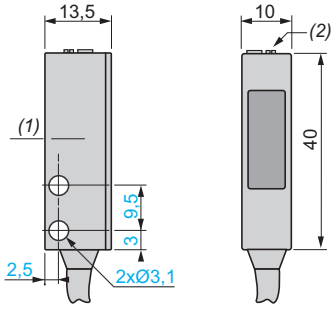


XUY1111



XUY●989S●

Transmitter/Receiver



(1) Optical axis
(2) Accuracy adjustment

Photo-electric sensors

OsiSense XU Application

Conveying and access control series
Miniature design
Four-wire DC, solid-state output

Characteristics

Sensor type			XUY●●●●●	XUY●CO●●●●●
Product certifications			CE, cULus *(1)*	
Connection	Connector		–	M8, 4-pin, on 0.2 m flying lead
	Pre-cabled		Length: 2 m	–
Nominal sensing distance (Sn)		**m**	0.08 diffuse with background suppression	
		m	0.25 diffuse with adjustable sensitivity	
		m	1 polarised reflex (with 50 x 50 mm reflector)	
		m	4 thru-beam	
Type of transmission	LED		Red, pulsed	
	Modulation frequency		6 kHz (4 kHz for XUYPS●●989S●)	
Degree of protection	Conforming to IEC 60529		IP 65 and IP 67	
Ambient air temperature	For storage	**°C**	- 20...+ 80	
	For operation	**°C**	0...+ 50	
Materials	Case		ABS	
	Lens		PMMA	
	Cable		PVC	PUR
Immunity to ambient light	Natural light	**Lux**	10 000 (insensitive for XUYPS●●989S●)	
	Incandescent bulb	**Lux**	5000 (insensitive for XUYPS●●989S●)	
Rated supply voltage		**V**	**⎓ 12...24 with protection against reverse polarity**	
Voltage limits (including ripple)		**V**	**⎓ 10...30**	
Current consumption, no-load		**mA**	< 25	
Switching capacity per output		**mA**	**100 with overload and short-circuit protection**	
Voltage drop, closed state		**V**	At 100 mA: < 2; at 10 mA: < 1	
Maximum switching frequency		**Hz**	**500**	
Delays	Response and recovery	**ms**	1	

(1) This product is UL Listed if supplied by a class II or isolated supply delivering ⎓ 30 V max. (isolated transformer for example) and protected by a UL fuse rated at 3 A max.

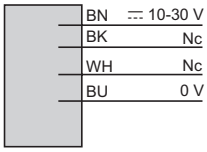
Wiring scheme - connector

M8

Pin n° - colour

- **1 BN**: Brown
- **2 WH**: White
- **3 BU**: Blue
- **4 BK**: Black

Transmitter

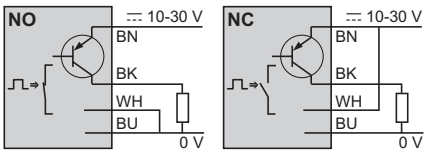


Nc: Not connected

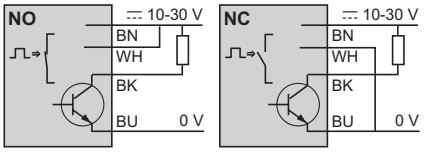
Wiring scheme - pre-cabled

Diffuse

PNP output

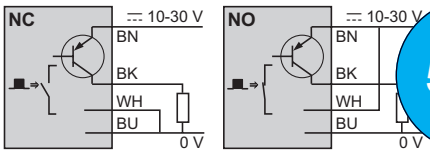


NPN output

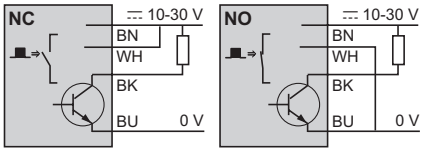


Polarised reflex and thru-beam

PNP output

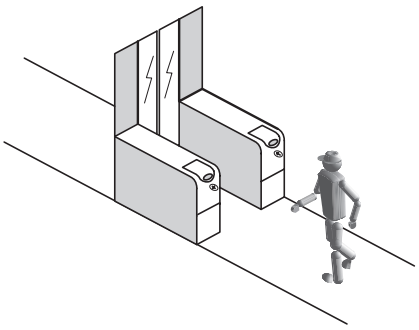


NPN output

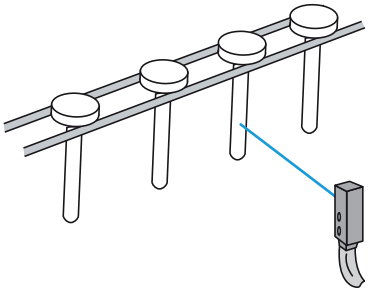


Application examples

Access control



Monitoring metal rods



Detection of tin cans on a conveyor

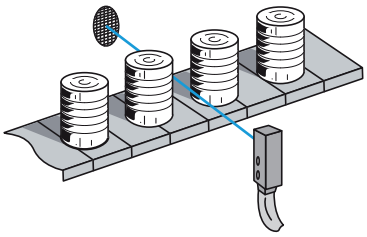
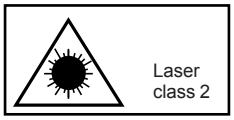


Photo-electric sensors

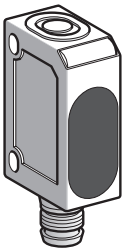
OsiSense XU Application, assembly series

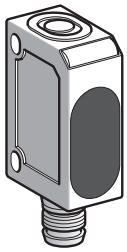
Miniature design
with laser transmission and teach mode
Three-wire DC, solid-state output

Miniature design



Laser class 2, conforming to IEC 825-1.
Visible laser radiation: do not stare into beam.





System		Polarised reflex	Diffuse with background suppression		Colour mark reader
Type of transmission		Red laser, pulsed, Class 2, wavelength: 655 nm			
Nominal sensing distance (Sn)		**100…1000 mm** *(1)*	**20…60 mm**	**30…110 mm**	**40…150 mm**
References					
4-wire, PNP output	NO/NC function, selectable	**XUYBCO929LSP**	**XUYPSCO929L1SP**	**XUYPSCO929L2SP**	**XUYPCCO929LSP**
Weight (kg)		0.056	0.056	0.056	0.056

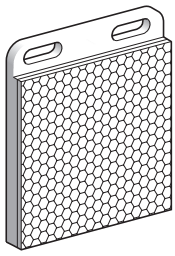
Characteristics

Product certifications		CE			
Ambient air temperature	For operation	- 20…+ 60 °C			
	For storage	- 20…+ 80 °C			
Degree of protection	Conforming to IEC 60529	IP 67			
Connection		M8, 4-pin male connector			
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 1.5 mm (f = 10 to 55 Hz)			
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms			
Materials	Case	ABS			
Rated supply voltage		⎓ **12…24 V with protection against reverse polarity**			
Voltage limits (including ripple)		⎓ **10…30 V**			
Immunity to ambient light		5000 lux			
Laser transmission		T pulse: 3 µs, pulse frequency: 5 kHz			
Spot diameter		< 0.7 mm	< 0.3 …40 mm	< 0.7 mm	
Switching capacity		**100 mA with overload and short-circuit protection**			
Voltage drop, closed state		< 2.4 V			
Current consumption, no-load		25 mA	30 mA		25 mA
Maximum switching frequency		**1000 Hz**			
Indicator lights	Supply on/Dirty	Green LED			
	Output signal	Yellow LED			
Adjustment		Using teach mode button or remote teaching (external input)			

*(1) With 50 x 50 mm reflector, reference **XUY1111**.*

■ Applications
□ Monitoring of small parts on production machines
□ Setting-up of sensors

Accessories



XUY1111

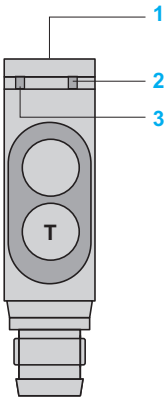
Description	Details	Length of cable	References	Weight
		m		kg
Pre-wired M8 connector	Straight	2	**XZCP0941L2**	0.080
	Elbowed (90°)	2	**XZCP1041L2**	0.080
	Straight	5	**XZCP0941L5**	0.180
	Elbowed (90°)	5	**XZCP1041L5**	0.180
Reflector for **XUYBCO929LSP**	50 x 50 mm	–	**XUY1111**	0.018
Fixing bracket			**XUY929**	0.013
Protection bracket	Vertical rear fixing		**XUY9291**	0.070
	Lower side fixing		**XUY9292**	0.061

Photo-electric sensors

OsiSense XU Application, assembly series

Miniature design
with laser transmission and teach mode
Three-wire DC, solid-state output

Description



XUYBCO929LSP

1 Teach In (T.I.)
2 Yellow LED: Detection LED *(1)*
3 Green LED: Supply on or fault due to accumulation of dirt (if LED off)

■ **Teach mode** (yellow and green LEDs are on)
□ Line up with reflector, press T.I. for 3 seconds: both LEDs flash
□ Insert the object, press T.I. for 1 second: the green LED flashes then remains on (teaching completed).

XUYPSCO929L●SP, XUYPCCO929LSP

1 Teach In (T.I.)
2 Yellow LED: Detection LED
3 *(2)*
Green LED: Supply on or fault due to accumulation of dirt (if LED off)

■ **Teach mode** (yellow and green LEDs are on)
□ Line-up with object, press T.I. for 3 seconds: both LEDs flash
□ Insert the object, press T.I. for 1 second: the green LED flashes then remains on (teaching completed)

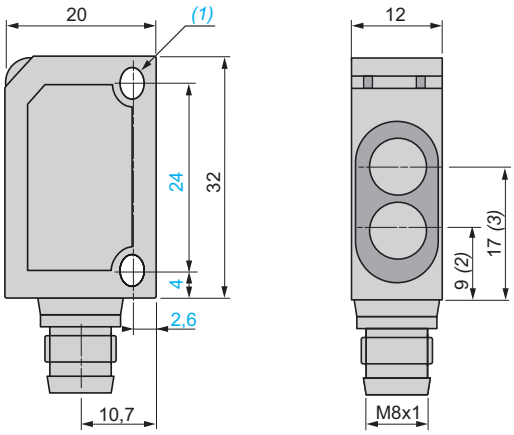
R: Receiver
T: Transmitter

NO/NC
■ Press T.I. for 13 seconds: the two LEDs alternatively flash (on the release of T.I., the green LED remains on).
■ Each press on T.I. changes the output state (NO, NC, NO, NC, ...). When T.I. is not pressed for 10 seconds, the green LED goes off: the selected state is memorised.

(1) Whether the output is direct or inverse, the "detection" LED goes off only on beam break.
(2) Whether the output is direct or inverse, the "detection" LED comes on only when an object is present.

Dimensions

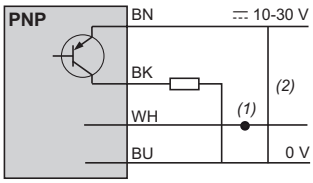
XUYBCO929LSP, XUYPSCO929L●SP



(1) 2 elongated holes Ø 3.2 x 4.2.
(2) Transmitter optical axis.
(3) Receiver optical axis.

Wiring schemes

Pre-cabled



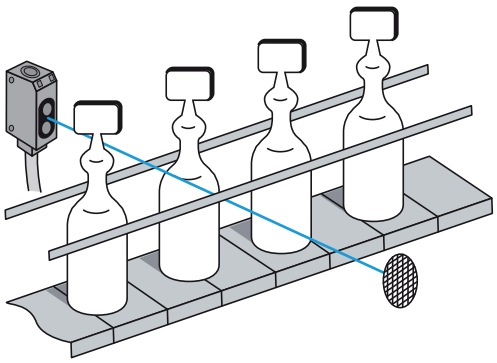
(1) - Connected to +: external teaching,
- Connected to –: locking of functions
(2) Output 100 mA max.

M8 connector

Pin n° - colour
1 BN: Brown
2 WH: White
3 BU: Blue
4 BK: Black

Application examples

Detection of pharmaceutical ampoules



Detection of connection tags on integrated circuits passing on rail

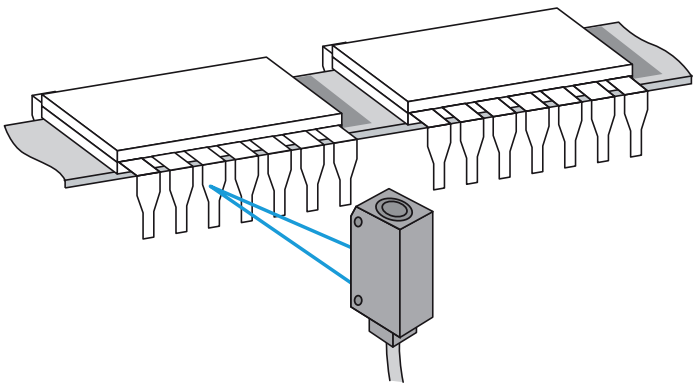


Photo-electric sensors

OsiSense XU Application, single mode

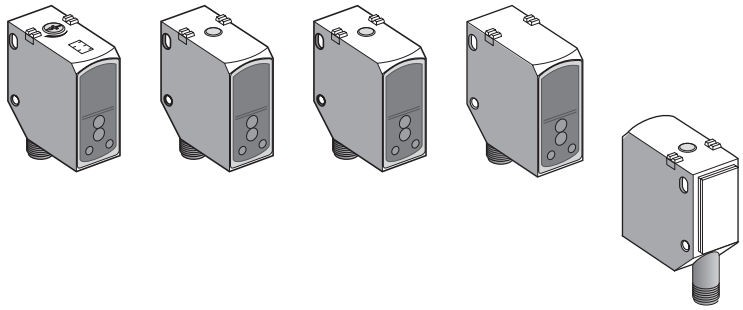
Assembly series
Plastic, M12 connector
DC

Compact design

ECOLAB® certified

Laser

Class 1 or class 2 laser, conforming to IEC 60825-1
Visible laser radiation: do not stare into beam



System	Diffuse with background suppression	Diffuse	Polarized reflex	Thru-beam	
Type of transmission	Red laser (655 nm) class 1	Red laser (650 nm) class 2	Red laser (655 nm) class 1	Red laser (655 nm) class 1	
Nominal sensing distance (Sn)/Maximum sensing distance	5…800 mm, on white 90% *(1)* 10…600 mm, on grey 18% 30…500 mm, on black 6% *(2)*	5…1200 mm, on white 90% 10…700 mm, on grey 18% 100…400 mm, on black 6% *(2)*	0.3…12/14 m (with reflector XUZC50HP)	0…25/30 m	

References

4-wire, PNP NO/NC programmable	XUK8LAPPNM12	XUK5LAPSMM12	XUK9LAPSMM12	Transmitter: XUK2LAKSMM12T	Receiver: XUK2LAPSMM12R
Weight (kg)	0.035	0.035	0.035	0.035	0.035

Characteristics

Product certifications		ECOLAB, CE, cULus				
Connection		M12, 4-pin connector				
Degree of protection	Conforming to IEC 60529	IP 67				
	Conforming to DIN 40050	IP 69K				
Ambient air temperature	For operation	-20…+60°C				
	For storage	-20…+80°C				
Material	Case	PC - ABS anti-shock				
	Lenses	PMMA				
Vibration resistance	Conforming to EN/IEC 60068-2-6	Amplitude ±0.5 mm (f = 10 to 55 Hz)				
Shock resistance	Conforming to EN/IEC 60068-2-27	30 gn, duration 11 ms				
Indicator lights	Output state	Yellow LED	Yellow LED	Yellow LED	–	Yellow LED
	Instability/alignment	Yellow LED, flashing/–			–/–	Yellow LED, flashing/ Red LED
	Supply on	Green LED				
Rated supply voltage		12…30 V ⎓	10…30 V ⎓			
Voltage limits (including ripple)		10.8…33 V ⎓/9…33 V ⎓				
Current consumption, no-load		< 30 mA				
Switching capacity		≤ 100 mA, with protection against reverse polarity and short-circuit				
Test function	Breaking red beam	–	–	–	Yes	–
Voltage drop, closed state		≤ 2.4 V				
Maximum switching frequency		1000 Hz	600 Hz	2000 Hz	–	3500 Hz
Delays	First-up	< 300 ms				
	Response	0.5 ms	0.8 ms	0.25 ms	–	0.14 ms
	Recovery	0.5 ms	0.8 ms	0.25 ms	–	0.14 ms

(1) On the minimum setting, the background suppression distance (white) is 70 mm.
(2) % of object remission.

Photo-electric sensors

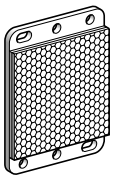
OsiSense XU Application, single mode

Assembly series

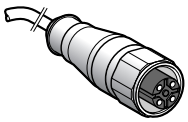
Plastic, M12 connector

DC

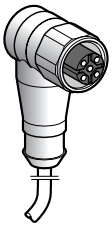
References of accessories



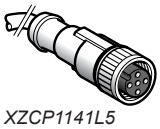
XUZC50HP



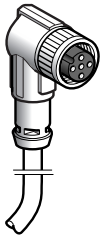
XZCPA1141L5



XZCPA1241L5



XZCP1141L5



XZCPA1241L5

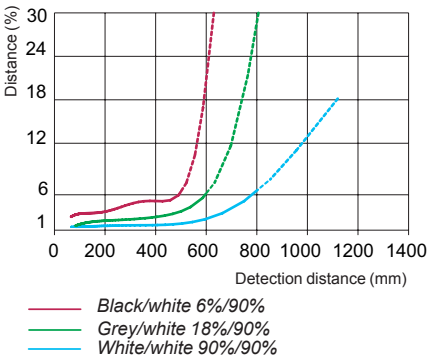
Description	Dimensions	Reference	Weight kg
Fixing bracket 304 stainless steel	–	**XUZA51S**	0.050
Protection bracket 304 stainless steel	–	**XUZASK001**	0.210
Mounting bracket on dovetail	–	**XUZASK002**	0.050
Rigid microprism reflector	50 x 50 mm	**XUZC50HP**	0.020
Pre-wired connectors with PVC cable for food and beverage applications			
Straight pre-wired connector M12, 4-pin, female connector, stainless steel clamping ring	5 m	**XZCPA1141L5**	0.210
Elbowed pre-wired connector M12, 4-pin, female connector, stainless steel clamping ring	5 m	**XZCPA1241L5**	0.210
Pre-wired connectors with PUR cable for industrial applications			
Straight pre-wired connector M12, 4-pin, female connector, nickel-plated brass clamping ring	5 m	**XZCP1141L5**	0.210
Elbowed pre-wired connector M12, 4-pin, female connector, nickel-plated brass clamping ring	5 m	**XZCP1241L5**	0.210

Note: To find other connection accessories, please consult our catalogue "OsiSense XZ cabling accessories".

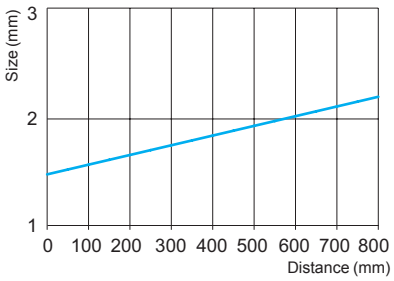
Curves

XUK8LAPPNM12

Scanning properties

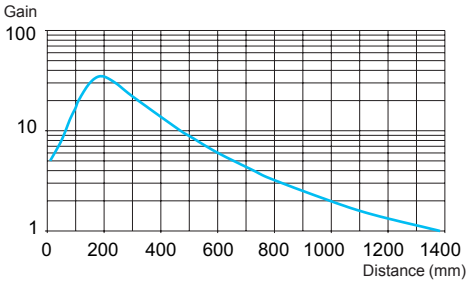


Size of luminous point

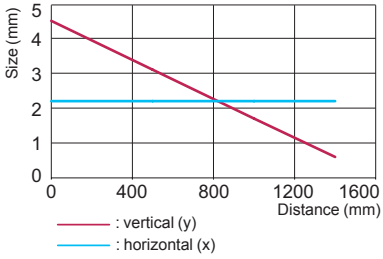


XUK5LAPSMM12

Excess gain curve



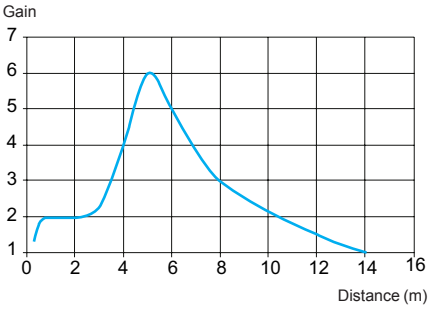
Size of luminous point



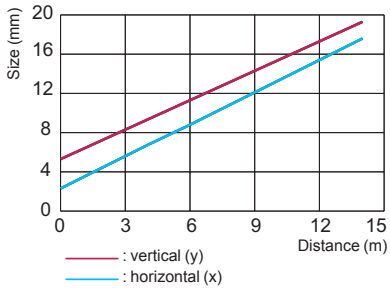
Curves *(continued)*

XUK9LAPSMM12

Excess gain curve

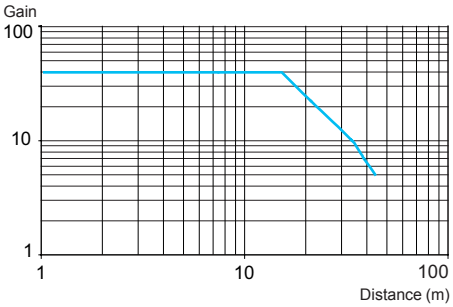


Size of luminous point

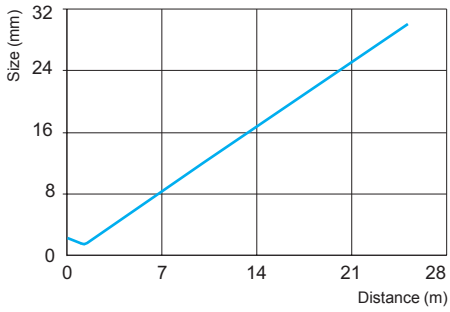


XUK2LAKSMM12T and XUK2LAPSMM12R

Excess gain curve



Size of luminous point

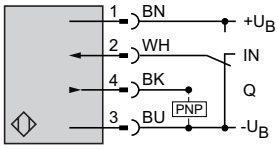


5

Wiring schemes using M12 connector

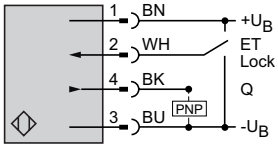
XUK8LAPPNM12

1 BN: Brown (+)
2 WH: White
(+UB = NC, -UB = NO, not connected = NO)
3 BU: Blue (-)
4 BK: Black (Output)



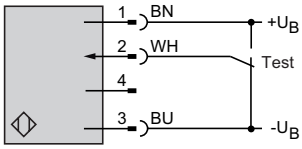
XUK5LAPSMM12, XUK9LAPSMM12 and XUK2LAPSMM12R

1 BN: Brown (+)
2 WH: White (ET/Lock) *(1)*
3 BU: Blue (-)
4 BK: Black (Output)



XUK2LAPSMM12T

1 BN: Brown (+)
2 WH: White (Test input) *(2)*
3 BU: Blue (-)
4 BK: Black (pin not connected)



(1) ET/Lock. ET: External Teach, Lock: pushbutton locking.
+ UB: external teach. - UB: pushbutton locking.
Not connected: normal operation.
(2) Test input: + UB = test function (transmitter disconnected). - UB or not connected = normal operation.

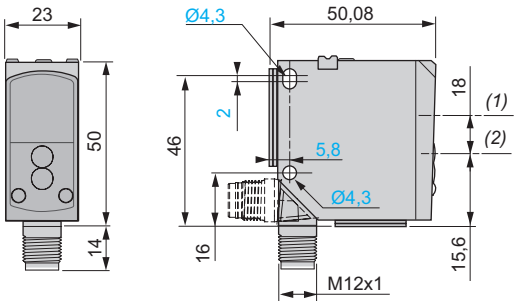
Photo-electric sensors

OsiSense XU Application, single mode
Assembly series
Plastic, M12 connector
DC

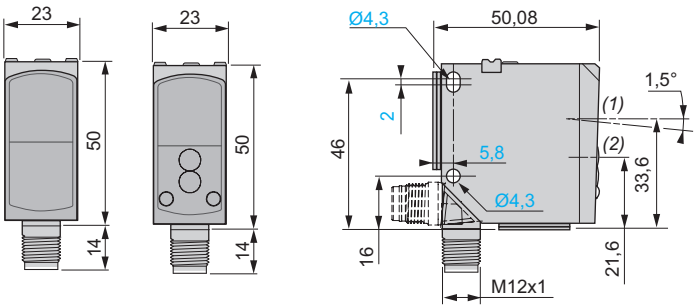
Dimensions

Sensors

XUK8LAPPNM12

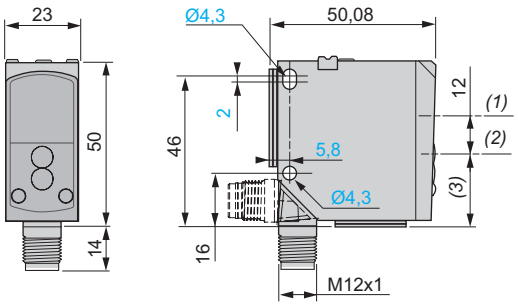


XUK2LAKSMM12T and **XUK2LAPSMM12R**



Sensors *(continued)*

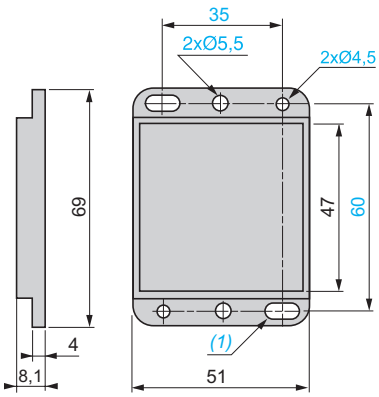
XUK5LAPSMM12 and **XUK9LAPSMM12**



(1) Receiver optical axis.
(2) Transmitter optical axis.
(3) 21.4 mm for XUK5LAPSMM12, 21.6 mm for XUK9LAPSMM12.

Reflector

XUZC50HP



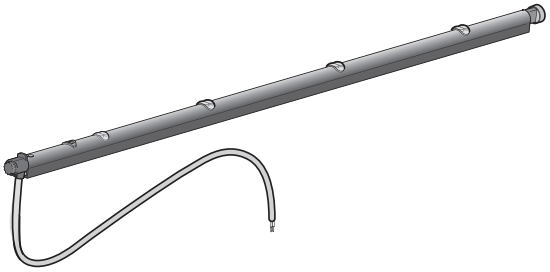
(1) 2 elongated holes for M4 screws.

5

Photo-electric sensors

OsiSense XU Application, conveying series

For detecting packages on a roller conveyor
DC supply, solid-state output



Nominal sensing distance (Sn)	**0.1 m**
Function	NO/NC programmable
Output	PNP + NPN
Connection	Remote M12 connector, L = 0.3 m

References

3-wire type	**XUY474NB4H03M12** *(1)*
Number of sensors (1 to 6)	4
Weight (kg)	0.075

***Note**: If you require more information about these products, please consult our Customer Care Centre.*

Characteristics

Product certifications		CE, cCSAus
Type of transmission		Infrared
Operating mode		Diffuse
Nominal sensing distance		100 mm (white paper)
Differential travel		< 25%
Degree of protection	Conforming to IEC 60529	IP 50 (IP 65 on request)
Ambient air temperature	For operation	- 10…+ 55°C
	For storage	- 20…+ 70°C
Vibration resistance	Conforming to EN/IEC 60068-2-8	For X, Y and Z: 1 mm from 10 to 42 Hz 7 gn from 42 to 55 Hz 30 mm at resonant frequency or 55 Hz
Shock resistance	Conforming to EN/IEC 60068-2-27	For X, Y and Z: 10 gn for 11 ms
Material	Case	Aluminium and PA
	Lenses	PC
Rated supply voltage		24 V with protection against reverse polarity
Voltage limits (including ripple)		18…30 V of rated operational voltage
Switching capacity		100 mA with overload and short-circuit protection
Voltage drop, closed state		≤ 2 V
Current consumption		≤ 35 mA
Maximum switching frequency		500 Hz
Delay		1 ms response 1 ms recovery
Indicator lights	Output state	1 yellow LED
Detection accuracy		2 mm at 2 m/s

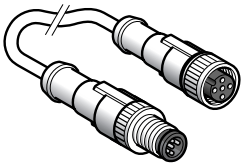
(1) These sensors are suitable for use on a 473-477 mm wide conveyor frame (-1, + 3 mm). Other possible widths are given on the next page.

Photo-electric sensors

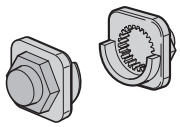
OsiSense XU Application, conveying series

For detecting packages on a roller conveyor
DC supply, solid-state output

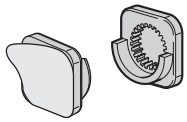
References of accessories



XZCR1511041C●



XUZASY01H



XUZASY01A

Description	Length m	Reference	Weight kg
Fixing accessories			
Pack of 20 hexagonal supports and Ø 8 mm fixing	–	**XUZASY01H**	0.020
Pack of 20 self-adhesive hexagonal supports	–	**XUZASY01A**	0.020
M12-M12 jumper cables			
4-pin, straight connector	1	**XZCR1511041C1**	0.065
	2	**XZCR1511041C2**	0.095
4-pin, elbowed connector	1	**XZCR1512041C1**	0.065
	2	**XZCR1512041C2**	0.095

Connections

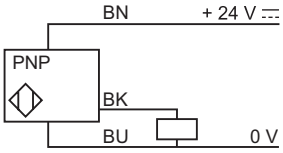
M12 connector

Pin no./colour

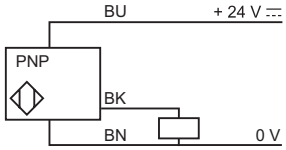
1 BN: Brown
2 WH: White (disconnected)
3 BU: Blue
4 BK: Black

PNP + NPN programmable, NO or NC output

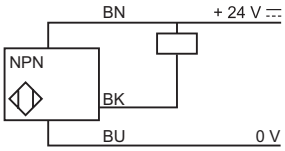
PNP, NO output



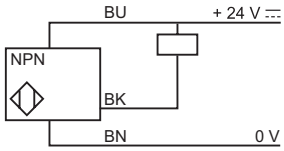
PNP, NC output



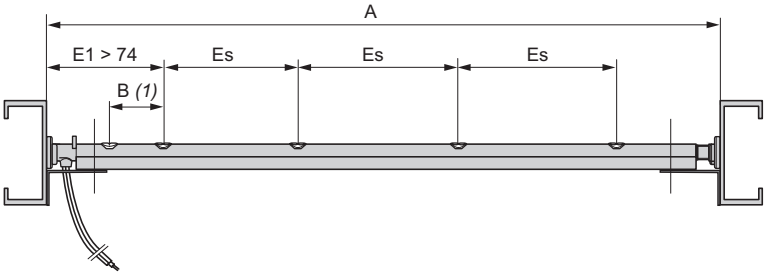
NPN, NC output



NPN, NO output



Dimensions (mm)



***A**: Conveyor width exact distance between lips (250 to 900 mm).*
For dimensions above 900 mm, please consult our Customer Care Centre.

Examples of components in the references

	Conveyor width (A)	Additional functions *(2)*	Spacing between sensors (Es)	Number of sensors	Fixing type	Connection
XUY380NA5D03M8	380 mm	No	54 mm	5	Ø 8 mm	Remote M8 connector with 0.3 m cable
XUY410NC3H1M12	410 mm	No	108 mm	3	11.2 mm hexagonal support	Remote M12 connector with 1 m cable
XUY450NB3N03M8	450 mm	No	93.1 mm	3	–	Remote M8 connector with 0.3 m cable
XUY600NC5H2	600 mm	No	108 mm	5	11.2 mm hexagonal support	2 m cable
XUY707ND4P2	707 mm	No	162 mm	4	Hexagonal support on each side	2 m cable

(1) B = 29 mm for Es = 54 mm, 108 mm, 162 mm ... B = 10.4 mm for Es = 93.1 mm, 186.2 mm...
(2) Timer, special settings, IP65 degree of protection: on request from our Customer Care Centre.

Photo-electric sensors

OsiSense XU Application, conveying series

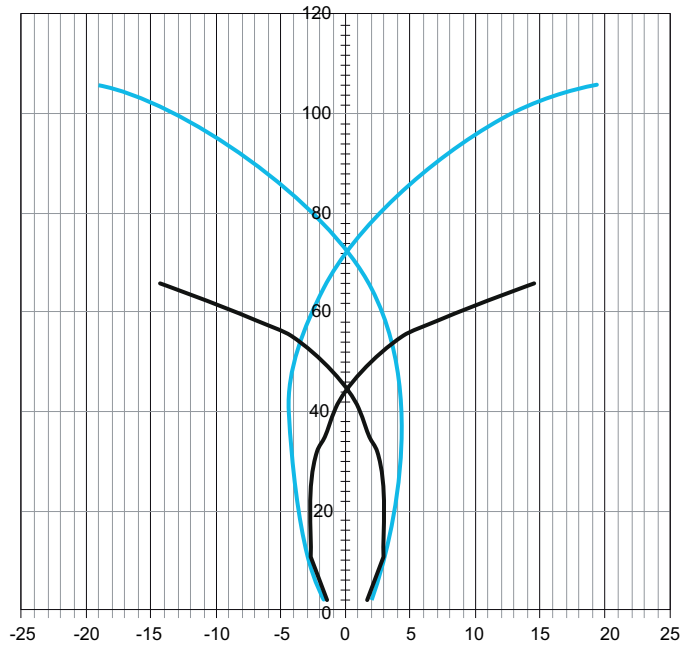
For detecting packages on a roller conveyor

DC supply, solid-state output

Detection curves

Conveyor axis - Load running direction

Distance between the target and the sensor in mm

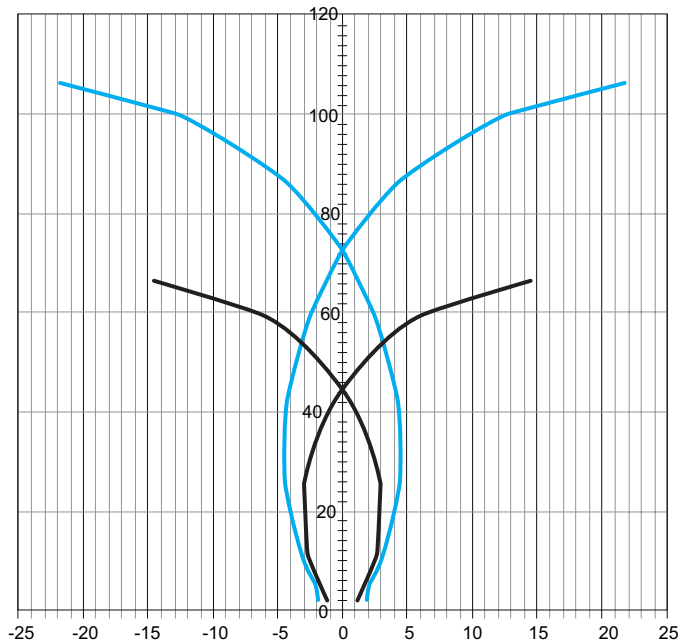


Distance between the target and the optical axis in mm

: Black 6%
: White 92%

Roller axis - Direction at right-angles to load running

Distance between the target and the sensor in mm



Distance between the target and the optical axis in mm

: Black 6%
: White 92%

Photo-electric sensors

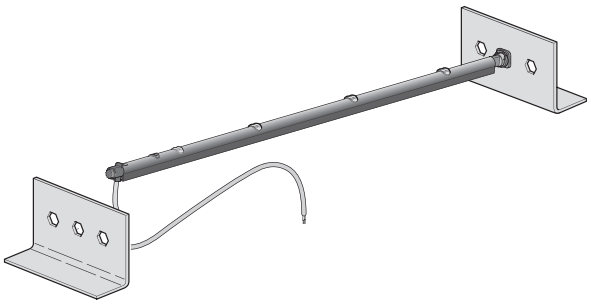
OsiSense XU Application, conveying series

For detecting packages on a roller conveyor

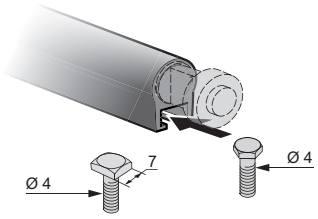
DC supply, solid-state output

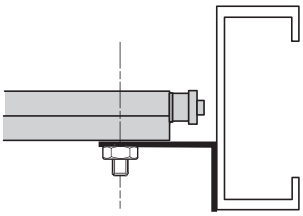
Mounting

Mounting on the sides, with XUZASY01H or XUZASY01A hexagonal supports
(2 of each support are supplied with the sensor)



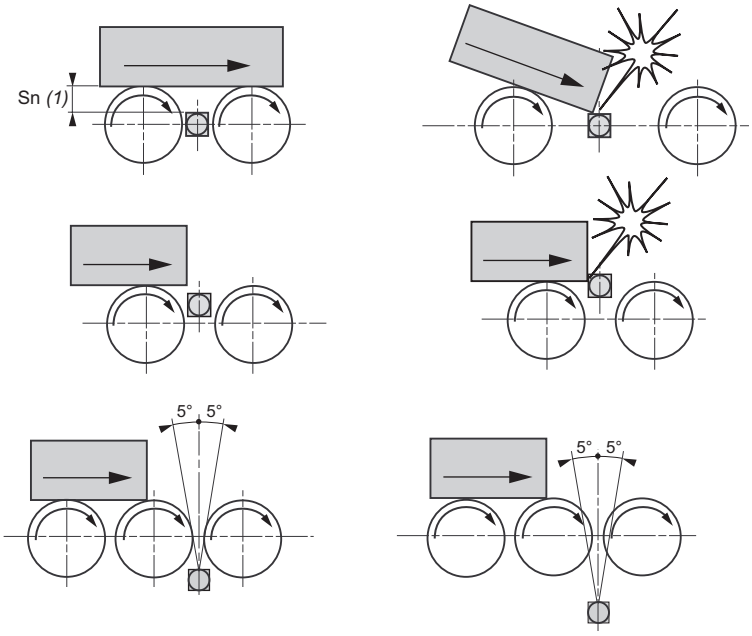
Mounting underneath *(brackets, screws and nuts not supplied)*





Mounting precautions

Recommended mounting	Not recommended



(1) Sn ≤ 100 mm.

Application example

Package detection - sensor mounted between motorized rollers

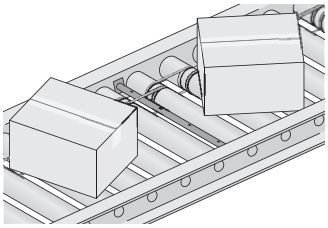
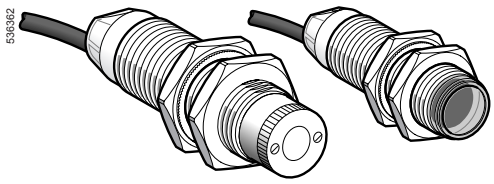


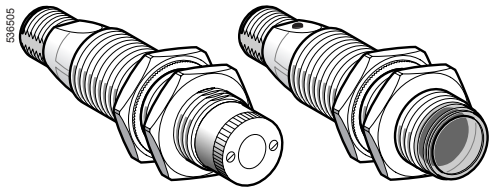
Photo-electric sensors

OsiSense XU Application, material handling series

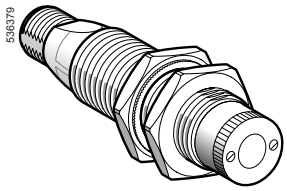
Laser transmission. Design 18, plastic or metal
Three-wire DC. Solid-state output



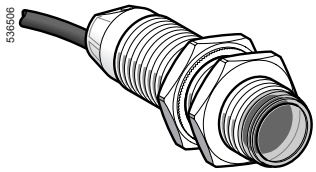
XUBL●●CNL2



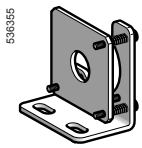
XUBL●●CNM12



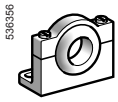
XUBL●●CNM12T



XUBL●●CNL2R



XUZA318



XUZA218

XUZA118

Ø 18, plastic, thru-beam system with teach mode, laser transmission (Transmitter + receiver)

Sensing distance (Sn) m	Function	Connection	Output	Reference	Weight kg
0...100	NO or NC, by programming	Pre-cabled	PNP	**XUBLAPCNL2**	0.180
			NPN	**XUBLANCNL2**	0.180
		M12 connector	PNP	**XUBLAPCNM12**	0.078
			NPN	**XUBLANCNM12**	0.078

Ø 18, metal, thru-beam system with teach mode, laser transmission (Transmitter + receiver)

Sensing distance (Sn) m	Function	Connection	Output	Reference	Weight kg
0...100	NO or NC, by programming	Pre-cabled	PNP	**XUBLBPCNL2**	0.230
			NPN	**XUBLBNCNL2**	0.230
		M12 connector	PNP	**XUBLBPCNM12**	0.130
			NPN	**XUBLBNCNM12**	0.130

Separate components

Ø 18 transmitter

Description	Connection	Output	For use with	Reference	Weight kg
Plastic	Pre-cabled	–	XUBLA●CNL2	**XUBLAKCNL2T**	0.090
	M12 connector	–	XUBLA●CNM12	**XUBLAKCNM12T**	0.040
Metal	Pre-cabled	–	XUBLB●CNL2	**XUBLBKCNL2T**	0.110
	M12 connector	–	XUBLB●CNM12	**XUBLBKCNM12T**	0.060

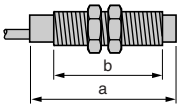
Ø 18 receiver

Description	Connection	Output	For use with	Reference	Weight kg
Plastic	Pre-cabled	PNP	XUBLAPCNL2	**XUBLAPCNL2R**	0.090
		NPN	XUBLANCNL2	**XUBLANCNL2R**	0.090
	M12 connector	PNP	XUBLAPCNM12	**XUBLAPCNM12R**	0.040
		NPN	XUBLANCNM12	**XUBLANCNM12R**	0.040
Metal	Pre-cabled	PNP	XUBLBPCNL2	**XUBLBPCNL2R**	0.120
		NPN	XUBLBNCNM12	**XUBLBNCNL2R**	0.120
	M12 connector	PNP	XUBLBPCNM12	**XUBLBPCNM12R**	0.070
		NPN	XUBLBNCNM12	**XUBLBNCNM12R**	0.070

Fixing accessories for XUBL● *(1)*

Description	Reference	Weight kg
Precision fixing bracket with micrometric adjustment	**XUZA318**	0.170
Plastic fixing bracket with adjustable ball-joint	**XUZA218**	0.035
Stainless steel fixing bracket	**XUZA118**	0.045

Dimensions



	Pre-cabled (mm)		Connector (mm)	
	a	b	a	b
Receiver *(2)*	62	44	76	44
Transmitter *(3)*	52	28	66	28

(1) For further information, see page 5/158
(2) Yellow, green and red LED on receiver
(3) Green LED on transmitter

Note: *fixing nut tightening torque: < 4 Nm*

Photo-electric sensors

OsiSense XU Application, material handling series

Laser transmission. Design 18, plastic or metal
Three-wire DC. Solid-state output

Characteristics

Sensor type			XUBL●●●●M12	XUBL●●●●L2
Product certifications			UL, CSA, CE	
Connection	Connector		M12	–
	Pre-cabled		–	Length: 2 m
Nominal sensing distance Sn		**m**	0...100, excess gain 70...3	
Blind zone			0	
Preferred object approach direction			Any	
Type of transmission			Red laser, wavelength 670 nm	
Transmission power			Power < 1 mW, class 1 conforming to IEC 60825-1	
Degree of protection	Conforming to IEC 60529		IP 67, double insulation ⧈	
Temperature	Storage	**°C**	- 40... + 70	
	Operation	**°C**	- 10... + 45	
Materials	Case		**XUBLA●●●●●**: PBT; **XUBLB●●●●●**: nickel plated brass	
	Lens		PMMA	
Vibration resistance	Conforming to IEC 60068-2-6		7 gn, amplitude ± 1.5 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27		30 gn, duration 11 ms	
Indicator lights	Output state and alignment aid		Yellow LED	
	Supply on and teaching		Green LED	
	Stability		Red LED	
Rated supply voltage		**V**	⎓ 12...24 with protection against reverse polarity	
Voltage limits (including ripple)		**V**	⎓ 10...30	
Current consumption, no-load		**mA**	25 for transmitter or receiver	
Switching capacity per output		**mA**	≤ 100 with overload and short-circuit protection	
Voltage drop, closed state		**V**	≤ 1.5	
Maximum switching frequency		**Hz**	1500	
Delays	First-up	**ms**	< 80	
	Response and recovery	**ms**	< 0.4	

Wiring schemes

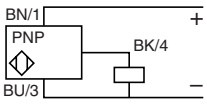
M12 connector

3 (-)
1 (+)
4 OUT/Output
2 Beam break input

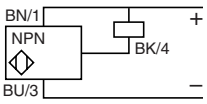
Pre-cabled

(-) BU (Blue)
(+) BN (Brown)
OUT/Output BK (Black)
Beam break input
VI (Violet)

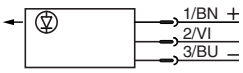
PNP



NPN



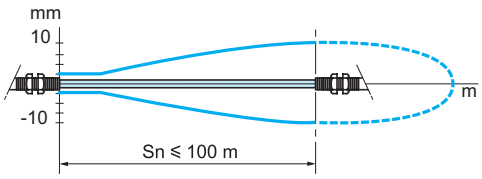
Transmitter



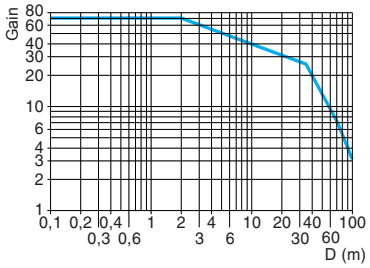
Input 2/VI:
- not connected: beam made
- connected to -: beam broken

Curves

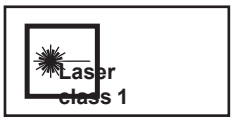
Detection curve (set to infinity)



Excess gain curve

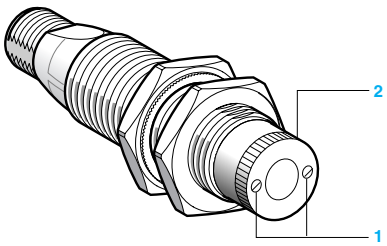


Operating precautions

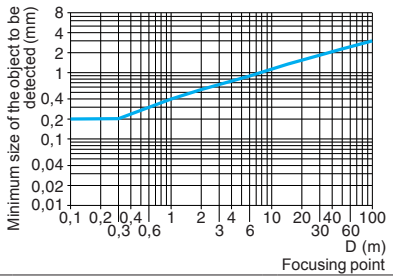


Laser class 1, conforming to IEC 60825-1.

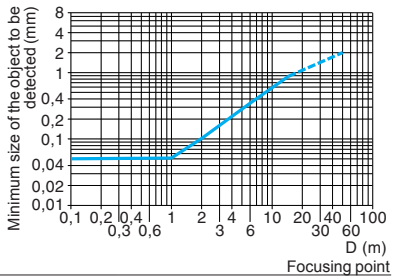
Adjustment



Standard curve



Detection limit curve



The adjustment of the focusing point enables the detection of objects down to a size of < 0.2 mm.

After slackening the fixing screws 1. adjust the focusing point of the laser beam by rotating the serrated sleeve 2 located on the face of the sensor. Re-tighten fixing screws.

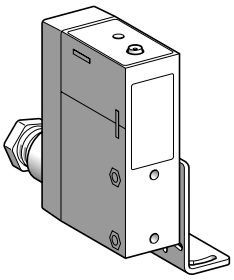
Note: fixing bracket ***XUZA218*** with ball-joint and, in particular, bracket ***XUZA318*** with precise micrometric adjustment and locking by 6 screws, are specially suited for mounting the sensor and adjusting beam alignment when the sensing range is several tens of metres (see page 5/158).

Photo-electric sensors

OsiSense XU Application, material handling series

With analogue output signal 4…20 mA and 0…10 V (1)
DC supply. Solid-state output

Compact design



System		Diffuse
Type of transmission		Infrared
Nominal sensing distance (Sn)		20…80 cm

References

3-wire	**PNP**	**XUJK803538**
Weight (kg)		0.200

Characteristics

Product certifications		CE, CSA, UL
Ambient air temperature	For operation	- 25…+ 60 °C
	For storage	- 40…+ 80 °C
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 1.5 mm (f = 10…55 Hz)
Shock resistance	Conforming to IEC 60068-2-27	20 gn, duration 11 ms
Degree of protection	Conforming to IEC 60529	IP 67
	Conforming to NF C 20-010	IP 671
Connection		Screw terminals, maximum capacity: 2 x 1.5 mm^2 or 1 x 2.5 mm^2
Materials		Case: PEI *(2)*
Rated supply voltage		⎓ 24 V with protection against reverse polarity
Voltage limits (including ripple)		⎓ 20…30 V
Output current	Maximum	20 mA
	Minimum	4 mA
Output voltage (Vs)		⎓ 0…10 V
Output voltage drift in relation to temperature		< 10% between - 25 and + 60 °C
Output voltage drift in relation to object colour		< 10%
Current consumption, no-load		⩽ 35 mA
Maximum switching frequency		10 Hz (for an output voltage variation of 1 V)
Delays	First-up	⩽ 150 ms
Indicator light		The brightness of the LED is proportional to the output voltage

(1) Applications: position control, monitoring concentricity or eccentricity, closed loop regulation, monitoring displacement, etc.

(2) PEI: high quality synthetic resin providing excellent withstand to mechanical shocks, vibration and the effects of external agents frequently encountered in industry: alcohol, salts, petroleum, oils, greases, washing agents (diluted sodium carbonate 4%, nitric acid 2%), formaldehyde vapour, splashing lactic acid, etc.

Accessories :
page 5/158

Photo-electric sensors

OsiSense XU Application, material handling series

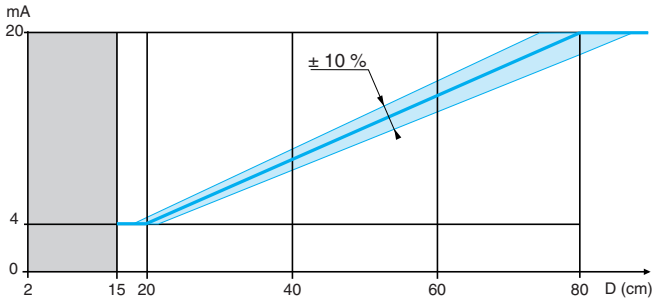
With analogue output signal 4…20 mA and 0…10 V *(1)*

DC supply. Solid-state output

Curves

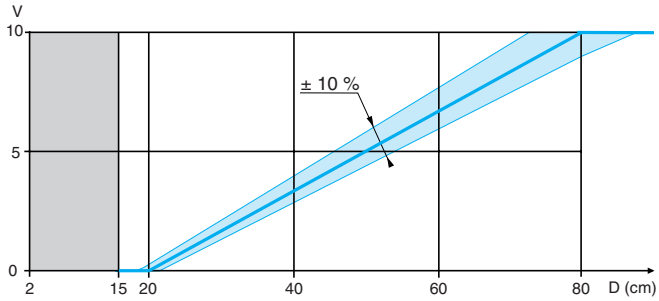
Output signal (related to distance of object). **Test performed with 20 x 20 cm, white 90% object**

Output current



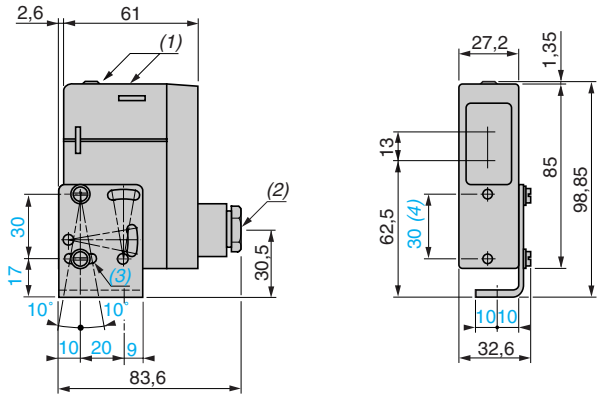
Forbidden zone

Output voltage



Dimensions

Sensor XUJK803538 (the bracket **XUZA41** is included with the sensor)

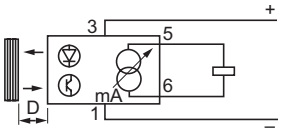


(1) LED.
(2) 11P cable gland.
(3) 1 elongated hole Ø 4.2 x 14.
(4) Front fixing (Ø 4 screws and inserts included).

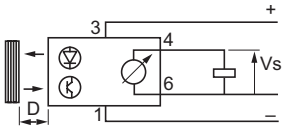
Wiring schemes

Diffuse system

Current output



Voltage output



Load characteristics

- Output current: the output current varies between 4 and 20 mA depending on the distance of the object and therefore, the load must be less than 1 kΩ.
- Voltage output: since the minimum rated output current of the sensor is 10 mA, the load must always have a resistive value of more than 1 kΩ.

Terminal connections

1 ⊘ — (–)
2 ⊘
3 ⊘ — (+)
4 ⊘ — Output voltage
5 ⊘ — Output current
6 ⊘ — (–)

Terminals 1 and 6 connected internally.

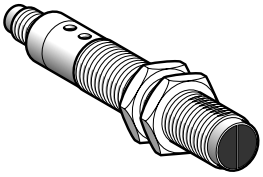
Accessories :
page 5/158

Photo-electric sensors

OsiSense XU Application, material handling series

With analogue output signal 4…20 mA (1)
DC supply

Design 18



System	**Diffuse**
Type of transmission	Infrared
Nominal sensing distance (Sn)	**5…40 cm**

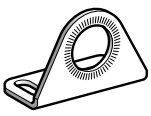
References

3-wire, PNP	**XU5M18AB20D**
Weight (kg)	0.075

Characteristics

Product certifications		CE, CSA, UL
Ambient air temperature		For operation: - 25…+ 55 °C. For storage: - 40…+ 70 °C
Vibration resistance	Conforming to IEC 60068-2-6	25 gn, amplitude ± 2 mm (f = 10…55 Hz)
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms
Degree of protection	Conforming to IEC 60529	IP 67
Connection		M12 male connector, 4-pin (suitable female connectors, including pre-wired versions, please refer to our catalogue "Cabling accessories OsiSense XZ")
Materials		Case: nickel plated brass, lens: PMAA
Rated supply voltage		**⎓ 12…24 V with protection against reverse polarity**
Voltage limits		⎓ 10…30 V (including ripple)
Output current	Maximum	**20 mA**
	Minimum	**4 mA**
Output current drift in relation to temperature		< 10% between - 25 and + 55 °C, < 5% between 0 and + 40 °C
Output current drift in relation to supply		< 3%
Current consumption, no-load		⩽ 30 mA
Maximum switching frequency		20 Hz (for an output current variation of 10 mA)
Delays		First-up: ⩽ 50 ms
Indicator light		The brightness of the green LED is proportional to the output current Ie = 20 mA: indicator light at maximum intensity Ie = 4 mA: indicator light at minimum intensity

Fixing accessory *(2)*



XUZA118

Description	Reference	Weight kg
Stainless steel fixing bracket	**XUZA118**	0,045

(1) Applications: position control, monitoring concentricity or eccentricity, closed loop regulation, monitoring displacement, etc.
(2) For further information, see page 5/158.

Accessories :
page 5/158

Photo-electric sensors

OsiSense XU Application, material handling series

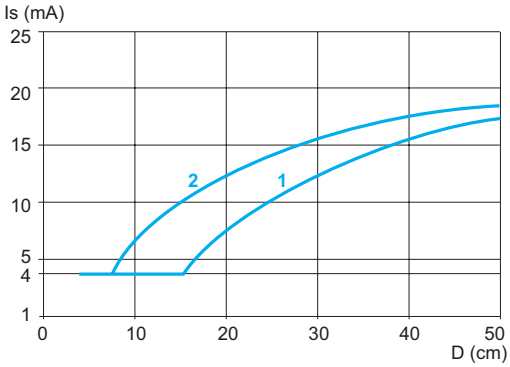
With analogue output signal 4…20 mA

DC supply

Curves

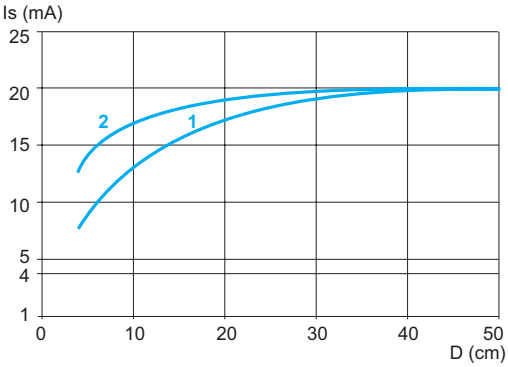
Output signal (related to distance of object)

Potentiometer set at maximum



1 White 90% object
2 Grey 15% object

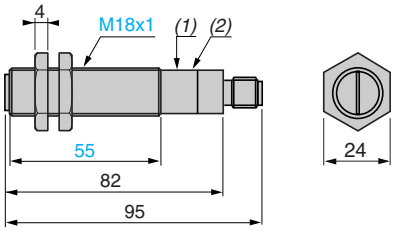
Potentiometer set at minimum



1 White 90% object
2 Grey 15% object

Dimensions

Sensor XU5M18AB20D



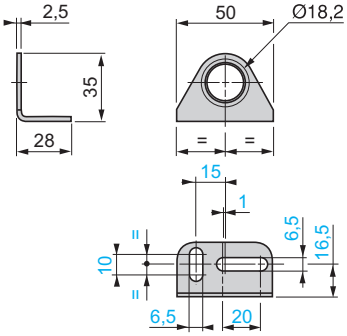
(1) Potentiometer.

(2) Green LED.

Fixing nut tightening torque: 15 N.m.

Connector tightening torque: 2 N.m.

Fixing bracket XUZA118

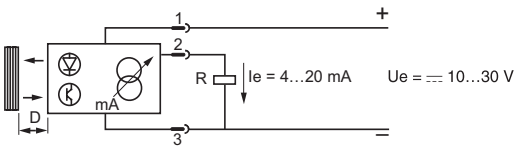


Schemes

Wiring schemes

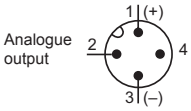
Diffuse system

Output current



Connector scheme

Sensor connector pin view



For suitable female connectors, including pre-wired versions, please refer to our catalogue "Cabling accessories OsiSense XZ".

Load characteristics (R)

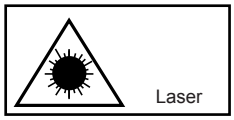
The output current varies between 4 and 20 mA, depending on the distance of the object, and therefore, the load must be less than 800 Ω for a 24 V supply and less than 300 Ω for a 12 V supply.

Accessories :
page 5/158

Photo-electric sensors

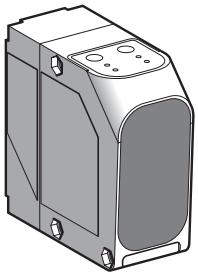
OsiSense XU Application
Material handling series
With solid-state and analogue output signal 4…20 mA
Laser transmission

Design 90 x 90 mm



Laser class 1, conforming to IEC 60825-1
Laser class 2 pointer, conforming to IEC 60825-1

Visible laser radiation:
do not stare into beam



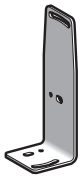
System		Object distance sensor	Reflector distance sensor
Type of transmission		**Infrared laser, class 1** (905 nm) **Red laser pointer, class 2** (650 nm) *(1)*	
Measuring distance		**0.2…6 m** (on white 90%) **0.2…6 m** (on grey 18%) **0.2…2.5 m** (on black 6%) *(2)*	**0.2…30 m** (with reflector XUZC250)
References			
5-wire solid-state outputs (x 2) analog output (x 1)	PNP, 4…20 mA	**XUE5AA2NM12**	**XUE1AA2NM12**
Weight (kg)		0.2	0.2
Characteristics			
Product certifications		cULus, CE	
Connection		M12, 5-pin connector	
Degree of protection	Conforming to IEC 60529	IP 67	
Vibration resistance	Conforming to EN/IEC 60947-5-2 and IEC 60947-4-2	Amplitude ±0.5 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to EN/IEC 60947-5-2 and IEC 60947-4-1	30 gn, duration 11 ms	
Ambient air temperature	For operation	- 20…+ 50 °C	
	For storage	- 40…+ 80 °C	
Repeat accuracy (analog output) *(3)*		Fast mode: ± 15 mm Slow mode: ± 10 mm	Fast mode: ± 10 mm Slow mode: ± 5 mm
Fast mode/slow mode (response time)		13 ms/80 ms	30 ms/65 ms
Linearity		≤ ± 40 mm	≤ ± 60 mm
Materials	Case	ABS, mechanical shocks resistant	
	Lenses	PMMA	
Rated supply voltage		18…30 V ⎓	
Voltage limits (including ripple)		±10% of rated operational voltage	
Immunity to ambient light		Conforming to EN/IEC 60947-5-2	
Output signal		Solid-state outputs: 2 x PNP analog output: 4…20 mA	
Light spot size		4 x 7 mm at 2 m 3 x 10 mm at 4 m 4 x 12 mm at 6 m	15 x 20 mm at 10 m 30 x 40 mm at 20 m 45 x 60 mm at 30 m
Switching capacity		100 mA, with protection against reverse polarity, overload and short-circuit	
Voltage drop, closed state		≤ 2.4 V	
Current consumption, no-load		≤ 125 mA on 24 V ⎓	
Maximum switching frequency		Fast mode: 38 Hz Slow mode: 16 Hz	
Indicator lights	Output state	2 yellow LEDs	
	Supply on	1 green LED	
	Slow mode	1 orange LED	
	Parametering	4 red LEDs	
Parametering		By 2 buttons: Set and Toggle	

(1) In operating mode, the red laser class 2 pointer can be stopped for working on infrared transmission.
(2) % of object remission.
(3) Information taken into account after 30 minutes.

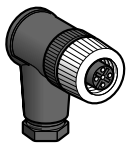
Photo-electric sensors

OsiSense XU Application
Material handling series
With solid-state and analogue output signal 4…20 mA
Laser transmission

References of accessories



XUZA618



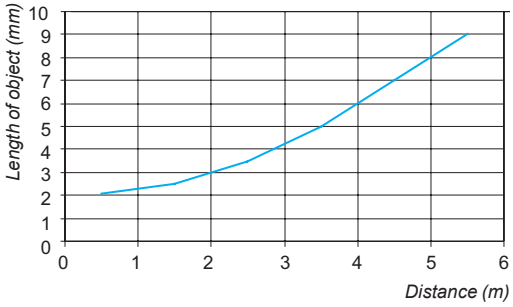
XZCC12FCM50B

Description	For use with	Dimensions (mm)	Reference	Weight kg
Fixing bracket (screws, nuts and washers included)	XUE5AA2NM12 XUE1AA2NM12	–	**XUZA618**	0.062
Adhesive reflector	XUE1AA2NM12	250 x 250	**XUZC250**	0.040
Straight connector, wired by user M12, 5-pin female	XUE5AA2NM12 XUE1AA2NM12	–	**XZCC12FDM50B**	0.020
Elbowed connector, wired by user M12, 5-pin female	XUE5AA2NM12 XUE1AA2NM12	–	**XZCC12FCM50B**	0.020

Presentation

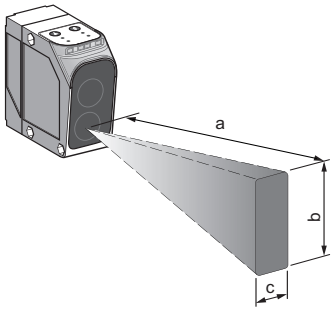
Minimum size of detectable object related to distance

XUE5AA2NM12



***Note**: Typical values for application involving measurements on a square white object*

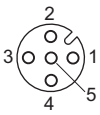
Light spot size (not visible)



	XUE5AA2NM12				XUE1AA2NM12			
a (m)	0	2	4	6	0	10	20	30
b (mm)	10	7	10	12	10	20	40	60
c (mm)	5	4	3	4	5	15	30	45

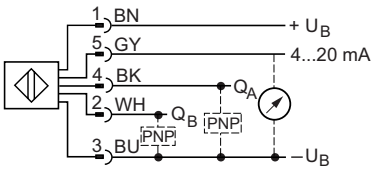
Wiring schemes

M12 connector

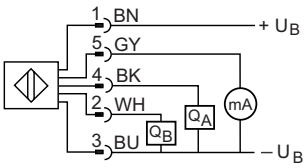


Pin n°/colour
1 BN: Brown
2 WH: White
3 BU: Blue
4 BK: Black
5 GY: Grey

XUE5AA2NM12

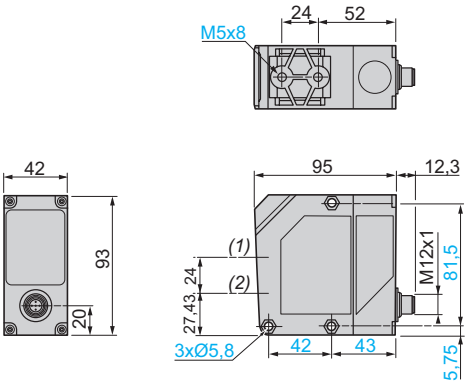


XUE1AA2NM12

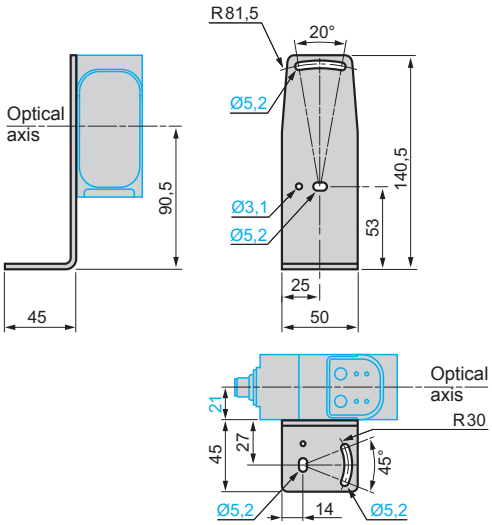


Dimensions

XUE5AA2NM12 and **XUE1AA2NM12**



XUE5AA2NM12 and **XUE1AA2NM12** with fixing bracket **XUZA618**



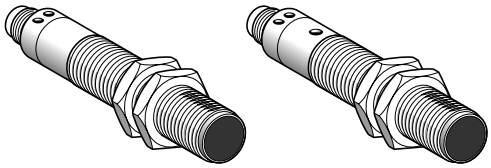
(1) Receiver optical axis.
(2) Transmitter optical axis.

Photo-electric sensors

OsiSense XU Application, material handling series

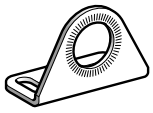
Through beam system with high “excess gain” (1)
Solid-state output and analogue output 4…20 mA

Design 18



System		**Thru-beam**
Type of transmission		Infrared
Nominal sensing distance (Sn) / maximum		**50 m /** 70 m (transmitter + receiver)
References		
3-wire, PNP	NO (object detection) + analogue output	**XU2M18AP20D** *(2)*
Weight (kg)		0.155
Characteristics		
Product certifications		CE, CSA, UL
Ambient air temperature	For operation	- 25…+ 55 °C
	For storage	- 40…+ 70 °C
Vibration resistance	Conforming to IEC 60068-2-6	25 gn, amplitude ± 2 mm (f = 10…55 Hz)
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms
Degree of protection	Conforming to IEC 60529	IP 67
Connection		M12 male connector, 4-pin (suitable female connectors, including pre-wired versions, please refer to our catalogue “Cabling accessories OsiSense XZ”)
Materials	Case	Nickel plated brass
	Lenses	PMMA
Rated supply voltage		**⎓ 12…24 V with protection against reverse polarity**
Voltage limits		⎓ 10…30 V (including ripple)
Solid-state digital output	Switching capacity (sealed)	**≤100 mA with overload and short-circuit protection**
	Voltage drop, closed state	≤ 1.5 V
	Maximum switching frequency	30 Hz
	First-up delay	≤ 50 ms
	Response delay	≤ 15 ms
	Recovery delay	≤ 15 ms
Analogue output	Output current	**4…20 mA** Drift < 5% for temperature between 0 and + 40 °C
	Delay	≤ 15 ms
Current consumption, no-load		≤ 55 mA (transmitter + receiver)
Indicator lights	Transmitter	Green LED, supply on
		Yellow LED illuminated = beam transmission
	Receiver	Yellow LED illuminated = solid-state output ON = object detected within beam
		Green LED: the brightness of the LED is proportional to the output current: - for I = 20 mA, object slightly opaque, intensity at maximum, - for I = 4 mA, object completely opaque, intensity at minimum.

Fixing accessory *(3)*



XUZA118

Description	Reference	Weight kg
Stainless steel fixing bracket	**XUZA118**	0,045

(1) Applications: detection of objects in spite of a difficult environment (smoke, dust, mist, etc.), detection of objects inside packaging, etc.
Example of values:

Object: white sheets of 80 gsm paper. Transmitter-receiver distance = 10 cm				
Number of sheets	1	11	27	31
Analogue output current (mA)	17.3	12	6	5

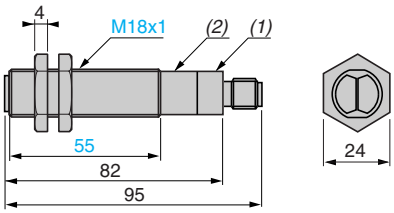
(2) Reference for both transmitter and receiver for thru-beam system.
(3) For further information, see page 5/158.

Photo-electric sensors

OsiSense XU Application, material handling series

Through beam system with high “excess gain”
Solid-state output and analogue output 4…20 mA

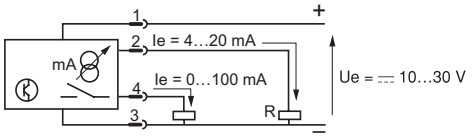
Dimensions



(1) LEDs
(2) Potentiometer (only on receiver)
Fixing nut tightening torque: 15 N.m
Connector tightening torque: 2 N.m

Wiring schemes

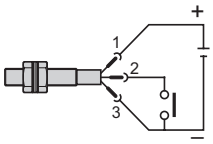
Receiver



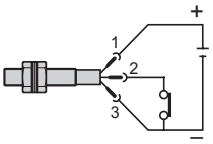
R max. < 800 Ω (Ue = 24 V), < 300 Ω (Ue = 12 V)

Beam break test (only on transmitter)

Beam made



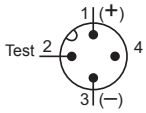
Beam broken



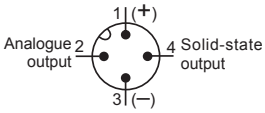
Connector scheme

Sensor connector pin view

Transmitter



Receiver

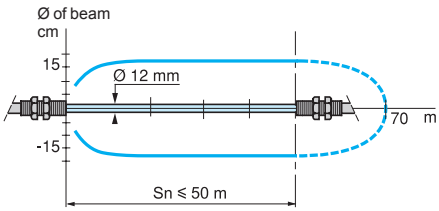


For suitable female connectors, including pre-wired versions, please refer to our catalogue “Cabling accessories OsiSense XZ”.

Curves

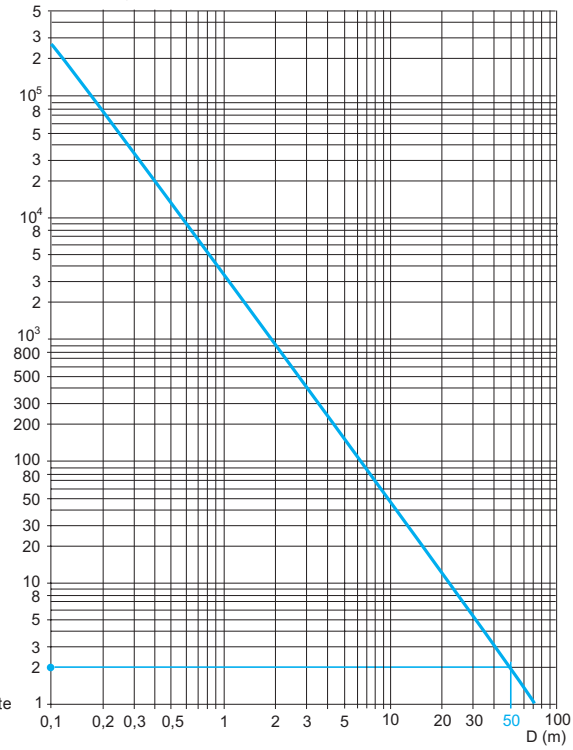
Detection curve

Thru-beam system



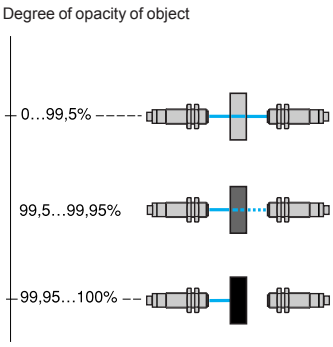
Excess gain curve (ambient temperature: + 25 °C)

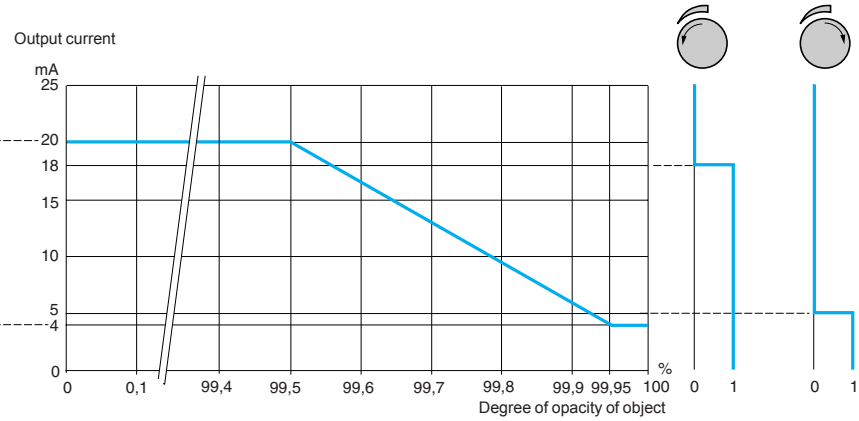
Thru-beam system



Operation, settings

Type, opacity of object	Analogue output curve	Switching level of digital solid-state PNP output





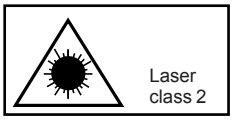
Accessories :
page 5/158

Photo-electric sensors

OsiSense XU Application, material handling series

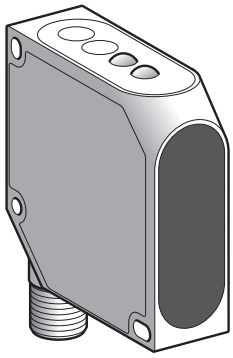
With analogue output signal 0...10 V or 4…20 mA
Laser transmission

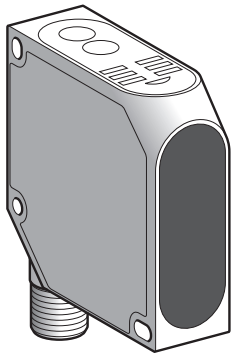
Compact design, 50 x 50



Laser class 2, conforming to IEC 825-1

Visible laser radiation: do not stare into beam.





System		**Diffuse**		
Type of transmission		**Red laser, pulsed, Class 2,** wavelength: 670 nm		
Measuring distance		**40…60 mm**	**45…85 mm**	**80…300 mm**
References				
3-wire, PNP output		**XUYPCO925L1ANSP**	**XUYPCO925L2ANSP**	**XUYPCO925L3ANSP**
Weight (kg)		0.057	0.057	0.057
Characteristics				
Product certifications		CE		
Ambient air temperature	For operation	0…+ 45 °C		
	For storage	- 20…+ 60 °C		
Degree of protection	Conforming to IEC 60529	IP 67		
Resolution		**7 µm**	**20 µm**	**200 µm**
Linearity		< 1%		< 0.25%
Temperature stability		10 µm/K	18 µm/K	22 µm/K
Connection		M12 male connector with alternative orientations		
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 1.5 mm (f = 10 to 55 Hz)		
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms		
Materials	Case	ABS, anti-shock		
Rated supply voltage		⎓ **24 V with protection against reverse polarity**		
Voltage limits (including ripple)		⎓ **18…28 V**		
Immunity to ambient light		5000 lux		
Output signal		0…10 V		4…20 mA
Output activation time (from 10 …90%)		30 ms		0.4 ms (fast speed mode) 40 ms (medium speed mode)
Laser transmission		T pulse: 8 µs, pulse frequency: 6 kHz, time base: 250 ms		
Spot diameter		< 1 mm at 50 mm	< 0.8 mm at 65 mm	1.5 x 3.5 mm at 80 mm
Switching capacity		**3 mA with overload and short-circuit protection**		
Voltage drop, closed state		< 2.4 V		
Current consumption, no-load		35 mA		≤ 40 mA on ⎓ 24 V
Maximum switching frequency		**40 Hz**		
Indicator lights	Dirty	Red LED		
	Supply on	Green LED		
Parametering		–		By buttons

■ Applications: position control of robot arm, measuring thickness of mechanical parts.

Accessories

Description	Details	Length of cable m	References	Weight kg
Pre-wired M12 connector	Straight, 4-pin	2	**XZCP1141L2**	0.090
		5	**XZCP1141L5**	0.190
	Straight, 5-pin	2	**XZCP1164L2**	0.115
		5	**XZCP1164L5**	0.270
Fixing bracket *(1)*	Stainless steel 316	–	**XUZA51S**	0.050

(1) For further information, see page 5/160.

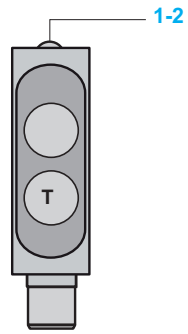
Photo-electric sensors

OsiSense XU Application, material handling series

With analogue output signal 0...10 V or 4…20 mA
Laser transmission

Presentation

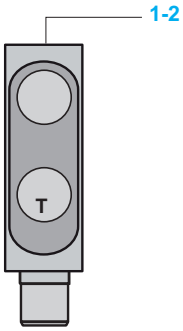
XUYPCO925L1ANSP, XUYPCO925L2ANSP



1 Green/red LED
2 LED display

R: Receiver
T: Transmitter

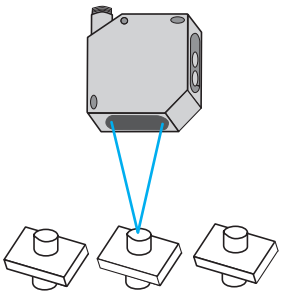
XUYPCO925L3ANSP



1 Green/red LED
2 Parametering by buttons

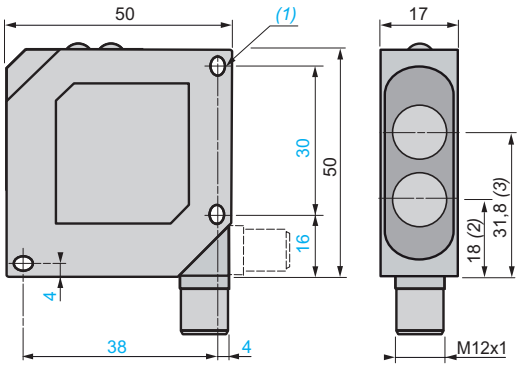
Application example

Monitoring dimensions in series

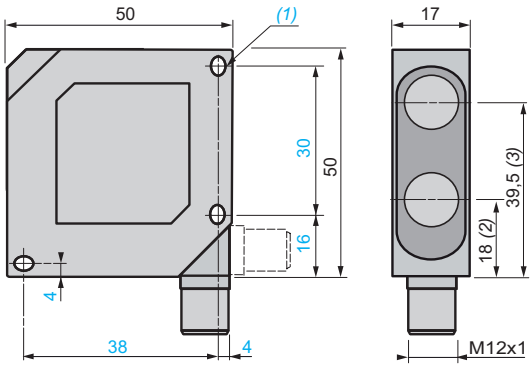


Dimensions

XUYPCO925L1ANSP, XUYPCO925L2ANSP



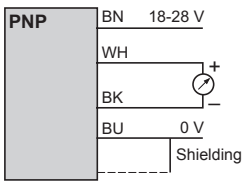
XUYPCO925L3ANSP



(1) 2 elongated holes Ø 4.3 x 4.
(2) Transmitter optical axis.
(3) Receiver optical axis.

Wiring schemes

XUYPCO925L1ANSP, XUYPCO925L2ANSP



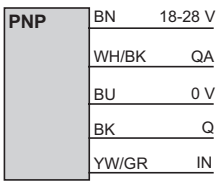
Connector

M12

Pin n° - colour
1 BN: Brown
2 WH: White
3 BU: Blue
4 BK: Black

Note: *Shielded cable recommended.*

XUYPCO925L3ANSP



Connector

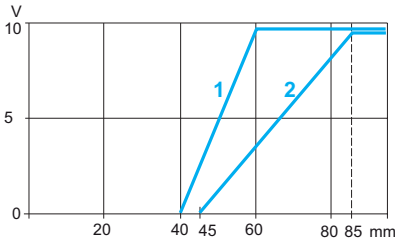
M12

Pin n° - colour
1 BN: Brown
2 WH: White
3 BU: Blue
4 BK: Black
5 GY: Grey

QA: 4-20 mA analogue output (R ⩽ 500 Ω)
Q: Switching output
IN: Control input (YW/GR: Yellow/green)

Adjustment curves

XUYPCO925L1ANSP, XUYPCO925L2ANSP



1 XUYPCO925L1ANSP
2 XUYPCO925L2ANSP

XUYPCO925L3ANSP

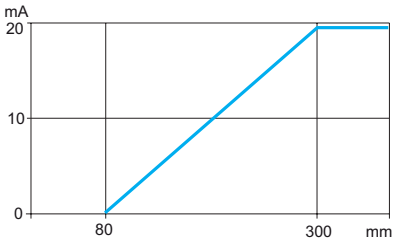
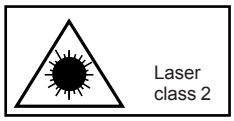


Photo-electric sensors

OsiSense XU Application, material handling series

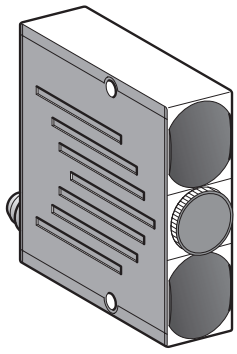
Diffuse, with laser transmission
With background suppression
DC supply. Solid-state output

Compact design



Laser class 2, conforming to IEC 60825-1

Visible laser radiation: do not stare into beam.



System		**Diffuse with background suppression**
Type of transmission		**Red laser, pulsed, Class 2,** wavelength: 675 nm
Detection distance		**Adjustable from 50 to 300 mm**
Minimum size of object		**0.5 mm**

References

4-wire, PNP and NPN output	NO/NC depending on wiring	**XUYPS1LCO965S**
Weight (kg)		0.081

Characteristics

Product certifications		CE, cULus *(1)*
Ambient air temperature	For operation	0…+ 50 °C
	For storage	- 20…+ 80 °C
Degree of protection	Conforming to IEC 60529	IP 65
Connection		M8, 4-pin male connector (for pre-cabled version please consult our Customer Care Centre)
Materials	Case	Glass impregnated nylon
	Lens	PMMA
Rated supply voltage		⎓ **12…24 V with protection against reverse polarity**
Voltage limits (including ripple)		⎓ **10…30 V**
Immunity to ambient light	Incandescent bulb	500 lux
	Natural light	10 000 lux
Laser transmission	Pulsed laser LED	T pulse: 6 µs, T period < 50 µs
Spot size		Manual adjustment of focusing
Switching capacity		**100 mA with overload and short-circuit protection**
Voltage drop, closed state		< 2 V
Current consumption, no-load		35 mA
Maximum switching frequency		**5 kHz**
Delays	Response and recovery	< 150 µs
Indicator lights	Time delay active	Red indicator
	Output state	Green indicator
	NO function	Red indicator
	NC function	Indicator off
Output signal time delay		40 ms, depending on wiring

(1) This product is UL Listed if supplied by a class II or isolated supply delivering ⎓ 30 V max. (isolated transformer for example) and protected by a UL fuse rated at 3 A max.

Applications: monitoring of small parts on production machine, detection of components on a printed circuit, monitoring for crack on a component, control of level, suppression of a background.

Accessories

Description	Details	Length of cable	References	Weight
		m		kg
Pre-wired M8 connector	Straight	2	**XZCP0941L2**	0.080
	Elbowed (90°)	2	**XZCP1041L2**	0.080
	Straight	5	**XZCP0941L5**	0.180
	Elbowed (90°)	5	**XZCP1041L5**	0.180

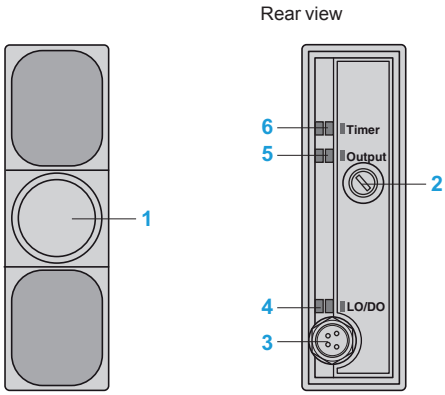
Photo-electric sensors

OsiSense XU Application, material handling series

Diffuse, with laser transmission
With background suppression
DC supply. Solid-state output

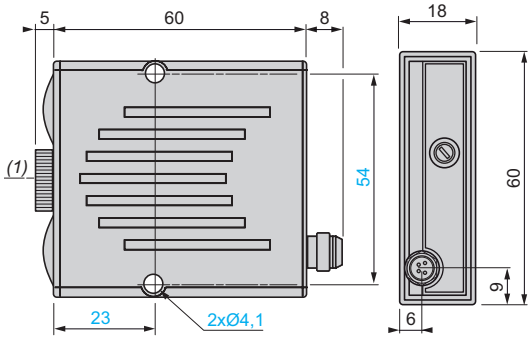
Presentation

XUYPS1LCO965S



1 Adjustment of spot size
2 Detection distance adjustment screw
3 M8 connector
4 On: NO function
Off: NC function
5 Object detected
6 Time delay active

Dimensions

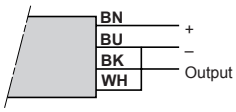


(1) Optical axis of laser

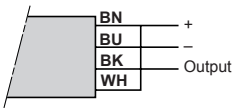
Wiring schemes

NO function

Without time delay

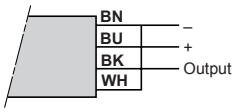


With 40 ms time delay

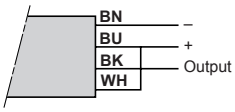


NC function

Without time delay



With 40 ms time delay

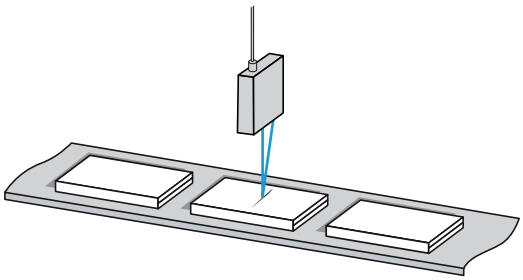


M8 connector

Pin n° - colour
1 BN: Brown
2 WH: White
3 BU: Blue
4 BK: Black

Application examples

Monitoring for crack in a component



Monitoring for a broken punch on press tool

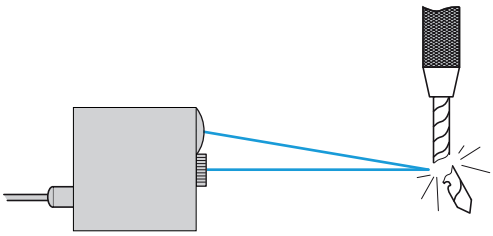
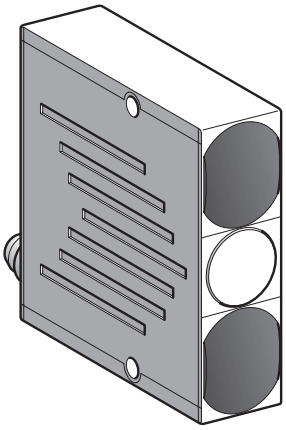


Photo-electric sensors

OsiSense XU Application, material handling series

Diffuse, with 2 channels using triangulation
with background suppression
DC supply. Solid-state output

Compact design



System		**Diffuse with background suppression**	
Type of transmission		Infrared LED, modulated, Ø 15 mm beam	
Detection distance		**Adjustable from 50 to 600 mm**	

References

4-wire, PNP and NPN output	NO/NC programmable function	**XUYPS2945S**	**XUYPS2CO945S**
Weight (kg)		0.135	0.055

Characteristics

Product certifications		CE, cULus *(1)*	
Ambient air temperature	For operation	0…+ 50 °C	
	For storage	- 20…+ 80 °C	
Degree of protection	Conforming to IEC 60529	IP 65	
Connection		Pre-cabled, length 2 m	M8, 4-pin male connector
Materials	Case	Glass impregnated nylon	
Rated supply voltage		⎓ **12…24 V with protection against reverse polarity**	
Voltage limits (including ripple)		⎓ **10…30 V**	
Immunity to ambient light	Incandescent bulb	1300 lux	
	Natural light	10 000 lux	
Switching capacity		**100 mA with overload and short-circuit protection**	
Voltage drop, closed state		< 2 V	
Current consumption, no-load		< 1.5 W	
Maximum switching frequency		**370 Hz**	
Delay	Response and recovery	< 1.8 ms	
Output signal time delay	For A and B/A or B *(2)*	Determined by wiring	
Indicator light	Output signal	Green LED	

(1) This product is UL Listed if supplied by a class II or isolated supply delivering ⎓ 30 V max. (isolated transformer for example) and protected by a UL fuse rated at 3 A max.
(2) See next page

■ Applications:
□ Control of filling, detection of object on conveyor against reflective background.

Accessories

Description	Details	Length of cable	References	Weight
		m		kg
Pre-wired M8 connector	Straight	2	**XZCP0941L2**	0.080
	Elbowed (90°)	2	**XZCP1041L2**	0.080
	Straight	5	**XZCP0941L5**	0.180
	Elbowed (90°)	5	**XZCP1041L5**	0.180

Photo-electric sensors

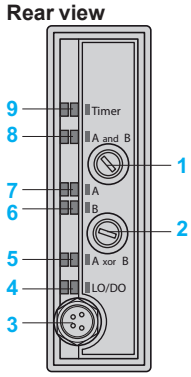
OsiSense XU Application, material handling series

Diffuse, with 2 channels using triangulation
with background suppression
DC supply. Solid-state output

Presentation

XUYPS2945S, XUYPS2CO945S

Rear view

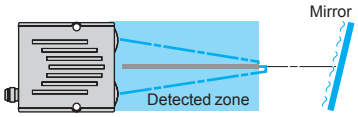


1 Adjustment of zone A detection distance
2 Adjustment of zone B detection distance
3 Pre-cabled connection (XUYPS2945S) or M8 connector
4 (XUYPS2CO945S)
5 On in direct mode
Illuminates when the "exclusive OR" function between the two
6 zones A and B is obtained
On when the object is present
7 in zone B
On when the object is present
8 in zone A
Illuminates when the "AND" object logic function between
9 the two zones A and B is
5 & 8 obtained
Indicates time delay mode
Simultaneously on when the "OR" logic function between the 2 zones A or B is obtained

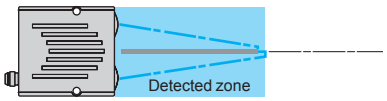
Description (4 operating modes)

Two independent sensors with triangulation: A, B

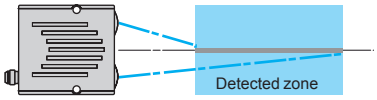
Immunity to reflection: A and B



Detection of contrasting objects: A or B

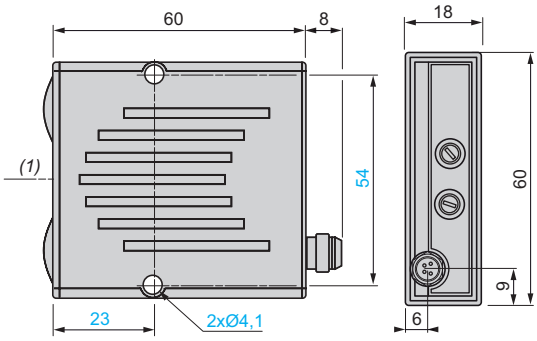


Monitoring of distance: A xor B



Dimensions

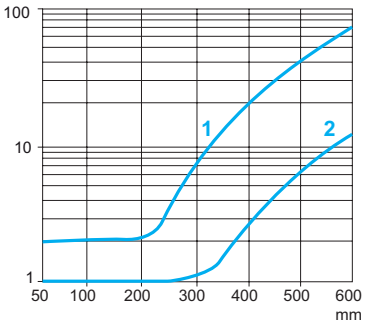
XUYPS2945S, XUYPS2CO945S



(1) Optical axis.

Detection curves (typical)

XUYPS2945S, XUYPS2CO945S

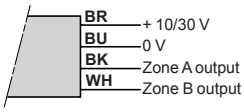


1 Black 6%
2 Grey 18% - *Distance (mm) set on 92% (Kodak 1527795)*

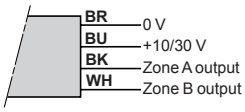
Wiring schemes and outputs

Two independent sensors with triangulation: A, B

NO output



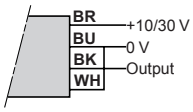
NC output



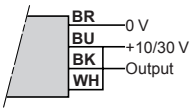
Immunity to reflection: A and B

Without time delay

NO output

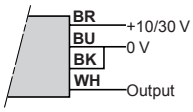


NC output

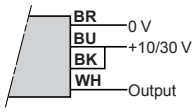


With 40 ms time delay

NO output

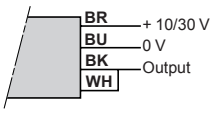


NC output

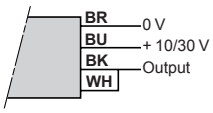


Detection of contrasting objects: A or B

NO output



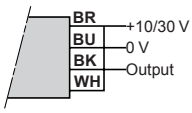
NC output



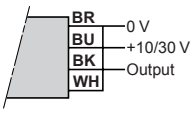
Monitoring of distance: A xor B

Without time delay

NO output

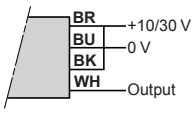


NC output

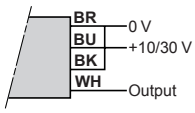


With 40 ms time delay

NO output



NC output

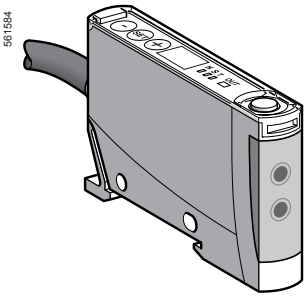


BR: Brown
BU: Blue
BK: Black
WH: White

Photo-electric sensors

OsiSense XU Application

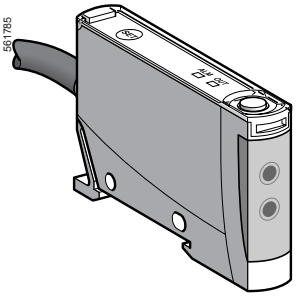
Fibre design, amplifiers
Three-wire DC, solid-state output
Teach mode



XUDA2

Amplifiers with fine adjustment and 4-digit screen

Sensing distance (Sn) m	Function	Output	Connection	Reference	Weight kg
Depending on fibre	NO/NC Programmable	PNP	Pre-cabled	**XUDA2PSML2**	0.040
			M8 connector	**XUDA2PSMM8**	0.040
		NPN	Pre-cabled	**XUDA2NSML2**	0.040
			M8 connector	**XUDA2NSMM8**	0.040



XUDA1

Amplifiers using teach mode

Sensing distance (Sn) m	Function	Output	Connection	Reference	Weight kg
Depending on fibre	NO/NC Programmable	PNP	Pre-cabled	**XUDA1PSML2**	0.040
			M8 connector	**XUDA1PSMM8**	0.040
		NPN	Pre-cabled	**XUDA1NSML2**	0.040
			M8 connector	**XUDA1NSMM8**	0.040

Photo-electric sensors

OsiSense XU Application

Fibre design, amplifiers
Three-wire DC, solid-state output
Teach mode

Characteristics

Sensor type			XUDA1●●SMM8, XUDA2●●SMM8	XUDA1●●SML2, XUDA2●●SML2
Product certifications			CE, cULus	
Connection	Connector		M8	–
	Pre-cabled		–	Length: 2 m
Sensing distance (Sn)			**Depending on fibre used**,see page 5/130. Sensing distance halved for XUDA2 configured for fast frequency	
Sensitivity adjustment			Teach mode on **XUDA1**, Teach mode and fine adjustment (+/- button) plus 4-digit screen on **XUDA2**	
Type of transmission			Red	
Degree of protection	Conforming to IEC 60529		IP 65 with Ø 2 mm fibre (IP 64 with Ø 1 mm fibre)	
Storage temperature		**°C**	- 30…+ 70	
Operating temperature		**°C**	- 10…+ 55	
Vibration resistance	Conforming to IEC 60068-2-6		7 gn, amplitude ± 0.5 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27		30 gn, duration 11 ms	
Indicator lights	Output state		Yellow LED	
	Stability		Red LED for **XUDA1**	
	Stability		Green LED for **XUDA2**	
Signal level			By 7 segment/4-digit display for **XUDA2**	
Rated supply voltage		**V**	⎓ 12…24 with protection against reverse polarity	
Voltage limits (including ripple)		**V**	⎓ 10.8…26.4	
Current consumption, no-load		**mA**	≤ 50	
Switching capacity		**mA**	≤ 100 with overload and short-circuit protection	
Alarm output		**mA**	≤ 50 for **XUDA2** with overload and short-circuit protection	
Protection against mutual interference			Yes for **XUDA2**	
Voltage drop, closed state		**V**	≤ 2 for **XUDA●P●●●●**, ≤ 1 for **XUDA●N●●●●●**	
Maximum switching frequency		**kHz**	1 kHz for **XUDA1**, 1 or 5 kHz configurable for **XUDA2**	
Output time delay		**ms**	0 or 40 on recovery for **XUDA2**	
Delays	First-up	**ms**	< 120	
	Response	**ms**	< 0.5 (0.1 for **XUDA2** in fast frequency mode)	
	Recovery	**ms**	< 0.5 (0.1 for **XUDA2** in fast frequency mode)	

XUDA2 wiring schemes

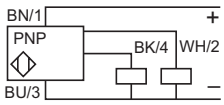
M8 connector

1(+)
3 (-)
4 (OUT/output)
2 (alarm)

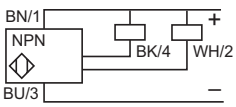
Pre-cabled

BN Brown (+)
BU Blue (-)
BK Black(output)
WH White (alarm)
(WH only on **XUDA2**)

PNP



NPN



XUDA1 wiring schemes

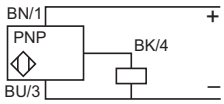
M8 connector

1(+)
3 (-)
4 (OUT/output)
2

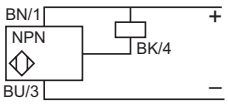
Pre-cabled

BN Brown (+)
BU Blue (-)
BK Black (Output)

PNP



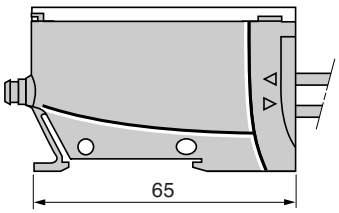
NPN



Please refer to our "Cabling accessories OsiSense XZ" catalogue.

Dimensions

XUDA●

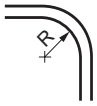


XUDA1

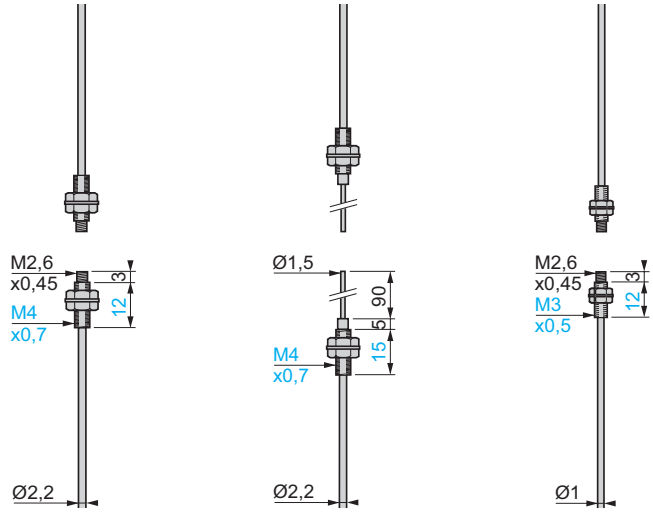
XUDA2

Photo-electric sensors

OsiSense XU Application
Fibre optics for amplifiers
"PLASTIC" fibres with end fittings, thru-beam system



R = minimum bend radius
Fibre of ext. Ø 2.2 mm, R = 25 mm
Fibre of ext. Ø 1 mm, R = 10 mm
XUFN2S01L●, R = 4 mm



Nominal sensing distance (Sn)	With fibre L = 2 m	**200 mm** *(1)*	**180 mm**	**50 mm** *(1)*
	With lens	**1500 mm** *(2)*	–	**1000 mm** *(2)*
Application, features		General purpose		Accurate positioning

References (complete assembly - 2 fibres)

With standard end fittings	L = 2 m	**XUFN12301**	–	**XUFN35301**
	L = 10 m	**XUFN12301L10**	–	–
With 90 mm flexible end fittings, L = 2 m		–	**XUFN12311**	–
Weight (kg)		0.058 (L = 2 m)	0.030	0.045

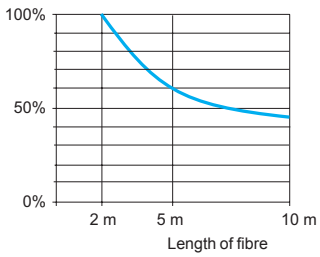
Characteristics

Fibre (view on sensing face)				
	Core (Ø mm)	1 x Ø 1	1 x Ø 1	1 x Ø 0.5
	Trimmable to required length (trimmer XUFZ11 included)	Yes	Yes	Yes
Ambient air temperature		For operation: - 25…+ 60 °C. For storage: - 40…+ 80 °C		
Vibration resistance		7 gn, amplitude ± 1.5 mm (f = 10…55 Hz), conforming to IEC 60068-2-6		
Shock resistance		30 gn, duration 11 ms, conforming to IEC 60068-2-27		
Degree of protection		IP 64 conforming to IEC 60529 and IP 641 conforming to NF C 20-010		
Materials		Fibres: PMMA; sheath: PE		

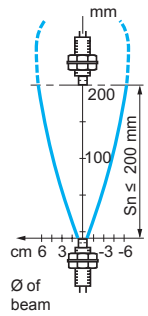
Detection curves

XUFN●●●●●L10

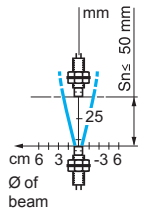
Percentage reduction in sensing distance related to length of fibre



XUFN12301, XUFN12311



XUFN35301

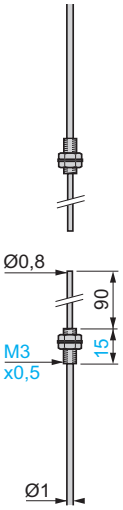


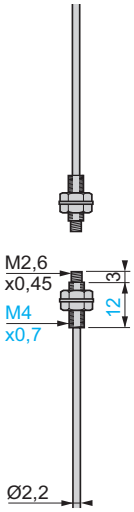
*(1) Can be used with 90° mirror **XUFZ02**, see page 5/136.*
*(2) With lens accessory **XUFZ01**, see page 5/136.*

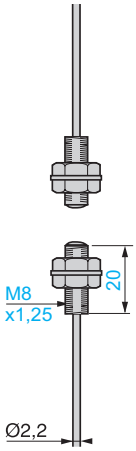
References of amplifiers: page 5/128
Accessories: page 5/136

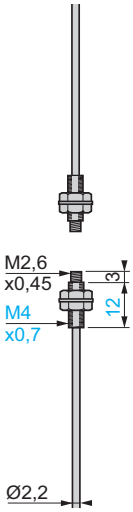
Photo-electric sensors

OsiSense XU Application
Fibre optics for amplifiers
"PLASTIC" fibres with end fittings, thru-beam system

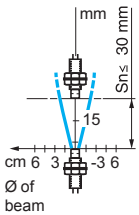


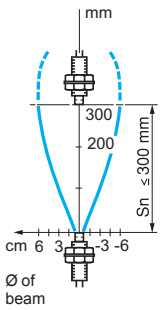


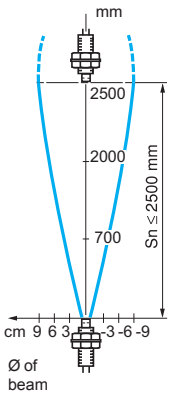




30 mm	**300 mm** *(1)*	**2500 mm**	**100 mm** *(1)*
–	**2000 mm** *(2)*	–	**750 mm** *(2)*
Accurate positioning	Long sensing distance fibres	Fibres with integral lens Resistant to accumulation of dirt	Flexible fibres for cyclic movements, areas with restricted access
–	**XUFN2P01L2**	**XUFN2L01L2**	**XUFN2S01L2**
–	**XUFN2P01L10**	**XUFN2L01L10**	**XUFN2S01L10**
XUFN35311	–	–	–
0.045	0.058 (L = 2 m)	0.060 (L = 2 m)	0.062 (L = 2 m)
1 x Ø 0.5	1 x Ø 1.5	1 x Ø 1	1 x Ø 1
Yes	Yes	Yes	Yes
For operation: - 25…+ 60 °C. For storage: - 40…+ 80 °C			
7 gn, amplitude ± 1.5 mm (f = 10…55 Hz), conforming to IEC 60068-2-6			
30 gn, duration 11 ms, conforming to IEC 60068-2-27			
IP 64 conforming to IEC 60529 and IP 641 conforming to NF C 20-010			
Fibres: PMMA; sheath: PE			
XUFN35311	**XUFN2P01L2**	**XUFN2L01L2**	**XUFN2S01L2**







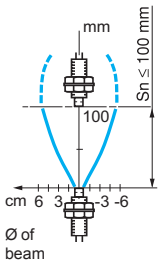
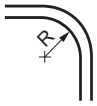


Photo-electric sensors

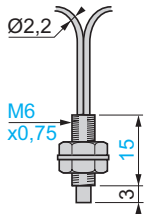
OsiSense XU Application

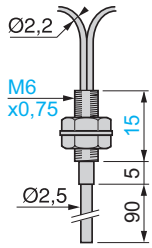
Fibre optics for amplifiers

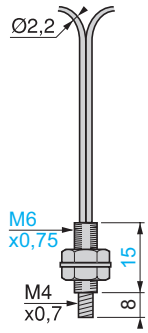
"PLASTIC" fibres with end fittings, diffuse system



R = minimum bend radius
Fibre of ext. Ø 2.2 mm, R = 25 mm
Fibre of ext. Ø 1 mm, R = 10 mm
XUFN5S01L●, R = 4 mm







Nominal sensing distance (Sn)	**70 mm**	**60 mm**	**60 mm**
Application, features	General purpose		Positioning

References

With standard end fittings	L = 2 m	**XUFN05321**	–	**XUFN05323**
	L = 10 m	**XUFN05321L10**	–	–
With 90 mm flexible end fittings, L = 2 m		–	**XUFN05331**	–
Weight (kg)		0.058 (L = 2 m)	0.030	0.060

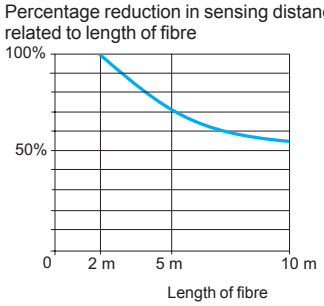
Characteristics

Fibre (view on sensing face)				
	Core (Ø mm)	2 x Ø 1	2 x Ø 1	1 x Ø 1 + 16 x Ø 0.265
	Trimmable to required length (trimmer XUFZ11 included)	Yes	Yes	Yes
Ambient air temperature		For operation: - 25…+ 60 °C. For storage: - 40…+ 80 °C		
Vibration resistance		7 gn, amplitude ± 1.5 mm (f = 10…55 Hz), conforming to IEC 60068-2-27		
Shock resistance		30 gn, duration 11 ms, conforming to IEC 60068-2-27		
Degree of protection		IP 64 conforming to IEC 60529 and IP 641 conforming to NF C 20-010		
Materials		Fibres: PMMA; sheath: PE		

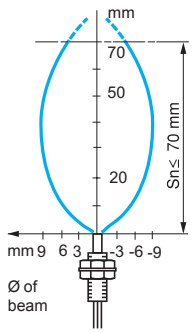
Detection curves (object 10 x 10 cm, white 90%)

XUFN●●●●●L10

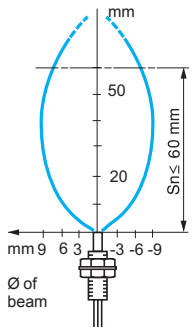
Percentage reduction in sensing distance related to length of fibre



XUFN05321



XUFN05331, XUFN05323



(1) Fixing clamps included with fibre optic.

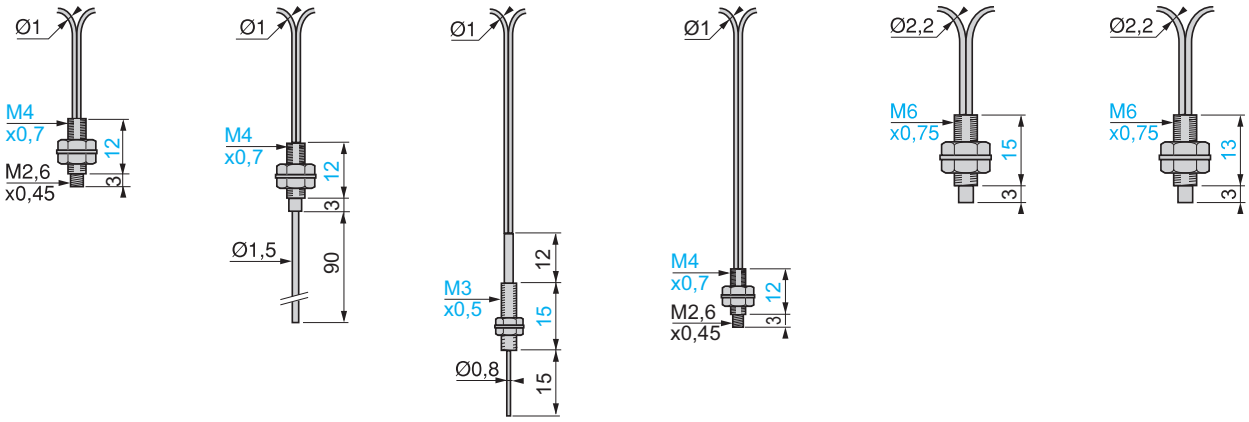
References of amplifiers: page 5/128
Accessories: page 5/136

Photo-electric sensors

OsiSense XU Application

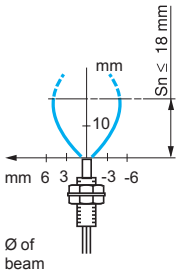
Fibre optics for amplifiers

“PLASTIC” fibres with end fittings, diffuse system

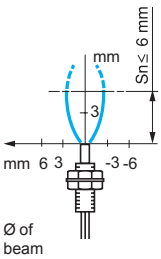


18 mm	**18 mm**	**6 mm**	**15 mm**	**95 mm**	**55 mm**
Positioning	Positioning	Areas with restricted access	Positioning	Long sensing distance fibres	Flexible fibres for cyclic movements, areas with restricted access
XUFN01321	–	**XUFN04331**	**XUFN02323**	**XUFN5P01L2**	**XUFN5S01L2**
–	–	–	–	**XUFN5P01L10**	**XUFN5S01L10**
–	**XUFN01331**	–	–	–	–
0.045	0.045	0.045	0.040	0.058 (L = 2 m)	0.062 (L = 2 m)
2 x Ø 0.5	2 x Ø 0.5	2 x Ø 0.265	1 x Ø 0.5 + 4 x Ø 0.25	2 x Ø 1.5	2 x Ø 1
Yes	Yes	Yes	Yes	Yes	Yes
For operation: - 25…+ 60 °C. For storage: - 40…+ 80 °C					
7 gn, amplitude ± 1.5 mm (f = 10…55 Hz), conforming to IEC 60068-2-27		7 gn, amplitude ± 1.5 mm (f = 10…55 Hz), conforming to IEC 60068-2-6			
30 gn, duration 11 ms, conforming to IEC 60068-2-27					
IP 64 conforming to IEC 60529 and IP 641 conforming to NF C 20-010					
Fibres: PMMA; sheath: PE					

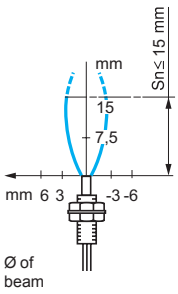
XUFN01321, XUFN01331



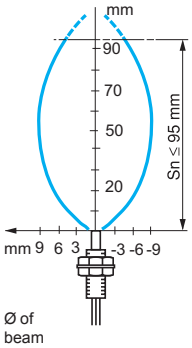
XUFN04331



XUFN02323



XUFN5P01L2



XUFN5S01L2

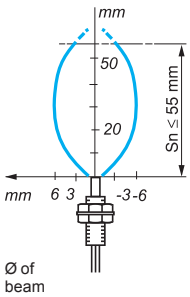
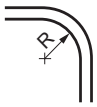
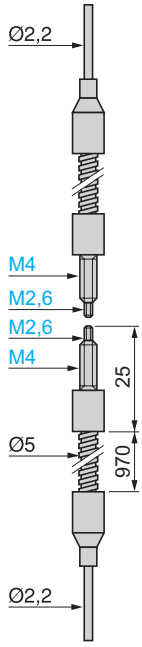


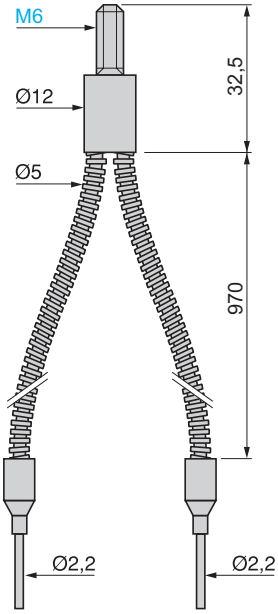
Photo-electric sensors

OsiSense XU Application
Fibre optics for amplifiers
"GLASS" fibres with end fittings, thru-beam and diffuse systems



R = minimum bend radius
Metal sheath, R = 90 mm





System	Thru-beam	Diffuse
Nominal sensing distance (Sn) with fibre L = 1 m	200 mm *(1)* 1500 mm *(2)*	70 mm
Application	High temperatures	

References (complete assembly - 2 fibres for thru-beam system)

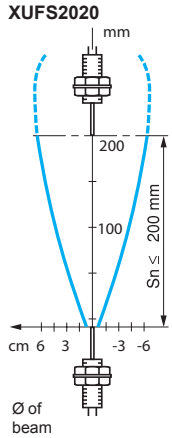
With standard end fittings L = 1 m	XUFS2020	XUFS0520
Weight (kg)	0.070	0.075

Characteristics

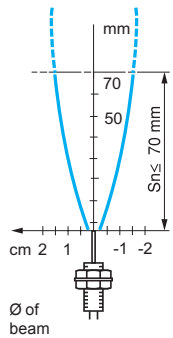
Fibre (view on sensing face)		
Core (Ø mm)	1 x Ø 1	2 x Ø 1
Ambient air temperature	For operation and storage: - 40…+ 180 °C	
Vibration resistance	7 gn, amplitude ± 1.5 mm (f = 10…55 Hz), conforming to IEC 60068-2-6	
Shock resistance	30 gn, duration 11 ms, conforming to IEC 60068-2-27	
Degree of protection	IP 64 conforming to IEC 60529 and IP 641 conforming to NF C 20-010	
Materials	Fibres: glass; sheath: metal	

Detection curves

XUFS2020



XUFS0520



*(1) Can be used with 90° mirror **XUFZ02**, see page 5/136.*
*(2) With lens accessory **XUFZ01**, see page 5/136.*

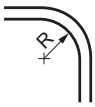
References of amplifiers: page 5/128
Accessories: page 5/136

Photo-electric sensors

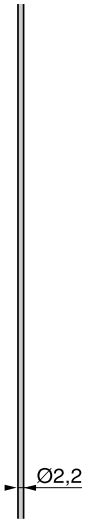
OsiSense XU Application

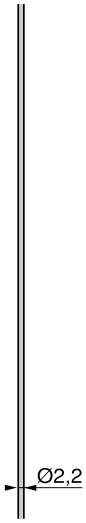
Fibre optics for amplifiers

"PLASTIC" fibres without end fittings, thru-beam system



R = minimum bend radius
Fibre of ext. Ø 2.2 mm, R = 25 mm





Nominal sensing distance (Sn) L = 2 m	**See detection curves below** *(1)*			
Application	General purpose			

References

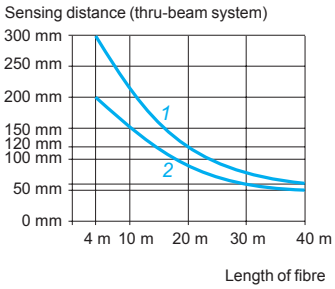
Fibre without end fitting	**XUFZ910**	**XUFZ920**	**XUFZ911**	**XUFZ921**
Weight (kg)	0.020	0.040	0.040	0.080

Characteristics

Fibre				
Core (Ø mm)	1 x Ø 1		1 x Ø 1.4	
Length	10 m	20 m	10 m	20 m
Trimmable to required length (trimmer XUFZ11 included)	Yes		Yes	
Ambient air temperature	For operation: - 25…+ 60 °C. For storage: - 40…+ 80 °C			
Vibration resistance	7 gn, amplitude ± 1.5 mm (f = 10…55 Hz), conforming to IEC 60068-2-6			
Shock resistance	30 gn, duration 11 ms, conforming to IEC 60068-2-27			
Degree of protection	IP 64 conforming to IEC 60529 and IP 641 conforming to NF C 20-010			
Materials	Fibres: PMMA; sheath: PE			

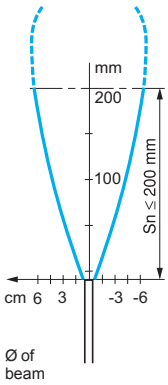
Detection curves

XUFZ911, XUFZ921
XUFZ910, XUFZ920

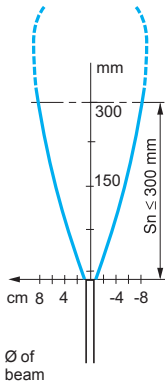


1 XUFZ911, XUFZ921
2 XUFZ910, XUFZ920
Total length = sum of the 2 strands used to constitute a thru-beam system

XUFZ910, XUFZ920



XUFZ911, XUFZ921



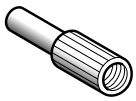
*(1) It is possible to increase the sensing distance of fibres without end fittings by using fixing clamps with lens (**XUFZ03**, **XUFZ04** or **XUFZ05**), see page 5/136).*

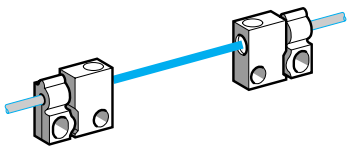
References of amplifiers: page 5/128
Accessories: page 5/136

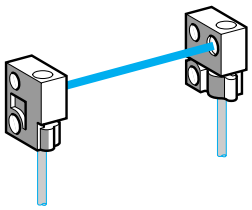
Photo-electric sensors
OsiSense XU Application
Fibre optics for amplifiers
Accessories

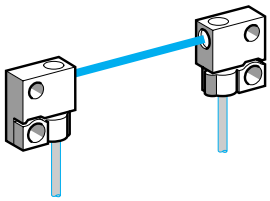
XUFZ02

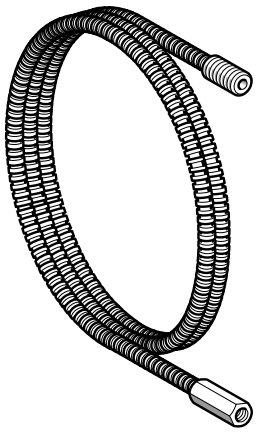
XUFZ01

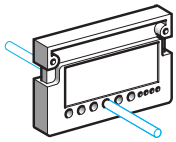

XUFZ06

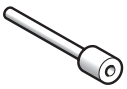

XUFZ13, XUFZ03


XUFZ14, XUFZ04


XUFZ15, XUFZ05


XUFZ●10


XUFZ11


XUFZ08

Accessories for fibres with threaded end fittings

Description	For use with	Reference	Weight kg
90° mirror (set of 2)	Fibre optics XUFN1●30●, XUFN35301 and XUFS2020 (thru-beam system) XUFN2●01L●●	**XUFZ02**	0.005
Lenses for increasing sensing distance (set of 2)	Fibre optics XUFN1●30●, XUFN35301 and XUFS2020 (thru-beam system)	**XUFZ01**	0.005
Focusing lens for high precision detection. Detection of 0.5 mm objects at a distance of 7 mm. Also enables detection of objects against a background *(1)*	Fibre optics XUFN02323 (diffuse system)	**XUFZ06**	0.001

Accessories for plastic fibres without end fittings

Description	Mounting plane	For use with	Reference	Weight kg
Fixing clamps (set of 2)	Axial	Plastic fibre optics XUFZ	**XUFZ13**	0.002
	Frontal	Plastic fibre optics XUFZ	**XUFZ14**	0.002
	Lateral	Plastic fibre optics XUFZ	**XUFZ15**	0.002
Fixing clamps with lens (set of 2)	Axial	Plastic fibre optics XUFZ	**XUFZ03**	0.002
	Frontal	Plastic fibre optics XUFZ	**XUFZ04**	0.002
	Lateral	Plastic fibre optics XUFZ	**XUFZ05**	0.002

Protection accessories

Description	For use with	Reference	Weight kg
Protective tubing Length 1 m	Plastic fibre optic light guides with M4 threaded end fittings	**XUFZ210**	0.040
	Plastic fibre optic light guides with M6 threaded end fittings	**XUFZ310**	0.065

Other accessories

Description	Sold in lots of	Unit reference	Weight kg
Fibre trimmer	1	**XUFZ11**	0.006
Plastic end adaptor, for connecting Ø 1 mm fibres to amplifiers XUDA	2	**XUFZ08**	0.002

(1) Characteristics obtained when the fibre is fully screwed into the lens (screwing depth = 4 mm).

References of fibres:
pages 5/130 to 5/135

Detection curves for plastic fibre optic light guides with fixing clamps

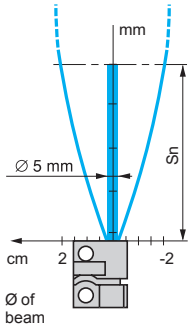
Sensing distance of fibres XUFZ9●●● fitted with fixing clamps XUFZ●●

Fibre type	Clamp type				
	XUFZ13	XUFZ14, Z15	XUFZ03	XUFZ04, XUFZ05	Without clamp
XUFZ910, XUFZ920 (2 fibres L = 2 m) **Sn**	150 mm	100 mm	800 mm	600 mm	200 mm
XUFZ911, XUFZ921 (2 fibres L = 2 m) **Sn**	220 mm	150 mm	1200 mm	900 mm	300 mm

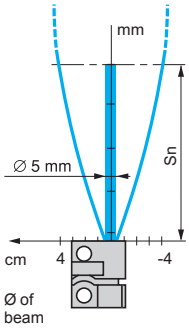
Other fibre lengths:
5 m fibres: reduce the sensing distance by a factor of 0.7.
10 m fibres: reduce the sensing distance by a factor of 0.5.
20 m fibres: reduce the sensing distance by a factor of 0.3.

Detection curves with lens

Fixing clamp XUFZ03, Z04 or Z05 + fibre XUFZ910 or XUFZ920

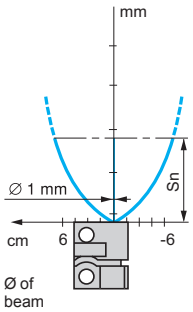


Fixing clamp XUFZ03, Z04 or Z05 + fibre XUFZ911 or XUFZ921

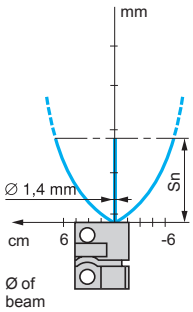


Detection curves without lens

Fixing clamp XUFZ13, Z14 or Z15 + fibre XUFZ910 or XUFZ920

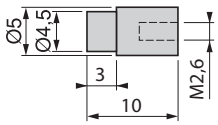


Fixing clamp XUFZ13, Z14 or Z15 + fibre XUFZ911 or XUFZ921

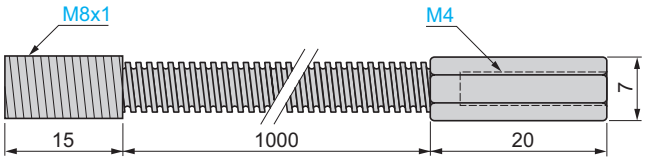


Dimensions

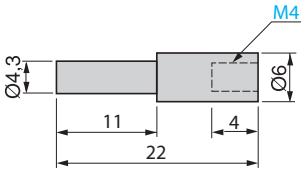
XUFZ01



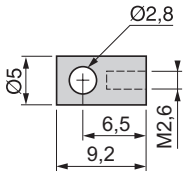
XUFZ210



XUFZ06



XUFZ02



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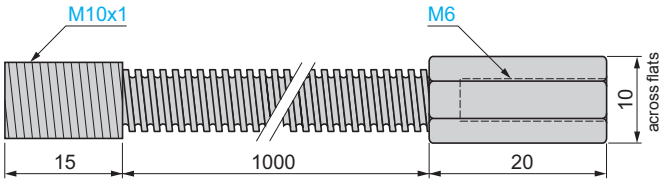
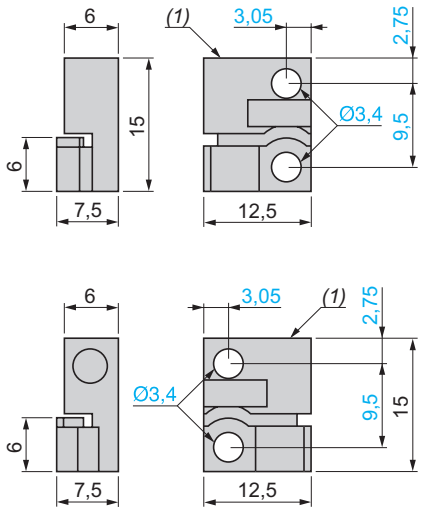
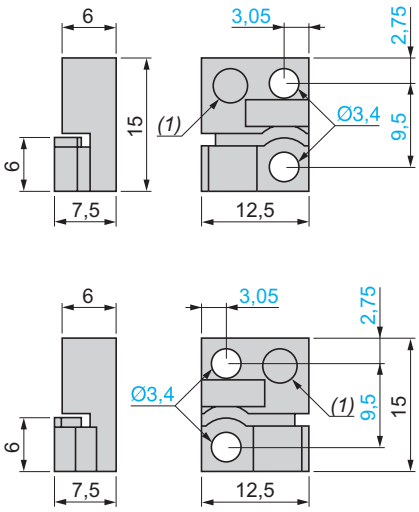


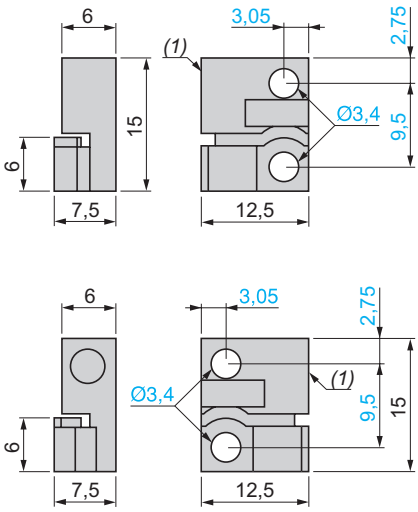
XUFZ03, XUFZ13



XUFZ04, XUFZ14



XUFZ05, XUFZ15

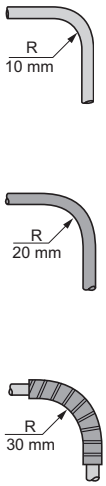


(1) Light beam window.

Photo-electric sensors

OsiSense XU Application
Fibre optics for amplifier
"GLASS" fibres with end fittings
For diffuse and thru-beam systems

"GLASS" fibre optics for diffuse system

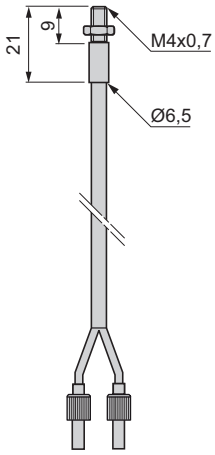


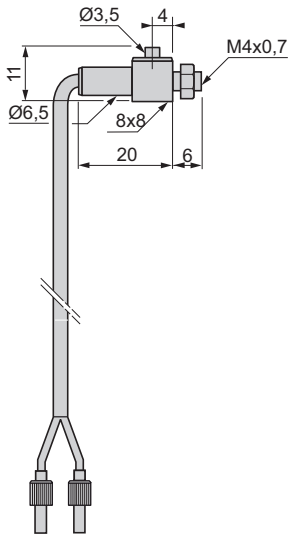
Standard sheath
External Ø
XUYFVP: 5 mm
XUYFVER: 3 mm

Metal reinforced sheath
XUYFVP: 5 mm
XUYFVER: 3.5 mm

High temperature sheath
XUYFVP: 5 mm
XUYFVER: 5 mm

R = minimum bend radius





Applications
- Detection in high temperature environment (up to 200 °C)
- Detection in aggressive environment
- Application requiring high level of performance

References

Type of end fitting	Straight			Lateral		
Sheath	Standard	Metal reinforced	High temperature	Standard	Metal reinforced	High temperature
References with 0.60 m long fibre *(1)*	**XUYFVPSD61**	**XUYFVPMD61**	**XUYFVPTD61**	**XUYFVPSL61**	**XUYFVPML61**	**XUYFVPTL61**
Nominal sensing distance Sn (mm)	80	80	80	80	80	80
Weight (kg)	0.040	0.045	0.052	0.042	0.056	0.056

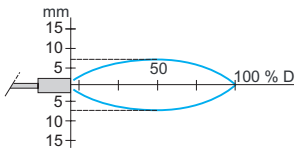
Characteristics

Fibre		400 strands per mm²
Usable diameter of fibre		1.2 mm
Ambient air temperature	For operation	**Standard**: - 25…+ 60 °C **Metal reinforced**: - 25…+ 120 °C **High temperature** :-25…+ 200 °C
Detection end fitting		Nickel plated brass
Materials	Fibre	50 µ glass
	Sheath	**Standard**: PVC + thermo polyolefine, **Metal reinforced**: spiralled metal + polyolefine **High temperature**: flexible stainless steel

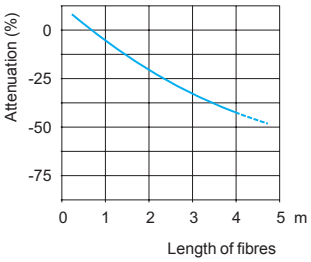
*(1) For 1 m long fibre, replace 61 in the reference by **101**. Example: XUYFVPSD61 becomes **XUYFVPSD101** for a 1 m long fibre.*
*For 1.5 m long fibre, replace 61 in the reference by **151**. Example: XUYFVPMD61 becomes **XUYFVPMD151** for a 1.5 m long fibre.*
*For 2 m long fibre, replace 61 in the reference by **201**. Example: XUYFVPTD61 becomes **XUYFVPTD201** for a 2 m long fibre.*

Detection and attenuation curves

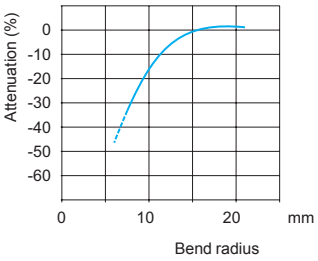
XUYFVP●●61



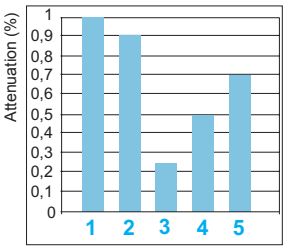
Attenuation related to length



Bending influence

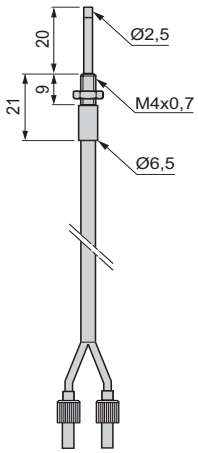


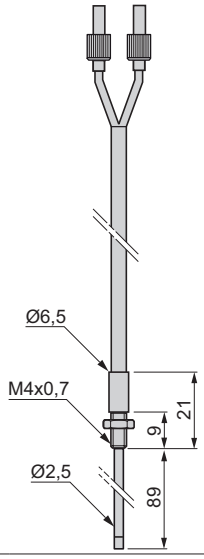
Material influence



1 White paper
2 Wood, beige cardboard
3 Black paper
4 Raw steel
5 Raw aluminium

References of amplifiers:
page 5/146





Extended			Pliable		
Standard	Metal reinforced	High temperature	Standard	Metal reinforced	High temperature
XUYFVPSA61 *(1)*	**XUYFVPMA61** *(1)*	**XUYFVPTA61** *(1)*	**XUYFVPSC61** *(1)*	**XUYFVPMC61** *(1)*	**XUYFVPTC61** *(1)*
80	80	80	80	80	80
0.041	0.046	0.053	0.043	0.057	0.057

400 strands per mm²
1.2 mm
Standard: - 25…+ 60 °C **Metal reinforced**: - 25…+ 120 °C **High temperature**: - 25…+ 200 °C
Nickel plated brass
50 µ glass
Standard: PVC + thermo polyolefine, **Metal reinforced**: spiralled metal + polyolefine **High temperature**: flexible stainless steel

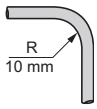
*(1) For 1 m long fibre, replace 61 in the reference by **101**. Example: XUYFVPSA61 becomes **XUYFVPSA101** for a 1 m long fibre.*
*For 1.5 m long fibre, replace 61 in the reference by **151**. Example: XUYFVPMA61 becomes **XUYFVPMA151** for a 1.5 m long fibre.*
*For 2 m long fibre, replace 61 in the reference by **201**. Example: XUYFVPTA61 becomes **XUYFVPTA201** for a 2 m long fibre.*

References of amplifiers:
page 5/146

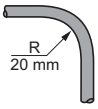
Photo-electric sensors

OsiSense XU Application
Fibre optics for amplifier
"GLASS" fibres with end fittings
For diffuse and thru-beam systems

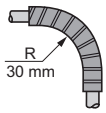
"GLASS" fibre optics for thru-beam system



Standard sheath
External Ø
XUYFVP: 5 mm
XUYFVER: 3 mm

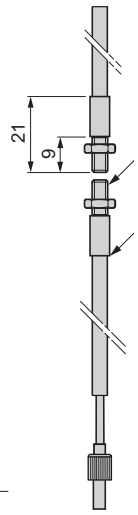


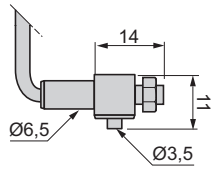
Metal reinforced sheath
XUYFVP: 5 mm
XUYFVER: 3.5 mm

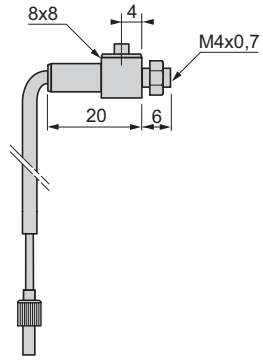


High temperature sheath
XUYFVP: 5 mm
XUYFVER: 5 mm

R = minimum bend radius







Applications
- Detection in high temperature environment (up to 200 °C)
- Detection in aggressive environment
- Application requiring high level of performance

References

Type of end fitting				Lateral		
Sheath	Standard	Metal reinforced	High temperature	Standard	Metal reinforced	High temperature
References with 0.6 m long fibre *(1)*	**XUYFVERSD61**	**XUYFVERMD61**	**XUYFVERTD61**	**XUYFVERSL61**	**XUYFVERML61**	**XUYFVERTL61**
Nominal sensing distance Sn (mm)	200	200	200	200	200	200
Weight (kg)	0.042	0.046	0.060	0.052	0.061	0.075

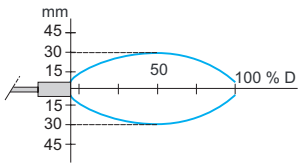
Characteristics

Fibre		400 strands per mm²
Usable diameter of fibre		1.2 mm
Ambient air temperature	For operation	**Standard**: - 25…+ 60 °C, **Metal reinforced**: - 25…+ 120 °C **High temperature**: - 25…+ 200 °C
Detection end fitting		Nickel plated brass
Materials	Fibre	50 µ glass
	Sheath	**Standard**: PVC + thermo polyolefine **Metal reinforced**: spiralled metal + polyolefine **High temperature**: flexible stainless steel

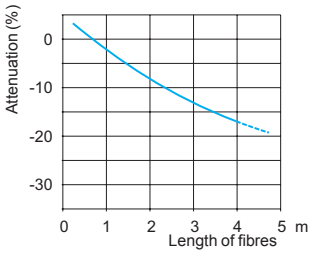
*(1) For 1 m long fibre, replace 61 in the reference by **101**. Example: XUYFVERSD61 becomes **XUYFVERSD101** for a 1 m long fibre.*
*For 1.5 m long fibre, replace 61 in the reference by **151**. Example: XUYFVERMD61 becomes **XUYFVERMD151** for a 1.5 m long fibre.*
*For 2 m long fibre, replace 61 in the reference by **201**. Example: XUYFVERTD61 becomes **XUYFVERTD201** for a 2 m long fibre.*

Detection and attenuation curves

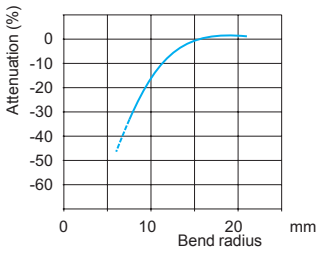
XUYFVER●●61



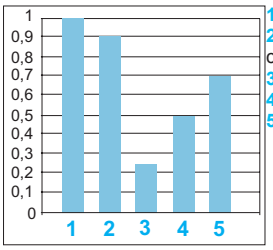
Attenuation related to length



Bending influence

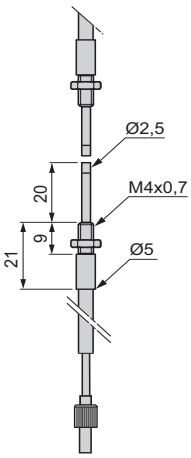


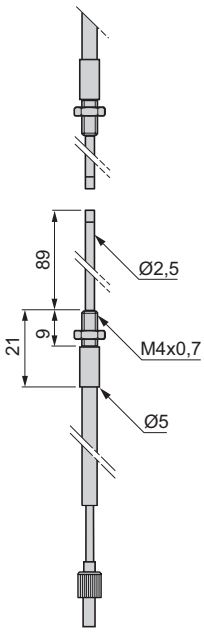
Material influence



1 White paper
2 Wood, beige cardboard
3 Black paper
4 Raw steel
5 Raw aluminium

References of amplifiers:
page 5/146





Extended			Pliable		
Standard	Metal reinforced	High temperature	Standard	Metal reinforced	High temperature
XUYFVERSA61 *(1)*	**XUYFVERMA61** *(1)*	**XUYFVERTA61** *(1)*	**XUYFVERSC61** *(1)*	**XUYFVERMC61** *(1)*	**XUYFVERTC61** *(1)*
80	80	80	80	80	80
0.043	0.047	0.061	0.053	0.061	0.076

400 strands per mm²
1.2 mm
Standard: - 25…+ 60 °C, **Metal reinforced**: - 25…+ 120 °C **High temperature**: - 25…+ 200 °C
Nickel plated brass
50 µ glass
Standard: PVC + thermo polyolefine **Metal reinforced**: spiralled metal + polyolefine **High temperature**: flexible stainless steel

*(1) For 1 m long fibre, replace 61 in the reference by **101**. Example: XUYFVERSA61 becomes **XUYFVERSA101** for a 1 m long fibre.*
*For 1.5 m long fibre, replace 61 in the reference by **151**. Example: XUYFVERMA61 becomes **XUYFVERMA151** for a 1.5 m long fibre.*
*For 2 m long fibre, replace 61 in the reference by **201**. Example: XUYFVERTA61 becomes **XUYFVERTA201** for a 2 m long fibre.*

References of amplifiers:
page 5/146

Photo-electric sensors

OsiSense XU Application
Fibre optics for amplifier
"GLASS" fibres with end fittings
For diffuse and thru-beam systems

Accessories

Focusers for diffuse system fibre optics

Description	For use with	Nominal sensing distance (Sn)	Unit reference	Weight
		mm		kg
Focusers for pinpoint reading of reference marks, contrasts, faults, etc.	XUYFVERSD61 XUYFVERMD61 XUYFVERTD61	10	**XUY1120**	0.003
		30	**XUY1125**	0.004

Focusers for thru-beam system fibre optics

Description	For use with	Nominal sensing distance (Sn)	Unit reference	Weight
		mm		kg
Focusers for increasing sensing distances (sold in lots of 2)	XUYFVERSD61 XUYFVERMD61 XUYFVERTD61	800	**XUY1121** *(1)*	0.004
		3000	**XUY1124** *(2)*	0.012
		800	**XUY1122** *(1)*	0.006

(1) 70° max.
(2) 250° max.

5

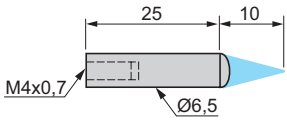
References of amplifiers :
page 5/146

Photo-electric sensors

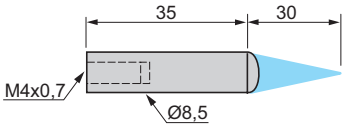
OsiSense XU Application
Fibre optics for amplifier
"GLASS" fibres with end fittings
For diffuse and thru-beam systems

Focuseurs

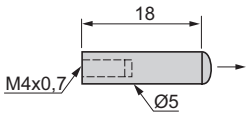
XUY1120



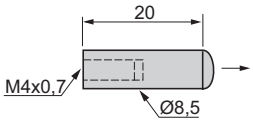
XUY1125



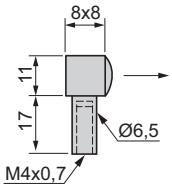
XUY1121



XUY1124



XUY1122R



References of amplifiers :
page 5/146

Photo-electric sensors

OsiSense XU Application

Fibre optics for amplifier

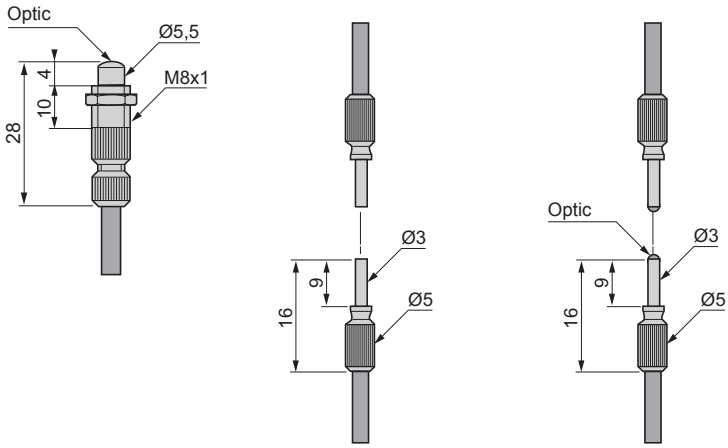
Ecofibre system in “PLASTIC” for customer assembly

Ecofibre concept

Assemble your own fibre optics.

Fibres without end fitting

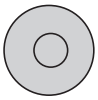
End fittings



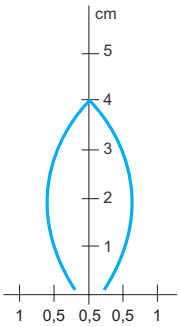
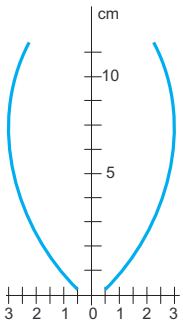
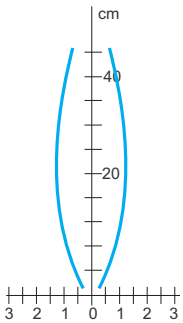
End fittings

Nominal sensing distance Sn (mm)	70	200	800
Reference	**XUYA110**	**XUYA210**	**XUYA211**
Weight (kg)	0.009	0.004	0.004

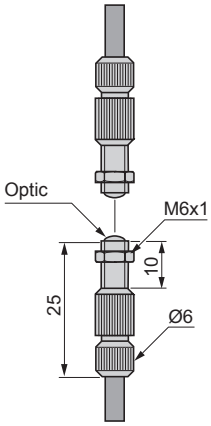
Fibres without end fitting

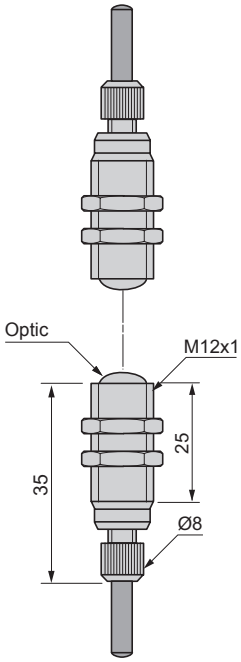
Type of fibre	**Single fibre, plastic, single strand** 		
Length (m)	1	10	50
Usable diameter (mm)	1	1	1
External diameter (mm)	2.2	2.2	2.2
Reference	**XUYA005**	**XUYA00510**	**XUYA00550**
Weight (kg)	0.006	0.042	0.220

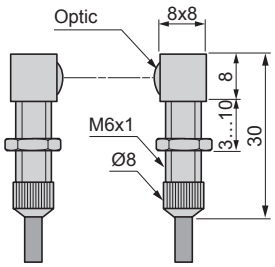
Curves

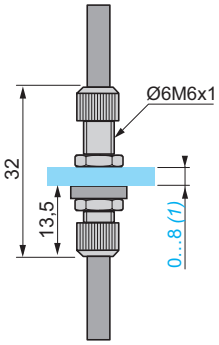
End fittings	**XUYA110**	**XUYA210**	**XUYA211**
			

References of amplifiers:
page 5/146





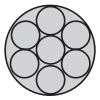
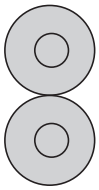




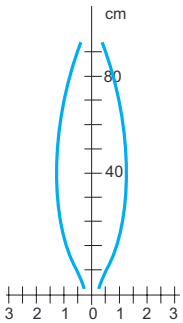
End fitting for passing through partition

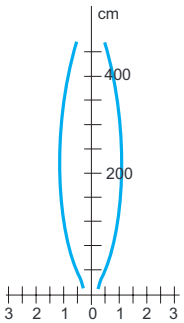
(1) Ø 6.2 cut-out

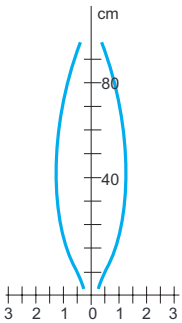
	1200	4000	1200	–
	XUYA212	**XUYA213**	**XUYA220**	**XUYA310**
	0.011	0.045	0.018	0.017

	Single fibre, plastic, multistrand 	**Dual fibre, plastic, single strand** 
	1	1
	1	1
	2.2	2.2
	XUYAU005	**XUYFP2BRINA005B**
	0.006	**0.080**

	XUYA212	**XUYA213**	**XUYA220**





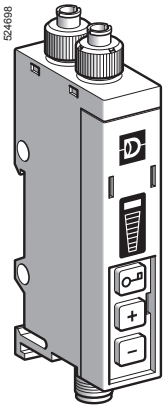


References of amplifiers:
page 5/146

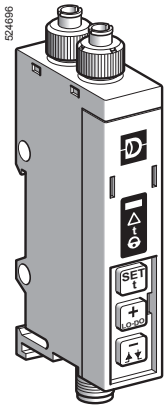
Photo-electric sensors

OsiSense XU Application

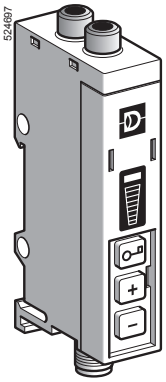
Amplifiers for plastic or glass fibre optics



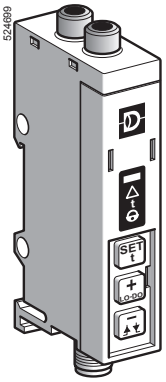
XUYAFP966S



XUYAFP946S



XUYAFV966S



XUYAFV946S

Amplifiers for plastic fibre optics *(1)*

Sensing distance (Sn) m	Function	Output	Connection	Reference	Weight kg
Adjustment using +/- button *(2)*					
Depending on fibre	NO/NC dpg. on wiring	PNP/NPN	Pre-cabled	**XUYAFP966S**	0.124
			M8 connector	**XUYAFPCO966S**	0.056
Adjustment using teach mode *(3)*					
Depending on fibre	NO/NC programmable	PNP/NPN	Pre-cabled	**XUYAFP946S**	0.124
			M8 connector	**XUYAFPCO946S**	0.056

Amplifiers for glass fibre optics

Sensing distance (Sn) m	Function	Output	Connection	Reference	Weight kg
Adjustment using +/- button *(2)*					
Depending on fibre	NO/NC dpg. on wiring	PNP/NPN	Pre-cabled	**XUYAFV966S**	0.116
			M8 connector	**XUYAFVCO966S**	0.047
Adjustment using teach mode *(3)*					
Depending on fibre	NO/NC programmable	PNP/NPN	Pre-cabled	**XUYAFV946S**	0.124
			M8 connector	**XUYAFVCO946S**	0.047

Accessories

Description	Details	Length of cable m	Reference	Weight kg
Pre-wired M8 connector	Straight	2	**XZCP0941L2**	0.080
	Elbowed (90°)	2	**XZCP1041L2**	0.080
	Straight	5	**XZCP0941L5**	0.180
	Elbowed (90°)	5	**XZCP1041L5**	0.180

(1) Fibre trimmer included
(2) Indication of level by bargraph, adjustment by pressing button
(3) Fine mode or standard mode, adjustment using teach

5

Characteristics

Sensor type			XUYAF●9●6S	XUYAFCO9●6S
Product certifications			CE, cULus *(4)*	
Connection	Connector		–	M8, 4-pin
	Pre-cabled		Length: 2 m	–
Nominal sensing distance (Sn)			Depending on fibre optic used	
Type of transmission	LED		Red LED	
	Modulation frequency		8 kHz	
Sensitivity adjustment			Using teach (fine mode or standard mode) and/or +/- button, depending on model	
Degree of protection	Conforming to IEC 60529		IP 65	
Ambient air temperature	For storage	**°C**	- 20...+ 80	
	For operation	**°C**	0...+ 60	
Materials			Polycarbonate	
Immunity to ambient light	Incandescent bulb	**Lux**	10 000	
	Natural light	**Lux**	20 000	
Rated supply voltage		**V**	**⎓ 12...24 with protection against reverse polarity**	
Voltage limits (including ripple)		**V**	**⎓ 10...30**	
Current consumption, no-load		**mA**	< 40	
Switching capacity		**mA**	**100 with overload and short-circuit protection**	
Voltage drop, closed state		**V**	< 2	
Maximum switching frequency		**kHz**	**< 1**	
External input *(5)*	Active	**V**	< 1.4	
	Inactive	**V**	> 3	
Delays	Response and recovery	**ms**	< 0.5	
Output time delay *(5)*	Range	**s**	0…5 in 11 adjustment increments	
	Duration of each increment	**ms**	First increment 40 ms then 500 ms for each press	

(4) This product is UL Listed if supplied by a class II or isolated supply delivering ⎓ 30 V max. (isolated transformer for example) and protected by a UL fuse rated at 3 A max.
(5) Only for models with teach mode.

■ **Applications using plastic fibre optics**
- □ Monitoring position or presence of parts on an assembly or packing machine
- □ Detection of objects on small conveyor
- □ Use of fibre optics in vibratory environments (robot arms)
- □ Detection of reference and colour marks in packaging

■ **Applications with glass fibre optics**
- □ Monitoring position or presence of parts on an assembly or packing machine
- □ Detection of presence of parts in a plastic mould
- □ Detection in aggressive environments
- □ Detection of items exiting an oven (high temperature fibres)

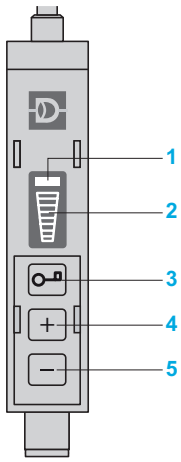
Photo-electric sensors

OsiSense XU Application

Amplifiers for plastic or glass fibre optics

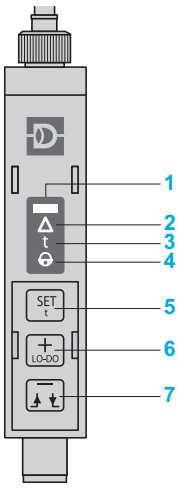
Presentation

XUYAF•, adjustment using button



1 Detection
2 Indication of the level of adjustment
3 Keypad locking
4 Sensitivity increase
5 Sensitivity decrease

XUYAF•, adjustment using teach mode

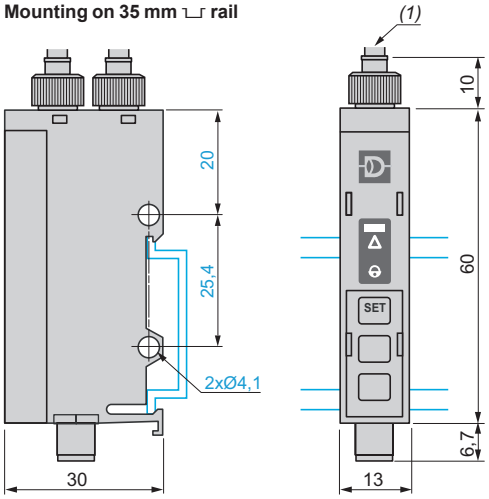


1 Detection
2 Dirty optics, limit of detection, alignment assistance
3 Time delay active
4 Action keypad, keypad locking
5 Automatic adjustment of the threshold, access to special functions
6 Sensitivity increase, direct/inverse output, time delay increase
7 Sensitivity decrease, On-delay, Off-delay inversion, time delay decrease

Dimensions

XUYAFP966S/AFPCO966S

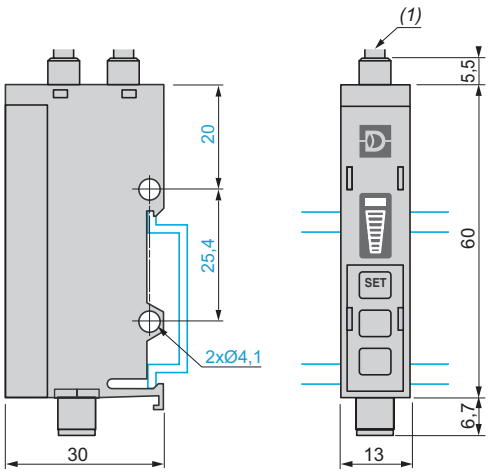
Mounting on 35 mm ⊔ rail



(1) Plastic fibre optic: Ø 2.2 mm

XUYAFV966S/AFVCO966S

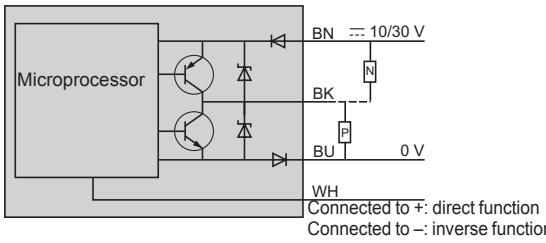
Mounting on 35 mm ⊔ rail



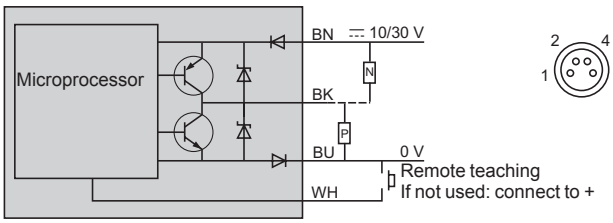
(1) Glass fibre optic: Ø 3 mm

Wiring schemes

XUYAFP966/AFV966



XUYAFP946/AFV946

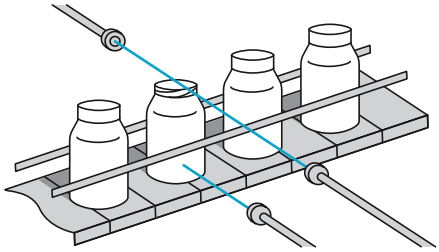


M8 connector

Pin N°	Colour
1 BN	Brown
2 WH	White
3 BU	Blue
4 BK	Black

Application examples

Thru-beam and diffuse system detection



Thru-beam system detection

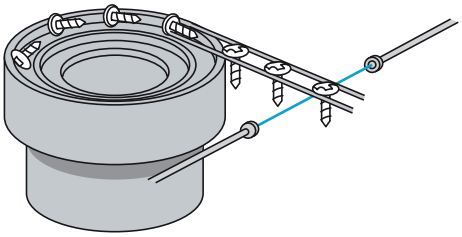


Photo-electric sensors

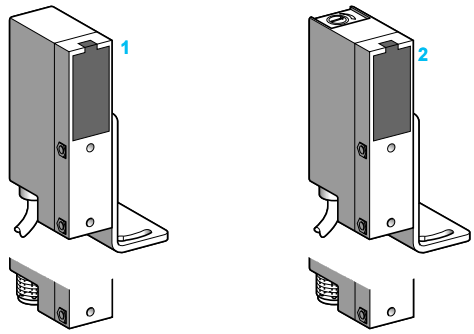
OsiSense XU Application, conveying series

Compact design

Two-wire AC, solid-state output

Compact design

Pre-cabled and connector versions



System				**Reflex 1**	**Polarised reflex 1**	**Diffuse 2**
Type of transmission				Infrared	Red	Infrared
Nominal sensing distance (Sn)				**6 m** (with Ø 80 mm reflector)	**4 m** (with Ø 80 mm reflector)	**0.7 m**
References						
2-wire	NC function	Connection	Pre-cabled	**XULA06021**	**XULA040219**	**XULA700115**
			Connector	**XULA06021K**	**XULA040219K**	**XULA700115K**
	NO function	Connection	Pre-cabled	**XULA06011**	**XULA040119**	**XULA700215**
			Connector	**XULA06011K**	**XULA040119K**	**XULA700215K**
Weight (kg)		Connection	Pre-cabled	0.195		
			Connector	0.135		

Characteristics

Product certifications		CE. Special H7 version: UL, CSA
Ambient air temperature	For operation	- 25…+ 60 °C
	For storage	- 40…+ 80 °C
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 2 mm (f = 10...55 Hz)
Shock resistance	Conforming to IEC 60068-2-27	20 gn, duration 11 ms
Degree of protection	Conforming to IEC 60529	IP 65
	Conforming to NF C 20-010	IP 651
Connection	Pre-cabled	Diameter 6 mm, length 2 m *(1)*, wire c.s.a.: 2 x 0.34 mm²
	Connector	1/2"-20UNF
Materials	Case	ABS/PC
	Lenses	PMMA
	Cable	PVC
Rated supply voltage		**∼ or ⎓ 24…240 V**
Voltage limits		∼ or ⎓ 20…264 V
Switching capacity *(2)* Sealed	Maximum	**∼ 12 or ⎓ 12 (resistive load): 0.5 A/240 V** **∼ 140 (inductive load): 0.3 A/240 V** **⎓ 13 (inductive load): 0.1 A/240 V; 0.2 A/110 V; 0.5 A/48 V**
	Minimum	**5 mA**
Inrush		**3000 mA**
Voltage drop, closed state		⩽ 3 V (I = 0.1…0.5 A); ⩽ 5.5 V (I = 10 mA); ⩽ 10 V (I = 5 mA)
Residual current, open state		⩽ 1.7 mA (on ∼); ⩽ 1.5 mA (on ⎓)
Maximum switching frequency		20 Hz
Delays	First-up	⩽ 300 ms
	Response	⩽ 20 ms
	Recovery	⩽ 20 ms

Function table

	Function	Reflex system				Function	Diffuse system			
		No object present in the beam		Object present in the beam			No object present in the beam		Object present in the beam	
Output state indicator (illuminated when sensor output is ON)	NC					NO				
	NO					NC				

*(1) For a sensor with a 5 m long cable add **L05** to the end of the reference; for a 10 m long cable add **L10** to the end of the reference.*
*Example: sensor **XULA06021** with 5 m cable becomes **XULA06021L05***

(2) These sensors do not incorporate overload or short-circuit protection and therefore, it is strongly advised to connect a "quick-blow" fuse in series with the load.

Accessories:
page 5/158

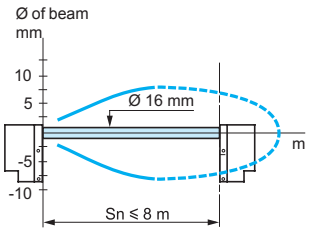
Photo-electric sensors

OsiSense XU Application, conveying series

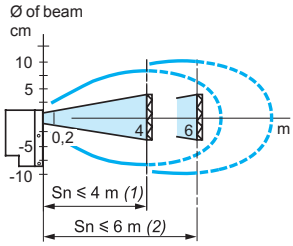
Compact design
Two-wire AC, solid-state output

Detection curves

Thru-beam system

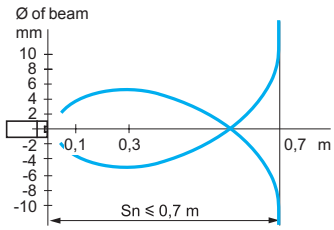


Reflex system



(1) Polarised
(2) Infrared

Diffuse system



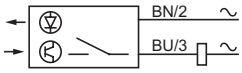
Object 20 x 20 cm
White 90%

Schemes

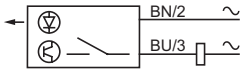
Wiring schemes (2-wire ∿)

NO function (no object present)

Reflex

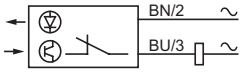


Diffuse

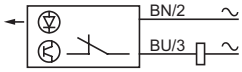


NC function (no object present)

Reflex



Diffuse



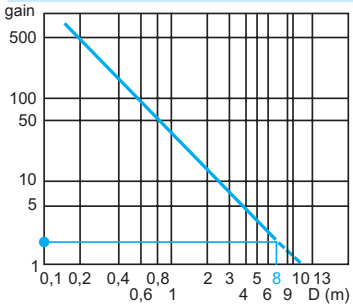
Attention: *it is essential to connect a load in series with the sensor*

Connector scheme (sensor connector pin view)

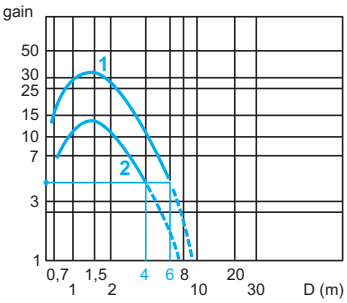
Solid-state output (reflex and diffuse system)

Excess gain curves (ambient temperature: + 25 °C)

Thru-beam system

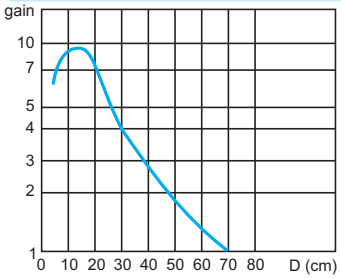


Reflex system

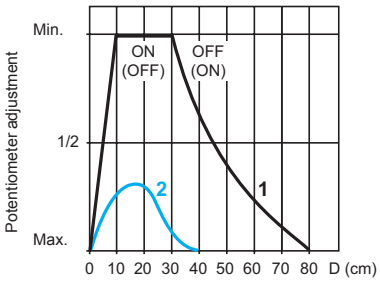


With reflector XUZC80
1 Infrared
2 Polarised

Diffuse system



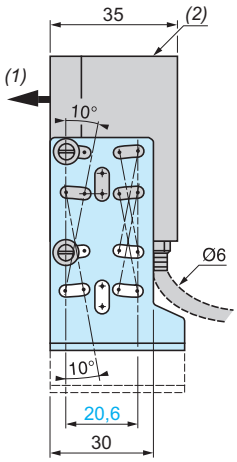
Object 20 x 20 cm
White 90%

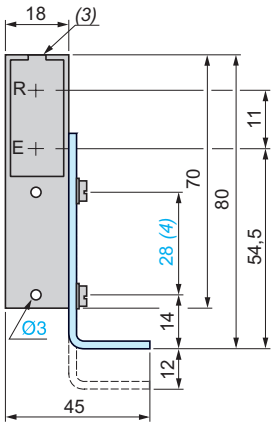


Object 20 x 20 cm
1 White 90 %
2 grey 18 %

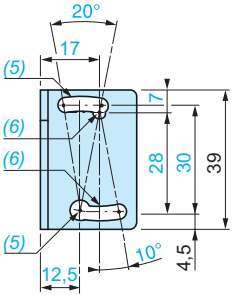
Dimensions (The bracket **XULZ41** is included with the sensor)

Sensor





Bracket fixing



(1) Optical axis
(2) Sensitivity potentiometer (diffuse model)
(3) Output LED indicator

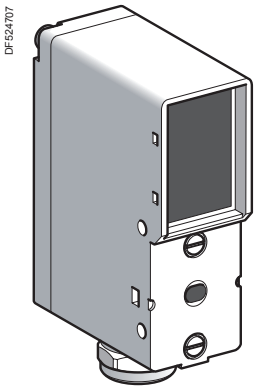
(4) Front fixing (Ø 3 screws and inserts included)
(5) 1 elongated hole Ø 4.1 x 10 and 1 x Ø 4.1
(6) 1 elongated hole Ø 3.1 x 10 and 1 x Ø 3.1

Accessories:
page 5/158

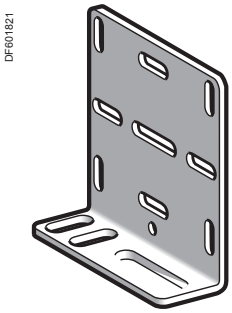
Photo-electric sensors

OsiSense XU Application
Conveying and access control series

Compact design with teach mode adjustment
Five-wire AC or DC, 1 CO relay output
Three-wire DC, solid-state output



XUY●95●●



XUZA49

Diffuse system *(1)*				
Sensing distance (Sn) m	**Function**	**Output**	**Reference**	**Weight kg**
DC				
1.5	NO/NC programmable	PNP/NPN	**XUYP954S**	0.130
4	NO/NC programmable	PNP/NPN	**XUYP952S**	0.130
AC or DC				
1.5	NO/NC programmable	Relay	**XUYP954R**	0.150
4	NO/NC programmable	Relay	**XUYP952R**	0.150

Polarised reflex system *(2)*				
Sensing distance (Sn) m	**Function**	**Output**	**Reference**	**Weight kg**
DC				
6	NO/NC programmable	PNP/NPN	**XUYB954S**	0.130
10	NO/NC programmable	PNP/NPN	**XUYB952S**	0.130
AC or DC				
6	NO/NC programmable	Relay	**XUYB954R**	0.150
10	NO/NC programmable	Relay	**XUYB952R**	0.150

Fixing accessory		
Description	**Reference**	**Weight kg**
Metal fixing bracket	**XUZA49**	0.120

(1) On 300 x 300 mm white paper
(2) With Ø 84 mm reflector

Characteristics

			XUY P954S	XUY P954R	XUY P952S	XUY P952R	XUY B954S	XUY B954R	XUY B952S	XUY B952R
Product certifications			CE, cULus for XUYP954S/952S and XUYB954S/952S							
Connection			Screw terminals							
Nominal sensing distance (Sn) Adjustment using teach (fine or standard mode)		m	**1.5**		4		6		10	
Type of transmission	LED		Infrared				Red			
Degree of protection	Conforming to IEC 60529		IP 65 and IP 67							
Ambient air temperature	For storage	°C	- 20...+ 80							
	For operation	°C	0...+ 60							
Materials			Polycarbonate							
Immunity to ambient light	Incandescent bulb	Lux	10 000 at 5° to the optical axis							
	Natural light	Lux	20 000 at 5° to the optical axis							
Indicator lights	Green LED		Output signal							
	Red LED		Dirty optics, limit of detection, alignment assistance, time delay active, time function indicator							
Voltage limits (including ripple)	⎓ 10...30 V		●	–	●	–	●	–	●	–
	∿/⎓ 20…250 V	V	–	●	–	●	–	●	–	●
Current consumption, no-load		mA	50	–	50	–	50	–	50	–
		VA	–	2	–	2	–	2	–	2
Type of output			PNP/NPN	Relay	PNP/NPN	Relay	PNP/NPN	Relay	PNP/NPN	Relay
Switching capacity	PNP/NPN	mA	**100 with overload and short-circuit protection**							
	Relay	A	**3 (max. continuous)**							
Voltage drop, closed state	PNP/NPN	V	At 100 mA: < 2; at 10 mA: < 1							
Maximum switching frequency		Hz	**1000**	**25**	**60**	**25**	**1000**	**25**	**60**	**25**
Delays	Response and recovery	ms	0.5	20	8	20	0.5	20	8	20
Test input	Active	V	< 1.4	–	< 1.4	–	< 1.4	–	< 1.4	–
	Inactive	V	> 3	–	> 3	–	> 3	–	> 3	–
Output time delay	Type		Retriggerable: leading edge and/or trailing edge							
	Duration of each increment	ms	0 to 11 s in 23 adjustment increments of 50 ms, then 0.5 s per press							
Adjustment			Using teach mode and/or fine manual adjustment							

■ Applications
□ Detection of belt breakage
□ Material handling
□ Access control

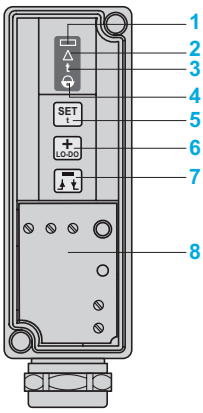
Photo-electric sensors

OsiSense XU Application
Conveying and access control series

Compact design with teach mode adjustment
Five-wire AC or DC, 1 CO relay output
Three-wire DC, solid-state output

Description

Rear view



Indicator lights

1
- Output signal: Green LED
- Dirty optics: Red LED
- Limit of detection: Red LED

2
- Alignment assistance: flashing red LED
- Activation/adjustment of time delay: Red LED

3
- Action keypad
- Keypad: Action/Locking

4

Controls

5
- Automatic adjustment of threshold
- Access to special functions
- Zero reset of time delay

6
- Sensitivity increase
- NO/NC programming
- Time delay increase

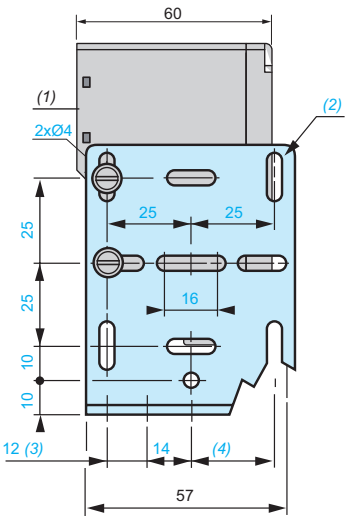
7
- Sensitivity decrease
- Inversion of time delay setting: On-delay, Off-delay
- Time delay decrease

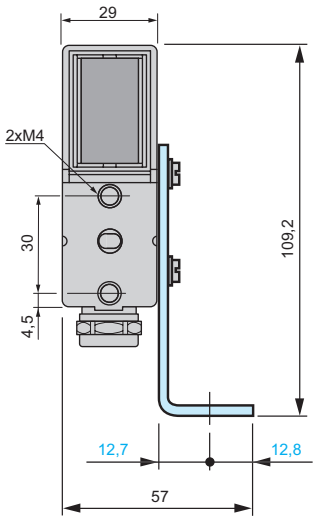
8
- Access to terminals

Note: *Both the red and green LEDs flash in the event of a short-circuit on the output (for XUYP●95●S and XUYB●95●S versions).*

Dimensions

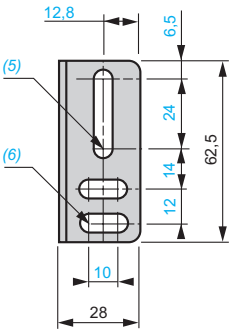
Sensors XUY●95●S and XUY●95●R





(1) Optical axis .
(2) 8 elongated holes Ø 4.2 x 10.
(3) 2 elongated holes Ø 6.5 x 10.
(4) 1 elongated hole Ø 6.5 x 24.

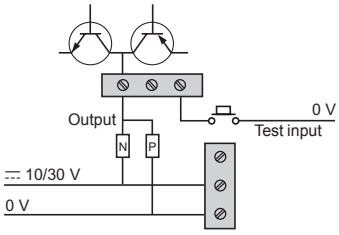
Bracket fixing XUZA49



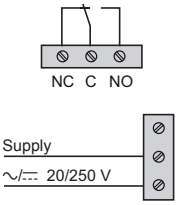
(5) 2 elongated holes Ø 6.5 x 16.5.
(6) 1 elongated hole Ø 6.5 x 30.5.

Wiring schemes

XUY●95●S



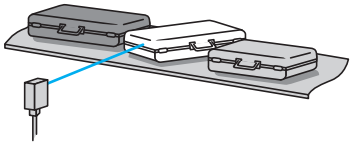
XUY●95●R



250 V, 1.5 mm^2 terminals.

Application examples

Monitoring for blockages on a baggage conveyor



Monitoring of gluing, fastening or labelling operations

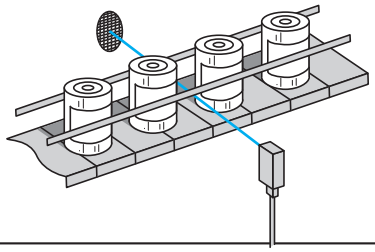
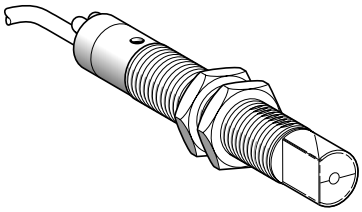


Photo-electric sensors

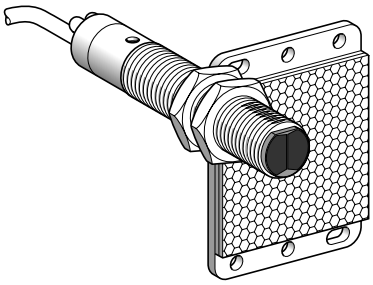
OsiSense XU Application

Design 18

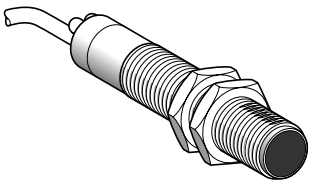
Two-wire AC *(1)* or DC, solid-state output with adjustable sensitivity



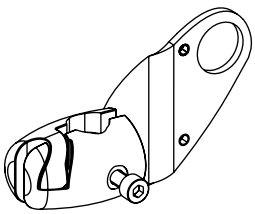
XU5M18M●230W
XU8M18M●230W



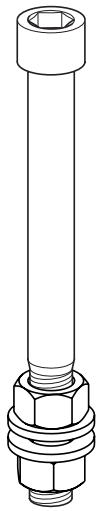
XU9M18M●230



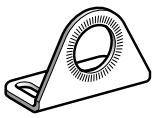
XU2M18M●230



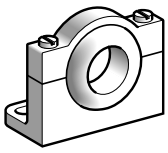
XUZB2003



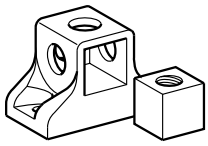
XUZ2001



XUZA118



XUZA218



XUZ2003

Diffuse system with adjustable background suppression

Sensing distance (Sn) m	Function	Line of sight	Connection	Reference	Weight kg
0.12	NO	Along case axis	Pre-cabled (L = 2 m) *(2)*	**XU8M18MA230**	0.150
			1/2"-20UNF	**XU8M18MA230K**	0.075
		90° to case axis	Pre-cabled (L = 2 m) *(2)*	**XU8M18MA230W**	0.150
			1/2"-20UNF	**XU8M18MA230WK**	0.075
	NC	Along case axis	Pre-cabled (L = 2 m) *(2)*	**XU8M18MB230**	0.150
			1/2"-20UNF	**XU8M18MB230K**	0.075
		90° to case axis	Pre-cabled (L = 2 m) *(2)*	**XU8M18MB230W**	0.150
			1/2"-20UNF	**XU8M18MB230WK**	0.075

Diffuse system

Sensing distance (Sn) m	Function	Line of sight	Connection	Reference	Weight kg
0.40	NO	Along case axis	Pre-cabled (L = 2 m) *(2)*	**XU5M18MA230**	0.150
			1/2"-20UNF	**XU5M18MA230K**	0.075
		90° to case axis	Pre-cabled (L = 2 m) *(2)*	**XU5M18MA230W**	0.150
			1/2"-20UNF	**XU5M18MA230WK**	0.075
	NC	Along case axis	Pre-cabled (L = 2 m) *(2)*	**XU5M18MB230**	0.150
			1/2"-20UNF	**XU5M18MB230K**	0.075
		90° to case axis	Pre-cabled (L = 2 m) *(2)*	**XU5M18MB230W**	0.150
			1/2"-20UNF	**XU5M18MB230WK**	0.075

Polarised reflex system *(3)*

Sensing distance (Sn) m	Function	Line of sight	Connection	Reference	Weight kg
2	NO	Along case axis	Pre-cabled (L = 2 m) *(2)*	**XU9M18MA230**	0.170
			1/2"-20UNF	**XU9M18MA230K**	0.090
		90° to case axis	Pre-cabled (L = 2 m) *(2)*	**XU9M18MA230W**	0.170
			1/2"-20UNF	**XU9M18MA230WK**	0.090
	NC	Along case axis	Pre-cabled (L = 2 m) *(2)*	**XU9M18MB230**	0.170
			1/2"-20UNF	**XU9M18MB230K**	0.095
		90° to case axis	Pre-cabled (L = 2 m) *(2)*	**XU9M18MB230W**	0.170
			1/2"-20UNF	**XU9M18MB230WK**	0.090

Thru-beam system *(4)*

Sensing distance (Sn) m	Function	Line of sight	Connection	Reference	Weight kg
15	NO	Along case axis	Pre-cabled (L = 2 m) *(2)*	**XU2M18MA230**	0.285
			1/2"-20UNF	**XU2M18MA230K**	0.155
		90° to case axis	Pre-cabled (L = 2 m) *(2)*	**XU2M18MA230W**	0.285
			1/2"-20UNF	**XU2M18MA230WK**	0.155
	NC	Along case axis	Pre-cabled (L = 2 m) *(2)*	**XU2M18MB230**	0.285
			1/2"-20UNF	**XU2M18MB230K**	0.155
		90° to case axis	Pre-cabled (L = 2 m) *(2)*	**XU2M18MB230W**	0.285
			1/2"-20UNF	**XU2M18MB230WK**	0.155

Fixing accessories *(5)*

Description	Reference	Weight kg
3D fixing kit for use on M12 rod, for XU●M18 or XUZC50	**XUZB2003**	0.170
M12 rod	**XUZ2001**	0.050
Support for M12 rod	**XUZ2003**	0.150
Stainless steel fixing bracket	**XUZA118**	0.045
Plastic fixing bracket with adjustable ball-joint	**XUZA218**	0.035

(1) These sensors do not incorporate overload or short-circuit protection and therefore, it is essential to connect a 0.4 A "quick-blow" fuse in series with the load.
*(2) For a 5 m long cable add **L5**.*
*Example: XU2M18MA230 becomes **XU2M18MA230L5**.*
*(3) 50 x 50 mm reflector **XUZC50** included with polarised reflex system.*
(4) Comprising both thru-beam transmitter and receiver.
(5) For further information, see page 5/158.

Photo-electric sensors

OsiSense XU Application

Design 18

Two-wire AC or DC, solid-state output with adjustable sensitivity

Characteristics

Sensor type			XU2M, XU5M, XU8M, XU9M	XU2M, XU5M, XU8M, XU9M●●●●●●●K
Product certifications			UL, CSA, CE	
Connection	Connector		–	1/2"-20UNF
	Pre-cabled		Length: 2 m	–
Sensing distance nominal Sn / maximum (excess gain = 2) (excess gain = 1)		m	**0.12 / 0.12 diffuse with background suppression**	
		m	**0.4 / 0.6 diffuse**	
		m	**2 / 3 polarised reflex**	
		m	**15 / 20 thru-beam**	
Type of transmission			Infrared, except XU9 (red)	
Degree of protection	Conforming to IEC 60529		IP 67, double insulation ⧈	IP 67
Storage temperature		°C	- 40…+ 70	
Operating temperature		°C	- 25…+ 55	
Materials			Case: nickel plated brass; Lens: PMMA; Cable: PvR	
Vibration resistance	Conforming to IEC 60068-2-6		7 gn, amplitude ± 1.5 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27		30 gn, duration 11 ms	
Indicator lights	Output state		Yellow LED	
	Stability		Red LED (for reflex and thru-beam only)	
Rated supply voltage		V	∿/⎓ 24…240	
Voltage limits (including ripple)		V	∿/⎓ 20…264	
Residual current, open state		mA	< 1.5	
Switching capacity		mA	10…200 *(1)*	
Voltage drop, closed state		V	6	
Maximum switching frequency		Hz	25	
Delays	First-up	ms	< 300	
	Response	ms	< 20	
	Recovery	ms	< 20	

(1) These sensors do not incorporate overload or short-circuit protection and therefore, it is essential to connect a 0.4 A "quick-blow" fuse in series with the load.

Wiring schemes

Connector

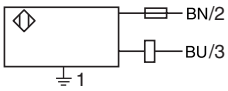
1/2"-20UNF

1 ⏚
2 ∿
3 ∿

Pre-cabled

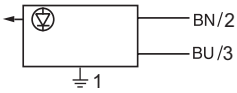
(∿) BU (Blue)
(∿) BN (Brown)

2-wire ∿ or ⎓



⏚ on connector models

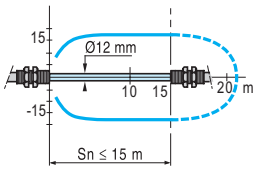
Transmitter



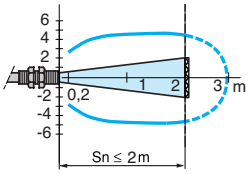
⏚ on connector models

Detection curves

Thru-beam system

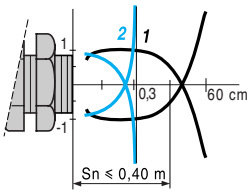


Polarised reflex system



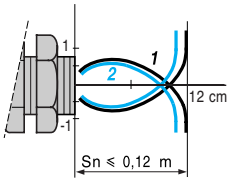
With reflector XUZC50

Diffuse system



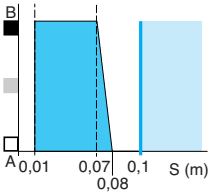
*Object 10 x 10 cm; **1** White 90%; **2** Grey 18%*

Diffuse system with adjustable background suppression

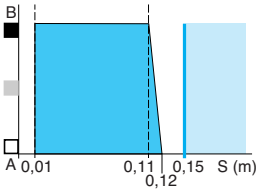


Variation of usable sensing distance Su

Potentiometer set at minimum



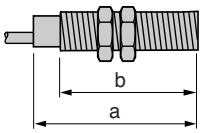
Potentiometer set at maximum



A-B: *object reflection coefficient*
- *Black 6%*
- *Grey 18%*
- *White 90%*
- *Sensing range*
- *Non sensing zone (matt surfaces)*

Dimensions

XU●



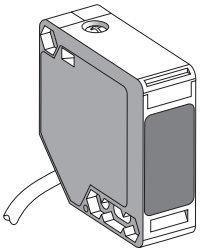
	Pre-cabled (mm)		Connector (mm)	
	a	b	a	b
Ø 18, line of sight along case axis	82	55	95	55
Ø 18, line of sight 90° to case axis	97	55	110	55

Photo-electric sensors

OsiSense XU Application, tertiary sector series

For access detection
AC or DC supply
1 CO relay output

Compact design



System	**Reflex**
Type of transmission	Infrared
Nominal sensing distance (Sn)	**7 m** (with 50 x 50 mm reflector)

References

5-wire	NC function	**XUK1ARCNL2H60** (supplied as kit comprising: sensor, fixing bracket, 50 x 50 mm reflector and mounting instructions in French and English)	**XUK1ARCNL2H61** (supplied as kit comprising: sensor, fixing bracket, 50 x 50 mm reflector and mounting instructions in French and German)
Weight (kg)		0.300	

Characteristics

Product certifications		UL, CSA, CE
Ambient air temperature		For operation: - 25…+ 55 °C. For storage: - 40…+ 70 °C
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 1.5 mm (f = 10…55 Hz)
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms
Degree of protection	Conforming to IEC 60529	IP 65, double insulation ⧈
Connection		Pre-cabled: diameter 6 mm, length 2 m, wire c.s.a.: 5 x 0.34 mm²/ AWG 22
Materials		Case: PBT; lenses: PMMA; cable: PVC
Rated supply voltage		**∿ or ⎓ 24…240 V**
Voltage limits		∿ or ⎓ 20…264 V
Switching capacity		**3 A**
Maximum voltage on output relay contacts		∿ 250 V
Power consumption, no-load		2 W *(1)*
Maximum switching frequency		20 Hz
Delays		First-up: ⩽ 60 ms; response: ⩽ 25 ms; recovery: ⩽ 25 ms

Function table	**Function**	**Reflex system**	
		No object present in the beam	**Object present in the beam**
Output state of relay contact indicator (illuminated when relay energised)	NO or NC	BK, WH, GY Relay de-energised	BK, WH, GY Relay energised

(1) No-load current consumption at ∿ 220 V: ⩽ 25 mA.

Accessories:
page 5/158

Photo-electric sensors

OsiSense XU Application, tertiary sector series

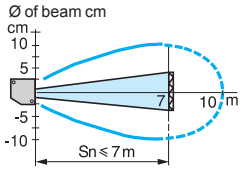
For access detection
AC or DC supply
1 CO relay output

Contents of kits XUK1ARCNL2H60 and XUK1ARCNL2H61

- ■ reflex system photo-electric sensor,
- ■ fixing bracket **XUZASK003** (screws included),
- ■ 50 x 50 mm reflector,
- ■ mounting instructions
- □ in french and english for **XUK1ARCNL2H60**,
- □ in french and german for **XUK1ARCNL2H61**.

Detection curve

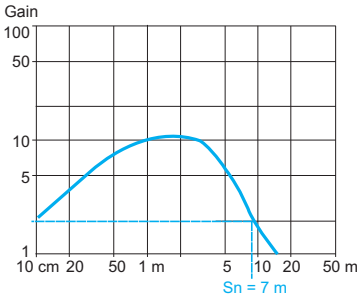
Reflex system ∿ or ⎓



Excess gain curve

(ambient temperature: + 25 °C)

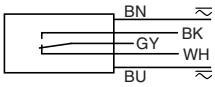
Reflex system ∿ or ⎓



With reflector XUZC50

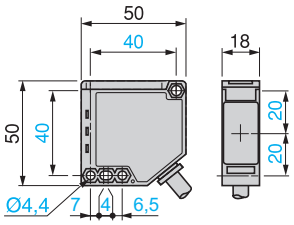
Wiring scheme

5-wire ∿ or ⎓

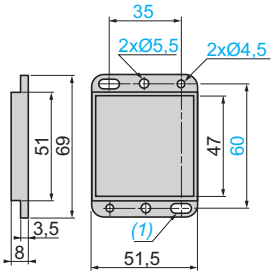


Dimensions

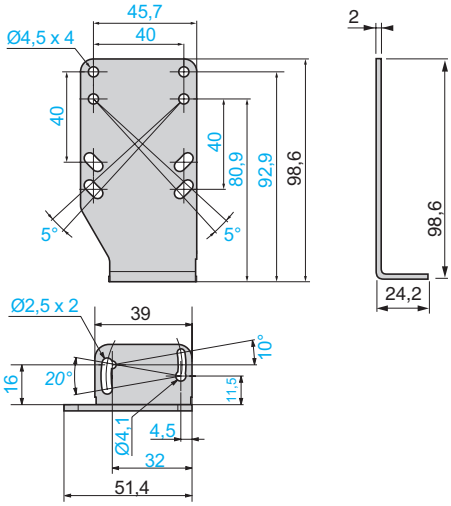
Sensor XUK1ARCNL2



Reflector XUZC50



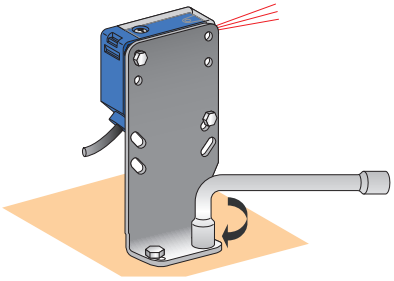
Fixing bracket XUZASK003



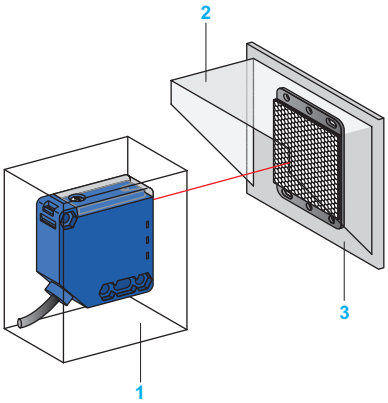
(1) 2 elongated holes Ø 4.5 x 8

Mounting precautions

Rigid fixing for trouble free detection



Outdoor mounting under protective cover



1 Protective housing.
2 Lens hood.
3 Thermal insulator to avoid frost or condensation forming on the optical parts.

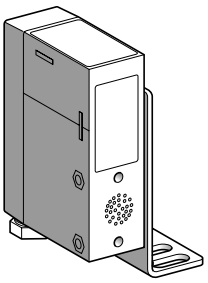
Accessories:
page 5/158

Photo-electric sensors

OsiSense XU Application, tertiary sector series

With integral buzzer
AC or DC supply
1 NO relay output

Compact design



System	**Reflex**
Type of transmission	Infrared
Nominal sensing distance (Sn)	**6 m** (with Ø 80 mm reflector)
Cable gland	9P, mounted in base

References

NO function	**XUJB06031H60** (supplied as kit comprising: sensor, fixing bracket, Ø 80 mm reflector and mounting instructions)
Weight (kg)	0.330

Characteristics

Product certifications		CE
Ambient air temperature		For operation: - 25…+ 55 °C. For storage: - 40…+ 70 °C
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 1.5 mm (f = 10…55 Hz)
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms
Degree of protection	Conforming to IEC 60529	IP 40, double insulation ⧈
Connection		Screw terminals, maximum capacity: 1 x 1.5 mm²
Materials		Case: PEI *(1)*
Rated supply voltage		**∿ 24…240 V or ⎓ 24…48 V**
Voltage limits		∿ 20…264 V or ⎓ 20…60 V (including ripple)
Switching capacity		**2000 mA (cos φ =1), 500 mA (cos φ = 0.4) for a contact life of 1 million operating cycles at an operating rate of 1 operating cycle per second, at 250 V**
Maximum voltage on output relay contacts		∿ 250 V or ⎓ 30 V
Current consumption, no-load		≤ 30 mA
Maximum switching frequency		20 Hz
Delays		First-up: ≤ 60 ms; response: ≤ 25 ms; recovery: ≤ 25 ms
Time delay		Adjustable from 0.3 to 3 seconds

Function table	**Function**	**Reflex system**			
		No object present in the beam		**Object present in the beam**	
Output state of relay contacts indicator: yellow LED (illuminated when relay energised)	NO	5 4 Relay de-energised	yellow	5 4 Relay energised	yellow

(1) PEI: high quality synthetic resin providing excellent withstand to mechanical shocks, vibration and the effects of external agents frequently encountered in industry: alcohol, salts, petroleum, oils, greases, washing agents (diluted sodium carbonate 4%, nitric acid 2%), formaldehyde vapour, splashing lactic acid, etc.

Accessories:
page 5/158

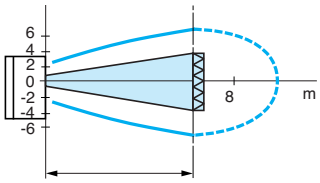
Photo-electric sensors

OsiSense XU Application, tertiary sector series

With integral buzzer
AC or DC supply
1 NO relay output

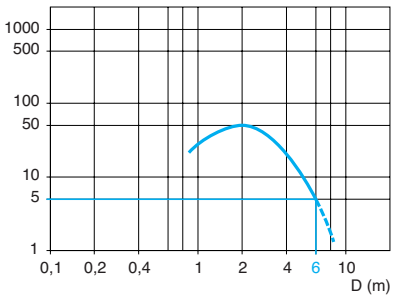
Detection curve

Reflex system



Excess gain curve (ambient temperature: + 25 °C)

Infrared reflex system



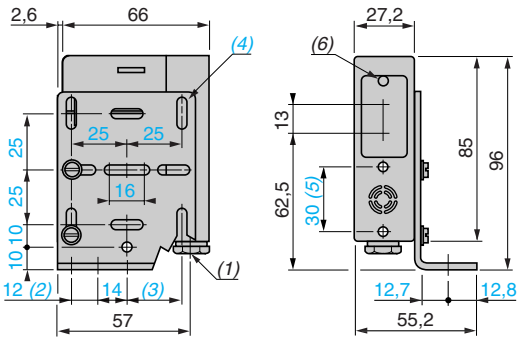
With reflector XUZC80

Contents of kit XUJB06031H60

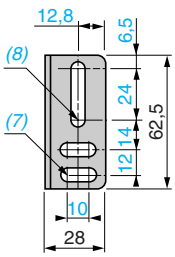
- reflex system photo-electric sensor,
- fixing bracket,
- Ø 80 mm reflector,
- mounting instructions.

Dimensions

XUJB06031H60 **Face view**



Bracket fixing



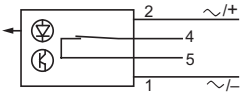
(1) 9P cable gland.
(2) 2 elongated holes Ø 6.5 x 10.
(3) 1 elongated hole Ø 6.5 x 24.
(4) 8 elongated holes Ø 4.2 x 10.
(5) Front fixing (Ø 4 screws and inserts included).
(6) Yellow LED.

(7) 2 elongated holes Ø 6.5 x 16.5.
(8) 1 elongated hole Ø 6.5 x 30.5.

Wiring schemes (∿ or ⎓)

NO function

Object present



Terminal connections

1 NO relay output

1 ∅ — A1 (∿/–)
2 ∅ — A2 (∿/+)
3 ∅ —
4 ∅ — ∿ 250 V, 100 VA max.
5 ∅ — ⎓ 30 V, 2 A max.

Accessories:
page 5/158

Photo-electric sensors

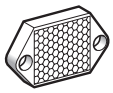
OsiSense XU

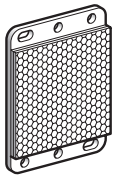
Accessories

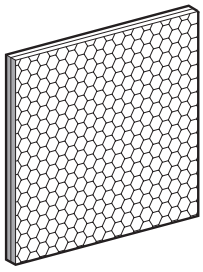
XUZC21

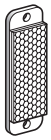
XUZC31

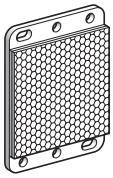
XUZC80

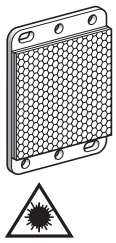

XUZC24

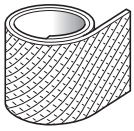

XUZC50

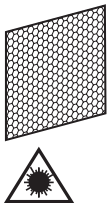

XUZC100


ECOLAB
XUZCR0402CR


ECOLAB
XUZC50CR


XUZC50HP


XUZCB11


XUZCB501HP

Reflectors

Description	Dimensions mm	Fixing mode	Chemical resistance	Micro-prism (1)	Reference	Weight kg
Rigid reflectors						
Rigid circular reflectors	Ø 21	–	No	No	**XUZC16**	0.002
	Ø 25	–	No	No	**XUZC21**	0.002
	Ø 35	–	No	No	**XUZC31**	0.005
	Ø 46	–	No	No	**XUZC39**	0.008
	Ø 84	1 hole	No	No	**XUZC80**	0.029
Rigid square reflectors	20 x 32	2 holes	**No**	Yes	**XUZCR0201CR**	0.004
	13 x 33	2 inserts	No	No	**XUZC08**	0.010
	23 x 40	Adhesive	No	No	**XUZC40S22**	0.015
	29 x 45	2 holes	No	No	**XUZC24**	0.007
	19 x 60	2 holes	**Ecolab**	Yes	**XUZCR0401CRHP** (2)	0.010
		2 holes	No	Yes	**XUZCR0401HP** (2)	0.010
	18 x 60	2 holes	**Ecolab**	No	**XUZCR0402CR** (2)	0.015
		2 holes	No	No	**XUZCR0402**	0.015
	30 x 82	2 holes	No	No	**XUZC30**	0.015
	50 x 70	6 holes	**Ecolab**	No	**XUZC50CR** (2)	0.020
			No	No	**XUZC50**	0.020
			No	Yes	**XUZC50HP**	0.020
	40 x 60	2 holes	No	No	**XUZC60S11**	0.022
	42 x 182	2 holes	No	No	**XUZC180S21**	0.080
	100 x 100	2 brackets	No	No	**XUZC100**	0.062
Adhesive tape						
For polarized reflex sensor	1 x 22	Adhesive	No	No	**XUZB11**	0.020
	5 x 22	Adhesive	No	No	**XUZB15**	0.085
For laser sensor	50 x 50	Adhesive	No	Yes	**XUZCB0501HP**	–
	250 x 250	Adhesive	No	Yes	**XUZC250**	–

Note: *All reflectors are IP 67 and IP 69K. They are suitable for use at operating temperatures between - 20 °C and + 60 °C except Ecolab certified products (- 20°C…+ 140 °C).*

(1) Microprism: enables effective short distance detection. Used with laser beams.
(2) Operating temperature between - 20 °C and + 140 °C.

Photo-electric sensors

OsiSense XU

Accessories: sensors/reflectors table

	Blind zone	XUZC16 Ø 16	XUZC24 20x25	XUZC39 Ø 39	XUZC50 50x50	XUZC80 Ø 80	XUZC100 100x100
XUB0	5 mm	0.9 m	1 m	2.5 m	3 m	4 m	4.5 m
XUB1	10 mm	1 m	2 m	3 m	4 m	5 m	5 m
XUB9	10 mm	0.6 m	0.6 m	1.4 m	2 m	4 m	4 m
XUM0	10 mm	0.9 m	1.4 m	2 m	3 m	4 m	4.5 m
XUM9	10 mm	1.5 m	2.5 m	3.2 m	5 m	6.5 m	6.5 m
XUK0	4 cm	1 m	1 m	2.6 m	4 m	5.5 m	6.5 m
XUK1	5 cm	2.5 m	4 m	7.5 m	7 m	14 m	16 m
XUK9	5 cm	1.2 m	2 m	3.7 m	6 m	7.5 m	10 m
XUX0	10 cm	3.5 m	5 m	8 m	15 m	21 m	22 m
XUX1	10 cm	5.5 m	5.5 m	10 m	14 m	17.5 m	21 m
XUX9	10 cm	4.5 m	4.5 m	8 m	11 m	13.5 m	17 m

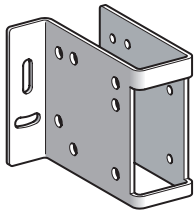
	XUZCR0402CR Ecolab 16x40	XUZC50CR Ecolab 50x50	XUZC50 50x50	XUZCR0401CRHP Ecolab Laser 16x40	XUZCB501HP Tape Laser 50x50	XUZC50HP Laser 50x70
XU9N18	0.7 m	1 m	2 m	–	–	–
XUK9L	–	–	–	1.8 m	6 m	12 m
XUBTA	–	–	–	0.35 m	0.7 m	1.4 m

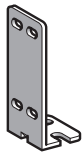
Nominal standard value given in catalogue.

Photo-electric sensors
OsiSense XU
Accessories

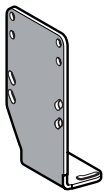
XUZA118

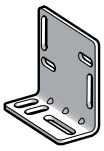
XUZASK002

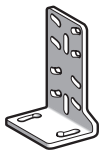

XUZASK001


XUZA50

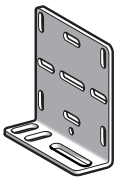
XUZA51


XUZASK003


XUZX2000


XULZ41

XUZA41


XUZA49

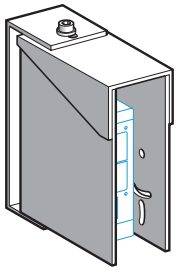
XUZASM001

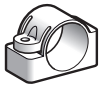
XUZA218

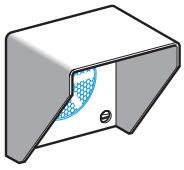
XUZA318

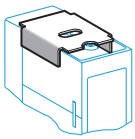
XSAZ1●●

XSZB1●●


XUZD25


XUZB2005


XUZD15


XUJZ01

Fixing accessories

Description	For use with sensors	Reference	Weight kg
Stainless steel grade 304 fixing brackets	XUB (Ø 18)	**XUZA118**	0.045
	XUK●L and XUK●S	**XUZASK001**	0.130
Stainless steel grade 316 fixing brackets	XUB (Ø 18)	**XUZASB001**	0.018
	XUK●L and XUK●S	**XUZA51S**	0.050
Aluminium dovetail	XUK●L and XUK●S	**XUZASK002**	0.030
Metal fixing brackets	XUM	**XUZA50**	0.025
	XUK (except XUK●L and XUK●S)	**XUZA51**	0.050
		XUZASK003 *(1)*	0.060
	XUX	**XUZX2000**	0.065
	XUL	**XULZ41**	0.050
	XUJ	**XUZA41**	0.050
	XUJB	**XUZA49**	0.120
Plastic fixing bracket	XUM (except XUM0)	**XUZASM001**	0.010
Plastic fixing bracket with adjustable ball-joint	XU● (Ø 18 mm)	**XUZA218**	0.035
Precision fixing bracket with micrometric adjustment	XU● (Ø 18 mm) with laser transmission	**XUZA318**	0.170
Plastic fixing clamps with locking screw	XUA (Ø 8 mm)	**XSAZ108**	0.007
		XSZB108	0.006
	XU● (Ø 18 mm) With indexing pin	**XSAZ118**	0.020
	With position reference	**XSZB118**	0.010
	With 24.1 mm centres	**XUZB2005**	0.007
Set of 2 plastic nuts	XU● (Ø 18 mm)	**XSZE218**	0.004
Set of 2 metal nuts	XU● (Ø 18 mm)	**XSZE118**	0.015
Set of 2 stainless steel nuts	XU● (Ø 18 mm)	**XSZE318**	0.015

Protective covers

Description	For use with	Reference	Weight kg
Protective cover	XUK and XUJ sensors	**XUZD25**	0.920
Potentiometer protective covers	XUZC80 or XUZC24 reflectors	**XUZD15**	0.270
	XUJ sensors	**XUJZ01**	0.015

*(1) Bracket **XUZASK003** can be used to replace an XUL sensor with an XUK sensor.*

Photo-electric sensors

OsiSense XU

Accessories

XUZB2003

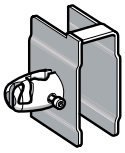
XUZM2003

XUZK2003

XUZX2003

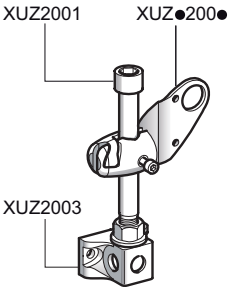
XUZM2004

XUZK2004

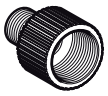

XUZX2004

XUZ2003

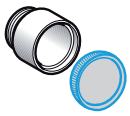
XUZ2001

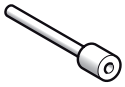


3D fixing kit example


XUZX2001

XURZ01


XURZ02


XUFZ08

3D fixing kit *(1)*

Description	For use with sensor type	Reference	Weight kg
Ball-joint mounted fixing bracket for mounting on M12 rod	XUB or XUZC50	**XUZB2003**	0.170
	XUM 0 or XUZC50	**XUZM2003**	0.140
	XUK or XUZC50	**XUZK2003**	0.170
	XUX or XUZC50	**XUZX2003**	0.220
Ball-joint mounted fixing bracket with protective cover for mounting on M12 rod	XUM0	**XUZM2004**	0.155
	XUK	**XUZK2004**	0.270
	XUX	**XUZX2004**	0.420
Support for M12 rod	–	**XUZ2003**	0.150
M12 rod (adjustment possible over complete height)	–	**XUZ2001**	0.050

(1) To obtain a 3D fixing kit, order:
- *rod support **XUZ2003***
- *M12 rod **XUZ2001***
- *ball-joint mounted fixing bracket **XUZ●200●***

Cabling accessories

Description	Reference	Weight kg
Adaptor, ISO 16 - 1/2" NPT	**XUZX2001**	0.050
Adaptor, ISO 16 - ISO 20	**XUZX2002**	0.050

Lenses

Description	For use with	Reference	Weight kg
Lens for spot enlargement	XUR sensors	**XURZ01**	0.010
Lens for spot reduction	XUR sensors	**XURZ02**	0.015

Spare parts

Description	For use with	Sold in lots of	Unit reference	Weight kg
Plastic end adaptor for connecting Ø 1 mm optical fibres	Amplifiers XUDA	2	**XUFZ08**	0.002

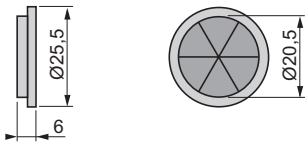
Protection fuses

Description	For use with	Sold in lots of	Unit reference	Weight kg
Cartridge fuse 5 x 20 0.4 A "quick-blow"	Sensors without short-circuit protection	10	**XUZE04**	0.001
Fuse terminal block	Cartridge fuses XUZE0●	50	**AB1FU10135U**	0.040

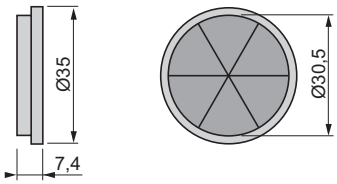
Rigid circular reflectors

XUZC16

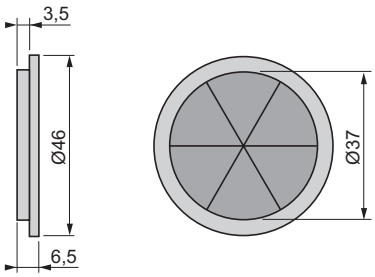
XUZC21



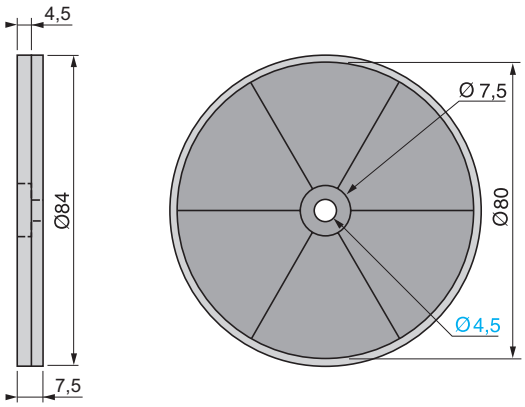
XUZC31



XUZC39

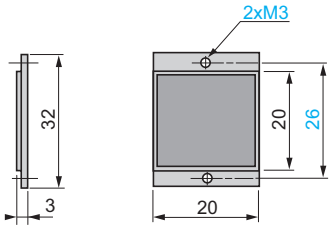


XUZC80

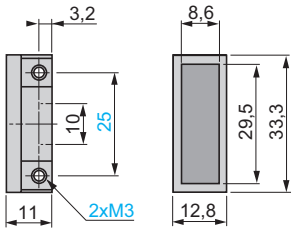


Rigid square reflectors

XUZCR0201CR



XUZC08



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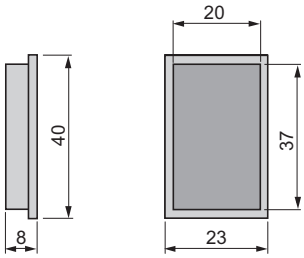
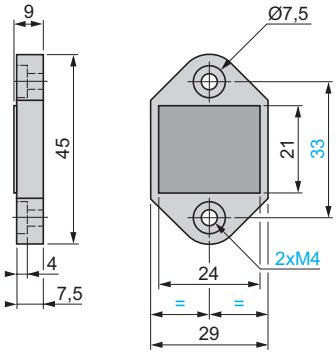
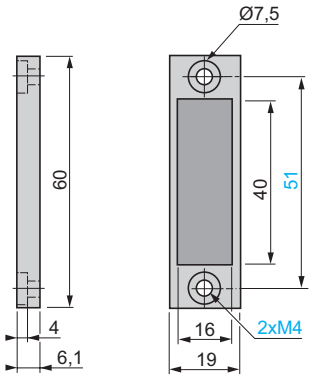


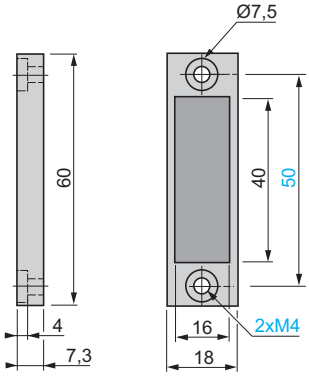
XUZC24



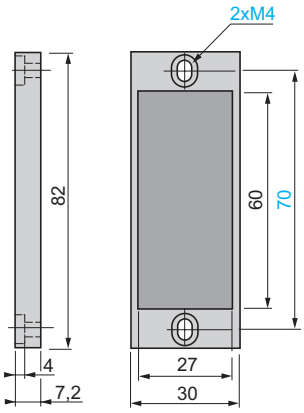
XUZCR0401●●●●



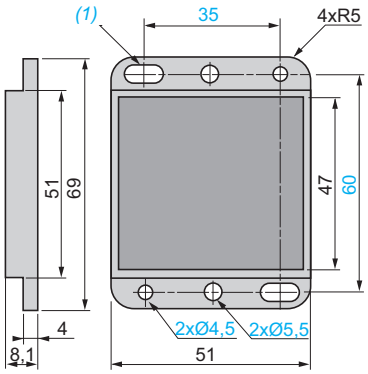
XUZCR0402●●



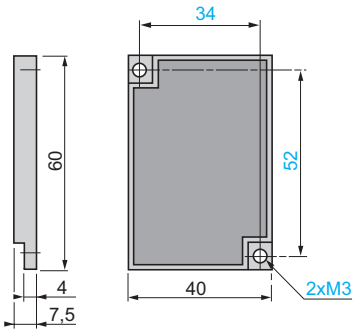
XUZC30



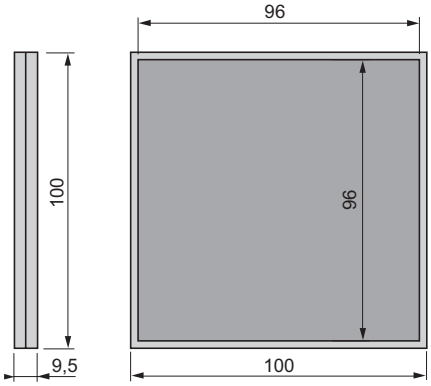
XUZC50, XUZC50●●



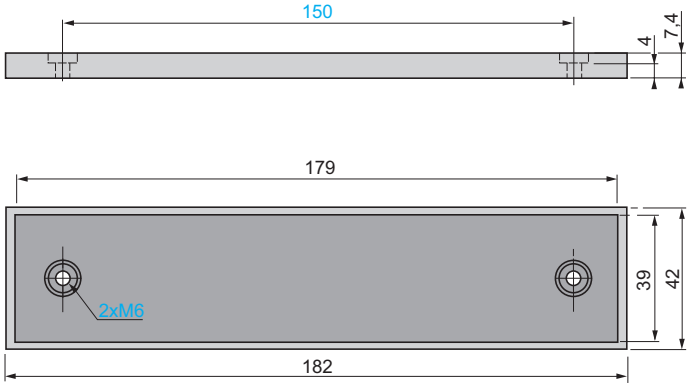
XUZC60S11



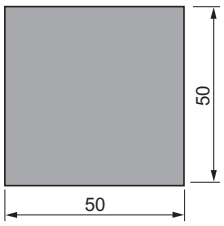
XUZC100



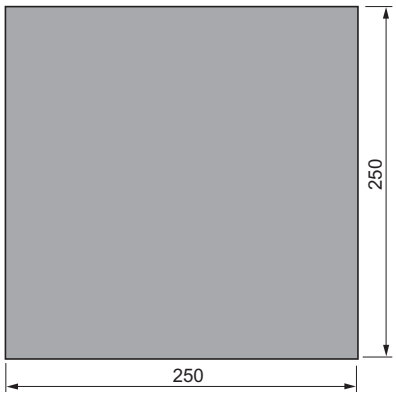
XUZC180S21



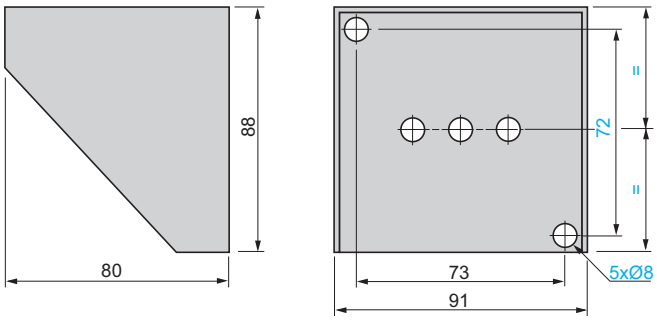
XUZCB0501HP



XUZC250

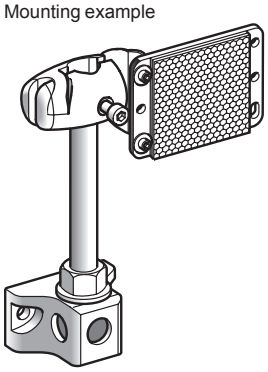


XUZD15

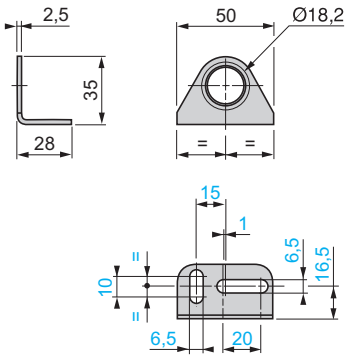


XUZM2003 + XUZ2001 + XUZ2003 + XUZC50

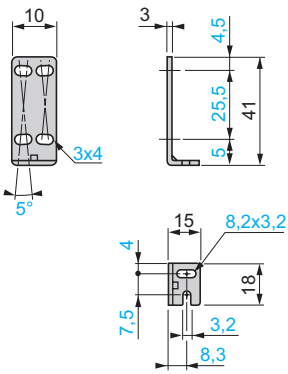
Mounting example



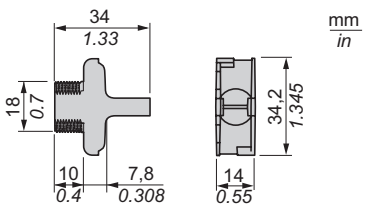
XUZA118
Fixing bracket for XUB



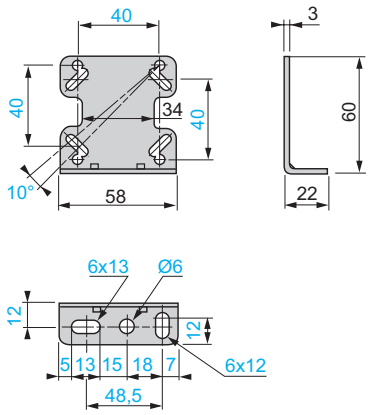
XUZA50
Fixing bracket for XUM *(1)*



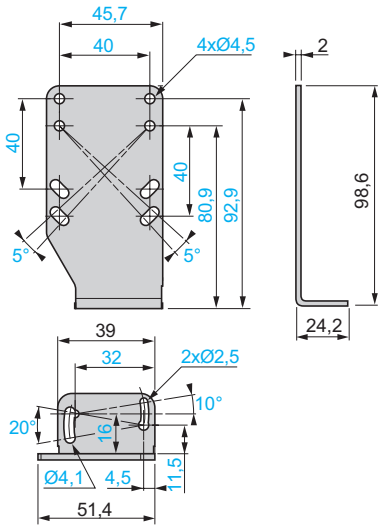
XUZASM001



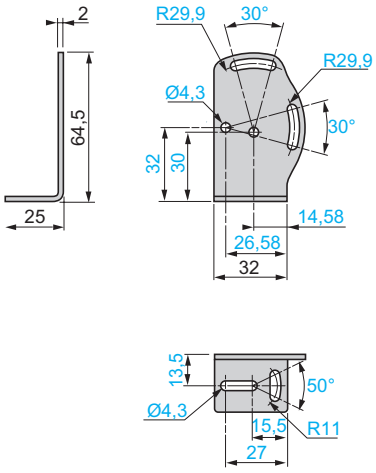
XUZA51
Fixing bracket for XUK *(1)*



XUZASK003



XUZA51S



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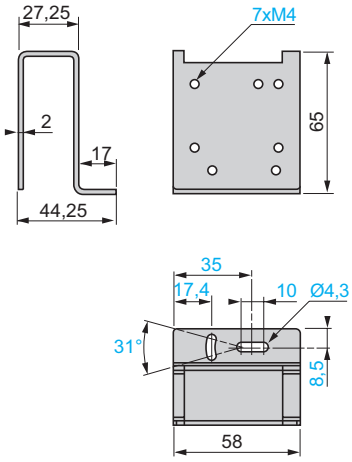
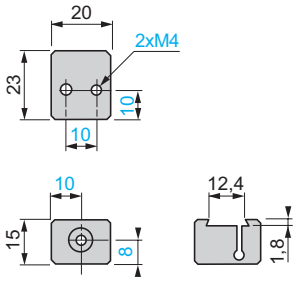
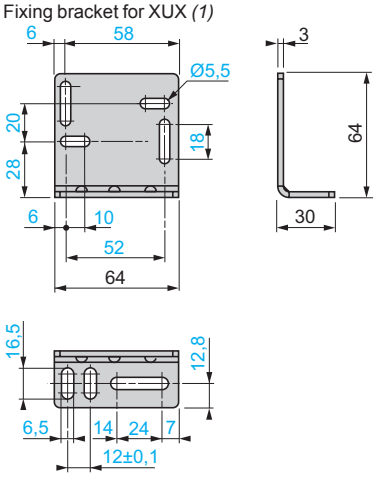


XUZASK002

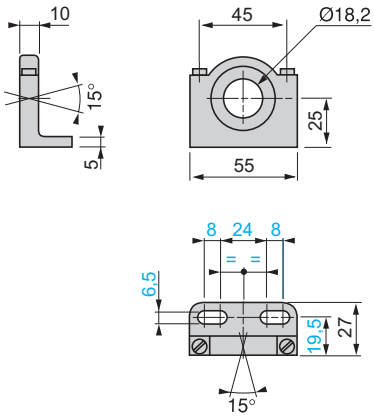


XUZX2000
Fixing bracket for XUX *(1)*

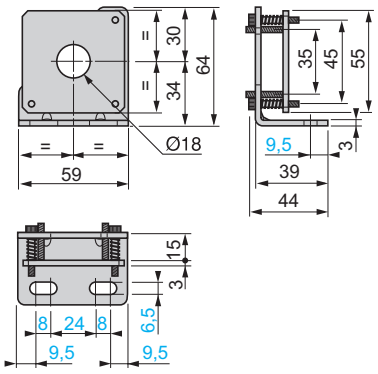


(1) Accessory fixing screws included.

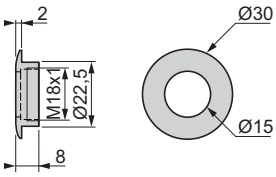
XUZA218
Fixing bracket with adjustable ball-joint for XU● (Ø 18)



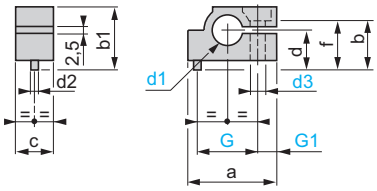
XUZA318
Fixing bracket with micrometric adjustment for XU2 (Ø 18) with laser transmission



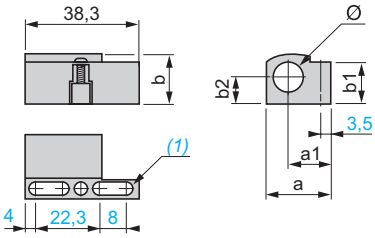
XUZASB001



XSAZ1●●
Fixing clamps for XUA, XU● (Ø 18), XUF



XSZB108, XSZB118
Fixing clamps for XUA and XU● (Ø 18)

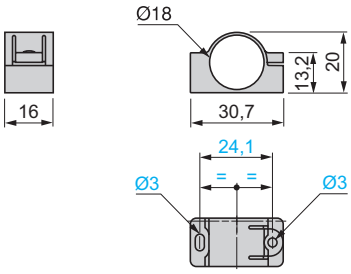


XSA	a	b	b1	c	d	Ød1	Ød2	Ød3	f	G	G1
Z108	23.5	14.2	16.7	10	8	8.1	2	4	10.5	16	5
Z118	41	30	33	17	18	18.1	3.9	6	24	30	7
Z145	23.5	14.2	16.7	10	8	4.7	2	4	10.5	16	5
Z155	23.5	14.2	16.7	10	8	5.7	2	4	10.5	16	5
Z185	23.5	14.2	16.7	10	8	8.6	2	4	10.5	16	5

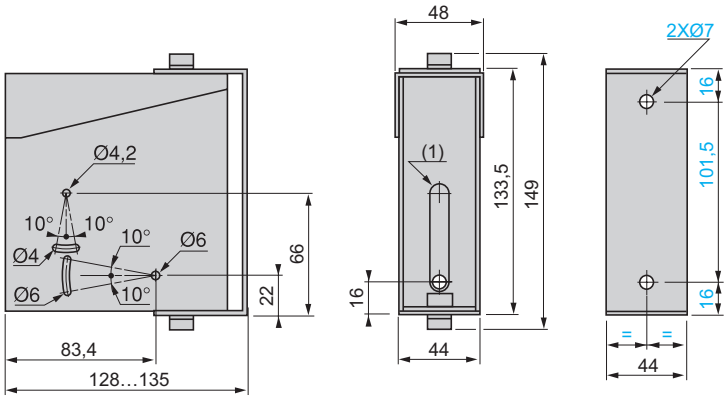
XCZ	a	a1	b	b1	b2	Ø
B108	21.1	14.5	14.2	12.8	7.5	8
B118	26	15.7	22.3	20.1	11.5	18

(1) 2 elongated holes Ø 4 x 8

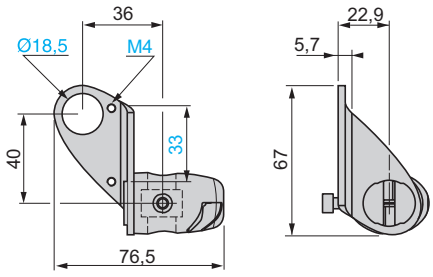
XUZB2005
Fixing clamps with 24.1 mm centres for XU● (Ø 18)



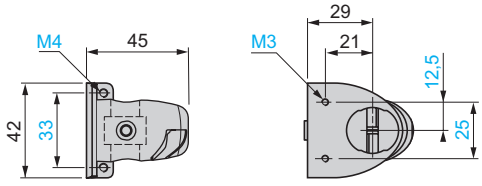
XUZD25
Protective cover for XUX or XUJ



XUZB2003
Ball-joint mounted fixing bracket for XUB or XUZC50



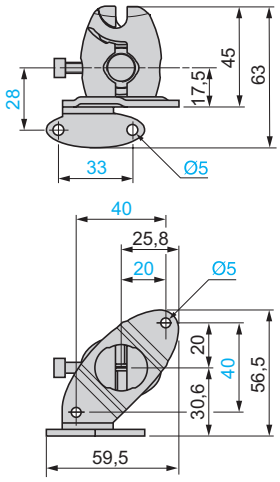
XUZM2003
Ball-joint mounted fixing bracket for XUM *(1)* or XUZC50



(1) Accessory fixing screws included.

XUZK2003

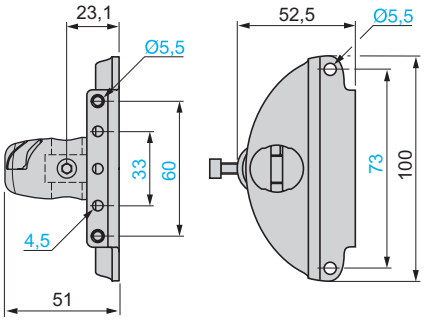
Ball-joint mounted fixing bracket for XUK *(1)* or XUZC50



(1) Accessory fixing screws included.

XUZX2003

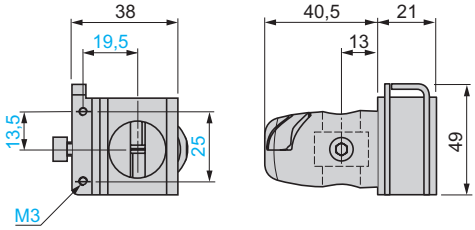
Ball-joint mounted fixing bracket for XUX *(1)* or XUZC50



(1) Accessory fixing screws included.

XUZM2004

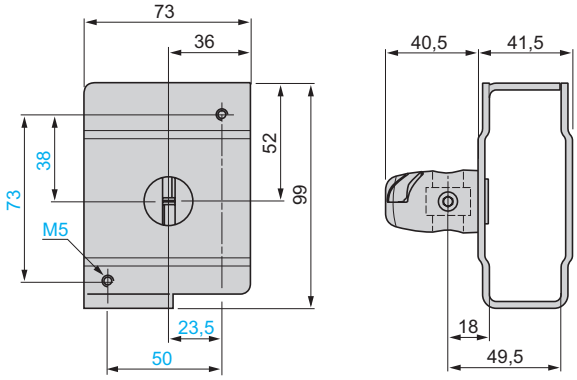
Ball-joint mounted fixing bracket with protective cover for XUM *(1)*



(1) Accessory fixing screws included.

XUZX2004

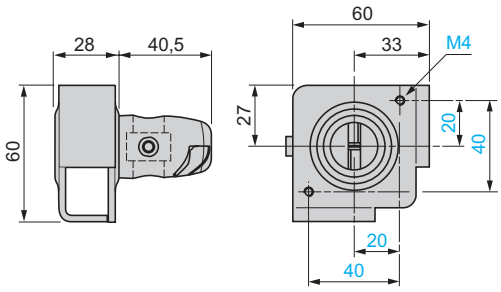
Ball-joint mounted fixing bracket with protective cover for XUX *(1)*



(1) Accessory fixing screws included.

XUZK2004

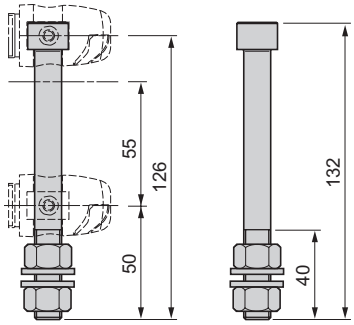
Ball-joint mounted fixing bracket with protective cover for XUK *(1)*



(1) Accessory fixing screws included.

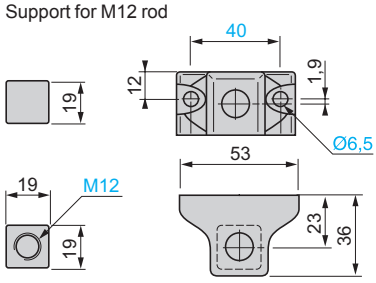
XUZ2001

M12 rod

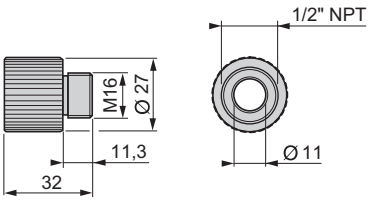


XUZ2003

Support for M12 rod



XUZX2001



XUZX2002

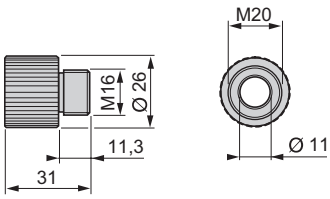


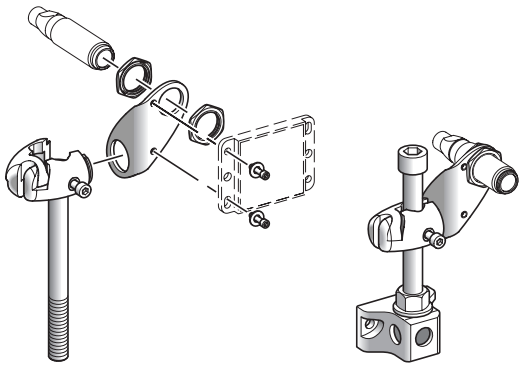
Photo-electric sensors

OsiSense XU

Accessories

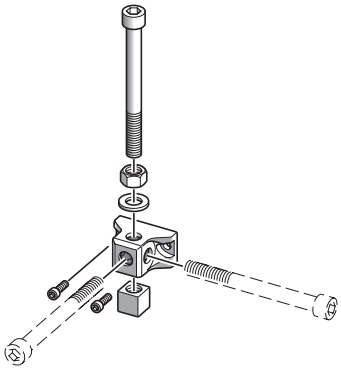
XUZB2003 + XUZ2001 + XUZ2003

3D fixing kit for XUB or XUZC50



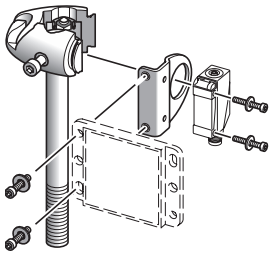
XUZ2001 + XUZ2003

M12 rod + rod support



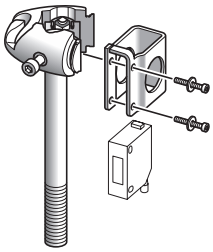
XUZM2003 + XUZ2001

3D fixing kit for XUM or XUZC50



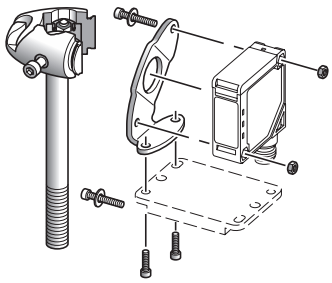
XUZM2004 + XUZ2001

3D fixing kit with protective cover for XUM



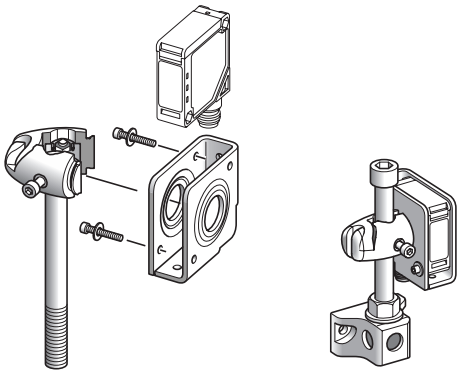
XUZK2003 + XUZ2001

3D fixing kit for XUK or XUZC50



XUZK2004 + XUZ2001 + XUZ2003

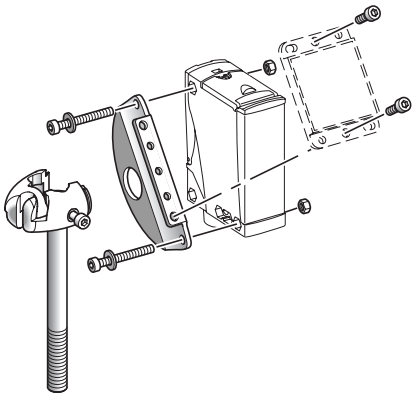
3D fixing kit with protective cover for XUK



Mounting example

XUZX2003 + XUZ2001

3D fixing kit for XUX or XUZC50



XUZX2004 + XUZ2001

3D fixing kit with protective cover for XUX

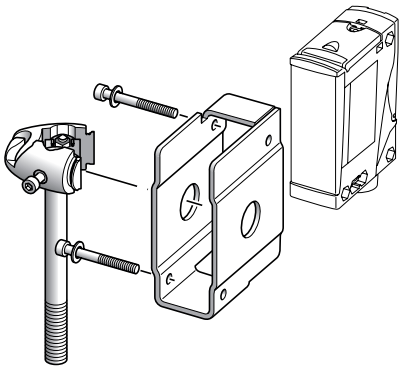


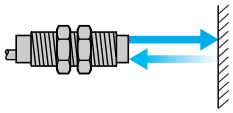
Photo-electric sensors

OsiSense XU, general purpose

XUB0 Multimode function with line of sight along case axis

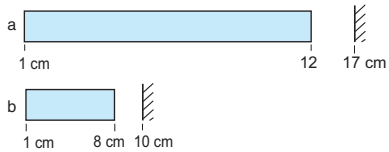
Sensing distance and operating margin

Background suppression mode



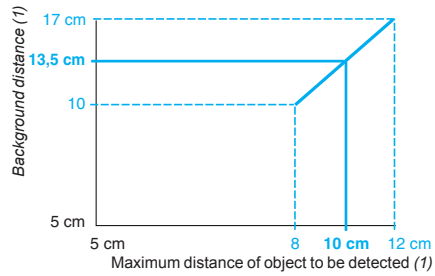
0,01…0,12 m max.

Without accessory



Background

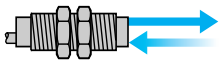
a: with background teaching at maximum recommended distance.
b: with background teaching at minimum recommended distance.



Example: teaching against a background located at 13.5 cm enables detection of an object at 1 to 10 cm.

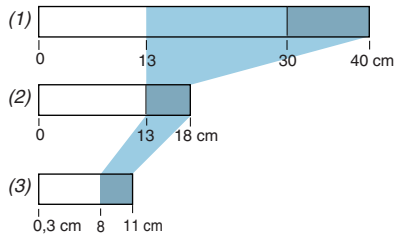
(1) From white 90% to black 6%.

Diffuse mode



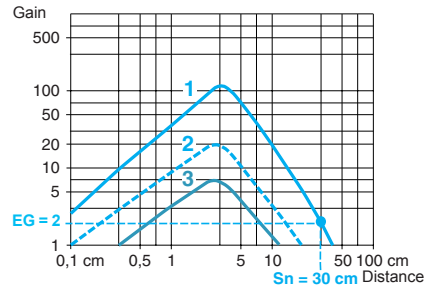
0…0,4 m max.

Without accessory



(1) White 90%. (2) Grey 18%. (3) Black 6%.

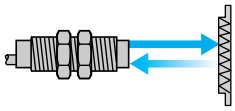
Object teaching zone



1 White object
2 Grey object
3 Black object

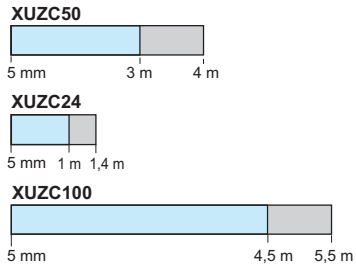
In diffuse mode, teaching of the position of the object to be detected, located between 0 and 12 cm, automatically configures the product to "background suppression" mode. This provides a constant usable sensing distance, whatever the colour of the object.

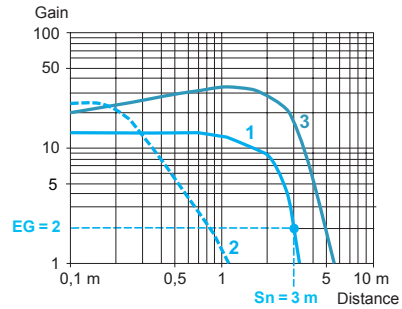
Polarised reflex mode



0,005…5,5 m max.

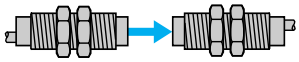
With reflector





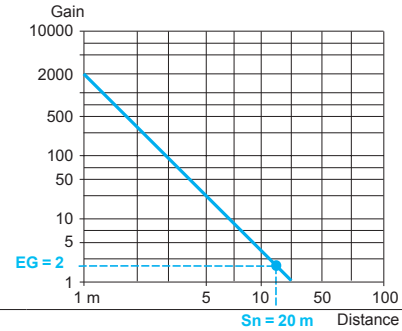
1 With reflector XUZC50
2 With reflector XUZC24
3 With reflector XUZC100

Thru-beam mode



0…30 m max.

With thru-beam accessory



Nominal sensing distance. EG ≥ 2.
Maximum sensing distance. The maximum sensing distances indicated are average values.

EG: Excess gain, operating margin.

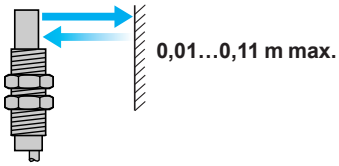
Photo-electric sensors

OsiSense XU, general purpose

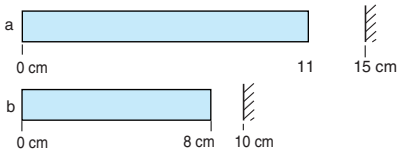
XUB0 Multimode function with line of sight 90° to case axis

Sensing distance and operating margin

Background suppression mode

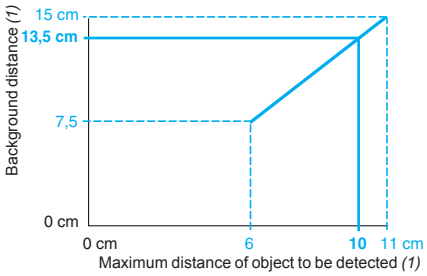


Without accessory



Background

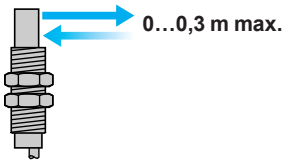
a: with background teaching at maximum recommended distance.
b: with background teaching at minimum recommended distance.



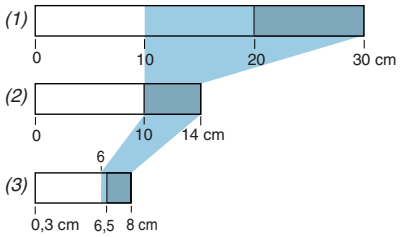
Example: teaching against a background located at 13.5 cm enables detection of an object at 0 to 10 cm.

(1) From white 90% to black 6%.

Diffuse mode

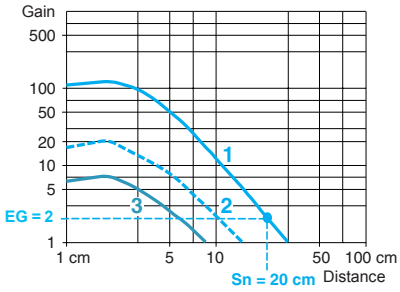


Without accessory



(1) White 90%. (2) Grey 18%. (3) Black 6%.

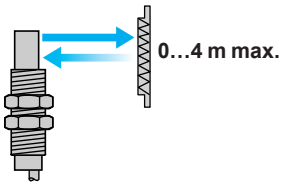
Object teaching zone



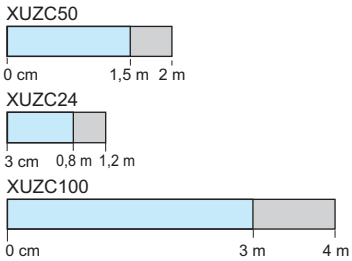
1 White object
2 Grey object
3 Black object

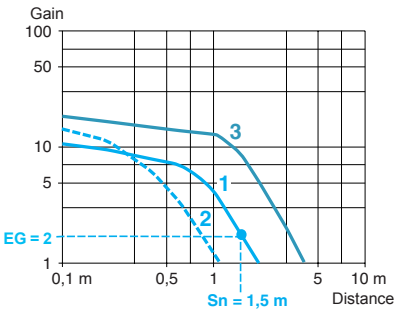
In diffuse mode, teaching of the position of the object to be detected, located between 0 and 11 cm, automatically configures the product to "background suppression" mode. This provides a constant usable sensing distance, whatever the colour of the object.

Polarised reflex mode



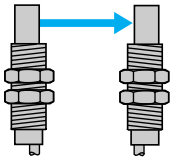
With reflector



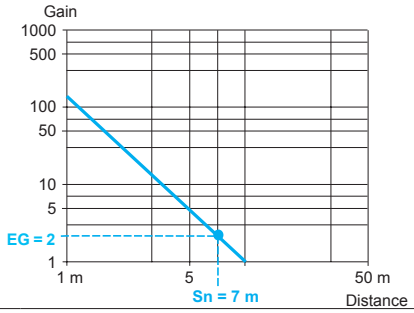


1 With reflector XUZC50
2 With reflector XUZC24
3 With reflector XUZC100

Thru-beam mode



With thru-beam accessory



Nominal sensing distance. EG ≥ 2.

Maximum sensing distance. The maximum sensing distances indicated are average values.

EG: Excess gain, operating margin.

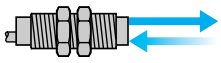
Photo-electric sensors

OsiSense XU, general purpose, single mode function

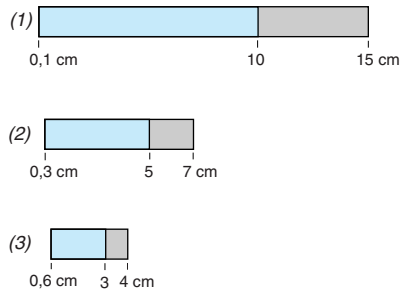
XUB●●●●● with line of sight along or at 90° to case axis

Sensing distance and operating margin

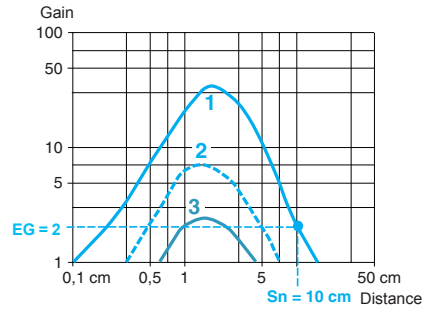
Diffuse sensor XUB4●●●●●●● with line of sight along case axis



0,001…0,15 m max.

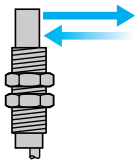


(1) White 90%. (2) Grey 18%. (3) Black 6%.

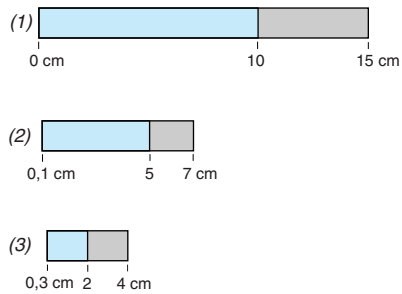


1 White object
2 Grey object
3 Black object

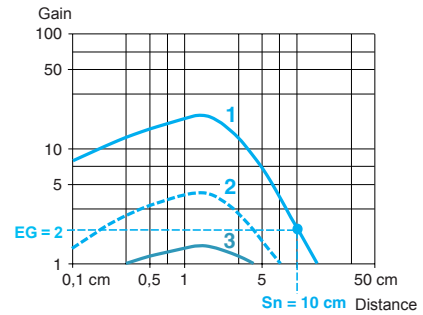
Diffuse sensor XUB4●●●●●●● with line of sight 90° to case axis



0…0,15 m max.

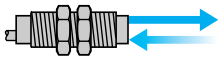


(1) White 90%. (2) Grey 18%. (3) Black 6%.

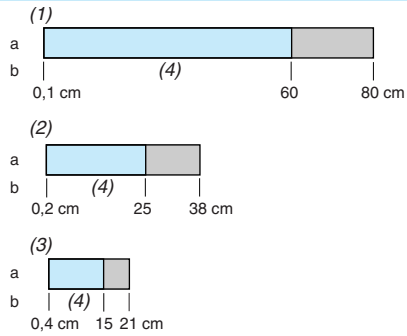


1 White object
2 Grey object
3 Black object

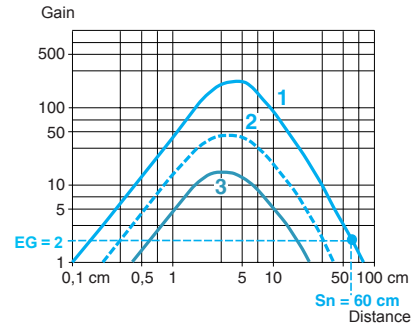
Diffuse sensor XUB5●●●●●●● with line of sight along or at 90° to case axis



0,001…0,8 m max.



(1) White 90%. (2) Grey 18%. (3) Black 6%.
(4) No detection.



1 White object
2 Grey object
3 Black object

Nominal sensing distance. EG ⩾ 2.
Maximum sensing distance. The maximum sensing distances indicated are average values.

EG: Excess gain, operating margin.
a: Potentiometer set at maximum.
b: Potentiometer set at minimum.

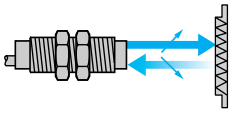
Photo-electric sensors

OsiSense XU, general purpose, single mode function

XUB●●●●● with line of sight along or at 90° to case axis

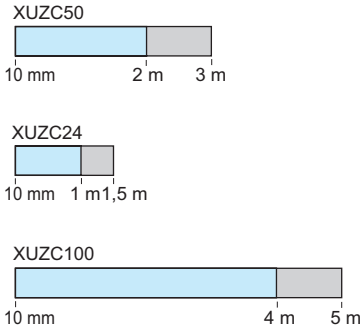
Sensing distance and operating margin

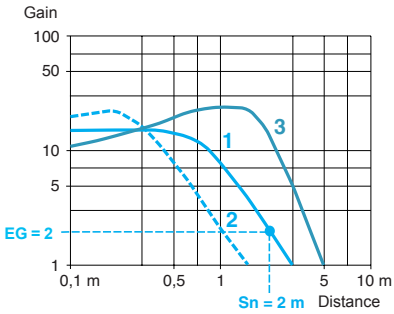
Polarised reflex sensor XUB9●●●●●●● with line of sight along or at 90° to case axis



0,01…5 m max.

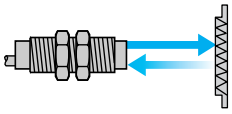
With reflector





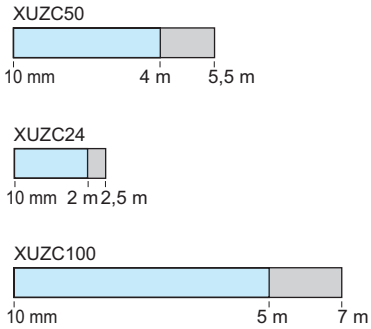
1 With reflector XUZ C50
2 With reflector XUZ C24
3 With reflector XUZ C100

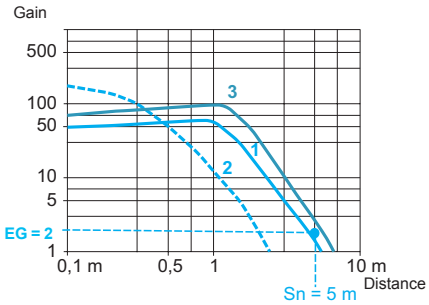
Reflex sensor XUB1●●●●●●● with line of sight along or at 90° to case axis



0,007…7 m max.

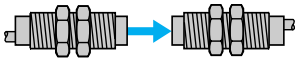
With reflector



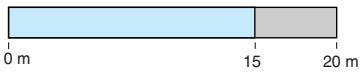


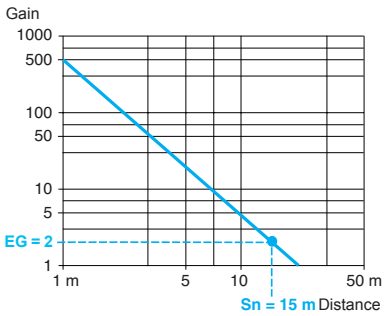
1 With reflector XUZC50
2 With reflector XUZC24
3 With reflector XUZC100

Thru-beam sensor XUB2●●●●●●● with line of sight along or at 90° to case axis



0…20 m max.





With thru-beam accessory

Nominal sensing distance. EG ⩾ 2.
Maximum sensing distance. The maximum sensing distances indicated are average values.

EG: Excess gain, operating margin.

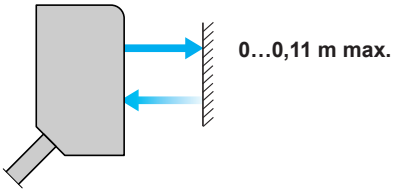
Photo-electric sensors

OsiSense XU, general purpose

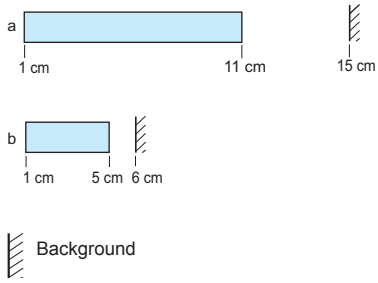
XUM0 multimode function

Sensing distance and operating margin

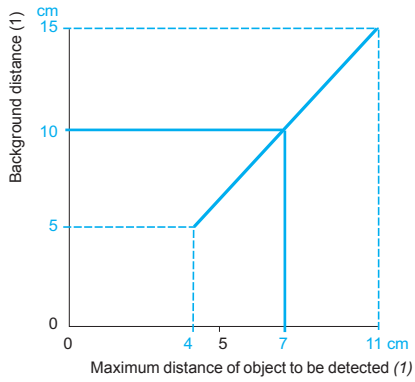
Background suppression mode



Without accessory



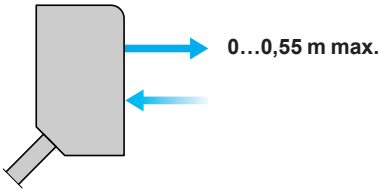
a: with background teaching at maximum recommended distance.
b: with background teaching at minimum recommended distance.



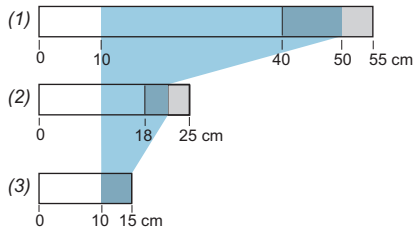
Example: teaching against a background located at 10 cm enables detection of an object at 1 to 7 cm.

(1) From white 90% to black 6%.

Diffuse mode

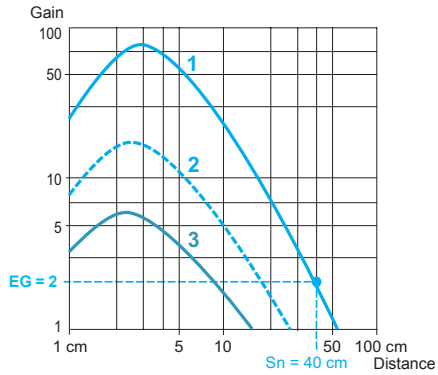


Without accessory



(1) White 90%. (2) Grey 18%. (3) Black 6%.

Object teaching zone



1 White object
2 Grey object
3 Black object

In diffuse mode, teaching of the position of the object to be detected, located between 0 and 10 cm, automatically configures the product to "background suppression" mode. This provides a constant usable sensing distance, whatever the colour of the object.

Nominal sensing distance. EG ⩾ 2.
Maximum sensing distance. The maximum sensing distances indicated are average values.

EG: Excess gain, operating margin.

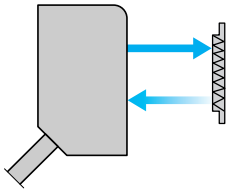
Photo-electric sensors

OsiSense XU, general purpose

XUM0 multimode function

Sensing distance and operating margin *(continued)*

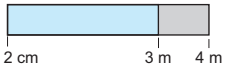
Polarised reflex mode



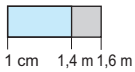
0,01…6,5 m max.

With reflector

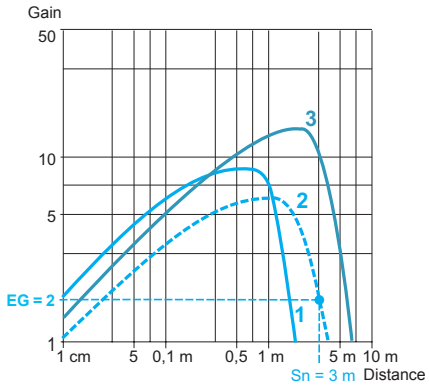
XUZC50



XUZC24

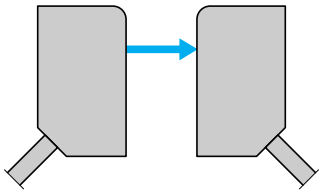


XUZC100



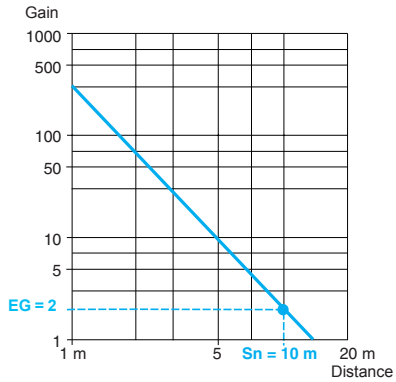
1 With reflector XUZC50
2 With reflector XUZC24
3 With reflector XUZC100

Thru-beam mode



0…14 m max.

With thru-beam accessory



Nominal sensing distance. EG ≥ 2.
Maximum sensing distance. The maximum sensing distances indicated are average values.

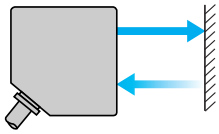
EG: Excess gain, operating margin.

Photo-electric sensors

OsiSense XU, general purpose
Multimode function
XUK0

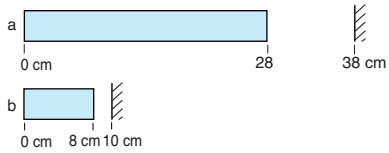
Sensing distance and operating margin

Background suppression mode



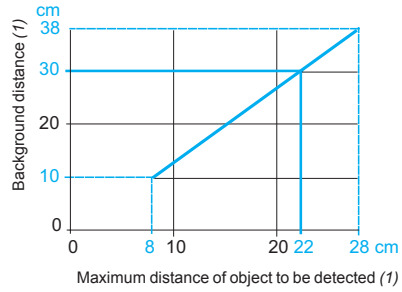
0…28 cm max.

Without accessory



Background

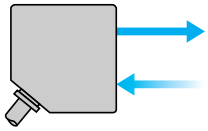
a: with background teaching at maximum recommended distance.
b: with background teaching at minimum recommended distance.



Example: teaching against a background located at 30 cm enables detection of an object at 0 to 22 cm.

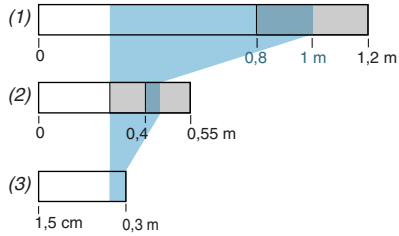
(1) From white 90% to black 6%.

Diffuse mode



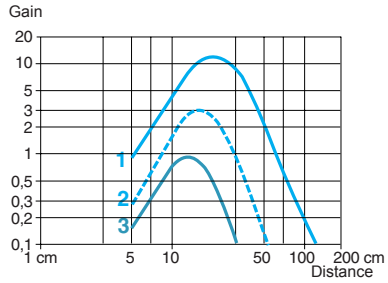
0…1,2 m max.

Without accessory



(1) White 90%. (2) Grey 18%. (3) Black 6%.

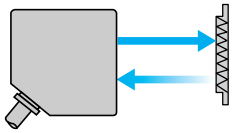
Object teaching zone



1 White object
2 Grey object
3 Black object

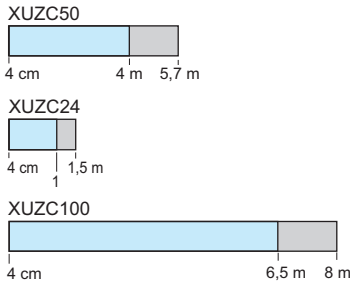
In diffuse mode, teaching of the position of the object to be detected, located between 0 and 0.3 m, automatically configures the product to "background suppression" mode. This provides a constant usable sensing distance, whatever the colour of the object.

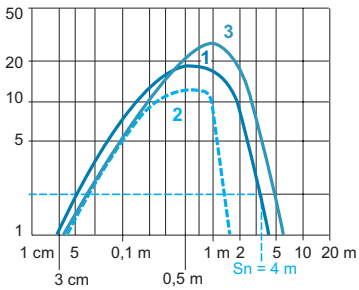
Polarised reflex mode



0,04…8 m max.

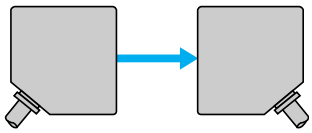
With reflector





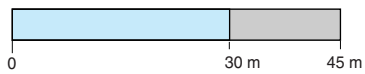
1 With reflector XUZC50
2 With reflector XUZC24
3 With reflector XUZC100

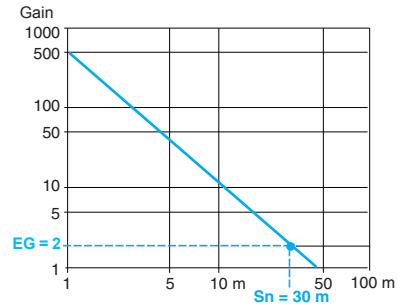
Thru-beam mode



0…45 m max.

With thru-beam accessory





Nominal sensing distance. EG ≥ 2.
Maximum sensing distance. The maximum sensing distances indicated are average values.

EG: Excess gain, operating margin.

Photo-electric sensors

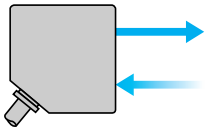
OsiSense XU, general purpose

Multimode function

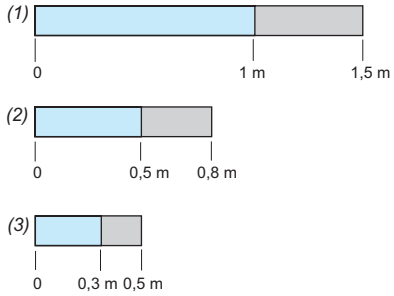
XUK●A●●●

Sensing distance and operating margin

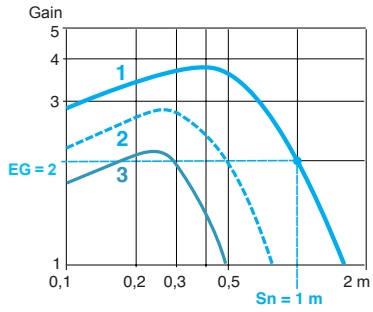
Diffuse sensor XUK5A●●●



Without accessory

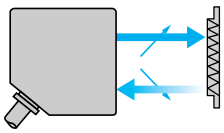


(1) White 90%.
(2) Grey 18%.
(3) Black 6%.

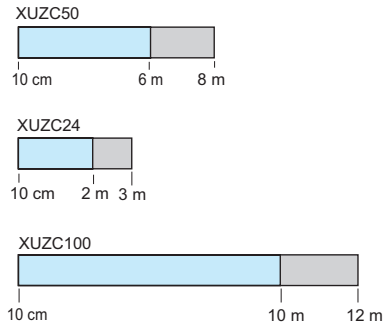


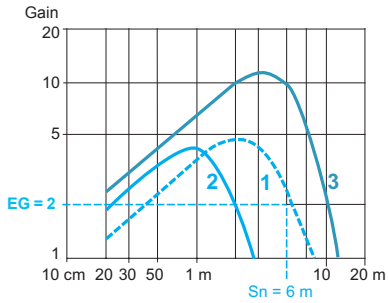
1 White object
2 Grey object
3 Black object

Polarised reflex sensor XUK9A●●●



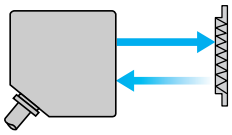
With reflector



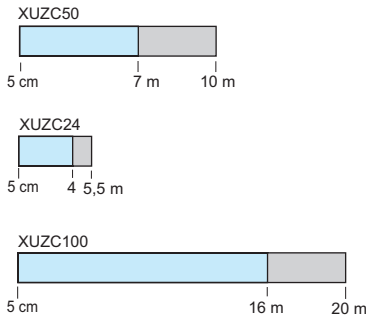


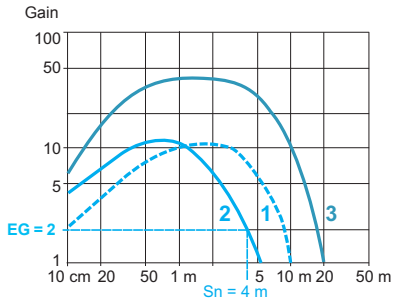
1 With reflector XUZC50
2 With reflector XUZC24
3 With reflector XUZC100

Reflex sensor XUK1A●●●



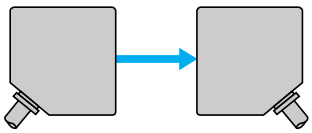
With reflector





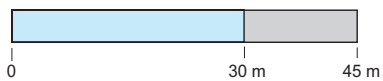
1 With reflector XUZC50
2 With reflector XUZC24
3 With reflector XUZC100

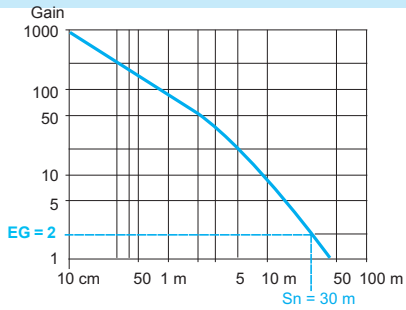
Thru-beam sensor XUK2A●●●



0…45 m max.

With thru-beam accessory





Nominal sensing distance. EG ≥ 2.
Maximum sensing distance. The maximum sensing distances indicated are average values.

EG: Excess gain, operating margin.

Photo-electric sensors

OsiSense XU Application, material handling and hoisting series.

With 4…20 mA and 0…10 V analog output signal.
DC supply, solid-state output. “Time of flight” technology.

Product type	Laser transmission sensors. Distance measurement	Laser transmission sensors. With background suppression
Applications	■ Packaging and conveying. ■ Material handling.	
Range	0.1… 5 m/*0.33…16.40 ft*	0… 5 m/*0…16.40 ft*
Type of light	Class 1 laser, red, 650 nm	
Resolution	< 5 mm (12-bit)	–
Repeat accuracy	< 0.3%	–
Linearity	± 30 mm	–
Differential travel	40 mm	
Materials	Front panel (screen): PMMA. Casing: PC-ABS shock-resistant. M12 connectors: metal	
Degree of protection	IP 67 and IP 69K, depending on connector	
Operating temperature	- 40… + 60°C / *- 40…+ 140°F* (- 40… + 50°C / *- 40…+ 117°F* for XUK8TE2MM12)	
Storage temperature	- 40… + 80°C/*- 40…+ 176°F*	
Dimensions (without connectors)	50 x 50 x 23 mm/*1.97 x 1.97 x 0.91 in.*	
Supply voltage + U_B	18…30 V⎓	
No-load supply current	⩽ 60 mA	
Output current Ie	⩽ 100 mA	
Switching frequency f/Response time	⩽ 500 Hz	
Type of outputs	1 x 4…20 mA and 0…10 V analog output + 1 auto-detect PNP switching output	1 or 2 auto-detect PNP switching outputs
Certifications	ECOLAB, CE, cULus	
References	**XUK8TAE1MM12** and **XUK8TAE2MM12**	**XUK8TAKSMM12** and **XUK8TAKDMM12**
Pages	5/179	5/179

Laser transmission sensors. Anti-collision mode and tandem mode	Accessories Brackets, clamps and connectors
■ Hoisting and mobile equipment.	Brackets and clamps for fixing sensors. Connectors for connecting sensors.
0.3… 70 m/*0.98…230 ft*	
Class 1 laser, red, 650 nm	
< 17 mm (12-bit) for scaling the analog output between 1 and 70 m	
<11 mm (for the discrete outputs)	
± 70 mm	
120 mm	
Front panel (screen): PMMA. Casing: PC-ABS shock-resistant. M12 connectors: metal	
IP 67 and IP 69K, depending on connector	
- 30… + 50°C/*- 22…+ 122°F*	
- 30… + 60°C/*- 22…+ 140°F*	
50 x 50 x 23 mm/*1.97 x 1.97 x 0.91 in.*	
18…30 V⎓	
≤ 60 mA	
100 mA	
10 ms	
1 x 4…20 mA analog output + 2 PNP or NPN switching outputs	
CE, cULus	
XUK9TAH2MM12	**XUZAS●●●, XUZCPV11V12●● and XUZCPV12V12●●**
5/181	5/179 and 5/181

5

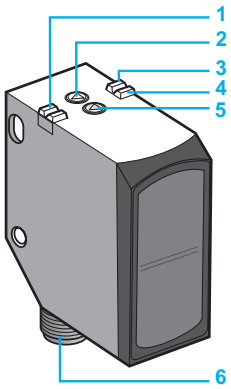
Photo-electric sensors

OsiSense XU Application, material handling series
"Time of flight" technology.
Distance measurement. Background suppression.

Certified

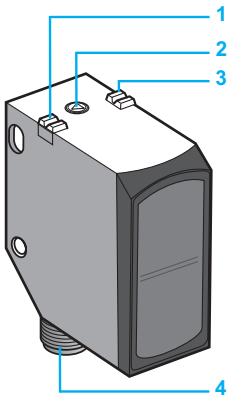
Laser

Class 1 laser
conforming to IEC 60825-1
Visible laser radiation:
do not stare into beam



XUK8TAE1MM12 and XUK8TAE2MM12:
1 Yellow LED: switching output Q indicator
2 Push button (teach-in) Q: switching output
3 Yellow LED: switching output QA indicator
4 Green LED: operating voltage indicator
5 Push button (teach-in) QA: analog output
6 M12 connector

XUK8TAKDMM12:
1 Yellow LED: switching output Q1 indicator
2 Push button (teach-in) Q1: switching output
3 Yellow LED: switching output Q2 indicator
4 Green LED: operating voltage indicator
5 Push button (teach-in) Q2: switching output
6 M12 connector



XUK8TAKSMM12:
1 Yellow LED: switching output Q indicator
2 Push button (teach-in) Q: switching output
3 Green LED: operating voltage indicator
4 M12 connector

Presentation

OsiSense XUK8T products are distance measurement sensors operating according to the Time of Flight (TOF) principle: light measured by time of flight.

These sensors are dedicated to tasks involving the measurement and control of objects with a variety of surfaces, over long distances.
They provide reliable and accurate distance measurement, even with tilted, clear, reflective or luminous objects.

Thanks to the various output configurations, XUK8T sensors offer excellent flexibility in order to meet the highest number of requirements:
- reversible analog outputs, 4…20 mA or 0…10 V
- one or two switching outputs, 24 VDC, PNP/NPN type *(1)*

XUK8T sensor setting is simplified by three teach modes:
- background
- fixed object
- scrolling objects

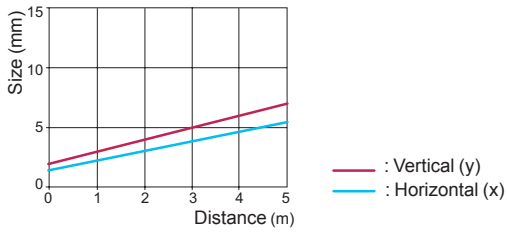
The sensors can also be set by the external input: teach-in mode.

The visible laser radiation (class 1 laser) makes it easier to align and contributes to operator safety. With compact dimensions (50 x 50 x 23 mm), available in degrees of protection IP 67 and IP 69K, XUK8T sensors can easily be integrated to detect a variety of materials and surfaces:
- metal
- plastic and rubber
- wood
- non-transparent liquids

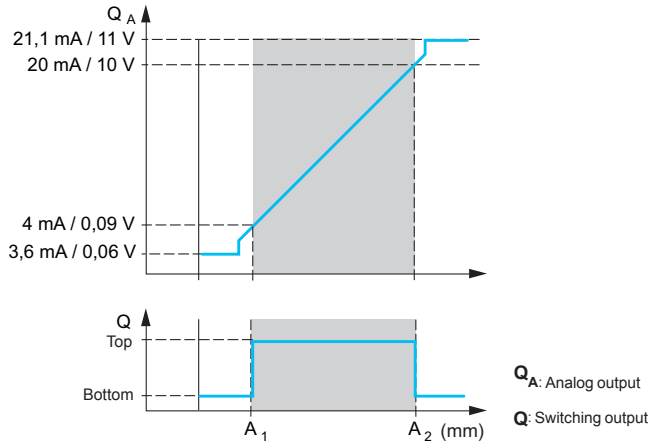
They are therefore suitable for a number of sectors:
- the timber industry, sawmills, furniture making
- the automotive industry, assembly, detection of dark objects
- conveying and material handling
- the metallurgy industry, etc.

Curves

Size of light spot (typical)



Characteristic output curve



(1) For detailed characteristics, please visit our website www.tesensors.com.

Photo-electric sensors

OsiSense XU Application, material handling series
"Time of flight" technology.
Distance measurement. Background suppression.

XUK8TAE1MM12

XUK8TAE2MM12

XUK8TAKSMM12

XUK8TAKDMM12

XUZASK004

XUZASW001

XUZASK001

XUZASW002

XUZA51S

XZCPV11V12L●

XZCPV12V12L●

Distance measurement sensors

Sensing distance (Sn): 0.1…5 m (white 90%), **3 m** (black 6%)

Connection method	Analog output type	Switching output type	Reference	Weight kg
M12, 5-pin connector	0…10 V	1 x auto-detect PNP/NPN	**XUK8TAE1MM12**	0.055
	4…20 mA	1 x auto-detect PNP/NPN	**XUK8TAE2MM12**	0.055

Laser transmission proximity sensors with background suppression

Sensing distance (Sn): 0…5 m (white 90%), **3 m** (black 6%)

Connection method	Switching output type	Reference	Weight kg
M12, 4-pin connector	1 x auto-detect PNP/NPN	**XUK8TAKSMM12**	0.055
M12, 5-pin connector	2 x auto-detect PNP/NPN	**XUK8TAKDMM12**	0.055

Mounting accessories

Description	Reference	Weight kg
Precision bracket **with precise micrometric adjustment and locking by 3 screws in order to align the beam**	**XUZASK004**	0.240
Aluminium dovetail bracket	**XUZASW001**	0.014
Protective fixing bracket for the sensor **304 stainless steel, supplied with screws**	**XUZASK001**	0.130
Fixing bracket **316 stainless steel**	**XUZA51S**	0.050
Simple metal fixing bracket	**XUZASW002**	0.017

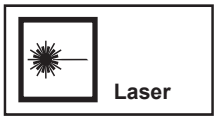
Cabling accessories

Description	Type	Cable length	Reference	Weight
		m		kg
M12 female connectors, 5-pin, PVC cable	Straight	2	**XZCPV11V12L2**	0.090
		5	**XZCPV11V12L5**	0.201
		10	**XZCPV11V12L10**	0.360
	Elbowed	2	**XZCPV12V12L2**	0.090
		5	**XZCPV12V12L5**	0.201
		10	**XZCPV12V12L10**	0.360

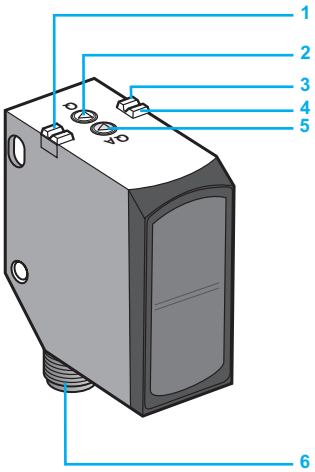
Photo-electric sensors

OsiSense XU Application, hoisting series Anti-collision mode and tandem mode for overhead cranes

Presentation



Class 1 laser, conforming to IEC 60825-1
Visible laser radiation: do not stare into beam



1 Yellow LED: switching output Q1 indicator.
2 Push button (teach-in) Q: teaches near and far distances for anti-collision mode.
3 Yellow LED: switching output Q2 or analog output QA indicator.
4 Green LED: operating voltage indicator.
5 Push button (teach-in) QA: teaches the analog range.
6 M12 connector.

The **XUK9TAH2MM12** sensor is a distance measurement sensor operating according to the Time of Flight (TOF) principle: light measured by time of flight.

It is dedicated to tasks involving measurement and control over long distances. Robust and compact, operating from -10 to + 60°C, it is specifically designed for overhead cranes *(1)*.

The visible laser radiation (class 1 laser) makes it easier to align and contributes to operator safety.

Operating from 0.3 to 70 meters with great accuracy (60 mm differential travel), the sensor is set to detect the reflector located on a fixed object or another overhead crane.

The system thus allows two operating modes:
- anti-collision mode
- tandem mode

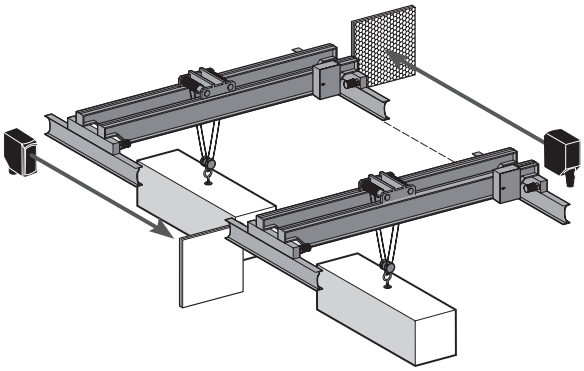
Anti-collision mode

Anti-collision mode is used to keep two overhead cranes a defined distance apart, in order to prevent equipment or loads bumping into one another.

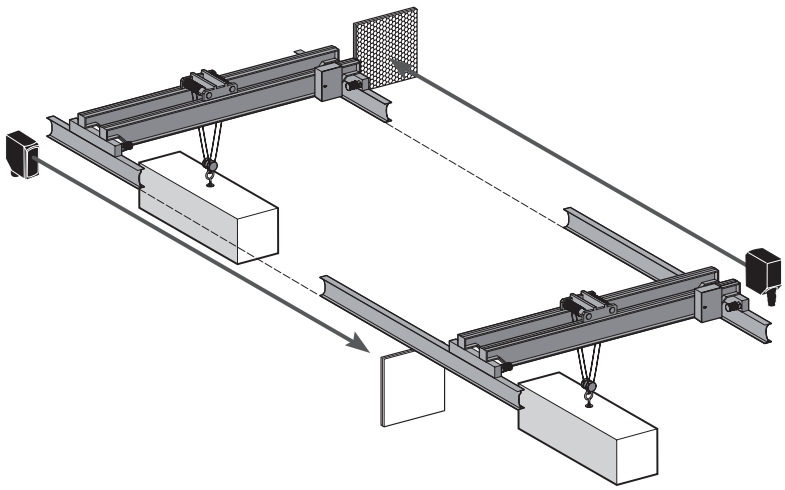
This mode can also be set by a push button on the sensor (item 2) or remotely, by the external input.

In both cases, the “near distance” and “far distance” positions (see below) are stored in the sensor. These distances can be modified by executing a new teach procedure.

Near distance



Far distance



(1) Detailed characteristics are available on our website www.tesensors.com.

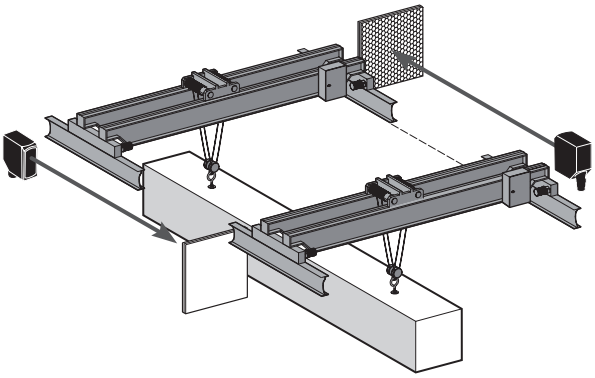
Photo-electric sensors

OsiSense XU Application, hoisting series Anti-collision mode and tandem mode for overhead cranes

Presentation *(continued)*

Tandem mode

Tandem mode is used to split a load that cannot be supported by just one crane between two overhead cranes. When coupled together, overhead cranes can be used to transport long or heavy loads in the same bay of an industrial site. With this mode, a single operator can control two cranes simultaneously.
Tandem mode is taught and activated by the external input.



The **XUK9TAH2MM12** sensor is also used for checking teaching and whether the cable has broken *(1)*.

XUK9TAH2MM12

Sensor reference

Sensing distance (Sn): 0.3…70 m with the XUZC250 reflector

Connection method	Analog output type	Switching output type	Reference	Weight kg
M12, 8-pin connector	4…20 mA	PNP or NPN	**XUK9TAH2MM12**	0.055

XUZASK004

XUZASW001

References of mounting accessories

Description	Reference	Weight kg
Precision bracket **with precise micrometric adjustment and locking by 3 screws in order to align the beam**	**XUZASK004**	0.240
Aluminium dovetail bracket	**XUZASW001**	0.014
Protective fixing bracket for the sensor **304 stainless steel, supplied with screws**	**XUZASK001**	0.130
Fixing bracket **316 stainless steel**	**XUZA51S**	0.050
Simple metal fixing bracket	**XUZASW002**	0.017
250 x 250 mm adhesive reflector	**XUZC250**	–

XUZASK001

XUZASW002

XUZA51S

References of connection accessories

Description	Type	Cable length	Reference	Weight
		m		kg
M12 female connectors, 8-pin, PUR cable	Straight	2	**XZCP29P12L2**	0.100
		5	**XZCP29P12L5**	0.240
		10	**XZCP29P12L10**	0.470

XZCP29P12L●

(1) The additional functions are described in the sensor instruction sheet. Please visit our website www.tesensors.com.

Photo-electric sensors

OsiSense XUW

Vision sensors for inspection of manufactured parts

Product type	Vision sensors, configurable via PC software	
	White light	Red light

Applications		For manufactured parts: □ quality control, presence, position, orientation, sorting, integrity □ marking checks □ guiding and gripping
Type of lighting		8 LEDs
Focal length		6 mm and 12 mm, adjustable by potentiometer
Detection distance/ size of field of vision	Focal length 6 mm	Minimum distance: 6 mm for a 5 x 4 mm field of vision. Maximum distance: 350 mm for a 260 x 175 mm field of vision.
	Focal length 12 mm	Minimum distance: 30 mm for an 8 x 6 mm field of vision. Maximum distance: 650 mm for a 250 x 170 mm field of vision.
Resolution		WVGA: 736 x 480 pixels
Materials		Front face: PMMA. Enclosure: ABS and aluminium M12 connectors: metal
Degree of protection		IP 65/67, depending on connector
Operating temperature		0…50 °C
Dimensions (without connectors)		65 x 45 x 45 cm
Nominal voltage		24 V ⎓
Type of discrete I/O		4 outputs/2 inputs, PNP or NPN
Configuration software	Number of jobs	2 jobs, selectable by discrete input
	Parts inspection tools	5 tools: pattern matching, contour, contrast, brightness and grey-scale level. These tools can be combined to obtain up to 32 check zones in a single job.
	Frequency and cycle time	25 images/second max. Typical cycle times: pattern matching (40 ms), contour (60 ms), contrast (4 ms), brightness (4 ms) and grey-scale level (4 ms).
Network interfaces		Ethernet IP
Certifications		CE
References		**XUWSA06W** and **XUWSA12W** / **XUWSA06R** and **XUWSA12R**
Page		5/188 / 5/188

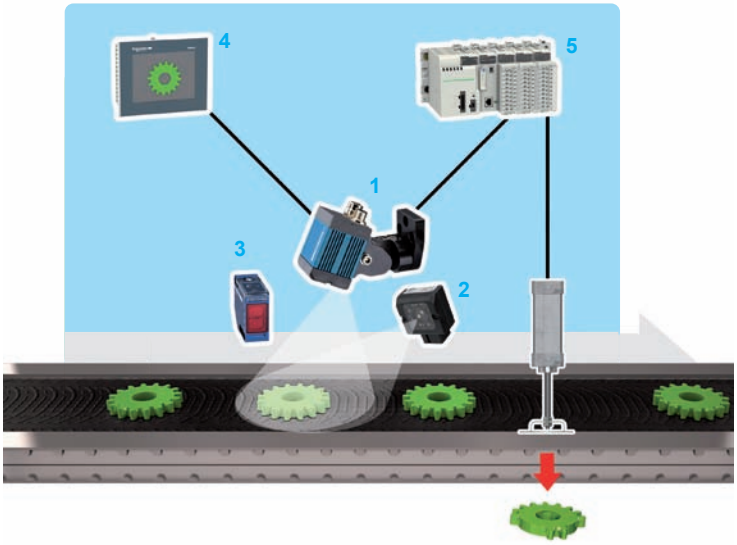
Additional lighting			Accessories
Direct linear lighting	**Ring lighting**	**Back-lighting**	**Brackets, clamps, pre-wired connectors and jumper cables**
To eliminate reflections generated by light from the sensor.	To ensure a consistent image of reflective or irregularly-shaped parts.	To highlight a silhouette and through holes, based on the shadow play principle.	Brackets and clamps for fixing and mounting sensors and lighting devices. Pre-wired connectors and jumper cables for connection of sensors and lighting devices.
LED, white or red	LED, white or red	LED, red	
–	–	–	
–	–	–	
–	–	–	
Front face: PMMA Enclosure: ABS	Front face: PMMA Enclosure: aluminium	Front face: acrylic Enclosure: aluminium	
IP 65	IP 65	IP 30	
0…50 °C	0…50 °C	0…35 °C	
45 x 45 x 24 mm	Ø 115 mm, depth 25 mm	47 x 47 x 15 mm 94 x 94 x 10 mm 133 x 133 x 10 mm	
24 V ⎓	24 V ⎓	24 V ⎓	
–	–	–	
–	–	–	
–	–	–	
CE	CE	CE	
XUZLW001 and **XUZLR001**	**XUZLW002** and **XUZLR002**	**XUZLR033, XUZLR063** and **XUZLR103**	**XUZASW00●**, **XZC●B●●** and **XGSZ●2E45●●**
5/188	5/188	5/188	5/188 and 5/189

Photo-electric sensors

OsiSense XUW

Vision sensors for inspection of manufactured parts

General



1 : Vision sensor XUW.
2 : Additional lighting.
3 : Photo-electric sensor.
4 : Human/machine interface.
5 : Automation platform.

With high industrial production rates and a constant need to improve quality and boost profits, industrial companies are increasingly anxious to automate their production methods.
Vision sensors for the inspection of manufactured parts provide an answer to these concerns.

Vision sensors, such as OsiSense XUW, allow checking of high rate production operations and ensure good repeat accuracy of checking. These XUW sensors can also be used to manage object flows.

Types of application for manufactured parts:
- quality control
- presence
- position, orientation, sorting, integrity
- checking markings
- guiding and gripping

Vision sensor

Direct linear lighting

"Good" part (marking complete)

"Bad" part (marking incomplete)

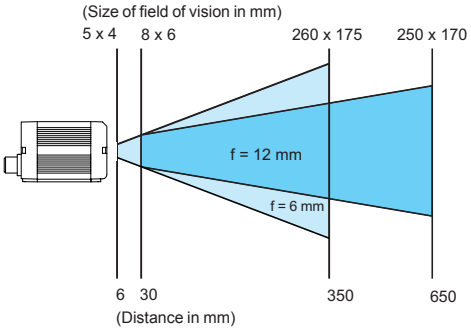
Operating Principle

Once the application to be created is well defined, i.e. when "good" and "bad" parts have been identified, implementation of the XUW vision sensors is simple.

The sensor is configured via the software. This software is supplied on CD-ROM and must be installed on a PC. An image of the "good" part and its acceptance tolerances are saved in the XUW sensor memory. Once the sensor has been configured, it is independent. The PC is no longer required.
Inspection results: the "good part" or "bad part" result is obtained via discrete outputs or Ethernet IP network outputs.
The inspection of parts is therefore simple to perform.

Presentation

The Telemecanique Sensors "vision" offer comprises:
- 4 vision sensors
- additional lighting (if necessary, depending on the application)
- configuration software
- fixing, mounting and cabling accessories



OsiSense XUW vision sensors

The main characteristics of these sensors are as follows:
- a grey-scale image
- compact size: 45 x 45 x 65 mm
- rugged construction: metal enclosure and connections
- connection by M12 connector
- a wide range of focal adjustment, for image sharpness
- white or red light, via LED (integrated and adjustable)
- integrated lens:
  - 12 mm focal length: high precision and long distance
  - 6 mm focal length: for close object and wide field of vision

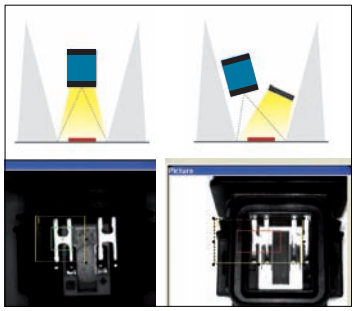


Figure 1: Direct linear lighting

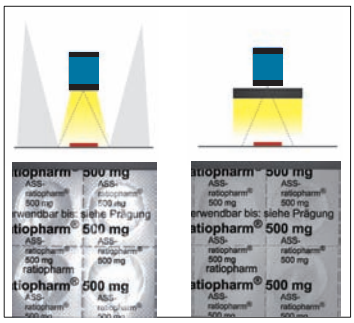


Figure 2: Ring lighting

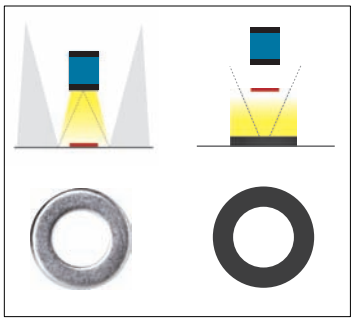


Figure 3: Back-lighting

Key for the 3 figures:

: Vision sensor

: Part to be detected

: Lighting

Presentation (continued)

Configuration software (see following pages)

In 5 simple steps, without any special training, the configuration software allows the user to:

- obtain the image quality needed to view the flaw being detected
- select the appropriate tool for the required inspection and set tolerances:
  - pattern matching
  - contour
  - contrast
  - brightness
  - grey-scale level
- assign inspection results to the discrete outputs or to the network outputs
- test the jobs created and view statistics
- save the jobs and set up the sensor

Inspections can be viewed using “viewer” mode.

Additional lighting

XUW sensors have integrated lighting.
However, it may be necessary to add further lighting for correct viewing of the flaw being sought.

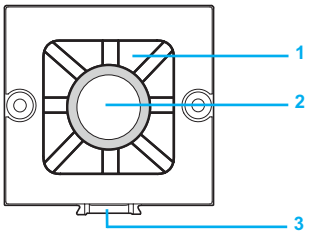
Three types of lighting, with white or red light, are offered:

- **direct linear lighting** to eliminate a reflection, on a part, generated by direct light from the sensor (Figure 1).
- **ring lighting** gives a consistent and uniform image of a highly reflective or irregularly-shaped part, for example a sheet of alumnium foil (Figure 2).
- **back-lighting** based on the shadow play principle, makes it possible to obtain more sharply contrasted contours. Object = black, light = white (Figure 3).

Accessories

To simplify the installation of lighting, Telemecanique Sensors offers installation and adjustment accessories, jumper cables and pre-wired connectors in PUR.

Description of vision sensors

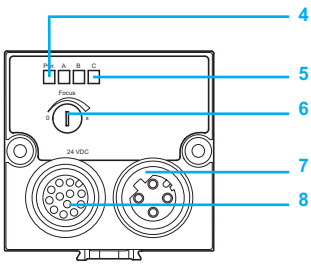


On the front panel:

1 LED lighting. White or red light, depending on model

2 Lens. Focal length 6 or 12 mm, depending on model

3 Dovetail fixing



Rear view:

4 Operating LED: green

5 A, B and C outputs LED: yellow

6 Focal adjustment potentiometer

7 Metal M12 connector, for connection to the Ethernet IP network

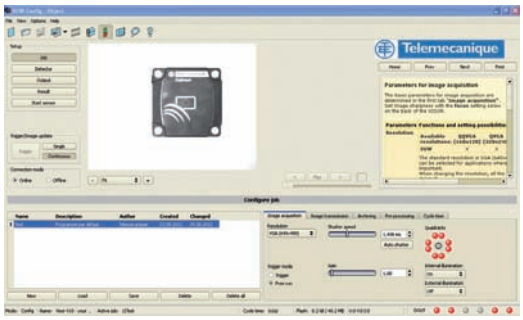
8 Metal M12 connector, for the power supply and the inputs/outputs

Photo-electric sensors

OsiSense XUW

Configuration software

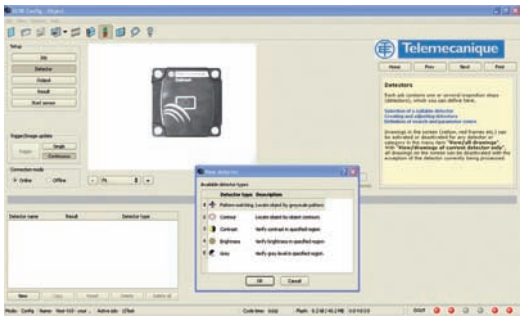
In 5 steps, the software installed on a PC allows you to configure your application.
The software is supplied on CD-ROM, in English, French and German.



Step 1: adjustment of image quality

This step is used to:

- adjust the focusing for image sharpness
- adjust the exposure time
- modify the number of lighting LEDs used or switch off the lighting
- use an external trigger (sensor) or an internal trigger (in continuous mode)



Step 2: tool selection and setting of tolerances

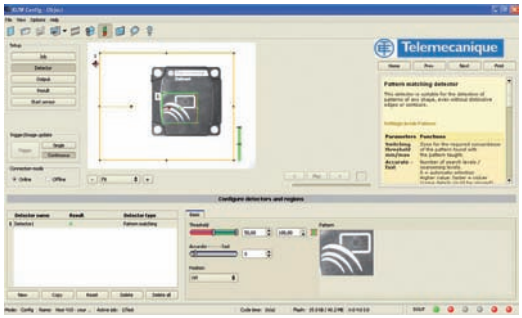
Tool selection

This step is used to select the tool or tools best suited to the required inspection.

The 5 inspection tools are:

- pattern matching (typical cycle time: 40 ms)
- contour (typical cycle time: 60 ms)
- contrast (typical cycle time: 4 ms)
- brightness (typical cycle time: 4 ms)
- grey-scale level (typical cycle time: 4 ms)

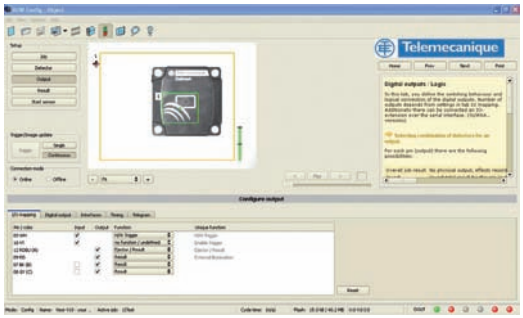
The 5 tools can be combined to obtain up to 32 check zones for a single part.



Setting of tolerances

This step is used to set the detection zone (in yellow), the teach zone (in green) and to set the tolerances of the tool or tools selected:

- acceptance threshold
- rotation angle
- mask modification
- position checking



Step 3: I/O module assignment

This step is used to:

- specify the assignment of discrete I/O
- configure the Ethernet IP network output
- assign logic functions for each output
- set a switching time

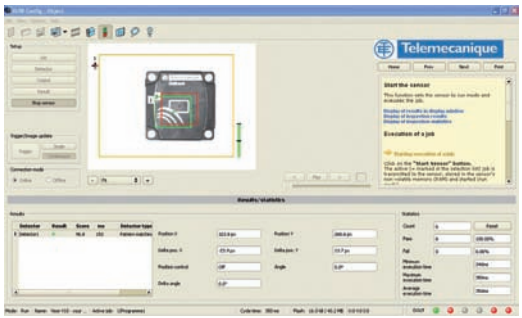
Good part: marking complies

Bad part: marking does not comply

Step 4: tests and results

This step is used for testing the jobs created on “good” and “bad” parts:

- good part: teach zone green and red and result bargraph green
- bad part: teach zone all red and result bargraph red
- score display (correspondence in relation to part saved, as %)
- display of X and Y positions
- display of rotation angle



Step 5: saving

This step is used to save the jobs in the vision sensor's memory and to start the application.

At this stage, the cycle time for each check can be seen.
Once the program has been saved in the sensor, the computer is no longer necessary. The sensor operates independently.

Photo-electric sensors

OsiSense XUW

Vision sensors and additional lighting systems
Fixing and mounting accessories

XUWSA●●W
XUWSA●●R

XUZL●002

XUZL●001

XUZLR033

XUZASW003

XUZASW002

XUZASW001

XUZASW009

XUZASW008

XUZASW006

Vision sensors

Description	Nominal voltage	Focal length	Reference	Weight kg
Vision sensors with white light				
Vision sensor	24 V ⎓	6 mm	**XUWSA06W** *(1)*	0.160
		12 mm	**XUWSA12W** *(1)*	0.160
Vision sensors with red light				
Vision sensor	24 V ⎓	6 mm	**XUWSA06R** *(1)*	0.160
		12 mm	**XUWSA12R** *(1)*	0.160

Configuration software

Configuration of XUW vision sensors requires the use of software installed on a PC.
The software is provided on a CD-ROM supplied with the sensor. Up-dates are available from our web site www.tesensors.com.

Additional lighting (if necessary, depending on the application)

Description	Nominal voltage	Size in mm	Reference	Weight kg
Direct linear lighting by LED				
White light	24 V ⎓	45 x 45	**XUZLW001** *(2)*	0.060
Red light	24 V ⎓	45 x 45	**XUZLR001** *(2)*	0.060
Ring lighting by LED				
White light	24 V ⎓	Ø 115	**XUZLW002**	0.150
Red light	24 V ⎓	Ø 115	**XUZLR002**	0.150
Back-lighting by LED				
Description	**Nominal voltage**	**Size in mm**	**Reference**	**Weight kg**
Red light	24 V ⎓	47 x 47 x 15	**XUZLR033**	0.045
	24 V ⎓	94 x 94 x 10	**XUZLR063**	0.160
	24 V ⎓	133 x 133 x 10	**XUZLR103**	0.290

Fixing and mounting accessories

Description	Reference	Weight kg
Vision sensor fixing accessories		
Dovetail bracket supplied with sensor XUW SA●●●	**XUZASW001**	0.014
Simple bracket	**XUZASW002**	0.017
2-axis dovetail clamp	**XUZASW003**	0.210
Lighting system fixing and connection accessories		
Clamp for direct lighting XUZ LW001 and XUZ LR001 (supplied with the lighting system)	**XUZASW001**	0.014
Bracket for ring lighting XUZ LW002 and XUZ LR002	**XUZASW009**	0.140
Assembly accessories		
Ø 12 mm fixing rod Length: 30 cm	**XUZASW006**	0.260
Mounting clamp for Ø 12 mm rod XUZ ASW006	**XUZASW008**	0.039
Mounting and adjustment clamp for 2 x Ø 12 mm tubes XUZ ASW006	**XUZASW005**	0.300

(1) The sensor is supplied with:
*- a dovetail fixing clamp **XUZASW001***
- a CD-ROM containing: the configuration software and a user guide for the software and sensor (in French, English and German)
- a screwdriver and a hexagon key.

*(2) Lighting systems **XUZLW001** and **XUZLR001** are supplied with fixing clamp **XUZASW001** and a hexagon key.*

Photo-electric sensors

OsiSense XUW

Cabling accessories

Cabling accessories

XZC PB44P14L●●

XZC PB45P14L●●

XGS Z12E45●●

XGS Z22E45●●

XZC RB4444P14L●●

XZC RB4545P14L●●

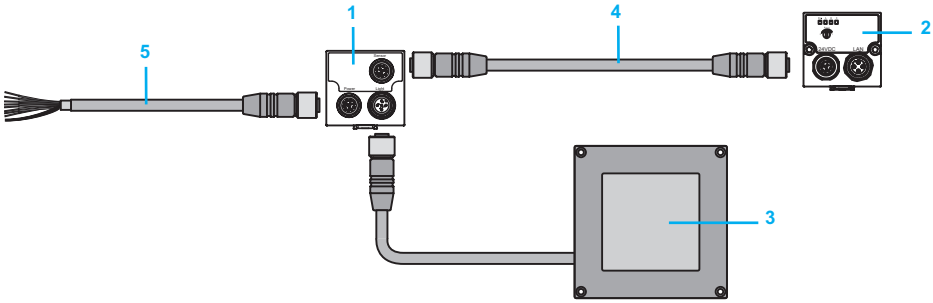
XUZSW003

Description	Cable material	Length	Reference	Weight kg
For connecting the vision sensor: power supply and I/O				
Straight pre-wired connectors shielded female M12 connector, 12-wire	PUR	5 m	**XZCPB44P14L5**	0.460
		10 m	**XZCPB44P14L10**	0.870
Pre-wired elbowed connectors shielded female M12 connector, 12-wire	PUR	5 m	**XZCPB45P14L5**	0.460
		10 m	**XZCPB45P14L10**	0.870
For connecting the vision sensor directly to the PC when configuring, or to a network				
Ethernet jumper cables, M12 straight/RJ45 shielded cable, straight cabling	PUR	3 m	**XGSZ12E4503**	0.140
		10 m	**XGSZ12E4510**	0.440
Ethernet jumper cables, M12 elbowed/RJ45 shielded cable, straight cabling	PUR	3 m	**XGSZ22E4503**	0.140
		10 m	**XGSZ22E4510**	0.440
For connecting the vision sensor to additional lighting				
Jumper cable, female M12 straight/ female M12 straight shielded cable, 12-wire	PUR	0.5 m	**XZCRB4444P14L05**	0.030
		2 m	**XZCRB4444P14L2**	0.120
Jumper cable, female M12 elbowed/ female M12 elbowed shielded cable, 12-wire	PUR	0.5 m	**XZCRB4545P14L05**	0.030
		2 m	**XZCRB4545P14L2**	0.120

For linking an XZCRB4●●●P14L● jumper cable, a back-lighting device and the sensor (see drawing below)

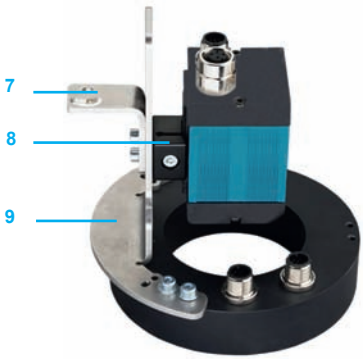
Description	Material	Size in mm	Reference	Weight kg
Connection adaptor for back-lighting devices supplied with a dovetail fixing clamp XUZASW001	ABS	45 x 45 x 25	**XUZSW003**	0.060

Use of the back-lighting connection adaptor



1 Connection adaptor XUZSW003
2 Vision sensor XUWSA●●●
3 Back-lighting XUZLR●●3
4 Jumper cable, female M12 XZCRB4444P14L●● or XZCRB4545P14L●●
5 Pre-wired M12 connector, XZCPB44P14L●● or XZCPB45P14L●●

Examples of vision sensor installation



6 2-axis dovetail clamp XUZASW003
7 Simple bracket XUZASW002
8 Dovetail bracket XUZASW001 (supplied with the sensor)
9 Bracket XUZASW009 for ring lighting

6

Content

6 - Ultrasonic sensors OsiSense XX

Guide de choix . . . . . *page 6/2*

■ General . . . . . *page 6/6*

OsiSense XX, General purpose

■ DC supply, solid-state output

□ Cylindrical, plastic or metal. . . . . *page 6/14*

□ Flat format, plastic . . . . . *page 6/18*

OsiSense XX, Application

■ Sensors for monitoring 2 levels

□ Cylindrical plastic case . . . . . *page 6/22*

OsiSense XX

■ Accessories . . . . . *page 6/24*

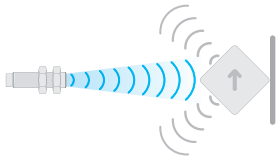
6

Selection guide based on application

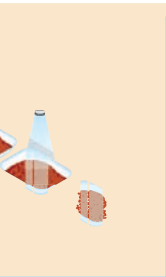
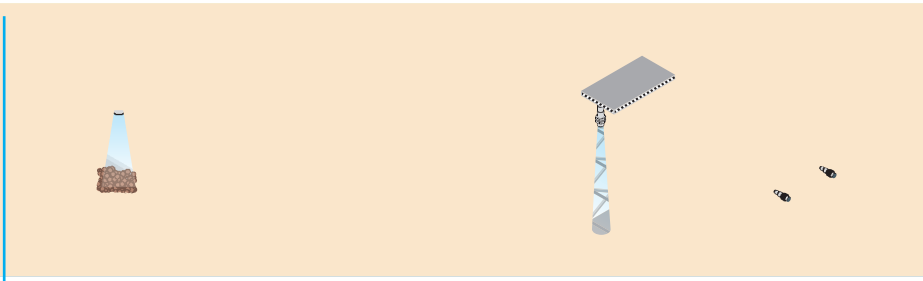
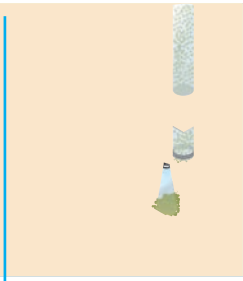
Type of detection	Detection "Digital"					
	Assembly			Conveying		
Sensor type	Machine part	Vibrating bowl	Presence Absence	Transparent bottles	Jam	Flow
Ø18 (M18x1)						
Ø12 (M12x1)						
Ø18 (M18x1)						
Ø30 (M30x1,5)						
7,6x19x33						
16x30x74						
18x33x60 Ø18 (M18x1)						
80X80X34						

Diffuse mode

Reflex mode



Thru-beam mode

	Regulation “Analogue output”					Level monitoring	
							
Packaging	Conveying		Packaging	Handling	Handling	Process	
Transparent film	Material level	Height of part	Radius of strip roll	Height of elevating table	Aircraft boarding bridge	Monitoring 2 thresholds	Filling Emptying

6

Ultrasonic sensors
OsiSense XX

Applications
Detection of any object, without physical contact, irrespective of: material (metal, plastic, wood, cardboard, etc.), nature (solid, liquid, powder, etc.), colour, degree of transparency, etc.

Sensors with solid-state digital output

Cylindrical type

Dimensions (mm)	**Ø 12** (M12 x 1)			**Ø 18** (M18 x 1)				
Sensing distance Sn – **Diffuse**	**5 cm**	**10 cm**	–	**5 cm**	**15 cm**	**50 cm (adjustable)**	–	–
Reflex	–	–	–	–	–	**50 cm (adjustable)**	–	–
Thru-beam	–	–	**20 cm**	–	–	–	**61 cm**	**1 m**
Assured operating distance (mm)	6.4...51 fixed	6.4...102 fixed	0...200 fixed	2...50 fixed	25...152 fixed	Adjustable using teach mode	Fixed	Fixed
Type of output	PNP/NPN	NPN or PNP	PNP/ NPN	PNP or NPN	PNP/NPN	NPN or PNP	PNP/NPN	PNP/NPN
Degree of protection	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
Function	NO	NO	NO/NC	NO NC	NO	NO	NO NC	NO NC
Connection	M8	M8	M8	M12 or pre-cabled	M12	M12 or pre-cabled *(1)*	M12	M12
Power supply	12...24 V ⎓ with protection against reverse polarity							
Sensor type	**XX5 12A1●**	**XX5 12A2●**	**XX●12 A8●**	**XXV 18B1●**	**XX5 18A1●**	**XX5 18A3● XXB 18A3●**	**XX●18 A3●**	**XX●18 A4●**
Page	6/14							

Sensors with analogue output

Cylindrical type

Dimensions (mm)	**Ø 18** (M12 x 1)	**Ø 30** (M30 x 1.5)		
Sensing distance Sn	**50 cm (adjustable)**	**1 m (adjustable)**		**2 m (adjustable)**
Assured operating distance (mm)	Adjustable using teach mode	Adjustable using teach mode		
Type of output	4-20 mA/0-10 V	4-20 mA/0-10 V		
Degree of protection	IP 67	IP 65		
Connection	M12	M12		
Power supply	12…24 V ⎓ *(2)*	15…24 V ⎓ *(2)*		
Sensor type	**XX918A3●**	**XX930A1●**	**XX930S1●**	**XX930A2●**
Page	6/18			

(1) XXB18A3●: M12 connector only. (2) With protection against reverse polarity.

			Cylindrical type		Flat format					
			Application, monitoring 2 levels							
Ø 30 (M30 x 1.5)			**Ø 18** (M18 x 1)	**Ø 30** (M30 x 1.5)	**7.6 x 19 x 33**		**16 x 30 x 74**		**18 x 33 x 60 + Ø 18** (M18 x 1)	**80 x 80 x 34**
1 m/2 m depending on model **(adjustable)**		**8 m (adjustable)**	**50 cm**	**1 m/2 m** dep. on model	**10 cm**	–	**25 cm**	–	**50 cm (adjustable)**	**1 m (adjustable)**
–	**1 m (adjustable)**								**50 cm (adjustable)**	**1 m (adjustable)**
–	–	–	–	–	–	**20 cm**	–	**61 cm/1 m**	–	–
Adjustable using teach mode			Adjustable using teach mode		6.4...102 fixed	0...200 fixed	51...254 fixed	0...1000 fixed	Adjustable using teach mode	
PNP/NPN or NPN or PNP	PNP or NPN	PNP or NPN	PNP or NPN	PNP/NPN	NPN or PNP	NPN/PNP	NPN or PNP	NPN/PNP	NPN or PNP	NPN or PNP
IP 65	IP 67	IP 65	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
NO + NO or NO + NC	NO or NO + NC	NO + NC	NO	NO + NO	NO	NO NC	NO	NO + NO NC + NC	NO	NO
M12	M12	M12	M12	M12	Connector on flying lead	M12	M12	M12	M12	M12
12...24 V ⎓ with protection against reverse polarity										
XX630A1● XX630A2● XX630S1●	**XX6V3A1● XXBV3A1●**	**XX630A3●**	**XX218A3●**	**XX230A1● XX230A2●**	**XX7F1A2●**	**XX● F1A8●**	**XX7 K1A2●**	**XX● K1A3● XX● K1A4●**	**XX7 V1A1● XXB V1A1●**	**XX8 D1A1● XXB D1A1●**
6/14			6/20		6/18					

6

				Flat format	
Ø 30 (M30 x 1.5)				**18 x 33 x 65 + Ø 18** (M18 x 1)	**80 x 80 x 34**
1 m (adjustable)		**8 m (adjustable)**		**50 cm (adjustable)**	**1 m (adjustable)**
Adjustable using teach mode				Adjustable using teach mode	
4-20 mA	0-10 V	4-20 mA	0-10 V	4-20 mA 0-10 V	4-20 mA 0-10 V
IP 67		IP 65		IP 67	IP 67
M12		M12		M12	M12
15...24 V ⎓ *(2)*				12...24 V ⎓ *(2)*	15...24 V ⎓ *(2)*
XX9V3A1●		**XX930A3●**		**XX9V1A1●**	**XX9D1A1●**
6/18					

Ultrasonic sensors
OsiSense XX

Quality, standards and certifications

Quality control

The OsiSense XX ultrasonic sensors are subjected to special precautions in order to guarantee their reliability in the most arduous industrial environments.

■ **Qualification**
A **qualification procedure** on the characteristics of OsiSense XX ultrasonic sensors is carried out in our laboratories.

■ **Production**
The electrical characteristics, sensing distances at the ambient temperature and operating temperatures are 100% verified.
Sensors are statistically selected during the course of production and subjected to **monitoring tests** on all qualified characteristics.

■ **Customer returns**
Returned ultrasonic sensors are subjected to systematic analysis and corrective actions are implemented to eliminate recurrence of the fault.

Conformity to standards

The OsiSense XX ultrasonic sensors conform to the standards IEC 60947-5-2.
Standards and characteristics: refer to pages 6/17, 6/19, 6/21 et 6/23.

Resistance to chemicals in the environment

To ensure lasting efficient operation, it is essential that any chemicals coming into contact with the ultrasonic sensors will not affect their casing and, in doing so, prevent their reliable operation.

Due to the materials used, OsiSense XX ultrasonic sensors are very resistant to:

■ Chemical agents:
salts, aliphatic and aromatic oils,
petroleum, diluted bases and acids.
Depending on their nature and concentration, tests should be carried out beforehand for the following chemical agents:
alcohols, ketones and phenols.

■ Food and beverage industry products:
vegetable oils, animal fats,
fruit juices,
milk proteins, etc.

Resistance to the environment

■ **IP 65**: protection against water jets.
Tested in accordance with IEC 60529: the device is subjected to water sprayed from a Ø 6.3 mm nozzle, at a flow rate of 12.5 litres/min for 3 min at a distance of 3 m.
No deterioration in either operating or insulation characteristics is permitted.

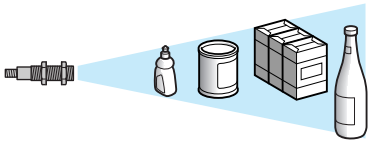
■ **IP 67**: protection against the effects of immersion.
Tested in accordance with IEC 60529: the sensor is immersed for 30 minutes in 1 m of water.
No deterioration in either operating or insulation characteristics is permitted.

■ **IP 69K**: protection against the effects of high pressure cleaning. Adherence to standard DIN 40050 which stipulates that the product must withstand a water jet at a pressure of 90 bar and temperature of +80°C for 3 minutes.
No deterioration in either operating or insulation characteristics is permitted.

Ultrasonic sensors
OsiSense XX

Recommendations
The ultrasonic sensors are designed for use in standard industrial applications involving presence detection.
Since these sensors do not incorporate a redundant electrical circuit, they are not suitable for use in safety applications.
For safety applications, please refer to our “Safety functions and solutions using Preventa” catalogue.

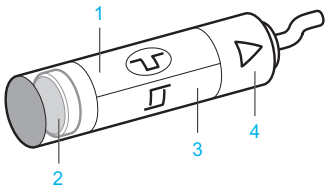
Principle of ultrasonic detection

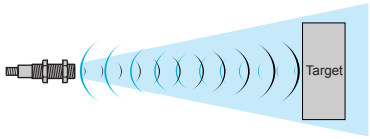


Presentation
Ultrasonic sensors enable detection, without contact, of any object irrespective of its:
- material (metal, plastic, wood, cardboard, etc.),
- nature (solid, liquid, powder, etc.),
- colour,
- degree of transparency.

They are used in industrial applications for detecting, for example:
- the position of machine parts,
- the presence of the windscreen during automobile assembly,
- the flow of objects on a conveyor system: glass bottles, cardboard packages, cakes, etc.,
- the level
  - of different colour paints in pots,
  - of plastic pellets in injection moulding machine feeders.

The ultrasonic sensors are simple to install due to their integral connector and availability of cabling and fixing accessories.





Operating principle
The principle of ultrasonic detection is based on measuring the time taken between transmission of an ultrasonic wave (pressure wave) and reception of its echo (return of transmitted wave).

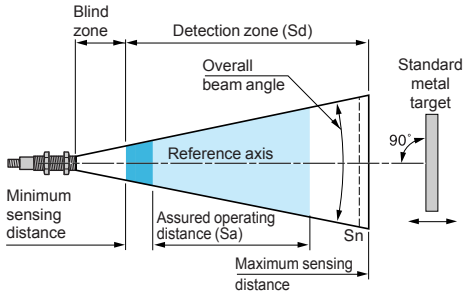
OsiSense XX ultrasonic sensors comprise:
1 a high voltage generator
2 a piezoelectric transducer (transmitter and receiver)
3 a signal processing stage
4 an output stage

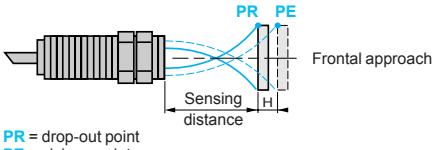
Excited by the high voltage generator 1, the transducer (transmitter-receiver) 2 generates a pulsed ultrasonic wave (200 to 500 kHz depending on the product) which travels through the ambient air at the speed of sound. When the wave strikes an object, it reflects (echo) and travels back towards the transducer. A micro controller 3 analyses the signal received and measures the time interval between the transmitted signal and the echo. By comparison with the preset or taught times, it determines and controls the output states 4.
The output stage 4 controls a solid-state switch (PNP or NPN transistor) corresponding to a NO or NC contact (detection of object).

Advantages of ultrasonic detection
- No physical contact with the object to be detected, therefore, no wear and detection possible of fragile and/or freshly painted objects, etc.
- Detection of any material, irrespective of colour, at the same distance, without adjustment or correction factor.
- Teach mode function, by simply pressing a button, for defining the effective detection zone. Teaching of the minimum and maximum sensing distances (very precise foreground and background suppression, ± 6 mm).
- Very good resistance to industrial environments (robust products entirely encapsulated in resin).
- Solid-state units: no moving parts in the sensor, therefore, service life independent of the number of operating cycles.
- Various types of outputs to suit requirements:
  - Digital output for level control or detection of any type of object
  - Analogue output for controlling systems that require a signal that is proportional to the distance at which the object is detected.

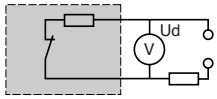
Ultrasonic sensors
OsiSense XX

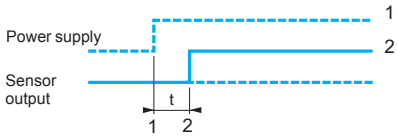
Terminology

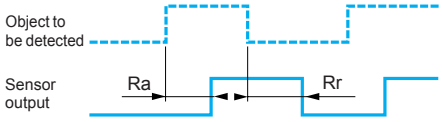




PR = drop-out point
PE = pick-up point







Definitions

The terms listed below are defined by the standard IEC 60947-5-2:

■ Nominal sensing distance (Sn)
Conventional value for indicating the sensing distance. It does not take into account manufacturing tolerances nor variations caused by external conditions such as voltage and temperature.

■ Detection zone (Sd)
Zone in which the sensor is sensitive to objects.

■ Minimum sensing distance
Lower limit of the specified detection zone.

■ Maximum sensing distance
Upper limit of the specified detection zone.

■ Assured operating distance (Sa)
This corresponds to the operating zone of the sensor (activation of outputs), and is included in the detection zone. It is also known as the “detection window”.
Its limits are fixed:
- at the factory for fixed sensing distance sensors,
- when setting-up within the application for sensors with teach mode.

■ Blind zone: Zone located in front of the sensing face of the sensor.
□ For diffuse sensors, it is the zone in which the object will not be reliably detected.
For reflex sensors, it is the zone in which the target (fixed background of machine for example) will not be reliably detected, but the object can be in this zone.
For thru-beam sensors, there is no blind zone.

■ Differential travel
The differential travel (H) or hysteresis is the distance between the pick-up point as the standard metal target moves towards the sensor and the drop-out point as it moves away from the sensor.

■ Repeat accuracy
The repeat accuracy (R) is the precision of reproduction between two successive measurements of the sensing distance, made in identical conditions.

■ Overall beam angle
Fixed angle around the reference axis of an ultrasonic proximity sensor.

■ Standard metal target
The standard IEC 60947-5-2 defines the standard target as a square metal plate, 1 mm thick with rolled finish, placed perpendicularly to the reference axis.
Its side dimension depends on the detection zone:

Detection zone (mm)	Size of target (mm)
< 300	10 x 10
300 < d < 800	20 x 20
> 800	100 x 100

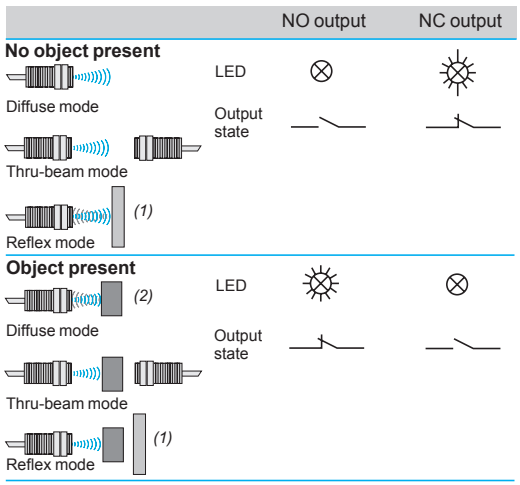
■ Voltage drop (Ud)
The voltage drop (Ud) corresponds to the voltage at the terminals of the sensor when in the closed state (value measured at the nominal current of the sensor).

■ First-up delay
Time required to ensure operation of the sensor’s output signal following power-up.
1 *Power-up*
2 *Output signal state (0 or 1)*

■ Response time
□ Response time (Ra): time taken between the instant the object to be detected enters the active zone and the changing of the output signal state. This time limits the passing speed of the target in relation to its dimensions.
□ Recovery time (Rr): time taken between the object being detected leaving the active zone and the changing of the output signal state. This time limits the interval between 2 objects.

Ultrasonic sensors
OsiSense XX

Digital outputs



(1) Fixed background of machine
(2) Object

LED indicators

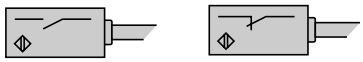
The majority of OsiSense XX ultrasonic sensors incorporate light-emitting diode output state indicators.

■ Ø 12 sensor
□ Green LED (power on)
□ Yellow LED (object present)

■ Ø 18 sensor, sensitivity 500 mm (except thru-beam versions XXT18 and XXR18)
□ □ Yellow LED (object present) or green LED (power on) + user assistance when adjusting the detection zone

■ Ø 30 sensor
□ Multicolour LED for assisting the user when adjusting the detection distance
□ Yellow LED (object present)
□ Analogue version with LED (object present, with luminosity increasing as output signal increases)

■ Parallelepiped format sensor
□ XXpF: Dual colour yellow (object present) or green (power on) LED
□ XXpV: Dual colour yellow (object present) or green (power on) LED + user assistance when adjusting the detection zone
□ XX7K: Yellow LED (object present); green LED (power on)
□ XXTK, XXRK: Yellow LED (object present) only
□ v XXpD: Yellow LED (object present); green LED (power on)
□ v Analogue version with LED (object present, with luminosity increasing as output signal increases)



NO contact NC contact

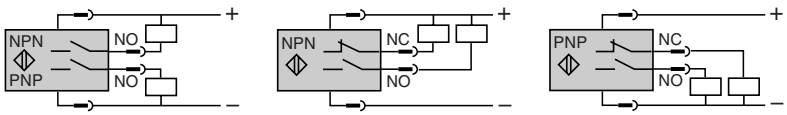
Sensors with digital switching

Output contact logic

■ NO contact (normally open)
Corresponds to a sensor whose output changes to the closed state when an object is present in the detection window.
■ NC contact (normally closed)
Corresponds to a sensor whose output changes to the open state when an object is present in the detection window.

4-wire technique ⎓

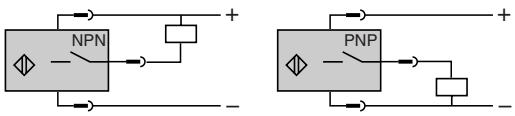
NO output/PNP and NPN | **NO + NC output/NPN** | **NO + NC output/PNP**



These sensors comprise 2 wires for the supply and 1 wire for each output signal

3-wire technique ⎓

NO output/NPN | **NO output/PNP**

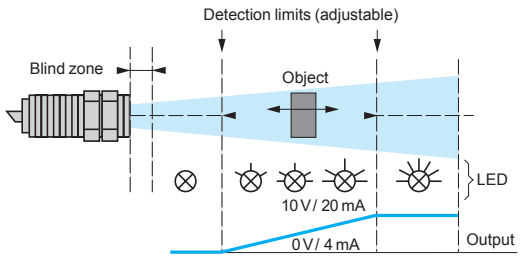


These sensors comprise 2 wires for the supply and 1 wire for the output signal,
PNP type: switching the positive side to the load.
NPN type: switching the negative side to the load.

Sensors with analogue output

Operation

The characteristic feature of these sensors is the output which delivers a signal (either current or voltage) that is proportional to the distance of the object being detected. Within the detection limits, which are adjustable using teach mode, the value of the output signal increases or decreases in relation to the distance of the object.
When an object is detected, an LED indicator (D) illuminates and its luminosity increases in relation to the value of the output signal. The slope of the signal can simply be changed by pressing the teach button

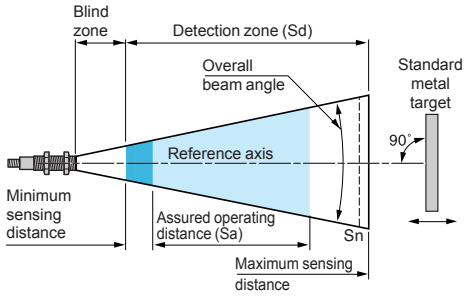


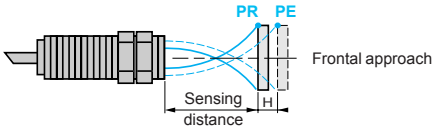
Advantages

■ Visual information available relating to the sensor/object distance.
■ Protection against reverse polarity.
■ Protection against overloads and short-circuits.
■ No residual current, low voltage drop.

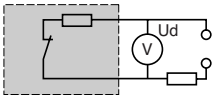
Ultrasonic sensors
OsiSense XX

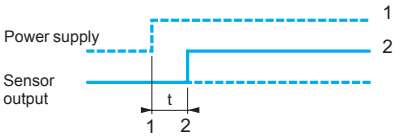
Terminology

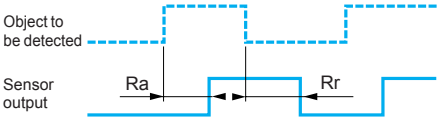




PR = drop-out point
PE = pick-up point







Definitions

The terms listed below are defined by the standard IEC 60947-5-2:

■ Nominal sensing distance (Sn)
Conventional value for indicating the sensing distance. It does not take into account manufacturing tolerances nor variations caused by external conditions such as voltage and temperature.

■ Detection zone (Sd)
Zone in which the sensor is sensitive to objects.

■ Minimum sensing distance
Lower limit of the specified detection zone.

■ Maximum sensing distance
Upper limit of the specified detection zone.

■ Assured operating distance (Sa)
This corresponds to the operating zone of the sensor (activation of outputs), and is included in the detection zone. It is also known as the “detection window”.
Its limits are fixed:
- at the factory for fixed sensing distance sensors,
- when setting-up within the application for sensors with teach mode.

■ Blind zone: Zone located in front of the sensing face of the sensor.
For diffuse sensors, it is the zone in which the object will not be reliably detected.
For reflex sensors, it is the zone in which the target (fixed background of machine for example) will not be reliably detected, but the object can be in this zone.
For thru-beam sensors, there is no blind zone.

■ Differential travel
The differential travel (H) or hysteresis is the distance between the pick-up point as the standard metal target moves towards the sensor and the drop-out point as it moves away from the sensor.

■ Repeat accuracy
The repeat accuracy (R) is the precision of reproduction between two successive measurements of the sensing distance, made in identical conditions.

■ Overall beam angle
Fixed angle around the reference axis of an ultrasonic proximity sensor.

■ Standard metal target
The standard IEC 60947-5-2 defines the standard target as a square metal plate, 1 mm thick with rolled finish, placed perpendicularly to the reference axis.
Its side dimension depends on the detection zone:

Detection zone (mm)	Size of target (mm)
< 300	10 x 10
300 < d < 800	20 x 20
> 800	100 x 100

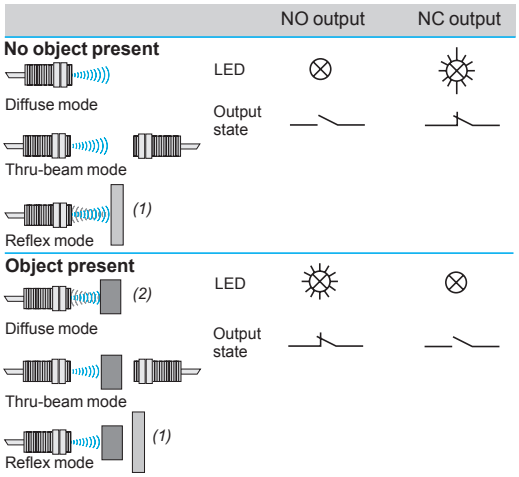
■ Voltage drop (Ud)
The voltage drop (Ud) corresponds to the voltage at the terminals of the sensor when in the closed state (value measured at the nominal current of the sensor).

■ First-up delay
Time required to ensure operation of the sensor’s output signal following power-up.
1 *Power-up*
2 *Output signal state (0 or 1)*

■ Response time
Response time (Ra): time taken between the instant the object to be detected enters the active zone and the changing of the output signal state. This time limits the passing speed of the target in relation to its dimensions.
Recovery time (Rr): time taken between the object being detected leaving the active zone and the changing of the output signal state. This time limits the interval between 2 objects.

Ultrasonic sensors
OsiSense XX

Digital outputs



(1) Fixed background of machine
(2) Object

LED indicators

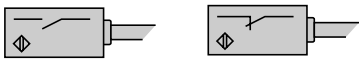
The majority of OsiSense XX ultrasonic sensors incorporate light-emitting diode output state indicators.

■ Ø 12 sensor
□ Green LED (power on)
□ Yellow LED (object present))

■ Ø 18 sensor, sensitivity 500 mm (except thru-beam versions XXT18 and XXR18)
□ Yellow LED (object present) or green LED (power on) + user assistance when adjusting the detection zone

■ Ø 30 sensor
□ Multicolour LED for assisting the user when adjusting the detection distance
□ Yellow LED (object present)
□ Analogue version with LED (object present, with luminosity increasing as output signal increases)

■ Parallelepiped format sensor
□ XX●F: Dual colour yellow (object present) or green (power on) LED
□ XX●V: Dual colour yellow (object present) or green (power on) LED + user assistance when adjusting the detection zone
□ XX7K: Yellow LED (object present); green LED (power on)
□ XXTK, XXRK: Yellow LED (object present) only
□ XX●D: Yellow LED (object present); green LED (power on)
□ Analogue version with LED (object present, with luminosity increasing as output signal increases)



NO contact NC contact

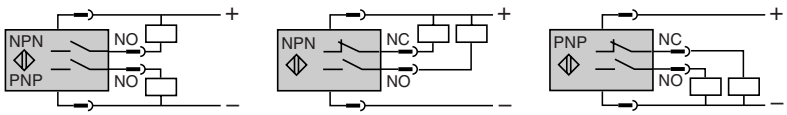
Sensors with digital switching

Output contact logic

■ NO contact (normally open)
Corresponds to a sensor whose output changes to the closed state when an object is present in the detection window.
■ NC contact (normally closed)
Corresponds to a sensor whose output changes to the open state when an object is present in the detection window.

4-wire technique ⎓

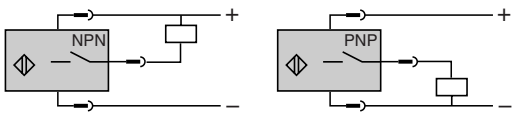
NO output/PNP and NPN | **NO + NC output/NPN** | **NO + NC output/PNP**



These sensors comprise 2 wires for the supply and 1 wire for each output signal

3-wire technique ⎓

NO output/NPN | **NO output/PNP**

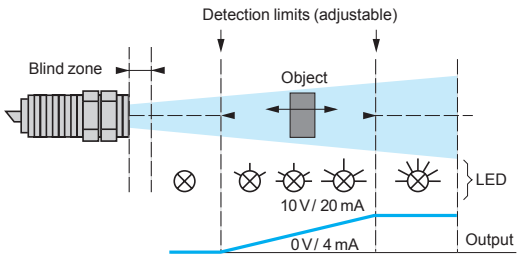


These sensors comprise 2 wires for the supply and 1 wire for the output signal,
PNP type: switching the positive side to the load.
NPN type: switching the negative side to the load.

Sensors with analogue output

Operation

The characteristic feature of these sensors is the output which delivers a signal (either current or voltage) that is proportional to the distance of the object being detected. Within the detection limits, which are adjustable using teach mode, the value of the output signal increases or decreases in relation to the distance of the object.
When an object is detected, an LED indicator (D) illuminates and its luminosity increases in relation to the value of the output signal. The slope of the signal can simply be changed by pressing the teach button



Advantages

■ Visual information available relating to the sensor/object distance.
■ Protection against reverse polarity.
■ Protection against overloads and short-circuits.
■ No residual current, low voltage drop.

Ultrasonic sensors
OsiSense XX

Power supply

Sensors for DC circuits

■ **DC source:** Check that the voltage limits of the sensor and the acceptable level of ripple, are compatible with the supply used.

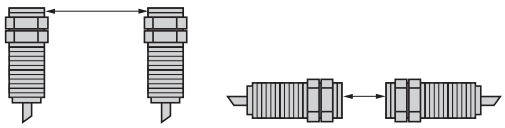
■ **AC source** (comprising transformer, rectifier, smoothing capacitor): The supply voltage must be within the operating limits specified for the sensor.

Where the voltage is derived from a single phase AC supply, the voltage must be rectified and smoothed to ensure that:
- the peak voltage of the DC supply is lower than the maximum voltage rating of the sensor.
Peak voltage = nominal voltage x √2
- the minimum voltage of the supply is greater than the minimum voltage rating of the sensor, given that:
ΔV = (I x t) / C
ΔV = max. ripple: 10% (V),
I = anticipated load current (mA),
t = period of 1 cycle (10 ms full-wave rectified for a 50 Hz supply frequency),
C = capacitance (µF).
As a general rule, use a transformer with a lower secondary voltage (Ue) than the required DC voltage (U).

Example:
18 V ∼ to obtain 24 V ⎓ ,
36 V ∼ to obtain 48 V ⎓.

Setting-up precautions

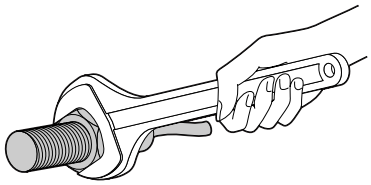
For diffuse sensors:



Mounting

Mounting distance between ultrasonic sensors

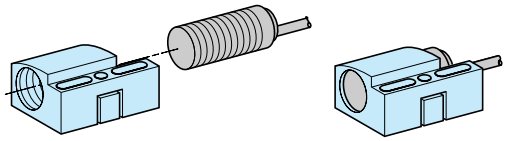
If 2 standard sensors are mounted too close to each other, the wave transmitted by one sensor is likely to interfere with the other and result in erratic operation.
In order to avoid this, it is necessary to adhere to the minimum distances between sensors. See setting-up precautions on page 6/30.



Maximum tightening torque

Cylindrical sensors	Diameter mm	Tightening torque
XX●12●	Ø 12	0.7 N.m/ 0.52 lb-ft
XX●18●	Ø 18	1 N.m/ 0.74 lb-ft
XX●30●	Ø 30	1.35 N.m/ 1 lb-ft
XX●V3●	Ø 30	1.35 N.m/ 1 lb-ft

Flat sensors	Screw	Tightening Torque
XX●F●	M3	0.7 N.m/ 0.52 lb-ft
XX●K●	M4	1 N.m/ 0.74 lb-ft
XX●V●	M3	0.7 N.m/ 0.52 lb-ft
	Ø 18	1 N.m/ 0.74 lb-ft



XSZB1●●

Interchangeability

Interchangeability is made easy by using **indexed** fixing clamps:
XSZB112 (Ø 12 mm),
XSZB118 (Ø 18 mm),
XSZB130 (Ø 30 mm).

Cabling

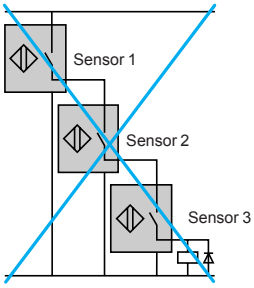
Electrical connection

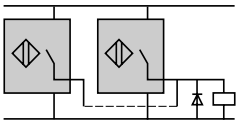
■ **Connect the sensor before switching on the supply**

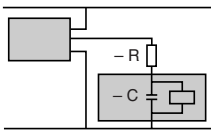
■ **Length of cable**
No limitation up to 200 m or up to a line capacitance of < 0.1 µF.
It is, however, advisable to take into account the voltage drop on the line.

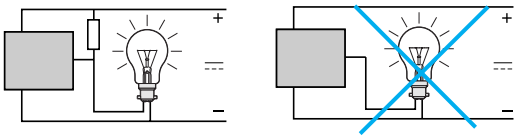
■ **Separation of control and power cables**
The sensors are immune to electrical interference encountered in normal industrial conditions. Where extreme conditions of electrical "noise" could occur (large motors, spot welders, etc.), it is advisable to protect against transients in the normal way:
- suppress interference at source,
- separate power and control wiring from each other,
- smooth the supply,
- limit the length of cable.

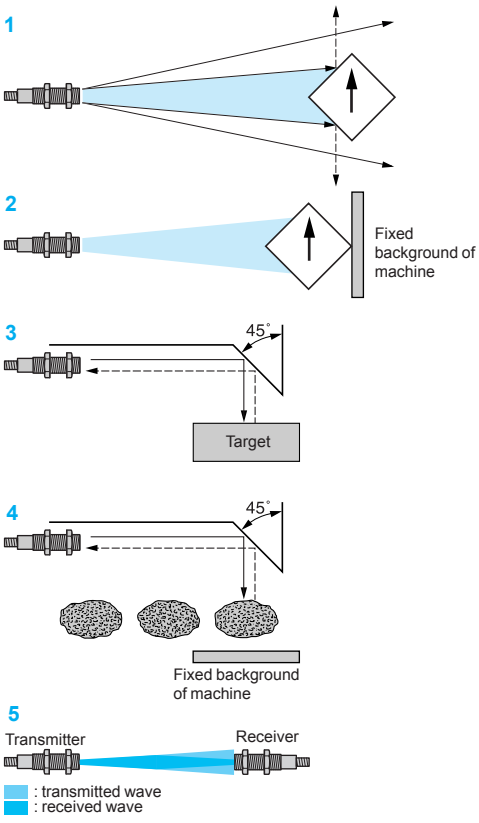
Setting-up precautions (continued)











Connection in series

This connection method is not recommended.

- Correct operation of the sensors cannot be assured and, if this method is used, tests should be made before installation.

The following points should be taken into account:
Sensor 1 carries the load current in addition to the no-load current consumption values of the other sensors connected in series. For certain models, this connection method is not possible unless a current limiting resistor is used.
When in the closed state, each sensor will produce a voltage drop and, therefore, the load voltage should be selected accordingly.
As sensor 1 closes, sensor 2 will not operate until a certain time "T" has elapsed (corresponding to the first-up delay) and likewise for the following sensors in the sequence.
"Flywheel" diodes should be used when the load being switched is inductive.

Sensors and units in series with an external mechanical contact

- The following points should be taken into account:

When the mechanical contact is open, the sensor is not supplied.
When the contact closes, the sensor will not operate until a certain time "T" has elapsed (corresponding to the first-up delay).

Connection in parallel

- No specific restrictions. The use of "flywheel" diodes is recommended when an inductive load (relay) is being switched.

Capacitive load (C > 0.1 mF)

- At switch-on, it is necessary to limit (by resistor) the charging current of the capacitive load C. The voltage drop in the sensor can also be taken into account by subtracting it from the supply voltage for calculation of R.

$$R = \frac{U\ (\text{supply})}{I\ \text{max.}\ (\text{sensor})}$$

Load comprising an incandescent lamp

- If the load comprises an incandescent lamp, the cold state resistance can be 10 times lower than the hot state resistance. This can cause very high current levels on switching. Fit a pre-heat resistance in parallel with the sensor.

$$R = \frac{U^2}{P} \times 10,\ U = \text{supply voltage and } P = \text{lamp power}$$

Detection

Influencing factors

The ultrasonic sensors are particularly suited for the detection of objects that are capable of reflecting an acoustic wave and, in general, having a flat surface perpendicular to the detection axis. However, the correct operation of the ultrasonic sensor can be disrupted by:
- air currents, which can accelerate or divert the acoustic wave transmitted by the sensor (ejection of part by air jet),
- high temperature gradients within the detection zone: an object emitting considerable heat can create zones of varying temperature that will modify the propagation time of the wave and thus prevent reliable operation,
- sound insulators: sound absorbing materials (cotton, fabrics, rubber, etc.),
- the angle between the face of the object to be detected and the reference axis of the sensor: when the angle is offset from 90°, the wave is no longer reflected back along the sensor axis and the operating distance is reduced. The greater the distance between the sensor and the target, the greater the effect. Detection is not possible when the angle exceeds ± 10°.
- the shape of the object to be detected: similar to the example above, an excessively angular object can be difficult to detect 1. In this case, use reflex mode detection.

Detection systems

Diffuse mode

In this mode, it is the object itself that reflects the ultrasonic wave back to the sensor which, in turn, switches its output. It is the most widely used and the most simple mode. In this mode, the object will not be detected in the blind zone.

Reflex or beam break mode

The sensor is in a permanently detecting state on a fixed background of the machine and when the object to be detected breaks the acoustic beam the output switches state 2. This mode is particularly recommended in cases where the shape of the object changes (irregular, angular, non perpendicular) and also for objects that absorb sound (see above). This mode can be achieved by using a diffuse mode sensor (with background teaching) or, more simply, by using a ready to use reflex mode sensor.
In cases where space is restricted, a reflector 3 and 4, angled at 45°, can be used. This system can be used for both the diffuse and reflex modes. This reflector can be a flat part of the machine or a separate element. In this mode, the background of the machine must not be within the blind zone. But if the object is within this zone, it will be reliably detected.

Thru-beam mode

Detection is achieved using both a transmitter and receiver, with the transmitter permanently transmitting an acoustic wave to the receiver. The breaking of the beam by the presence of an object switches the output of the receiver. This mode provides long detection distances 5.
In this mode there is no blind zone.

Ultrasonic sensors

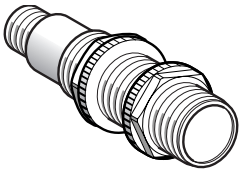
OsiSense XX, General purpose

Cylindrical, plastic or metal
DC supply, solid-state output

564546

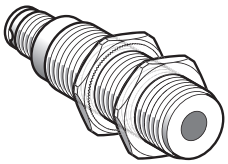
XX512A1KAM8

564547



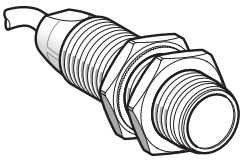
XX518A1KAM12

504422



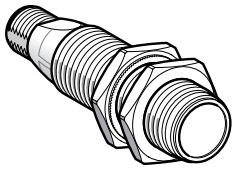
XXV18B1●●M12

537688



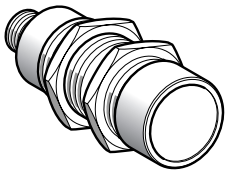
XX518A3●●L2

532713



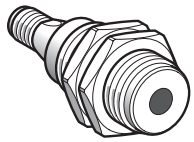
XX518A3●AM12

532243



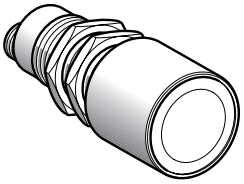
XX630A1●●●12
XX630A2●●●M12

537727



XX6V3A1●AM12

564531



XX630A3●CM12

Diffuse system

Fixed sensing distance sensors

Sensors	Sensing distance (Sn)	Function/output	Connection	Reference	Weight
	m				kg
Ø 12 Plastic	0.05	NO/PNP + NO/NPN	M8 connector	**XX512A1KAM8**	0.011
	0.10	NO/NPN	M8 connector	**XX512A2NAM8**	0.011
		NO/PNP	M8 connector	**XX512A2PAM8**	0.011
Ø 18 Plastic	0.15	NO/PNP + NO/NPN	M12 connector	**XX518A1KAM12**	0.033
Ø 18 Metal	0.05	NO/NPN	Pre-cabled (L = 2 m)	**XXV18B1NAL2**	0.110
			Pre-cabled (L = 5 m)	**XXV18B1NAL5**	0.200
			Pre-cabled (L = 10 m)	**XXV18B1NAL10**	0.340
			M12 connector	**XXV18B1NAM12**	0.050
		NO/PNP	Pre-cabled (L = 2 m)	**XXV18B1PAL2**	0.110
			Pre-cabled (L = 5 m)	**XXV18B1PAL5**	0.200
			Pre-cabled (L = 10 m)	**XXV18B1PAL10**	0.340
			M12 connector	**XXV18B1PAM12**	0.050
		NC/NPN	Pre-cabled (L = 2 m)	**XXV18B1NBL2**	0.110
			Pre-cabled (L = 5 m)	**XXV18B1NBL5**	0.200
			Pre-cabled (L = 10 m)	**XXV18B1NBL10**	0.340
			M12 connector	**XXV18B1NBM12**	0.050
		NC/PNP	Pre-cabled (L = 2 m)	**XXV18B1PBL2**	0.110
			Pre-cabled (L = 5 m)	**XXV18B1PBL5**	0.200
			Pre-cabled (L = 10 m)	**XXV18B1PBL10**	0.340
			M12 connector	**XXV18B1PBM12**	0.050

Adjustable sensing distance sensors

Ø 18 Plastic	0.50 (adjustable)	NO/NPN	Pre-cabled (L = 2 m)	**XX518A3NAL2**	0.080
		NO/PNP	Pre-cabled (L = 2 m)	**XX518A3PAL2**	0.080
		NO/NPN	M12 connector	**XX518A3NAM12**	0.033
		NO/PNP	M12 connector	**XX518A3PAM12**	0.033
Ø 30 Plastic	1 (adjustable)	NO/PNP + NO/NPN	M12 connector	**XX630A1KAM12**	0.090
		NO/NPN	M12 connector	**XX6V3A1NAM12**	0.090
		NO/PNP	M12 connector	**XX6V3A1PAM12**	0.090
		NO/NPN + NC/NPN	M12 connector	**XX630A1NCM12**	0.090
			M12 connector	**XX630S1NCM12** *(1)*	0.090
		NO/PNP + NC/PNP	M12 connector	**XX630A1PCM12**	0.090
			M12 connector	**XX630S1PCM12** *(1)*	0.090
	2 (adjustable)	NO/NPN + NC/NPN	M12 connector	**XX630A2NCM12**	0.090
		NO/PNP + NC/PNP	M12 connector	**XX630A2PCM12**	0.090
	8 (adjustable)	NO/NPN + NC/NPN	M12 connector	**XX630A3NCM12**	0.110
		NO/PNP + NC/PNP	M12 connector	**XX630A3PCM12**	0.110

(1) Stainless steel 303 case.

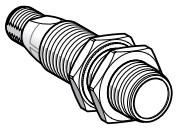
General: pages 6/6 to 6/13
Dimensions: pages 6/60 and 6/61
Schemes: pages 6/62 and 6/63
Setting-up and curves: pages 6/30 and 6/65

Ultrasonic sensors

OsiSense XX, General purpose

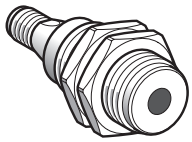
Cylindrical, plastic or metal
DC supply, solid-state output

532713



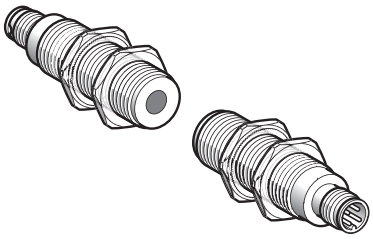
XXB18A3PAM12

537727



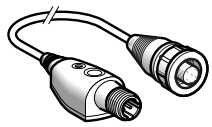
XXBV3A1PAM12

600810



XXT18● + XXR18● (thru-beam system)

564530



XXZPB100

Reflex system

Adjustable sensing distance sensors

Sensors	Sensing distance (Sn)	Function/output	Connection	Reference	Weight
	m				kg
Ø 18 Plastic	0.50 (adjustable)	NO/PNP	M12 connector	**XXB18A3PAM12**	0.033
Ø 30 Plastic	1 (adjustable)	NO/PNP	M12 connector	**XXBV3A1PAM12**	0.090

Thru-beam system

Sensors	Sensing distance (Sn)	Function/output	Connection	Reference	Weight
	m				kg
Ø 12					
Transmitter	0.20		M8 connector	**XXT12A8M8**	0.020
Receiver	0.20	NO/PNP + NO/NPN	M8 connector	**XXR12A8KAM8**	0.020
		NC/PNP + NC/NPN	M8 connector	**XXR12A8KBM8**	0.020
Ø 18					
Transmitter	0.61		M12 connector	**XXT18A3M12**	0.040
Receiver	0.61	NO/PNP + NO/NPN	M12 connector	**XXR18A3KAM12**	0.040
		NC/PNP + NC/NPN	M12 connector	**XXR18A3KBM12**	0.040
Transmitter	1		M12 connector	**XXT18A4M12**	0.040
Receiver	1	NO/PNP + NO/NPN	M12 connector	**XXR18A4KAM12**	0.040
		NC/PNP + NC/NPN	M12 connector	**XXR18A4KBM12**	0.040

Accessories

Teach pushbutton	For use with sensors	Reference	Weight kg
Selection of detection window **Input:** M12 female connector **Output:** M12 male connector	XX518A3●AM12, XXB18A3●AM12, XXBV3A1●AM12 and XX6V3A●AM12	**XXZPB100**	0.035

Other connection and fixing accessories

See page 6/24.

Ultrasonic sensors

OsiSense XX, General purpose

Cylindrical, plastic or metal
DC supply, solid-state output

Sensor type			XX5 12A1●	XX5 12A2●	XX● 12A8●	XXV 18B1●	XX5 18A1●	XX● 18A3● XX● 18A4●	XX5 18A3● XXB 18A3●	XX6 V3A1● XXB V3A1●	XX630A1● XX630A2● XX630S1●	XX6 30A3●
General characteristics												
Conformity to standards			CE,IEC 60947-5-2									
Product certifications			UL	UL	UL	cULus		UL	UL, cCSAus *(1)*	UL, cCSAus *(2)*		
Nominal sensing distance (Sn)		m	0.05	0.1	0.2	0.05	0.15	0.60 or 1 *(3)*	0.50	1	1 or 2 *(4)*	8
Blind zone (in diffuse mode the object is not detected in this zone, in reflex mode the background is not detected in this zone)		mm	0…6.4	0…6.4	–	0...2	0…19	–	0 ... 51 (XX518A3●) 0 ... 165 (XXB18A3●)	0 ...100 (XX6V3A1●) 0 ... 315 (XXBV3A1●)	0…51 (XX630●1 0...120 (XX630A2●)	0…300
Detection window		mm	Fixed						Remotely adjustable or by using external teach button		Adjustable using teach button on sensor	
Detection system	Diffuse		●	●	–	●	●	–	●	●	●	●
	Reflex		–	–	–	–	–	–	●	●	–	–
	Thru-beam		–	–	●	–	–	●	–	–	–	–
Transmission frequency (transmitter resonance)		kHz	500			360	200	300	300	180	200	75
Differential travel		mm	< 0.7	< 0.7	–	< 3	–	< 2.5	< 2.5	< 2.5	< 2.5	< 12.7
Repeat accuracy		mm	± 0.7		± 0.79	± 1.5	± 0.79	± 1.27	± 1.27	± 1.6	± 0.87	± 2.54
Overall beam angle (see detection lobe)			11°	10°	10°	10°	20	6°	6°	7°	10°	16°
Minimum size of object to be detected	Cylinder Ø (in mm), at distance (in mm)		Ø 2.5 at 38	Ø 2.5 at 50	Ø 12 at 200	Ø 2.5 at 20	Ø 1.6 at 63	Ø 38 at 600 Ø 114 at 1000	Ø 2.5 at 150	Ø 50 at 1000	Ø 1.6 at 635	Ø 51 at 4732
Deviation angle from 90° of the object to be detected			± 10°	± 10°	–	± 8°	± 10°	–	± 7°	± 5°	± 7° or ± 10° *(4)*	± 5°
Materials	Case		ULTEM®			Nickel plated brass	ULTEM®	ULTEM®	Valox®	Valox®	ULTEM®	ULTEM®
			Stainless steel 303 for XX630AS1●●●●									
	Sensing face *(5)*		Epoxy			Epoxy	Silicone	Silicone	Epoxy	Epoxy	Silicone	Epoxy
Connection	Connector		M8, 4-pin	M8, 3-pin	M8, 4-pin	M12, 4-pin	M12, 4-pin	M12, 4-pin	M12, 4-pin	M12, 4-pin	M12, 4-pin	M12, 4-pin
	Pre-cabled (wire c.s.a.)		–	–	–	3 x 0.34 mm^2/ *AWG 22*	–	–	4 x 0.08 mm^2/*AWG 28*	–	–	–

(1) Only XX518A3● sensors are cCSAus certified.
(2) Only XX6V3A1●, XX630A1●, XX630A2●, XX630S1● and XX630A3● sensors are cCSAus certified.
(3) The first value is given for XX●18A3●, the second value for XX●18A4●.
(4) The first value is given for XX630A1● and XX630S1●, the second value for XX630A2●.
(5) Silicone face for optimum chemical resistance.

Ultrasonic sensors

OsiSense XX, General purpose

Cylindrical, plastic or metal
DC supply, solid-state output

Sensor type			XX5 12A1●	XX5 12A2●	XX● 12A8●	XXV 18B1●	XX5 18A1●	XX● 18A3 XX● 18A4●	XX5 18A3● XXB 18A3●	XX6 V3A1● XXB V3A1●	XX630A1● XX630A2● XX630S1●	XX6 30A3●
Supply characteristics												
Rated supply voltage		V	12…24 V ⎓ with protection against reverse polarity									
Voltage limits (including ripple)		V	10…28 V ⎓			10…36 V ⎓	10…28 V ⎓					
Current consumption, no-load		mA	25		50	15	60	40	40	60	50 or 100 *(1)*	50
Output characteristics												
LED indicators	Output state		Yellow LED				–	–	Yellow LED			
	Power on		Green LED			–	–	–	Green LED			
	Setting-up assistance		–	–	–	–	–	–	Multicolour LED			
Switching capacity (with overload and short-circuit protection)		mA	< 100			< 200	< 100					
Voltage drop		V	< 1 (NPN); < 1.5 (PNP); 1.1 for XX●12A8, < 2 for XXV18B1●; 0.5 for XX630A2●									
Maximum switching frequency		Hz	125	125	125	80	80	40	40	70	10 or 16 *(1)*	2
Delays	First-up	ms	20	20	20	5	350	100	100	75	720	800
	Response	ms	2	3	0.4	4	3	10	10	15	20 or 25 *(1)*	200
	Recovery	ms	2	3	0.4	4	3	10	10	75	20	200
Environment characteristics												
Degree of protection	Conforming to IEC 60529 and IEC 60947-5-2		IP 67			IP 65, IP 67 or IP 69K *(2)*	IP 67	IP 67	IP 67	IP 67	IP 65 or IP 67 *(1)*	IP 67
Storage temperature		°C	- 40…+ 80									
Operating temperature		°C	- 20…+ 65			0 …+ 60	0 …+ 50	0 …+ 60	- 20 …+ 65	0 …+ 70	0…+ 60 or 0...+ 50 *(1)*	- 20 …+ 60
Vibration resistance	Conforming to IEC 60068-2-6		Amplitude ± 1 mm (f = 10…55 Hz); ± 2 mm for XXV18B1●									
Mechanical shock resistance	Conforming to IEC 60068-2-27		30 gn, duration 11 ms, in all 3 axes 50 gn, duration 11 ms, in all 3 axes for XXV18B1●									
Resistance to electromagnetic interference			Conforming to IEC 60947-5-2									

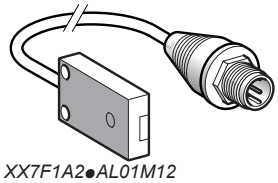
(1) The first value is given for XX630A1● and XX630S1●, the second value for XX630A2●.
(2) Double insulation for pre-cabled sensors. IP 69K for sensors with M12 connector.

Ultrasonic sensors

OsiSense XX, General purpose

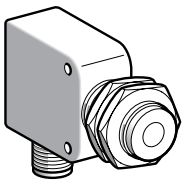
Flat format, plastic
DC supply, solid-state output

564439



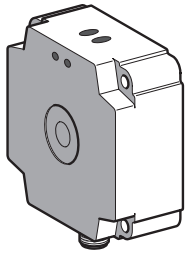
XX7F1A2●AL01M12

564441



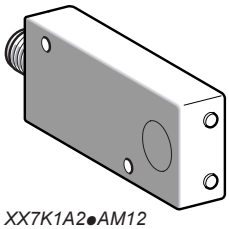
XX7V1A1●AM12
XXBV1A1PAM12

DF537726



XX8D1A1●AM12
XXBD1A1PAM12

564440



XX7K1A2●AM12

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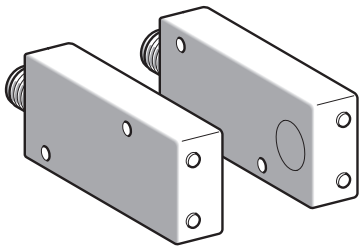
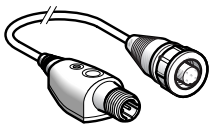


XX7K1A2●AM12 + XX7K1A2●AM12 (thru-beam system)

564530



XXZPB100

Diffuse system

Fixed sensing distance sensors

Sensors	Sensing distance (Sn)	Function/output	Connection	Reference	Weight
mm	m				kg
7.6 x 19 x 33	0.10	NO/NPN	152 mm flying lead + M12 connector	**XX7F1A2NAL01M12**	0.040
		NO/PNP	152 mm flying lead + M12 connector	**XX7F1A2PAL01M12**	0.040
16 x 30 x 74	0.25	NO/NPN	M12 connector	**XX7K1A2NAM12**	0.050
		NO/PNP	M12 connector	**XX7K1A2PAM12**	0.050

Adjustable sensing distance sensors

Sensors	Sensing distance (Sn)	Function/output	Connection	Reference	Weight
mm	m				kg
18 x 33 x 60 + Ø 18	0.50 (adjustable)	NO/NPN	M12 connector	**XX7V1A1NAM12**	0.060
		NO/PNP	M12 connector	**XX7V1A1PAM12**	0.060
80 x 80 x 34	1 (adjustable)	NO/NPN	M12 connector	**XX8D1A1NAM12**	0.300
		NO/PNP	M12 connector	**XX8D1A1PAM12**	0.300

Reflex system

Adjustable sensing distance sensors

Sensors	Sensing distance (Sn)	Function/output	Connection	Reference	Weight
mm	m				kg
18 x 33 x 60 + Ø 18	0.50 (adjustable)	NO/PNP	M12 connector	**XXBV1A1PAM12**	0.060
80 x 80 x 34	1 (adjustable)	NO/PNP	M12 connector	**XXBD1A1PAM12**	0.300

Thru-beam system

Sensors	Sensing distance (Sn)	Function/output	Connection	Reference	Weight
mm	m				kg
7.6 x 19 x 33					
Transmitter	0.20		152 mm flying lead + M12 connector	**XXTF1A8M12L**	0.030
Receiver	0.20	NO/PNP + NO/NPN	152 mm flying lead + M12 connector	**XXRF1A8KAM12L**	0.030
		NC/PNP + NC/NPN	152 mm flying lead + M12 connector	**XXRF1A8KBM12L**	0.030
16 x 30 x 74					
Transmitter	0.61		M12 connector	**XXTK1A3M12**	0.060
Receiver	0.61	NO/PNP + NO/NPN	M12 connector	**XXRK1A3KAM12**	0.060
		NC/PNP + NC/NPN	M12 connector	**XXRK1A3KBM12**	0.060
Transmitter	1		M12 connector	**XXTK1A4M12**	0.060
Receiver	1	NO/PNP + NO/NPN	M12 connector	**XXRK1A4KAM12**	0.060
		NC/PNP + NC/NPN	M12 connector	**XXRK1A4KBM12**	0.060

Accessories

Description	For use with sensor	Reference	Weight kg
Teach pushbutton **Selection of detection window** **Length of cable:** 152 mm **Input:** M12 female connector **Output:** M12 male connector	XX7V1A1●AM12, XX8D1A1●AM12, XXBV1A1●AM12 and XXBD1A1●AM12	**XXZPB100**	0.035

Other connection and fixing accessories

See page 6/24.

Ultrasonic sensors

OsiSense XX, General purpose

Flat format, plastic

DC supply, solid-state output

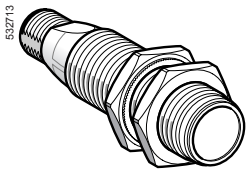
Sensor type			XX7F●	XXTF● XXRF●	XX7K●	XXTK● XXRK●	XX7V● XXBV1●	XX8D● XXBD●
General characteristics								
Conformity to standards			CE, IEC 60947-5-2					
Product certifications			UL, cCSAus	UL	cCSAus	UL	UL, cCSAus *(1)*	UL, cCSAus *(1)*
Nominal sensing distance (Sn)		**m**	0.1	0.2	0.25	0.6 (XX●K1A3) 1 (XX●K1A4)	0.5	1
Blind zone (in diffuse mode the object is not detected in this zone, in reflex mode the background is not detected in this zone)		**mm**	0…6.4	–	0…51	–	0 ... 51 (XX7V1●) 0 ... 165 (XXBV1●)	0 ... 100 (XX8D●) 0 ... 315 (XXBD●)
Detection window			Fixed	Fixed	Fixed	Fixed	Remotely adjustable or by using teach button	
Detection system	Diffuse		●	–	●	–	●	●
	Reflex		–	–	–	–	●	●
	Thru-beam		–	●	–	●	–	–
Transmission frequency		**kHz**	500	500	500	200	300	180
Differential travel		**mm**	< 0.7	–	< 0.35	–	< 2.5	< 2.5
Repeat accuracy		**mm**	± 0.7	± 0.79	± 0.7	± 0.79	± 1.27	± 1.6
Overall beam angle (see detection lobe)			14°	10°	14°	20°	12°	7°
Minimum size of object to be detected			Cylinder Ø 2.5 mm or flat bar 1 mm wide up to 50 mm	Cylinder Ø 12.2 mm at a distance of 200 mm	Cylinder Ø 1.6 mm up to 76 mm	XX●K1A3: Cylinder Ø 38 mm at a sensing distance of 600 mm XX●K1A4: Cylinder Ø 114 mm at a distance of 1 m	Cylinder Ø 2.5 mm or flat bar 1 mm wide for a sensing distance of 150 mm	Cylinder Ø 50 mm up to 1 m
Materials	Case		ULTEM®	ULTEM®	ULTEM®	ULTEM®	Valox®	Valox®
	Sensing face *(2)*		Epoxy	Epoxy	Silicone	Silicone	Epoxy	Epoxy
Connection	Connector		M12, 4-pin, on 152 mm flying lead	M12, 4-pin, on 152 mm flying lead	M12, 4-pin	M12, 4-pin	M12, 4-pin	M12, 4-pin
Supply characteristics								
Rated supply voltage		**V**	12…24 V ⎓ with protection against reverse polarity					
Voltage limits (including ripple)		**V**	10…28 V ⎓					
Current consumption, no-load		**mA**	25	50	60	XX●K1A3: 60 XX●K1A4: 100	40	70
Output characteristics								
LED indicators	Output state		Yellow LED					
	Power on		Green LED			–	Green LED	
	Setting-up assistance		–	–	–	–	Multicolour LED	
Switching capacity	(PNP and NPN)	**mA**	< 100, NO or NC function					100
Voltage drop	(PNP and NPN)	**V**	< 1	< 1.1	< 1	< 1	< 1	< 1
Maximum switching frequency		**Hz**	100	125	80	125	40	72
Delays	First-up	**ms**	20	20	350	200	100	75
	Response	**ms**	4	4	5	5	10	15
	Recovery	**ms**	4	4	5	5	10	75
Environment characteristics								
Degree of protection	Conforming to IEC 60529 and IEC 60947-5-2		IP 67					
Storage temperature		**°C**	- 40…+ 80					
Operating temperature		**°C**	- 20…+ 65		0…+ 50	- 20…+ 65	- 20…+ 65	0…+ 70
Vibration resistance	Conforming to IEC 60068-2-6		Amplitude ± 1 mm (f = 10…55 Hz)					
Mechanical shock resistance	Conforming to IEC 60068-2-27		30 gn, duration 11 ms, in all 3 axes					
Resistance to electromagnetic interference			Conforming to IEC 60947-5-2					

(1) Only XX7V● and XX8D● sensors are cCSAus certified.
(2) Silicone face for optimum chemical resistance.

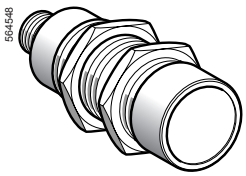
Ultrasonic sensors

OsiSense XX, Application

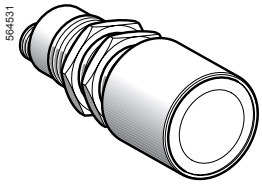
Plastic case, cylindrical type and flat format
Sensors with analogue output signal 0…10 V or 4-20 mA



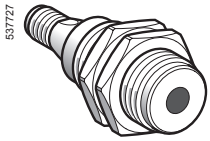
XX918A3●●M12



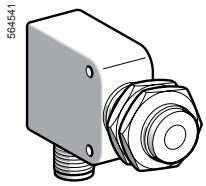
XX930A1A●M12



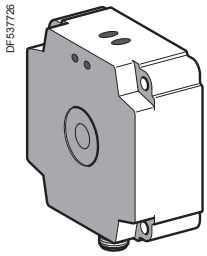
XX930A3A●M12



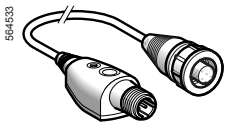
XX9V3A1●●M12



XX9V1A1●●M12



XX9D1A1●●M12



XXZPB100

Cylindrical sensors

Sensors	Sensing distance (Sn) m (adjustable)	Analogue output (Slope selection using teach button)	Reference	Weight kg
Standard analogue output				
Ø 18	0.5	4-20 mA	**XX918A3C2M12**	0.033
		0-10 V	**XX918A3F1M12**	0.033
Ø 30	1	4-20 mA	**XX930A1A2M12**	0.095
			XX930S1A2M12 *(1)*	0.095
		0-10 V	**XX930A1A1M12**	0.095
			XX930S1A1M12 *(1)*	0.095
		4-20 mA	**XX9V3A1C2M12**	0.090
		0-10 V	**XX9V3A1F1M12**	0.090
	2	4-20 mA	**XX930A2A2M12**	0.095
		0-10 V	**XX930A2A1M12**	0.095
	8	4-20 mA	**XX930A3A2M12**	0.115
		0-10 V	**XX930A3A1M12**	0.115
250 ms delayed analogue output (for unstable object)				
Ø 30	1	4-20 mA	**XX930A1A2230M12**	0.095
		0-10 V	**XX930A1A1230M12**	0.095
	2	4-20 mA	**XX930A2A2230M12**	0.095
		0-10 V	**XX930A2A1230M12**	0.095

Flat format sensors

Sensors	Sensing distance (Sn) m (adjustable)	Analogue output (Slope selection using teach button)	Reference	Weight kg
18 x 33 x 65 + Ø 18	0.5	4-20 mA	**XX9V1A1C2M12**	0.090
		0-10 V	**XX9V1A1F1M12**	0.060
80 x 80 x 34	1	4-20 mA	**XX9D1A1C2M12**	0.300
		0-10 V	**XX9D1A1F1M12**	0.300

Accessories

Teach pushbutton

Teach pushbutton	For use with sensors	Reference	Weight kg
Selection of detection window **Length of cable: 152 mm** **Input:** M12 female connector **Output:** M12 male connector	XX918A● XX9V3A● XX9D1A●	**XXZPB100**	0.035

Other connection and fixing accessories

See page 6/24.

(1) Stainless steel 303 case.

Ultrasonic sensors

OsiSense XX, Application

Plastic case, cylindrical type and flat format
Sensors with analogue output signal 0…10 V or 4-20 mA

Sensor type			XX918A3●	XX9V1A1●	XX930A1● XX930A2● XX930S1●	XX930A3●	XX9V3A1●	XX9D1A1●
General characteristics								
Conformity to standards			CE, IEC 60947-5-2					
Product certifications			UL, cCSAus	UL, cCSAus				
Nominal sensing distance (Sn)		m	0.5	0.5	1 or 2 *(1)*	8	1	1
Blind zone (no object must pass through this zone whilst the sensor is operating)		mm	0…51		0…51 or 0...120 *(1)*	0…203	0…100	0…100
Detection window		mm	Remotely adjustable or by using external teach button		Adjustable using teach button on sensor		Remotely adjustable or by using external teach button	
Transmission frequency		kHz	300		200	75	180	180
Repeat accuracy		mm	1.27		± 0.9	± 2.54	± 0.9	± 1.6
Overall beam angle (see detection lobe)			6°		10°	16°	7°	7°
Minimum size of object to be detected			Cylinder Ø 2.5 mm or flat bar 1 mm wide for a sensing distance of 150 mm		Cylinder Ø 1.6 mm up to a sensing distance of 635 mm	Cylinder Ø 50.68 mm up to a sensing distance of 4732 mm	Cylinder Ø 50 mm up to a sensing distance of 1 m	Cylinder Ø 50 mm up to a sensing distance of 1 m
Deviation angle from 90° of the object to be detected			± 7°		± 8°	± 5°	± 5°	± 5°
Materials	Case		Valox®		ULTEM®: XX930A1● and XX930A2● Stainless steel 303: XX930S1●	ULTEM®	Valox®	Valox®
	Sensing face *(2)*		Epoxy		Silicone	Epoxy		
Connection	Connector		M12, 4-pin					
Supply characteristics								
Rated supply voltage (with protection against reverse polarity)		V	12…24 V ⎓		15…24 V ⎓	15…24 V ⎓	15…24 V ⎓	15…24 V ⎓
Voltage limits (including ripple)		V	10…28 V ⎓					
Current consumption, no-load		mA	40	40	60 or 80 *(1)*	60	60	70
Output characteristics								
Slope type			Direct or inverse by using teach button, see page 6/31.					
LED indicators	Output state		Yellow LED					
	Power on		Green LED					
	Setting-up assistance		Dual colour LED					
Delays	First-up	ms	100	100	720	1200	75	75
Recovery time		ms	150	150	250 (delayed) 50 (standard)	250	180	180
Resistive load impedance	4-20 mA	Ω	10...500			10...500	10...350	10...350
	0-10 V	Ω	1 k...∞			1 k...∞	2 k...∞	2 k fixed
Environment characteristics								
Degree of protection	Conforming to IEC 60529 and IEC 60947-5-2		IP 67		IP 67	IP 65	IP 67	IP 67
Storage temperature		°C	- 40…+ 80					
Operating temperature		°C	- 20…+ 65		0…+ 50	- 20…+ 60	0…+ 70	0…+ 70
Vibration resistance	Conforming to IEC 60068-2-6		Amplitude ± 1 mm (f = 10…55 Hz)					
Mechanical shock resistance	Conforming to IEC 60068-2-27		30 gn, duration 11 ms, in all 3 axes					
Resistance to electromagnetic interference			Conforming to IEC 60947-5-2					

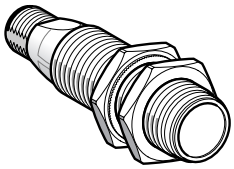
(1) The first value is given for XX930A1● and XX930S1●, the second value for XX930A2●.
(2) Silicone face for optimum chemical resistance.

Ultrasonic sensors

OsiSense XX, Application

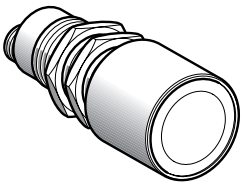
Sensors for monitoring 2 levels
Cylindrical plastic case, M18 x 1 and M30 x 1.5
DC supply, solid-state output

532713



XX218A3●●M12

537674



XX230A●1/●2●●●00M12

Sensors for monitoring levels

Sensors	Sensing distance (Sn)	Function/output	Reference	Weight
	m			kg
Ø 18, threaded M18 x 1				
2 emptying levels	0.5 (adjustable)	NO/NPN	**XX218A3NHM12**	0.035
		NO/PNP	**XX218A3PHM12**	0.035
2 filling levels	0.5 (adjustable)	NO/NPN	**XX218A3NFM12**	0.035
		NO/PNP	**XX218A3PFM12**	0.035
Ø 30, threaded M30 x 1.5				
2 levels 2 independent outputs	1 (adjustable)	NO/NPN + NO/NPN	**XX230A12NA00M12**	0.090
		NO/PNP + NO/PNP	**XX230A12PA00M12**	0.090
	2 (adjustable)	NO/NPN + NO/NPN	**XX230A22NA00M12**	0.090
		NO/PNP + NO/PNP	**XX230A22PA00M12**	0.090
2 emptying levels	1 (adjustable)	NO/PNP + NO/PNP	**XX230A10PA00M12**	0.090
	2 (adjustable)	NO/PNP + NO/PNP	**XX230A20PA00M12**	0.090
2 filling levels	1 (adjustable)	NO/PNP + NO/PNP	**XX230A11PA00M12**	0.090
	2 (adjustable)	NO/PNP + NO/PNP	**XX230A21PA00M12**	0.090

Accessories

Teach pushbutton

Teach pushbutton	For use with sensors	Reference	Weight kg
Selection of detection window **Length of cable:** 152 mm **Input**: M12 female connector **Output**: M12 male connector	XX218A3●	**XXZPB100**	0.035

Other connection and fixing accessories

See page 6/24.

Ultrasonic sensors

OsiSense XX, Application

Sensors for monitoring 2 levels
Cylindrical plastic case, M18 x 1 and M30 x 1.5
DC supply, solid-state output

Sensor type			XX218A3●●●●	XX230A1●●●●	XX230A2●●●●
General characteristics					
Conformity to standards			CE, IEC 60947-5-2		
Product certifications			UL, cCSAus	UL, cCSAus	UL, cCSAus
Nominal sensing distance (Sn)		**m**	0.50 (adjustable)	1 (adjustable)	2 (adjustable)
Blind zone (no object must pass through this zone whilst the sensor is operating)		**mm**	0…51	0…51	0…120
Detection window			Remotely adjustable or by using external teach button	Adjustable using teach button on sensor	
Transmission frequency		**kHz**	300	200	
Differential travel		**mm**	< 2.5	< 2.5	< 2.5
Repeat accuracy		**mm**	± 1.27	± 0.9	
Overall beam angle (see detection lobe)			6°	10°	10°
Minimum size of object to be detected			Cylinder Ø 2.5 mm up to a sensing distance of 150 mm	Cylinder Ø 1.6 mm up to a sensing distance of 305 mm	
Deviation angle from 90° of the object to be detected			± 7°	± 10° on 305 x 305 mm	
Materials	Case		Valox®	ULTEM®	
	Sensing face *(1)*		Epoxy	Silicone	
Connection	Connector		M12, 4-pin		
Supply characteristics					
Rated supply voltage		**V**	12…24 V ⎓ with protection against reverse polarity		
Voltage limits (including ripple)		**V**	10…28 V ⎓		
Current consumption, no-load		**mA**	40	100	
Output characteristics					
LED indicators	Output state		Yellow LED	Multicolour LED	
	Power on		Green LED	–	
	Setting-up assistance		Dual colour LED	Multicolour LED	
	Distance indication		–	Yellow LED	
Switching capacity		**mA**	< 100 (PNP and NPN) with overload and short-circuit protection		
Voltage drop		**V**	< 1 (PNP and NPN)		
Delays	First-up	**ms**	100	1000	1000
	Response	**ms**	15	150	150
	Recovery	**ms**	1000	1000	1000
Environment characteristics					
Degree of protection	Conforming to IEC 60529 and IEC 60947-5-2		IP 67	IP 65	
Storage temperature		**°C**	- 40…+ 80	- 10…+ 80	
Operating temperature		**°C**	- 20…+ 65	0…+ 50	
Vibration resistance	Conforming to IEC 60068-2-6		Amplitude ± 1 mm (f = 10…55 Hz)		
Mechanical shock resistance	Conforming to IEC 60068-2-27		30 gn, duration 11 ms, in all 3 axes		
Resistance to electromagnetic interference			Conforming to IEC 60947-5-2		

(1) Silicone face for optimum chemical resistance.

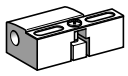
Ultrasonic sensors
OsiSense XX
Accessories

564533

XZCC12FD●40B

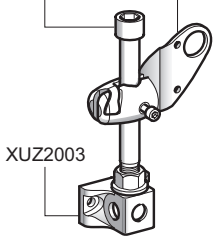
564534

XZCP1041L●

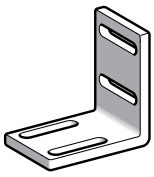
564535

XSZB11●

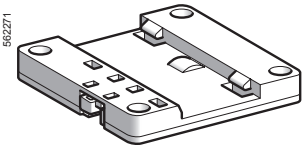
564532

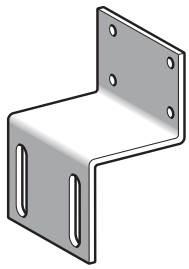
XUZA118

532417


3D fixing kit example

564542

XXZ1933

562271

XSZBD10

532250

XXZ3074S

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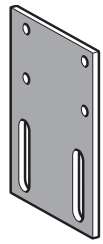

XXZ3074F

References of accessories

Cabling accessories

Connectors	For use with sensor	Type of connection		Reference	Weight kg
M8 3-pin	Ø 12	IDC (Insulation Displacement Connector)	Straight	**XZCC8FDM30V**	0.010
	XX512A2●		Elbowed	**XZCC8FCM30V**	0.010
M8 4-pin	XX512A1●		Straight	**XZCC8FDM40V**	0.010
	XX●12A8●		Elbowed	**XZCC8FCM40V**	0.010
M12	Ø 18, Ø 30	Screw terminals, metal clamping ring	Straight	**XZCC12FDM40B**	0.020
			Elbowed	**XZCC12FCM40B**	0.020
		Screw terminals, plastic clamping ring	Straight	**XZCC12FDP40B**	0.020
			Elbowed	**XZCC12FCP40B**	0.020

Pre-wired connectors	For use with sensor	Type	Cable length m	Reference	Weight kg
M8 3-pin	Ø 12 XX512A2●	Straight	2	**XZCP0166L2** *(1)*	0.080
		Elbowed	2	**XZCP0266L2** *(1)*	0.080
M12	Ø 18, Ø 30	Straight	2	**XZCP1141L2** *(1)*	0.090
		Elbowed	2	**XZCP1241L2** *(1)*	0.090

Fixing accessories

Description		For use with sensor	Reference	Weight kg
Fixing clamps		Ø 12	**XSZB112**	0.006
		Ø 18	**XSZB118**	0.010
		Ø 30	**XSZB130**	0.020
Fixing clamps (mounting on 35 mm ⎓ rail)		XX●D●	**XSZBD10**	0.065
90° fixing bracket		Ø 12	**XXZ12**	0.025
		Ø 18	**XUZA118**	0.038
		Ø 30	**XXZ30**	0.115
		XX7F	**XXZ1933**	0.025
Flat mounting plate		XX7K	**XXZ3074F**	0.025
Cranked mounting plate		XX7K	**XXZ3074S**	0.075
3D fixing kit *(2)*	M12 rod	Ø 12, Ø 18 and Ø 30	**XUZ2001**	0.050
	Support for M12 rod	Ø 12, Ø 18 and Ø 30	**XUZ2003**	0.160
	Ball-joint mounted fixing bracket	Ø 12	**XUZB2012**	0.175
		Ø 18	**XUZB2003**	0.175
		Ø 30	**XUZB2030**	0.160

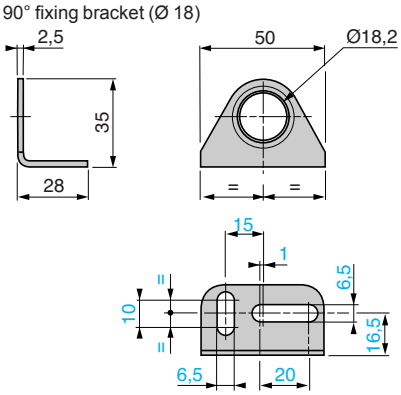
*(1) For a 5 m long cable replace **L2** by **L5**, for a 10 m long cable replace **L2** by **L10**.*
(2) To obtain a 3D fixing kit, order:
*rod support **XUZ2003**, M12 rod **XUZ2001** and ball-joint mounted fixing bracket **XUZB20●●***

Dimensions

Fixing accessories

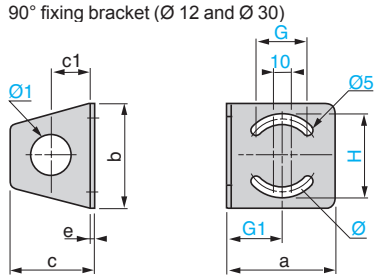
XUZA118

90° fixing bracket (Ø 18)



XXZ12, XXZ30

90° fixing bracket (Ø 12 and Ø 30)



XXZ	a	b	c	c1	e	H	G	G1	Ø	Ø1
12	35	40	33	18	2	31	18	18	25	13
30	67	65	52	25	3	51	35	33	50	31

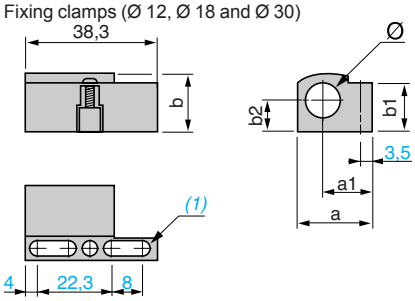
General:
pages 6/6 to 6/13

Dimensions *(continued)*

Fixing accessories *(continued)*

XSZB112, XSZB118

Fixing clamps (Ø 12, Ø 18 and Ø 30)

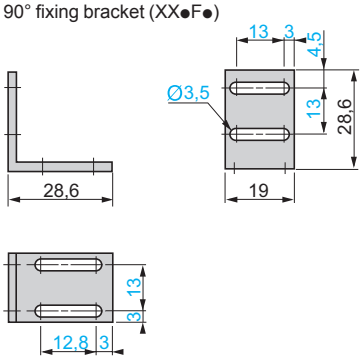


XSZ	a	a1	b	b1	b2	Ø
B112	21.9	14.5	16	15.5	8.5	12
B118	26	15.7	22.3	20.1	11.5	18
B130	39	21.7	35.5	31	18.5	30

(1) 2 elongated holes Ø 4 x 8.

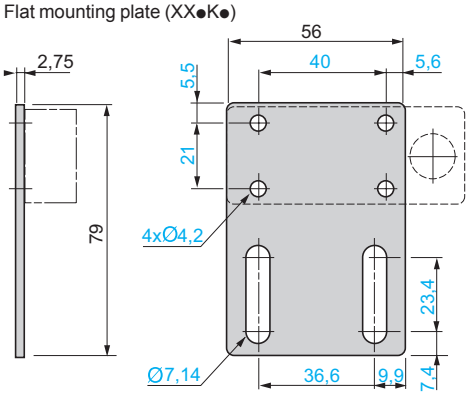
XXZ1933

90° fixing bracket (XX●F●)



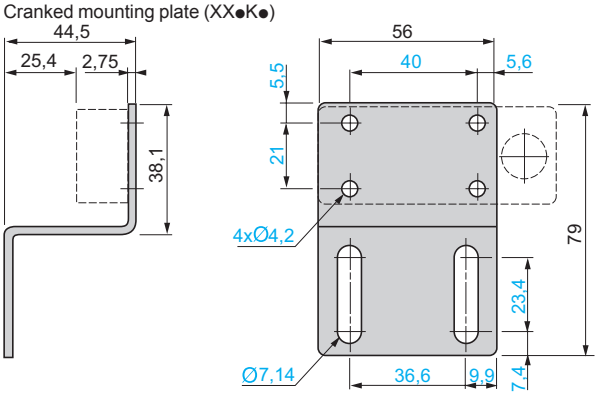
XXZ3074F

Flat mounting plate (XX●K●)



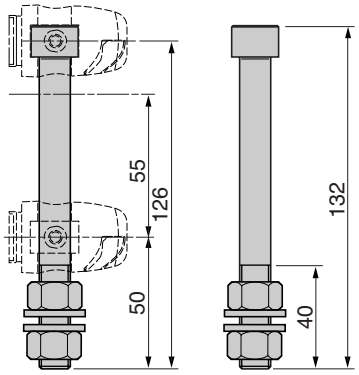
XXZ3074S

Cranked mounting plate (XX●K●)



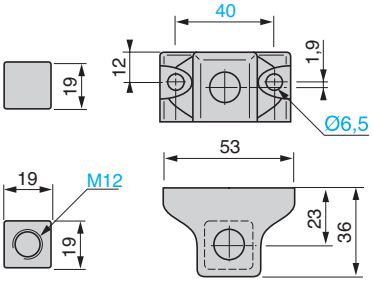
XUZ2001

M12 rod

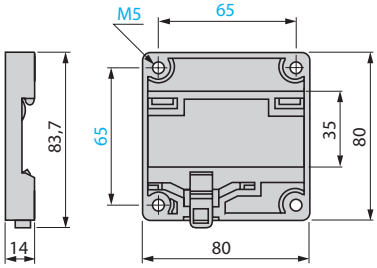


XUZ2003

Support for M12 rod

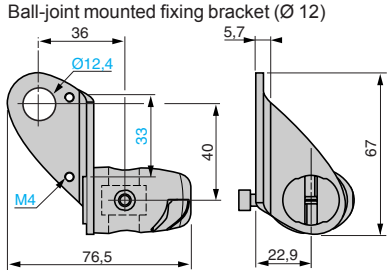


XSZBD10



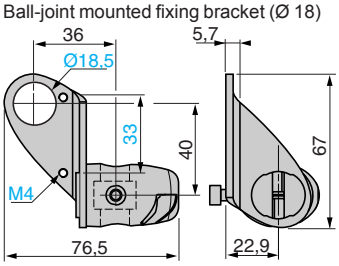
XUZB2012

Ball-joint mounted fixing bracket (Ø 12)



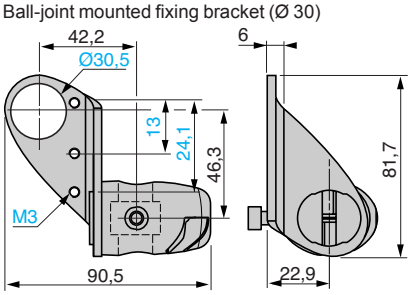
XUZB2003

Ball-joint mounted fixing bracket (Ø 18)



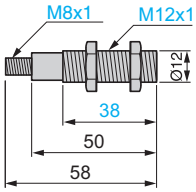
XUZB2030

Ball-joint mounted fixing bracket (Ø 30)

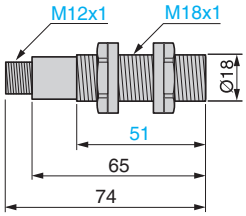


Dimensions

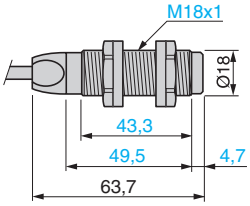
XX●12A●●●M8



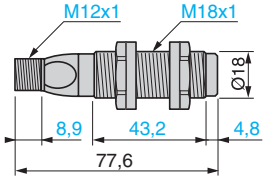
XX518A1KAM12
XXT18A●M12
XXR18A●●●●●



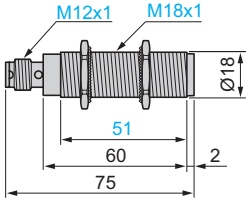
XX518A3●●L2



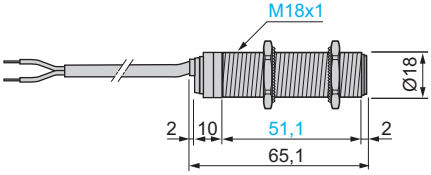
XX518A3●AM12
XXB18A3●AM12
XX918A3●AM12
XX218A3●●M12



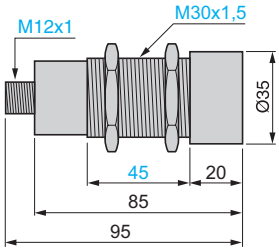
XXV18B1●●●M12



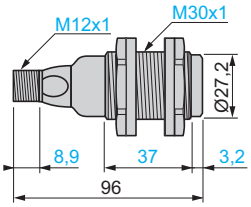
XXV18B1●●L●



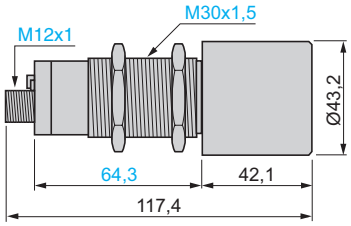
XX630A1●●M12
XX630S1●●M12
XX630A2●●M12
XX930A1A●M12
XX230A1●●A00M12
XX230A2●●A00M12



XX6V3A1●AM12
XXBV3A1●AM12
XX9V3A1●●M12

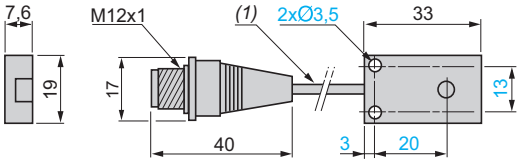


XX630A3●●M12
XX930A3A●M12



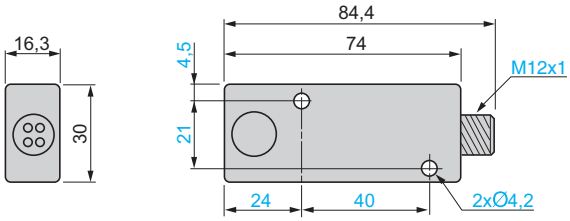
Dimensions

XX7F1A2●AL01M12
XXTF1A8●/XXR F1A8●

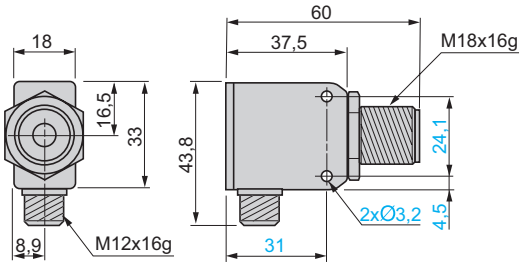


(1) Cable, length: 152 mm.

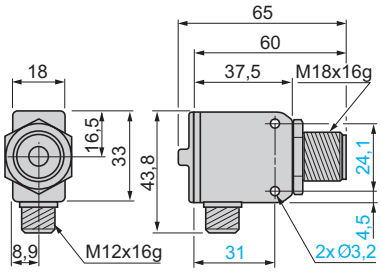
XX7K1A2●AM12
XXTK1A3●/A4●, XXRK1A3●/A4●



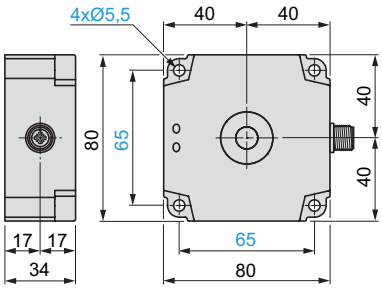
XX7V1A1●AM12
XXBV1A1●AM12



XX9V1A1●●M12

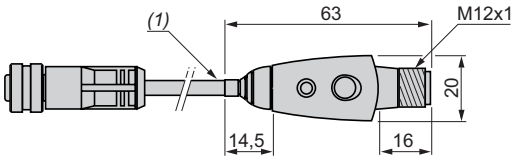


XX8D1A1●AM12
XXBD1A1●AM12
XX9D1A1●●AM12



XXZPB100

Teach pushbutton



(1) Cable, length: 152 mm.

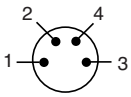
Ultrasonic sensors
OsiSense XX

Schemes

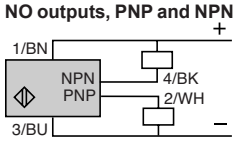
Digital output, Ø 12 sensor, M8 connector

XX512A1KAM8

4-wire type



NO outputs, PNP and NPN

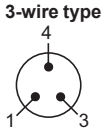


1 (+) 2 PNP output
3 (-) 4 NPN output

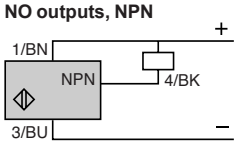
(-) BU (Blue) (+) BN (Brown)
WH (White) BK (Black)

XX512A2●

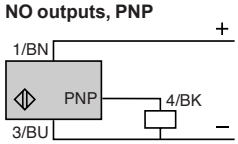
3-wire type



NO outputs, NPN



NO outputs, PNP



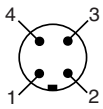
1 (+) 3 (-)
4 NPN or PNP output

(-) BU (Blue) (+) BN (Brown)
BK (Black)

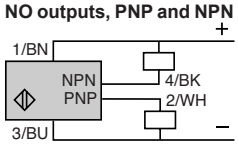
Digital output, Ø 18 sensor, M12 connector, Ø 30 (XX6V3●, XXBV3●)

XX518A1KAM12

4-wire type



NO outputs, PNP and NPN

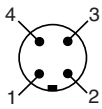


1 (+) 2 PNP output
3 (-) 4 NPN output

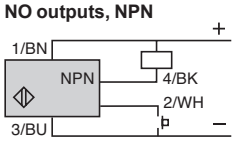
(-) BU (Blue) (+) BN (Brown)
WH (White) BK (Black)

XX518A3●, XXB18A3●, XX6V3●, XXBV3●, XX218A3●, XX7V1●, XXBV1●, XX8D1●, XXBD1●

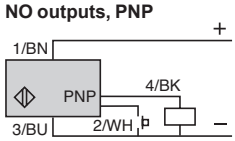
3-wire type



NO outputs, NPN



NO outputs, PNP

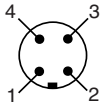


1 (+) 2 Teach input (WH)
3 (-) 4 NPN or PNP output

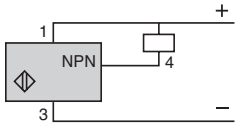
(-) BU (Blue) (+) BN (Brown)
BK (Black)

XXV18B1●●●M12

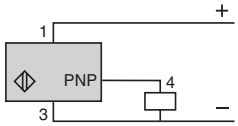
3-wire type



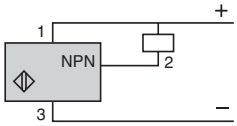
NO outputs, NPN



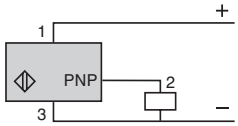
NO outputs, PNP



NC outputs, NPN



NC outputs, PNP

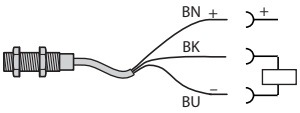


1 (+)
3 (-)

Digital output, Ø 18 sensor, pre-cabled

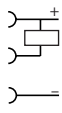
XXV18B1●● L●

3-wire type



PNP/NO, NC

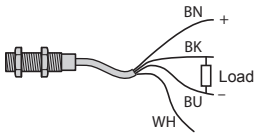
NPN/NO, NC



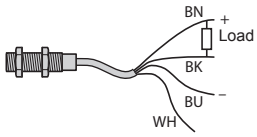
(-) BU (Blue) (+) BN (Brown) BK (Black)

XX518A3●● L2

PNP output



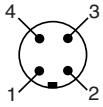
NPN output



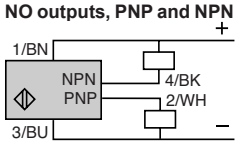
Digital output, Ø 30 sensor, M12 connector (XX630A●)

XX630A1KAM12

4-wire type



NO outputs, PNP and NPN

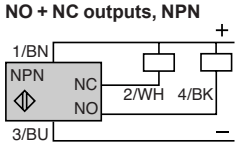


1 (+) 2 PNP output
3 (-) 4 NPN output

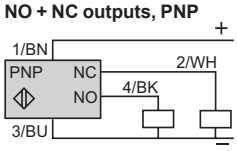
(-) BU (Blue) (+) BN (Brown)
WH (White) BK (Black)

XX630A●●●M12

NO + NC outputs, NPN



NO + NC outputs, PNP



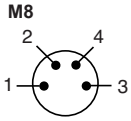
(-) BU (Blue) (+) BN (Brown)
WH (White) BK (Black)

Thru-beam sensors: XXT12●/XXR12●, XXT18●/XXR18●, XXTF1●/XXRF1●, XXTK1●/XXRK1●

Transmitter

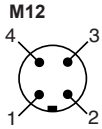
XXT12A8M8, XXT18A3M12, XXTF1A8M12L, XXTK1A●M12

M8

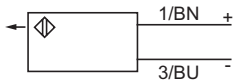


1 (+)
3 (-)

M12



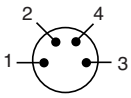
1 (+)
3 (-)



Receiver

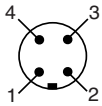
XXR12A8K●M8, XXRF1A8●K●M12L, XXRK1A●K●M12

M8



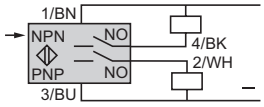
1 (+)
2 (PNP)
3 (-)
4 (NPN)

M12

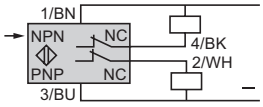


1 (+)
2 (PNP)
3 (-)
4 (NPN)

NPN, PNP, NO



NPN, PNP, NC

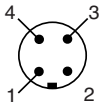


***Note**: See "NO output/NC output according to the detection mode" table on page 6/29.*

Schemes *(continued)*

M12 connector, digital output (XXF●, XXK●)

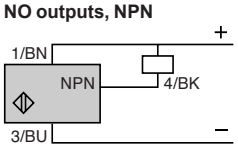
3-wire type



1 (+)
3 (-)
4 NPN or PNP output

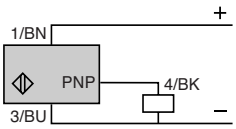
XX7F1A2NAL01M12 *(1)*, **XX7K1A2NAM12**

NO outputs, NPN



XX7F1A2PAL01M12 *(1)*, **XX7K1A2PAM12,**

NO outputs, PNP

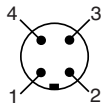


(-) BU (Blue)
(+) BN (Brown)
BK (Black)

(1) Remote connector on flying lead approximately 15 cm long.

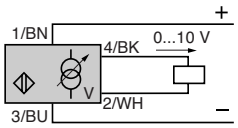
M12 connector, analogue output

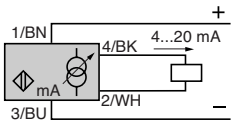
4-wire type



1 (+)
2 Return signal or teach
3 (-)
4 Output signal

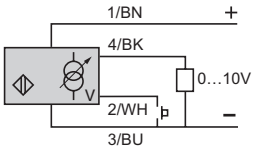
XX930A●/XX930S●

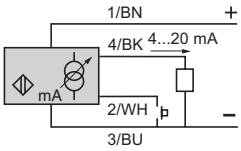




BN (Brown)
WH (White)
BU (Blue)
BK (Black)

XX918A●/XX9V1A●/XX9V3A●/XX9D1●



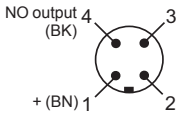


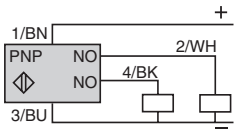
For impedance of resistive load refer to values on page 6/19.

Ø 30 sensor, 2 digital outputs for monitoring 2 levels

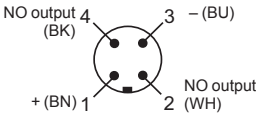
XX230A●0●/XX230A●1●

NO + NO outputs, PNP

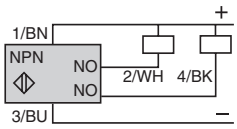




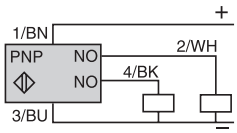
XX230A●2●



NO + NO outputs, NPN



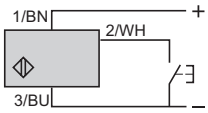
NO + NO outputs, PNP



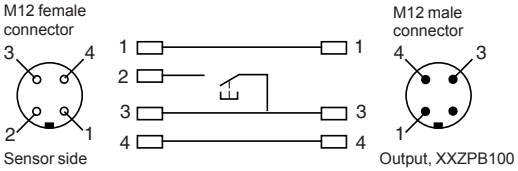
BN (Brown) WH (White) BU (Blue) BK (Black)

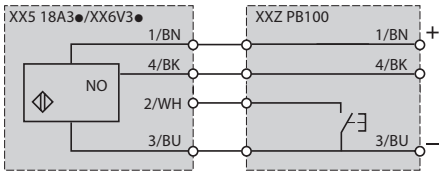
Wiring for teaching of detection window

Using external contact XX●18A3●/XX●V3●/XX●D1●



With XXZPB100





1 (+) BN (Brown)
2 WH (White)
3 (-) BU (Blue)
4 BK (Black)

Note: Terminal 2 must be disconnected during product use.

NO output/NC output according to the detection mode

		NO output	NC output
No object present	LED	⊗	⊗
Diffuse mode	Output state	⎽⎺	⎺⎽
Thru-beam mode			
Reflex mode *(1)*			
Object present	LED	⊗	⊗
Diffuse mode *(2)*	Output state	⎺⎽	⎽⎺
Thru-beam mode			
Reflex mode *(1)*			

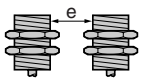
(1) Fixed background of machine
(2) Object

Setting-up precautions

Minimum mounting distances

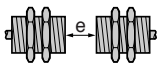
Diffuse sensors, cylindrical type

Side by side



e: respect the distances indicated on the detection curves

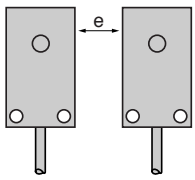
Face to face



e ≥ 4 x Sn

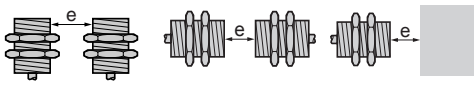
Diffuse sensors, flat format

Side by side



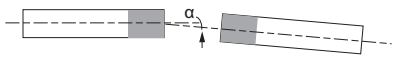
e: respect the distances indicated on the detection curves

XXV18●



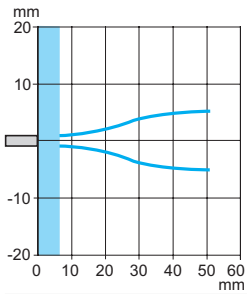
e > 25 mm e > 700 mm e > 60 mm

Thru-beam sensors

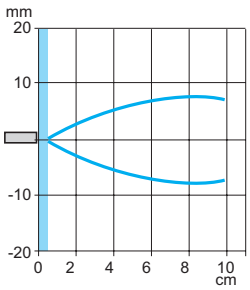


Sensors	α
XX●12●●/XX●F1●●	±5°
XX●18A3●●/XX●K1A3●●●	±8°
XX●18A4●●/XX●K1A4 XX●18A2●●/XX●K1A2	±10°

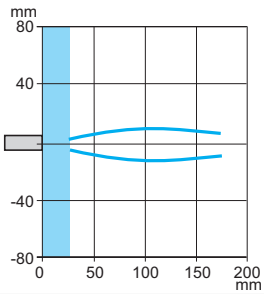
XX512A1KAM8



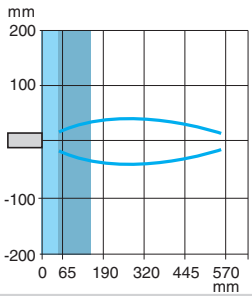
XX512A2●NAM8



XX518A1KAM12

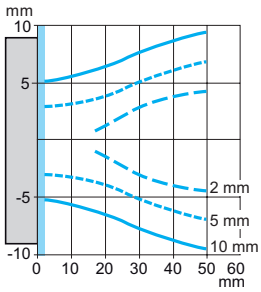


XX218A3●●M12, XX518A3●●L2, XXB18A3●AM12, XX518A3●AM12 XX7V1A1●AM12, XXBV1A1●AM12 XX918A3●●M12, XX9V1A1●●M12

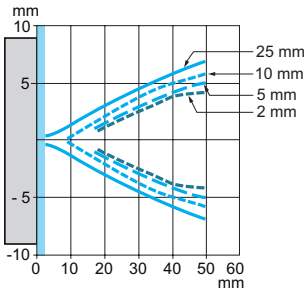


XXV18B1●

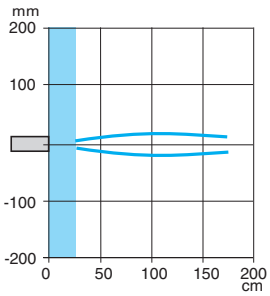
Square object



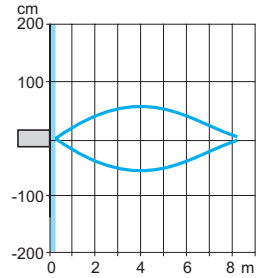
Cylindrical object



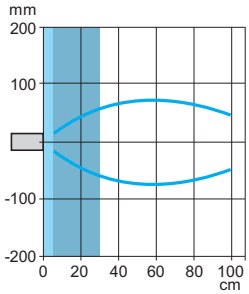
XX630A2●CM12



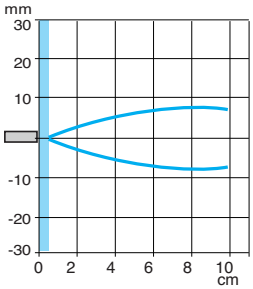
XX630A3●CM12 XX930A3●●M12



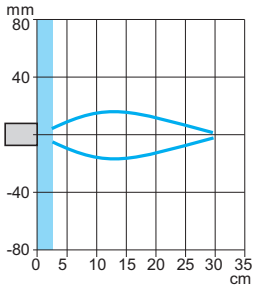
XX230A1●, XX630A1●CM12, XX6V3A1●AM12, XXBV3A1●AM12, XX930A1●●M12, XX9V3A1●●M12, XX8D1A1●AM12, XXBD1A1●AM12



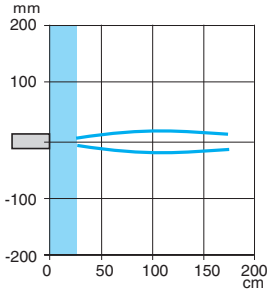
XX7F1A2● AL01M12



XX7K1A2● AM12



XX230A2●



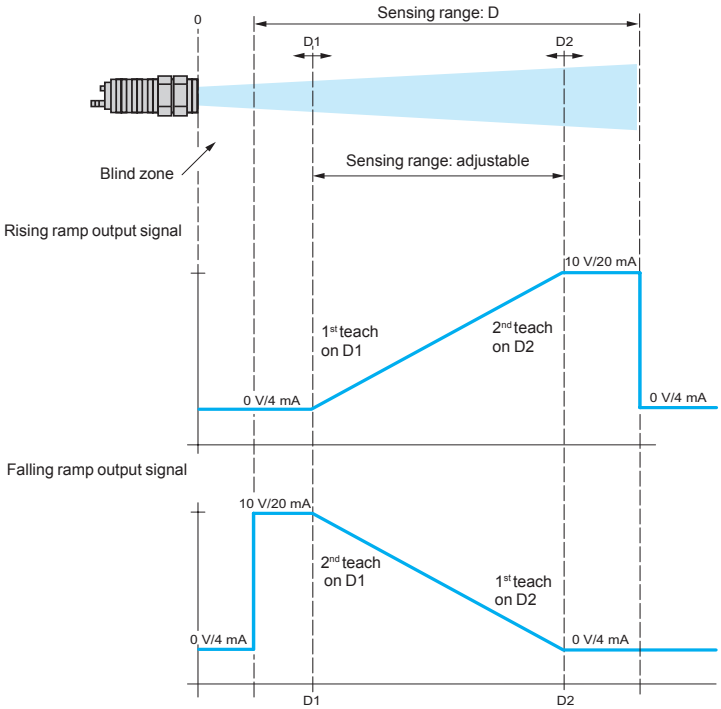
Blind zone for diffuse sensors.

Blind zone for reflex sensors.

General: pages 6/6 to 6/13
References: pages 6/14 to 6/20
Characteristics: pages 6/16 to 6/23
Dimensions: pages 6/60 and 6/61
Schemes: pages 6/62 and 6/63

Output signal curve

Sensors with analogue output signal 0... 10 V or 4-20 mA



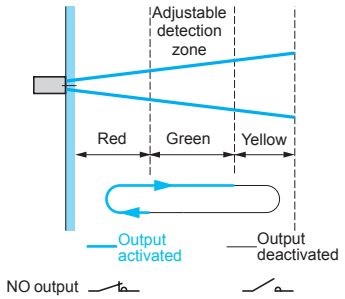
The direction of the slope of the signal is obtained by teaching the first limit:
- D1 for rising ramp
- D2 for falling ramp

Maximum deviation < 0.5%

Operating curves

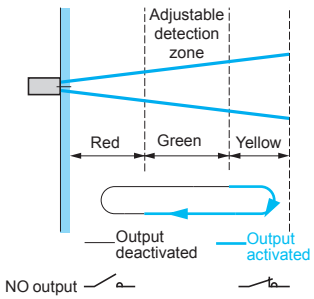
XX218A3●H●/XX230A●0●

Emptying (stored in high threshold memory)



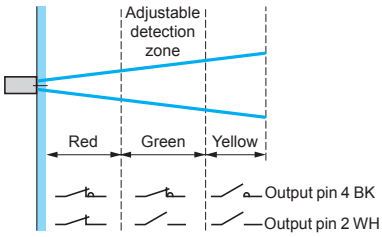
XX218A3●F●/XX230A●1●

Filling (stored in low threshold memory)



XX230A●2●

2 levels, 2 independent outputs



***Note**:*
One output is available on the Ø 18 (XX218●)
Two outputs are available on the Ø 30 (XX230●)

7

Contents

7 - OsiSense XG
Radio frequency identification

Selection guide . . . . . ***page 7/2***

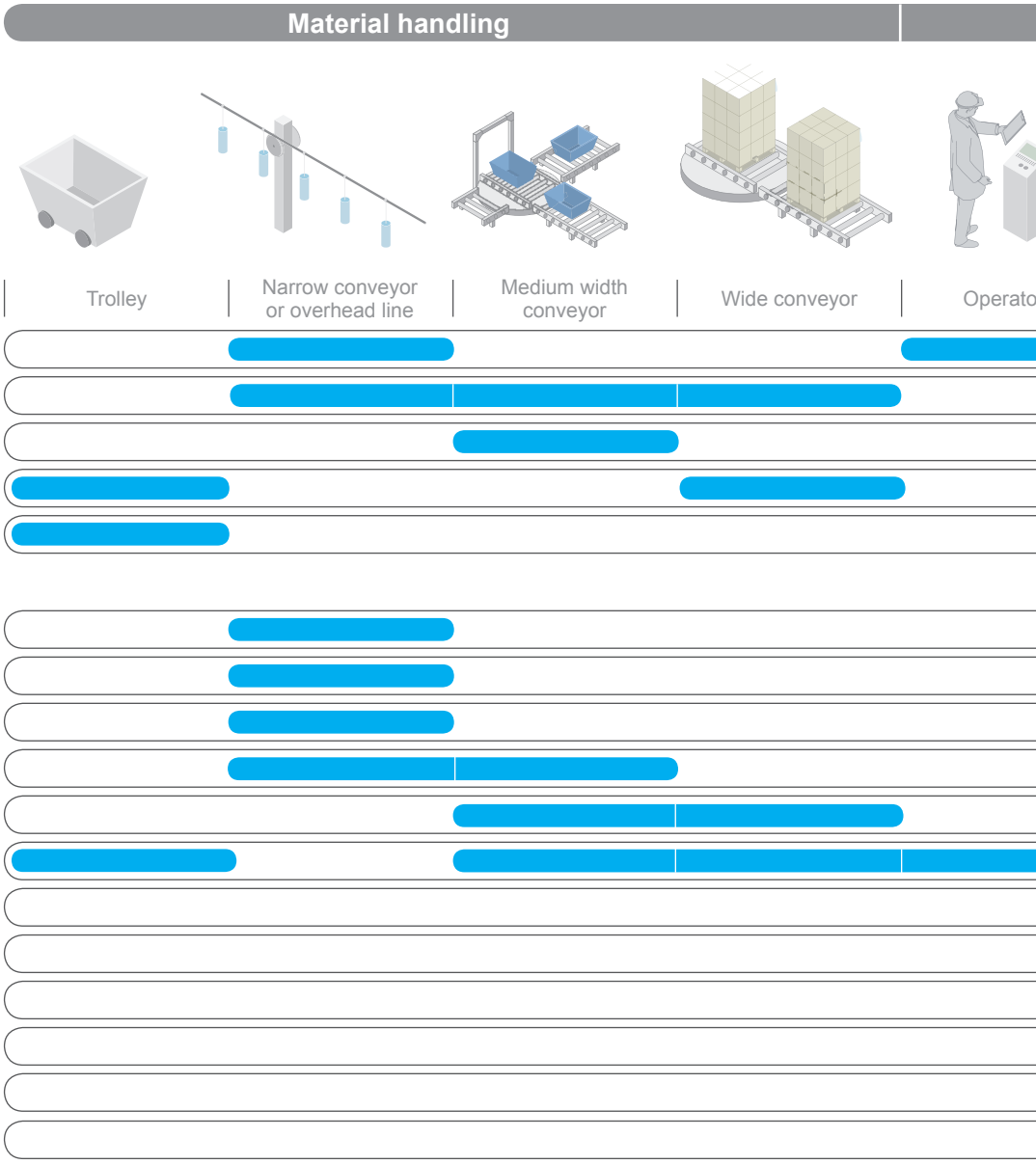
- Description. . . . . *page 7/6*
- Characteristics. . . . . *page 7/16*
- References . . . . . *page 7/18*
- Dimensions . . . . . *page 7/22*
- Connections . . . . . *page 7/24*
- Curves . . . . . *page 7/26*

Selection guide Compact smart antennas, Ø 22 mm mounting . . . . . ***page 7/28***

- Characteristics. . . . . *page 7/30*
- References . . . . . *page 7/32*

7

Selection guide



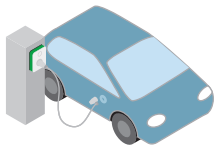
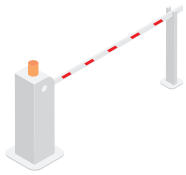
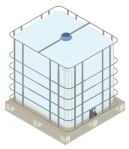
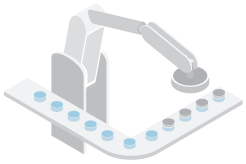
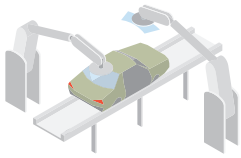
5 XGST2422

1 XGCS4901201

2 XGCS8901201 and XGCS850C201

3 XGCS4901201 + XGFEC540

4 XGCS4901201 + XGFEC2525

Access control		Traceability		Flexible assembly	
					
Service	Vehicle	Container	Tools	Simple	Tools

Overall size of dialogue zone

Length x width (mm)	Distance (mm)											
39 x 35	18	18	40	48	70	70	33	45	45	25	25	25
79 x 75	20	20	55	65	100	100	48	65	65	39	39	39
390 x 45	-	-	-	42	70	90	-	45	45	-	-	-
240 x 240	-	-	42	80	150	150	-	40	40	-	-	-
Memory capacity (bytes)	304	256	256	112	112	256	3408	2000	2000	8192	16384	32768

6 7 8 9 10 11 12 13 14 15 16 17

OsiSense XG
Radio frequency identification
13.56 MHz

Compact smart antenna

Electronic tags

RFID handheld terminal

Network connecting box

Presentation

RFID (Radio Frequency IDentification) refers to radio frequency identification systems. These frequencies range between 50 kHz and 2.5 GHz.
The most widely used is 13.56 MHz.

The OsiSense XG RFID system makes it possible to perform traceability, object identification (tracking) and access control functions.

The information is stored in a memory that can be accessed using a simple radio frequency link. This memory is in the form of an electronic tag, which contains an antenna and an integrated circuit.
The tag contains the information associated with the object to which it is fixed.
When a tag enters the field generated by the reader/smart antenna, it detects the signal and exchanges the data (read or write) between its memory and the reader/smart antenna.

The applications are numerous:
- Logistics: Goods Out, Goods In, transit, etc.
- Tracking and sorting of baggage
- Traceability in the food processing industry
- Flexible assembly lines in the automotive sector
- Automatic toll booths
- Access control, etc.

The OsiSense XG RFID system is also suitable for use in difficult environments (humidity, temperature, mechanical shock, vibration, dust, etc.).

OsiSense XG RFID system

The OsiSense XG identification system is open to the majority of ISO 18000-3, ISO 15693 and ISO 14443 electronic tags.

The OsiSense XG system integrates Modbus RTU, Uni-Telway, Modbus TCP/IP, PROFIBUS-DP and EtherNet/IP protocols.

The OsiSense XG RFID offer comprises:
- 4 models of 13.56 MHz RFID reader (read/write)
- 12 models of 13.56 MHz electronic tag
- 1 RFID handheld terminal
- 3 models of network connection box
- 2 models of field expander (accessories enabling modification of the shape of the dialogue zone between the tag and compact smart antenna)
- Connection and mounting accessories

Setup

OsiSense XG RFID readers are simple to set up:
- ◻ Integrated RFID and network functions
- ◻ No programming
- ◻ Automatic detection of the RFID electronic tags (read or write)
- ◻ Automatic setting of the communication parameters (speed, format, parity, protocol, etc.)
- ◻ Network address configuration (1 to 15) using the RFID card provided with the smart antenna or via PC software for the Ethernet smart antenna
- ◻ Read/write compatibility with the majority of 13.56 MHz tags on the market
- ◻ Low sensitivity to metal environments

Installation

OsiSense XG readers are compact and robust. They can easily be integrated into flexible manufacturing production lines:
- quick connection using M12 connector
- clip-on mounting

An extensive range of connecting cables and adaptor boxes enables OsiSense XG readers to be easily connected to communication networks.

Characteristics: page 7/14
References: page 7/16
Dimensions: page 7/22
Connections: page 7/24
Curves, installation: pages 7/26 and 7/27

OsiSense XG
Radio frequency identification
13.56 MHz

RFID reader: compact smart antenna, flat form 40

RFID readers: compact smart antennas, flat form 80

RFID reader: wand antenna with flexible head

Description

13.56 MHz OsiSense XG RFID readers

XGCS readers enable reading and writing of 13.56 MHz RFID tags that are compatible with standards ISO 15693 and ISO 14443 A and B.

Four models of OsiSense XG reader are available:
■ Compact smart antenna, flat form 40, **XGCS4901201**:
□ Dimensions (mm): 40 x 40 x 15
□ Nominal sensing distance: 10 to 70 mm depending on the associated tag
■ Compact smart antenna, flat form 80, **XGCS8901201**:
□ Dimensions (mm): 80 x 80 x 26
□ Nominal sensing distance: 20 to 100 mm depending on the associated tag
■ Compact smart antenna, flat form 80, **XGCS850C201**:
□ Dimensions (mm): 80 x 93 x 40
□ Nominal sensing distance: 20 to 100 mm depending on the associated tag
■ **XGW4F111** wand antenna with flexible head for location of tags located in places that are difficult to access, with the XGST2020 handheld terminal
□ Dimensions (mm): 290 x 40 x 25

■ **Functions integrated in RFID readers***:*
OsiSense XG RFID readers integrate functions which simplify communication between tags, readers and controllers (automation platform, PC, etc.).

These embedded functions are activated by standard requests to read/write words, sent by the automation platform:
□ **Firmware version:** Polling of the reader to discover its version.
□ **Reset:** The RFID reader is reinitialized and assumes its factory default configuration (network address at 1, transmission speed at 19,200 bauds, parameters deleted).
□ **Init:** The reader is reinitialized and operates as it would after being switched back on (address unchanged, transmission speed unchanged, parameters deleted).
□ **Sleep mode:** Transmission of the reader's electromagnetic field is only activated upon receipt of a read or write instruction.
This mode reduces the reader's power consumption and prevents interference when the readers are close to one another.
□ **Auto Read/Write:** This mode enables the reader to execute up to 10 read or write instructions in a tag automatically as soon as it enters the dialogue zone (up to 87 write words and up to 109 read words).

Communication

RS485 serial port

■ **XGCS4901201** and **XGCS8901201** readers, equipped with an RS485 serial port, support Modbus RTU and Unitelway protocols, enabling up to 123 words to be exchanged per read or write request.
■ The communication parameters and protocol are detected automatically. The smart antennas require no configuration.
■ Up to 15 smart antennas can be connected to the same network. All connections are made via M12 connectors, using a complete range of cables, T-connectors and network adaptors.

Ethernet

■ The **XGCS850C201** Ethernet smart antenna is equipped with two M12 connectors, enabling up to 32 smart antennas to be daisy-chained. Looping of the ring network is supported.
■ The protocols supported are Modbus/TCP and EtherNet/IP.
They permit up to 123 words to be exchanged per transaction.
■ The supported I/O scanning and assembly services enable permanent access to the smart antenna status and synchronization as the tags pass in front of the smart antenna.
■ The network address parameters are easily set, using:
□ dedicated software, supplied with the smart antenna (on USB stick)
□ or handheld terminal **XGST2020** (from version V2.37)

OsiSense XG
Radio frequency identification
13.56 MHz

Electronic tags

Handheld terminal

Field expanders

Description (continued)

OsiSense XG RFID electronic tags

■ **XGHB electronic tags with EEPROM or FeRAM type memory** *(1)* **offer the following advantages:**

□ Fast access to data
□ Wide range of memory capacities
□ Secure access to contents
□ Batteryless operation
□ Positioning flexibility
□ Protection suited to the environmental conditions

The nominal transmission distance is 18 to 100 mm, depending on the tag model and associated reader.

RFID handheld terminal

The **XGST2020** RFID terminal, with firmware and wand antenna, is a powerful tool for easy and efficient operations on RFID tags.
The removable wand antenna communicates with a wide range of ISO 14443 and ISO 15693 electronic tags. It is also has a wide dialogue range of up to 70 mm.

The integrated battery provides the terminal with excellent autonomy (at least one full day of intensive use).

Field expanders

Field expanders are accessories designed to operate with OsiSense XG smart antennas. They enable the shape of the dialogue field of the **XGCS4901201** smart antenna to be adapted to conveying/handling applications.

The concept is a connection-free induction link between the smart antenna and the field expander. Two standard models are available:

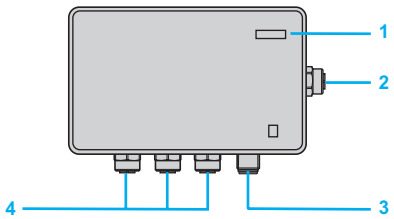
■ The **XGFEC540** conveyor model detects ISO 15693 tags on a narrow strip covering the width of the conveyor (mounted between two rollers of the conveyor).
□ Dimensions (mm): 400 x 23 x 50
□ Nominal sensing distance: 30 to 90 mm depending on the associated tag

■ The **XGFEC2525** universal model increases the area and distance for detection of ISO 15693 tags, which also enables higher passing speeds of the tags.
□ Dimensions: 250 x 250 x 10
□ Nominal sensing distance: 26 to 150 mm depending on the associated tag

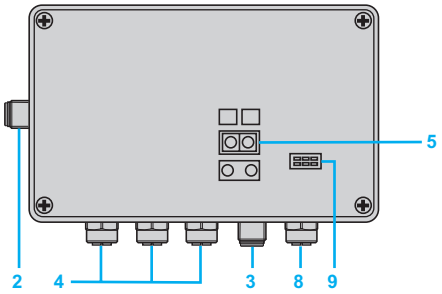
■ Read/write compatibility with the majority of 13.56 MHz ISO 15693 tags on the market
(Caution: these accessories are not compatible with ISO 14443 tags).

(1) ***EEPROM*** *(Electrically-Erasable Programmable Read-Only Memory).*
FeRAM *(Ferroelectric Read-Only Memory): non-volatile RAM.*

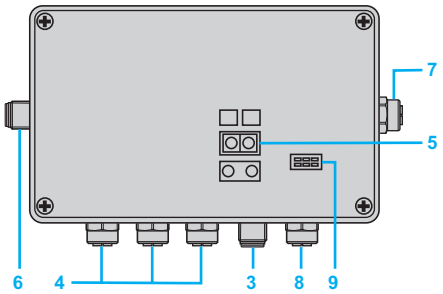
OsiSense XG
Radio frequency identification
13.56 MHz



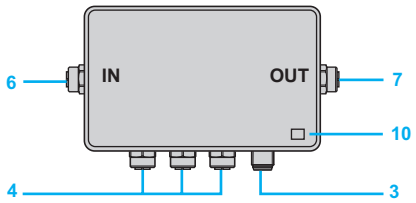
XGSZ33ETH Ethernet box



XGSZ33EIP EtherNet/IP box



XGSZ33PDP PROFIBUS-DP box



TCSAMT31FP tap-off box

1 Power on and Ethernet indicator LEDs
2 One M12 type Ethernet socket, D-coded
3 One M12 type power supply socket, male 4-pin
4 Three M12 type female sockets, A-coded, for connecting XGCS smart antennas
5 Network address configuration
6 One male M12 type network input socket
7 One female M12 type network output socket
8 One female M12 type configuration port
9 Network and connection box status LEDs
10 One green LED: power on

Description (continued)

OsiSense XG connection boxes

Four types of quick connection box are available:
- **XGSZ33ETH** Ethernet box for Ethernet Modbus TCP/IP network
- **XGSZ33EIP** EtherNet/IP box for EtherNet/IP network
- **XGSZ33PDP** PROFIBUS-DP box for PROFIBUS-DP network
- **TCSAMT31FP** tap-off box for Modbus and Uni-Telway communication bus

XGSZ33ETH Modbus TCP/IP box

The **XGSZ33ETH** OsiSense box enables connection of XGCS smart antennas to the Ethernet network (Modbus TCP/IP protocol).

It enables an automation platform or PC to access the XGCS smart antenna functions:
- Reading/writing tags
- Control and command
- Monitoring
- Diagnostics

The **XGSZ33ETH** box is fitted with M12 connectors. It is used to connect the power supply, the Ethernet network and 1 to 3 XGCS smart antennas (up to 8 smart antennas, by daisy-chaining).

XGSZ33EIP EtherNet/IP box

The **XGSZ33EIP** OsiSense box enables connection of XGCS smart antennas to the EtherNet/IP network.

It enables an automation platform or PC to access the XGCS smart antenna functions:
- Reading/writing tags
- Control and command
- Monitoring
- Diagnostics

The XGSZ33EIP box is fitted with M12 connectors. It is used to connect the power supply, the EtherNet/IP network and 1 to 3 XGCS smart antennas (up to 15 smart antennas, by daisy-chaining).

XGSZ33PDP PROFIBUS-DP box

The XGSZ33PDP OsiSense box enables connection of XGCS smart antennas to the PROFIBUS-DP network.

It enables an automation platform or PC to access the XGCS smart antenna functions:
- Reading/writing tags
- Control and command
- Monitoring
- Diagnostics

The XGSZ33PDP box is fitted with M12 connectors. It is used to connect the power supply, the PROFIBUS-DP network and 1 to 3 XGCS smart antennas (up to 15 smart antennas, by daisy-chaining).

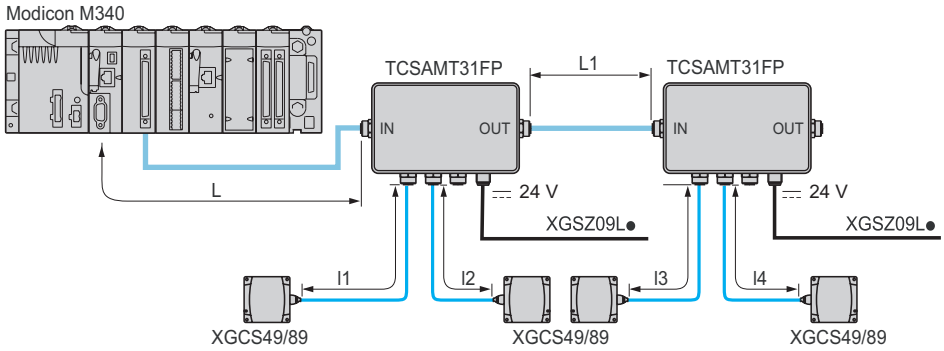
TCSAMT31FP tap-off box

The **TCSAMT31FP** OsiSense tap-off box enables connection of XGCS smart antennas to Modbus and Uni-Telway communication buses.

The **TCSAMT31FP** box is fitted with M12 connectors.
It is used to connect the power supply, the communication bus (Modbus) and 1 to 3 XGCS smart antennas (up to 15 smart antennas, by daisy-chaining).
It consists of a dust and damp-proof metal enclosure.

Description (continued)

Mounting example for a Modbus network

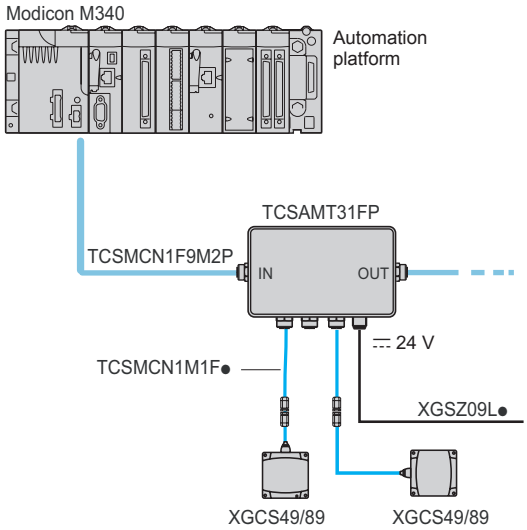


Maximum length of bus
The maximum length of the bus (L + L1 + I4) depends on the speed of the network:
- 9600 bauds: 1000 m
- 19,200 bauds: 500 m

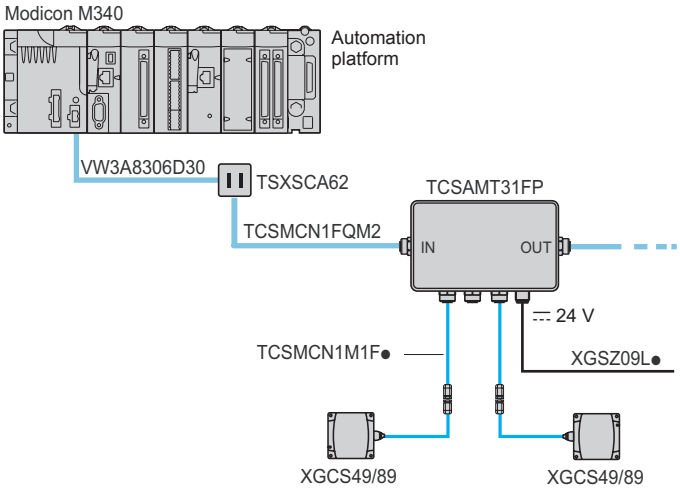
Maximum length of tap-offs:
I1, I2 and I3: 10 m

Examples of connection to a Schneider Electric automation platform

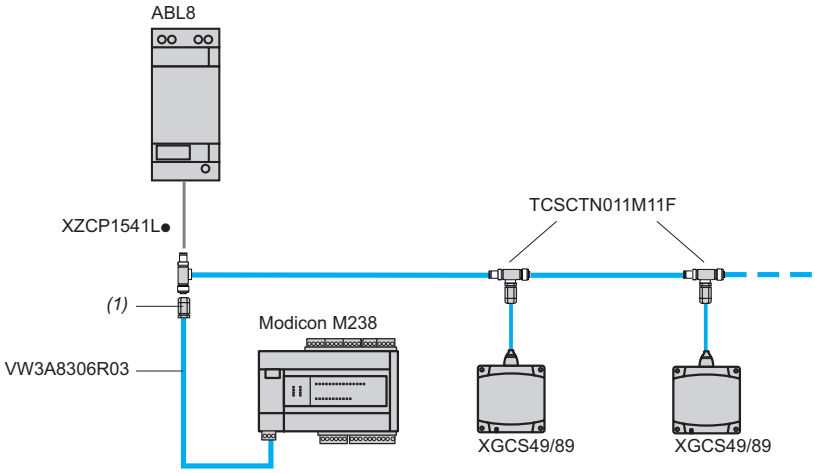
Direct connection



Connection via a TSXSCA62



Daisy-chain connection



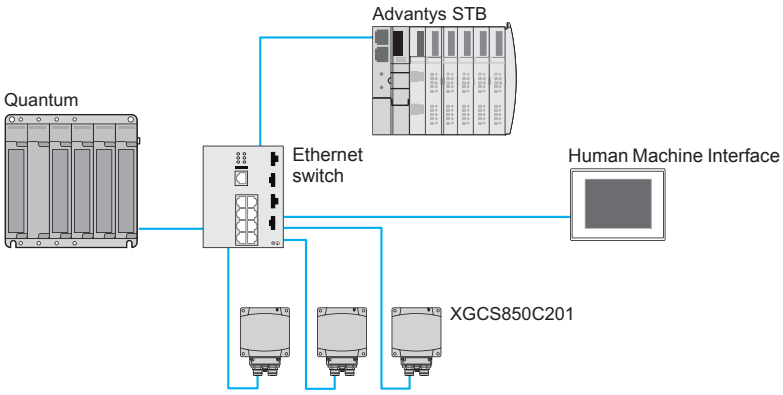
*(1) **XZCC12MDB50R** male M12 connector, to be ordered separately (see page 7/19).*

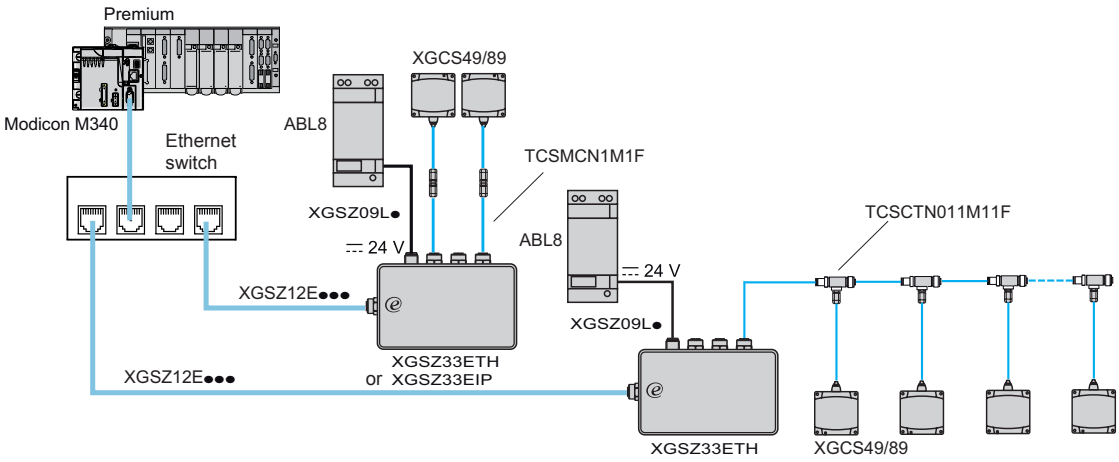
RFID readers can be connected directly to the Modbus port of an automation platform. Up to 15 RFID readers can be linked to the RS 485 port using “T” connectors (in cases where the length of the network exceeds 100 m, fit a line terminator, reference TM7ACTLA).
This cabling system is specific to OsiSense XG (powered network).
No other Modbus slave equipment must be connected to it.

Description (continued)

Mounting examples for an Ethernet network

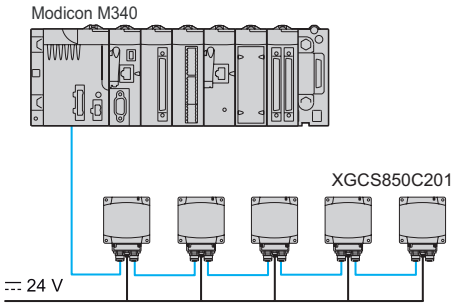
Star topology



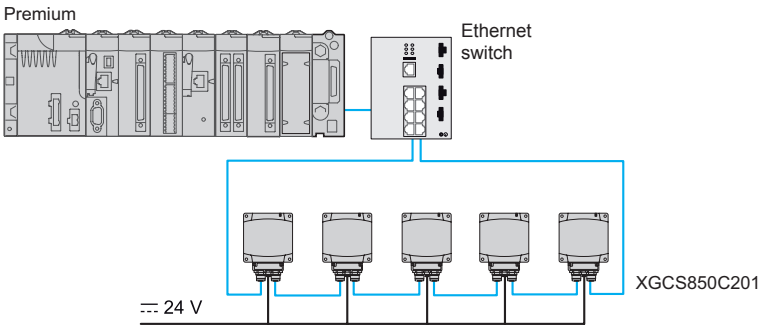


The number of smart antennas connected to each box can be increased by using M12 “T” connectors (ref. TCSCTN011M11F).
Note concerning use of the XGSZ33ETH box on Modbus/TCP: to maintain high-performance operation it is recommended that a maximum of 8 RFID smart antennas are connected (the Ethernet box has 8 communication ports that can be open simultaneously on TCP/IP). In cases where the I/O scanning function is used (which requires an additional communication port), do not connect more than 7 smart antennas.
The total length of the smart antenna-side network for XGCS49/89 smart antennas is limited to 160 m.

Daisy chain topology

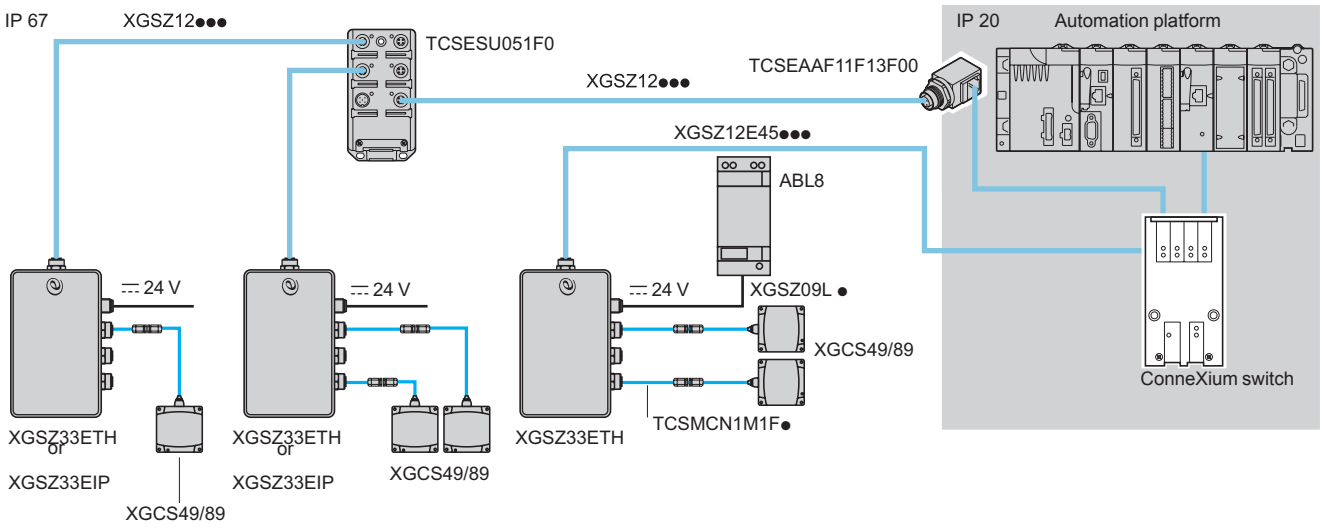


Ring topology

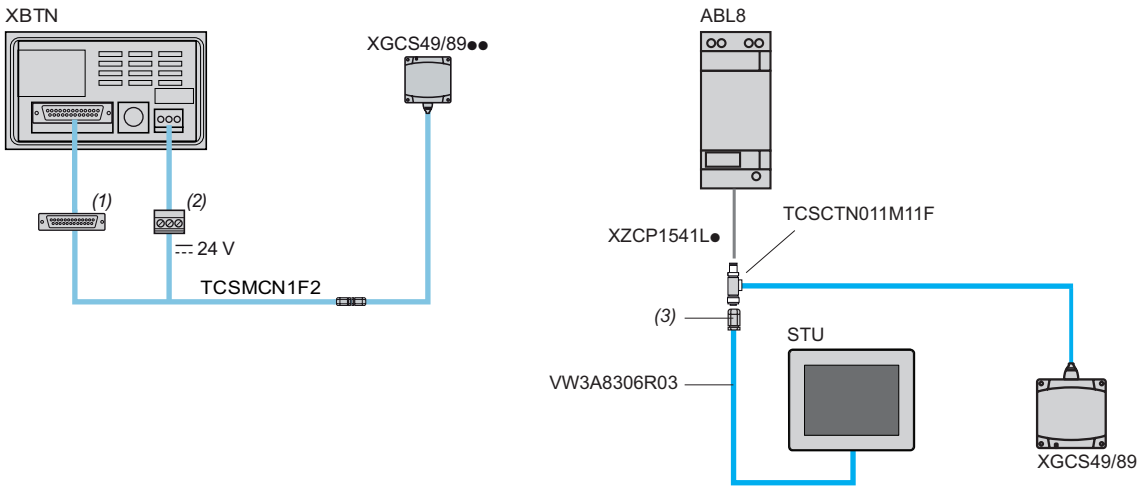


OsiSense XG
Radio frequency identification
13.56 MHz

Example of mixed IP 20 and IP 67 connection on Ethernet network



Examples of connection to a Magelis terminal

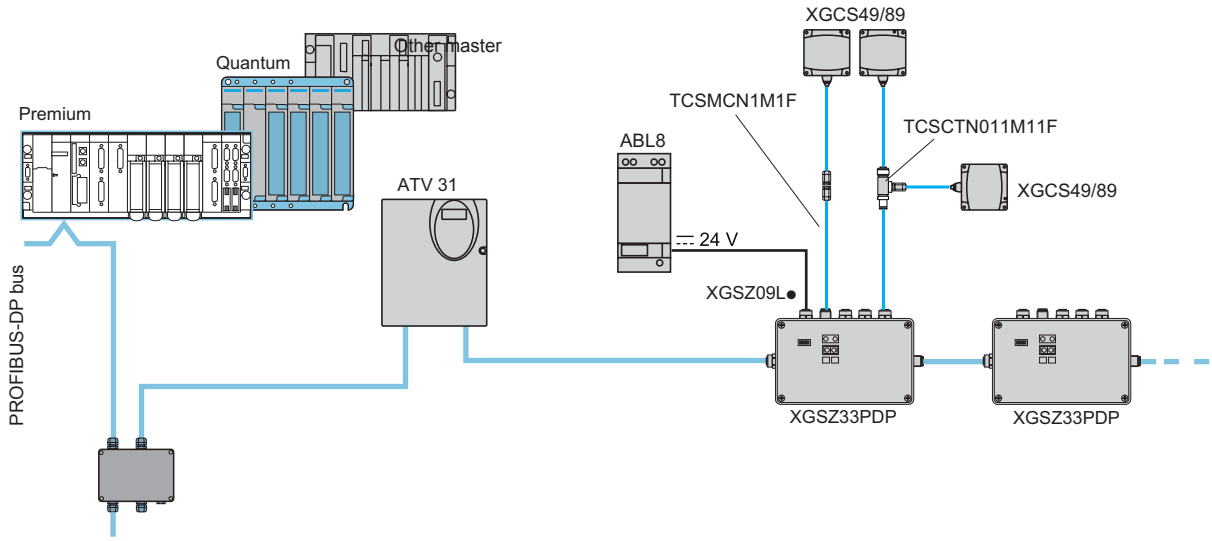


(1) 25-pin male SUB-D connector.
(2) Magelis terminal power supply connector (supplied with the Magelis terminal).
*(3) **XZCC12MDB50R** M12 male connector, to be ordered separately (see page 7/19).*

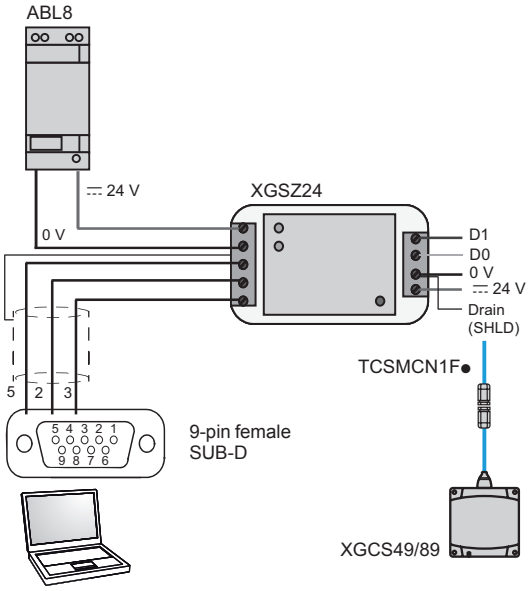
RFID smart antennas can be connected directly to the Modbus port of an automation platform. Up to 15 RFID smart antennas can be linked to the RS 485 port using “T” connectors (in cases where the length of the network exceeds 100 m, fit a line terminator, reference TM7ACTLA).
This cabling system is specific to OsiSense XG (powered network).
No other Modbus slave equipment must be connected to it.

OsiSense XG
Radio frequency identification
13.56 MHz

Example of architecture in a PROFIBUS-DP network



Example of connection to a PC



RFID smart antennas can be connected directly to the Modbus port of an automation platform. Up to 15 RFID smart antennas can be linked to the RS 485 port using “T” connectors (in cases where the length of the network exceeds 100 m, fit a line terminator, reference TM7ACTLA).
This cabling system is specific to OsiSense XG (powered network).
No other Modbus slave equipment must be connected to it.

OsiSense XG
Radio frequency identification
13.56 MHz
Handheld terminal

Handheld terminal

Main screen

Tag tools

XGST2020 handheld terminal

Functions

Three types of function are embedded in the terminal:

- Direct operations on RFID tags
- Mapping (screens predefined by the operator)
- Configuration

Direct processing of RFID tags

■ **Read/Write words**. Groups containing up to 15 words can be read/written from a given start address. Dates can be displayed in different formats: Decimal/Signed decimal/Binary/Decimal IP/Hexadecimal/ASCII.

■ **Copy tag** from one tag to another. The whole tag memory or part of it can be copied.

■ **Tag initialization.** The whole tag memory or a defined part of it can be written using a value chosen by the operator.

■ **Tag presence**. Cyclic test for presence of the tag in front of the RFID reader linked to the terminal. An indicator light and a bargraph provide information regarding the test results.

■ **Tag identification**. The RFID protocol, unique identifier and user memory size of a tag, which are in front of the reader, are detected by a scanner activated by the handheld terminal and displayed on screen.

Mapping

A mapping is a list of variables, stored permanently in the terminal memory for quick and simple access by the operators.

Each mapping variable is associated with a name and displayed in the selected format in the selection list, in read only or read/write mode.

Creation, modification and backup tools are embedded in the handheld terminal software.

Up to 256 mappings can be stored in the memory (each being identifiable by a number and a name).
Each mapping can contain up to 256 variables. Each variable is defined by its position within the tag memory, its size and its type (word or byte) and its display format on screen.

The formats supported by the handheld terminal are:

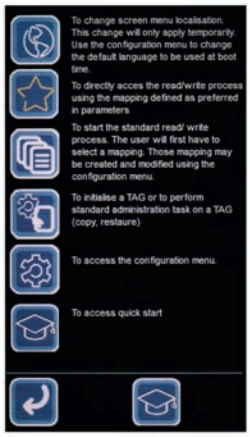
- Decimal (1 word): 0 to 65535
- Decimal (1 byte): 0 to 255
- Signed decimal (1 byte): -128 to +127
- Decimal IP (2 words): 0.0.0.0 to 255.255.255.255
- Hexadecimal (4 bytes): 0000 to FFFF
- Boolean bit (one bit): ☐☑
- Binary (1 byte): 00000000 to 11111111
- List (1 byte): 0 to 15. A string, associated with each byte value, is displayed on screen in place of the byte value
- ASCII string: 1 to 21 characters
- Hexadecimal string: 2 to 30 hexadecimal characters (1 to 15 bytes)
- Date (8 bytes): YYYY/MM/DD
- Time (2 bytes): HH:MM

The data displayed on a mapping can be stored in the terminal memory or written to an RFID tag.

A backup of each mapping or all mappings can be stored on a USB memory stick inserted in the USB socket of the handheld terminal.

OsiSense XG
Radio frequency identification
13.56 MHz
Handheld terminal

Mapping management



Online help

XGST2020 handheld terminal (continued)

Functions (continued)

Configuration

■ **Updating the terminal**

This function is password-protected and provides access to the following elements:
- ◻ Updating the RFID reader linked to the handheld terminal
- ◻ Changing the boot screen picture by uploading a file from a USB memory stick
- ◻ Restoring the handheld terminal to factory settings
- ◻ Changing the password

■ **Terminal parameters**

This function is used to modify the following elements:
- ◻ Screen localization
- ◻ Shutdown delay
- ◻ Preferred mapping number
- ◻ Ethernet port gateway and IP addresses
- ◻ Backlighting level

■ **Mapping management**

This function is used to access the following elements:
- ◻ Backup and restoration of all user mappings from and to the USB memory stick
- ◻ Exporting and importing a user mapping from and to the USB memory stick
- ◻ Creation, modification, copying and deletion of mappings. Each mapping is password-protected.

Online help

Contextual online help is permanently accessible for users.
Furthermore, a tutorial on mapping creation can be accessed via the main screen.

Battery management

The handheld terminal is powered by a high-capacity lithium battery.

- ■ The battery charge status is displayed on the menu screen.
- ◻ A blue LED flashes when the battery needs recharging.
- ◻ An orange LED flashes while the battery is charging.

PF121919

XGST2422

Accessories

Handheld terminal accessories

The handheld terminal is supplied in an XGST2422 plastic case, with the following accessories:

- ■ A USB charger with international plugs
- ■ An **XGST2BA** high-capacity lithium battery
- ■ An **XGSZK1** 2 GB USB flash memory stick for transferring data between handheld terminals or to and from the PC. This USB memory stick also contains all the technical documents on the OSiSense XG RFID range: catalogues, training and examples.
- ■ A stylus for the touch screen
- ■ A wrist strap for safe handling of the terminal
- ■ An Allen key

The RFID reader connected to the terminal should be ordered separately, see page 7/16.

RFID readers associated with the handheld terminal

Two RFID reader versions are available:

- ■ **XGCS4901201** compact smart antenna for mounting on the back of the handheld terminal
- ■ **XGW4F111** wand antenna with flexible head for remote operations on tags located in confined places (under pallets, for example)

PF121920

XGW4F111

OsiSense XG
Radio frequency identification
13.56 MHz

Characteristics of electronic tags

Tag type			XGHB123345	XGHB211345	XGHB221346	XGHB320345
Ambient air temperature	For operation	**°C**	- 25…+ 70	- 25…+ 70	- 25…+ 70	- 25…+ 85 *(4)*
	For storage	**°C**	- 40…+ 85	- 40…+ 85	- 40…+ 85	- 40…+ 90
Degree of protection			IP 68	IP 68	IP 68	IP 68
Standard supported			ISO 15693	ISO 15693	ISO 15693	ISO 15693
Vibration resistance	Conforming to EN 60068.2.6		2 mm from 5 to 29.5 Hz/7 gn from 29.5 to 150 Hz			
Shock resistance	Conforming to EN 60068.2.27		30 gn/11 ms			
	Conforming to EN 50102		Degree IK02			
Dimensions		**mm**	Ø 12 x 8	M18 x 1 x 12	26 x 26 x 13	Ø 30 x 3
Housing material			PBT	PBT	PBT	PPA
Fixing method			Glued	Screw	Screw or clip	Screw
Memory capacity		**bytes**	304	256	256	112
Type of memory			EEPROM			
Type of operation			Read/Write			
Nominal sensing distance (Read/Write)	With XGCS4901201	**mm**	18	18	40	48
	With XGCS8901201 or XGCS850C201	**mm**	20	20	55	65
	With XGCS4901201 smart antenna + XGFEC540	**mm**	–	–	–	42
	With XGCS4901201 smart antenna + XGFEC2525	**mm**	–	–	42	80
Number of read cycles			Unlimited			
Number of write cycles	Guaranteed minimum (per data bit, throughout the temperature range)		100,000			
	At 30°C		2.5 million typical value			
Read time		**ms**	12 + 0.825 x n *(1)*	12 + 0.825 x n *(1)*	12 + 0.825 x n *(1)*	12 + 0.825 x n *(1)*
Write time		**ms**	20 + 11.8 x n *(1)*	19 + 4.1 x n *(1)*	20 + 11.8 x n *(1)*	12 + 5.6 x n *(1)*
Max. speed XGCS49●●	Read a serial number	**ms**	1.8	1.8	2.8	3.1
	Read a word *(2)*	**ms**	0.6	0.6	0.8	1.4
	Read or write 10 words *(2)*	**ms**	0.2	0.2	0.3	0.7
Max. speed XGCS89●● and XGCS850C201	Read a serial number	**ms**	3	3.2	4.2	5.8
	Read a word *(2)*	**ms**	0.9	1.1	2.6	2.7
	Read or write 10 words *(2)*	**ms**	0.4	0.6	0.5	0.9
Data retention time			10 years			
Mounting on metal support			No	No	Yes *(3)*	No

(1) n = number of 16-bit words.
(2) With use of the Auto read/write function.
(3) Installation precautions: see page 7/27.
(4) + 140°C for 10 minutes maximum, except for data exchange.

XGHB520246	XGHB90E340	XGHB444345	XGHB320246	XGHB440245	XGHB440845, XGHB441645 and XGHB443245
- 25…+ 85 *(4)*	- 25…+ 50	- 25…+ 70	- 25…+ 70	- 25…+ 70	- 25…+ 70
- 40…+ 90	- 40…+ 55	- 40…+ 85	- 40…+ 85	- 40…+ 85	- 40…+ 85
IP 68	IP 65	IP 68	IP 68	IP 68	IP 68
ISO 15693	ISO 15693	ISO 14443	ISO 15693	ISO 15693	ISO 14443
2 mm from 5 to 29.5 Hz/7 gn from 29.5 to 150 Hz					
30 gn/11 ms			30 gn/11 ms		
Degree IK02			Degree IK02		
Ø 50 x 3	54 x 85.5 x 1	40 x 40 x 15	Ø 30 x 3	40 x 40 x 15	40 x 40 x 15
PPA	PVC	PBT	PPA	PBT	PBT
Screw	–	Screw or clip	Screw	Screw or clip	Screw or clip
112	256	3408	2000	2000	8192 (XGHB440845) 16,384 (XGHB441645) 32,768 (XGHB443245)
EEPROM			FeRAM		
Read/Write			Read/Write		
70	70	33	45	45	25
100	100	48	65	65	39
70	90	–	45	45	–
150	150	–	40	40	–
Unlimited			10^{10}		
100,000			10^{10}		
2.5 million typical value			–		
12 + 0.825 x n *(1)*	12 + 0.825 x n *(1)*	9.25 + 0.375 x n *(1)*	7 + 2 x n *(1)*	7 + 2 x n *(1)*	6 + 0.25 x n *(1)*
12 + 5.6 x n *(1)*	20 + 11.8 x n *(1)*	13 + 0.8 x n *(1)*	7 + 2.4 x n *(1)*	7 + 2.4 x n *(1)*	6 + 0.25 x n *(1)*
5.3	5.3	3.1	2.1	2.1	2.3
1.6	1.6	1.4	1.5	1.5	1.8
0.6	0.6	1.2	0.6	0.6	1.7
7.1	7.1	4.8	3.5	3.5	3.8
4.0	4.0	2.7	2.5	2.5	3.0
0.8	0.8	1.8	1	1	2.6
10 years					
No	No	Yes *(3)*	No	Yes	Yes

OsiSense XG
Radio frequency identification
13.56 MHz

Characteristics of OsiSense XG readers

RFID reader type			XGCS850C201	XGCS8901201	XGCS4901201	XGW4F111
Certifications			UL, FCC part 15c CE			
Conforming to standards			EN 301489-1, EN 301489-3, ETS 300330-1 and ETS 300330-2			
Ambient air temperature	For operation	**°C**	- 25…+ 70			
	For storage	**°C**	- 40…+ 85			
Degree of protection	Conforming to IEC 60529		IP 65			
Vibration resistance	Conforming to EN 60068.2.6		2 mm from 5 to 29.5 Hz/7 gn from 29.5 to 150 Hz			
Shock resistance	Conforming to EN 60068.2.27		30 gn/11 ms			
	Conforming to EN 50102		Degree IK02			
Resistance to interference	Conforming to IEC 61000		Resistance to electrostatic discharge, radiated electromagnetic fields, fast transients, electrical surges, conducted and induced interference and network frequency magnetic fields.			
Dimensions, W x H x D		**mm**	Flat form: 80 x 93 x 40	Flat form: 80 x 80 x 26	Flat form: 40 x 40 x 15	290 x 40 x 25
RFID frequency		**MHz**	13.56			
Nominal sensing distance		**mm**	20 to 100 depending on associated tags		10 to 70 depending on associated tags	
Type of associated tag			ISO 15693 and ISO 14443 standardized tags. Automatic detection of the tag type			
Examples of RFID compatible chips			Fujitsu (MB89R118), INSIDE (micropass) NXP (I-Code SL2, SL1, Ultralight, Std 1K/4K, Desfire), STM (CRIX4K) Texas (Tag-it HFI), µEM4135			
Nominal supply voltage		**V**	24 ⎓ PELV (Protective Extra Low Voltage)			
Supply voltage limits (including ripple)		**V**	19.2...29 ⎓			
Consumption		**mA**	< 150	< 60		
Communication ports	Physical interface		10BASE-T/ 100BASE-TX	RS 485		
	Protocol		Modbus/TCP and EtherNet/IP	Modbus RTU and Uni-Telway		Modbus RTU
	Data rate		10/100 Mbps	9600…115,000 bauds (automatic detection)		
	Medium (see cable references on page 7/20)		Ethernet cable with M12 connector, D-coded	Two shielded twisted pair cable with M12 connector, A-coded		
Display	For network communication		4 two-tone LEDs (Ethernet)	1 two-tone LED (Modbus/Uni-Telway)		
	For RFID communication		2 two-tone LEDs	1 two-tone LED (Presence of tag/Reader/tag dialogue)		
Connections			2 female M12 connectors, D-coded for Ethernet 1 male 4-pin M8 connector for power supply	A single male 5-pin shielded M12 connector, A-coded, for connection to the communication network and power supply		
Tightening torque	Screw		< 3 Nm/*2.21 lb-ft*	< 3 Nm/*2.21 lb-ft*	< 1 Nm/*0.74 lb-ft*	–

Characteristics of the XGST2020 handheld terminal

Certifications			CE
Conforming to standards			IEC 61000-6-2, IEC 61000-6-4
Ambient air temperature	For operation	**°C**	0 ... + 45
	For storage	**°C**	- 20... + 45
Material	Casing		ABS
Power supply	Internal		3.7 V/4000 mAh lithium battery. Full charge duration: 8 hours
	Charging connector		Mini USB
Autonomy	Typical		> 8 hours (reading one tag per minute - screen brightness = standard)
	Minimum		> 3 hours (continuous reading)
Charging time	Maximum		< 8 hours (to fully charge a completely flat battery)
Degree of protection	Conforming to IEC 60529		IP 40
	Conforming to IEC 62262		IK02 (touch screen)
	Drop test		Free fall onto a concrete floor: 1 meter
RFID reader serial link connection	Connector		M12 female socket
	Type		RS485
	Protocol		Modbus RTU master
	Speed	**Bauds**	115,000
External port			USB for memory stick (2 GB maximum)
Operating system			Proprietary operating system
Display			OLED resistive touch screen: 480 x 272 pixels, 16 M colours
Signalling			Two-tone (blue/orange) power supply and status LED

OsiSense XG
Radio frequency identification 13.56 MHz

Characteristics of connection boxes

Connection box type			XGSZ33ETH Ethernet Modbus/TCP box	XGSZ33EIP EtherNet/IP box	XGSZ33PDP PROFIBUS-DP box
Certifications			UL	–	PROFIBUS
Conforming to standards			CE		
Ambient air temperature	For operation	°C	0...+ 70	0...+ 55	0...+ 55
	For storage	°C	- 40...+ 85	- 25...+ 85	- 25...+ 85
Relative humidity		RH	30...95% non-condensing		
Degree of protection			IP 65		
Supply voltage		V	24 ∿⎓ PELV (limits 19.2 V...29 V). Male 4-pin M12 connector, A-coded	24 ⎓ PELV (limits 21.6 V...26.4 V). Male 4-pin M12 connector, A-coded	
Consumption (box only)		W	< 1	< 2.5	< 2.5
Smart antenna connection			Female 5-pin M12 connector, A-coded Total cable length < 160 meters		
Electromagnetic interference	Conforming to IEC 61000		Level 3		
	Conforming to EN 55022		Class B		
Protocol			Modbus TCP/IP	EtherNet/IP	PROFIBUS-DP V1
LED display			- Ethernet network activity (RUN, green) - Collision detection (COL, red) - Diagnostics (STS, yellow) - Fault (Err, red) - Power on (green)	- Ethernet network activity (RUN, green) - Ethernet network activity (OFF, red) - Communication bus (Error, flashing red) - Modbus (RUN, green) - Gateway configuration (green)	- PROFIBUS-DP network activity (RUN, green) - PROFIBUS network activity (OFF, red) - Communication bus (Error, flashing red) - Modbus (RUN, green) - Gateway configuration (green)
Transparent Ready Services	Class		A10	–	–
	Standard Web server		IP configuration address	–	–
	Standard communication services		Modbus messaging (read/write words: 1 to 123 words per request)	Read/write words (1 to 123 per request) via the periodic exchanges service.	Read/write words (1 to 49 read operations per request) via the PROFIBUS-DP periodic exchanges service. PROFIBUS-DP V2 aperiodic exchanges not supported.
Connection	Physical interface		10BASE-T/100BASE-TX		RS485
	Data rate		10/100 Mbps		9.6 to 12,000 kbauds - automatic detection of speed
	Medium		Ethernet cable with M12 connector, D-coded, reference **XGSZ12E●●** (see page 7/20)		PROFIBUS cable with M12 connector, B-coded

Connection box type			TCSAMT31FP tap-off box
Certifications			UL
Conforming to standards			CE
Ambient air temperature	For operation	°C	- 25…+ 55
	For storage	°C	- 40…+ 85
Relative humidity		RH	30...95% non-condensing
Degree of protection			IP 65
Supply voltage		V	24 ⎓ PELV (limits 19.2 V...29 V). Male 4-pin M12 connector, A-coded
Smart antenna connection			Female 5-pin M12 connector, A-coded
Electromagnetic interference	Conforming to IEC 61000		Level 3
	Conforming to EN 55022		Class B
LED display			Power supply (green)

OsiSense XG
Radio frequency identification
13.56 MHz

PF130046

XGCS850C201

105909

XGCS4901201

121920A

XGW4F111

105910

XGHB44●●45

105914

XGHB90E340

105911

XGHB221346

105913

XGHB320345

105912

XGHB211345

13.56 MHz RFID readers

Description	Protocols	Dimensions mm	Reference	Weight kg
Ethernet compact smart antenna Form 80 2 x M12 connectors 1 x M8 connector	Modbus TCP and EtherNet/IP	80 x 93 x 40	**XGCS850C201**	0.360
Compact smart antenna Flat form 80 *(1)* Male M12 connector on flying lead	Modbus RTU and Uni-Telway	80 x 80 x 26	**XGCS8901201**	0.257
Compact smart antenna Flat form 40 *(1)* Male M12 connector on flying lead	Modbus RTU and Uni-Telway	40 x 40 x 15	**XGCS4901201**	0.057
Wand antenna with flexible head and 1-meter cable Male M12 connector on flying lead	Modbus RTU	290 x 40 x 25	**XGW4F111**	0.228

Electronic tags *(2)*

Tag type	Nominal sensing distance according to smart antenna (mm) XGCS49●	XGCS89●	Dimensions (mm)	Sold in lots of	Unit reference	Weight kg
Tag with EEPROM type memory						
Cylindrical 304 bytes	10	–	Ø 12 x 8	5	**XGHB123345**	0.008
Cylindrical 256 bytes	18	20	M18 x 1 x 12	5	**XGHB211345**	0.020
Flat form 26 256 bytes	40	55	26 x 26 x 13	1	**XGHB221346**	0.025
Disc 112 bytes	48	65	Ø 30 x 3	5	**XGHB320345**	0.005
Disc 112 bytes	70	100	Ø 50 x 3	5	**XGHB520246**	0.015
ISO RFID card *(3)* 256 bytes	70	100	54 x 85.5 x 1	10	**XGHB90E340**	0.005
Flat form 40 3408 bytes	33	48	40 x 40 x 15	1	**XGHB444345**	0.031
Tag with FeRAM type memory						
Disc 2000 bytes	45	65	Ø 30 x 3	5	**XGHB320246**	0.005
Flat form 40 2000 bytes	45	65	40 x 40 x 15	1	**XGHB440245**	0.031
Flat form 40 8192 bytes	25	39	40 x 40 x 15	1	**XGHB440845**	0.031
Flat form 40 16,384 bytes	25	39	40 x 40 x 15	1	**XGHB441645**	0.031
Flat form 40 32,768 bytes	25	39	40 x 40 x 15	1	**XGHB443245**	0.031

*(1) Supplied with an **XGSZCNF01** configuration badge. Installation guide to be downloaded from www.tesensors.com.*
(2) Other versions (high temperature, adhesive, flexible tags, etc.): please contact our Customer Care Centre.
(3) Customized versions on request.

Presentation, description: page 7/6
Characteristics: page 7/14
Dimensions: page 7/22
Connections: page 7/24
Curves, installation: pages 7/26 and 7/27

OsiSense XG
Radio frequency identification
13.56 MHz

105915

TCSAMT31FP

539828

539829

XGFEC2525

XGFEC540

PF121919

XGST2422

PF121917

XGST2BA

Connection boxes

Description	For use with	Voltage	Reference	Weight kg
Modbus/TCP Ethernet box	Compact smart antennas XGCS49● and XGCS89●	24 V ⎓	**XGSZ33ETH**	1.060
EtherNet/IP box *(1)*	Compact smart antennas XGCS49● and XGCS89●	24 V ⎓	**XGSZ33EIP**	1.060
PROFIBUS-DP box *(1)*	Compact smart antennas XGCS49● and XGCS89●	24 V ⎓	**XGSZ33PDP**	1.060
Tap-off box, 3-channel Modbus and Uni-Telway	Compact smart antennas XGCS49● and XGCS89●	24 V ⎓	**TCSAMT31FP**	1.060

Field expanders

Description	Nominal sensing distance	For use with	Reference	Weight kg
Conveying type field expander Dimensions (mm) 400 x 23 x 50 *(2)*	30 ... 90 mm depending on tag used (ISO 15693 only)	Smart antenna XGCS4901201 Tags XGHB90E340 XGHB320345 XGHB520246 XGHB320246 XGHB440245	**XGFEC540**	0.640
Universal type field expander Dimensions (mm) 250 x 250 x 10 *(2)*	26 ...150 mm depending on tag used (ISO 15693 only)	Smart antenna XGCS4901201 Tags XGHB90E340 XGHB221346 XGHB320345 XGHB520246 XGHB320246 XGHB440245	**XGFEC2525**	0.565

OsiSense XG handheld terminal

Description	Composition	Reference	Weight kg
RFID handheld terminal set in a plastic case	■ 1 handheld terminal ■ 1 wrist strap ■ 1 lithium battery ■ 1 battery charger pack ■ 1 stylus ■ 1 USB memory stick	**XGST2422**	1.000

***Note**: RFID reader to be ordered separately (see page 7/16).*

Accessories

Description	Reference	Weight kg
Screen protector sheets Sold in lots of 5	**XGST2FP**	0.005

Spare parts

Description	Reference	Weight kg
Handheld terminal Terminal unit only (without battery, charger or RFID reader)	**XGST2020**	0.295
Lithium battery 3.7 V, 4000 mAh	**XGST2BA**	0.078
USB memory stick 2 GB	**XGSZK1**	0.008

(1) Configuration file and installation guide to be downloaded from www.tesensors.com.
(2) Field expanders with other dimensions: please contact our Customer Care Centre.

OsiSense XG
Radio frequency identification
13.56 MHz

105925

TCSMCN1FQM2

105927

TCSMCN1F9M2P

106927

TCSCTN011M11F

533803

TCSESU051F0

535625

TCSEAAF11F13F00

106410

ABL8MEM24003

Modbus network connection accessories

Description	For use with	Length m	Reference	Weight kg
Shielded cable: Modbus black IP 67 M12 connectors, male/female, A-coded *(1)*	RS 485 connection between a compact smart antenna and a tap-off box or between 2 TCSAMT31FP tap-off boxes	1	**TCSMCN1M1F1**	0.080
		2	**TCSMCN1M1F2**	0.115
		5	**TCSMCN1M1F5**	0.270
		10	**TCSMCN1M1F10**	0.520
Shielded pre-wired connector: Modbus IP 67 female M12 connector/bare wires, A-coded *(1)*	Connection between a TCSAMT31FP tap-off box and a Modbus/Uni-Telway (TSXSCA50) network	2	**TCSMCN1F2**	0.115
		5	**TCSMCN1F5**	0.270
		10	**TCSMCN1F10**	0.520
Shielded cable: Modbus black M12/ SUBD-15, A-coded	Connection between a TCSAMT31FP tap-off box and a Modbus/Uni-Telway (TSXSCA62) network	2	**TCSMCN1FQM2**	0.270
Shielded cable: Modbus black M12/ Mini-DIN, 8-pin, A-coded	Modbus connection between a TCSAMT31FP tap-off box and an automation platform (Premium, Twido, etc.)	2	**TCSMCN1F9M2P**	0.350
Modbus SL serial link cable (RS 485 double shielded twisted pair main cables)	Modbus SL serial link	100	**TSXCSA100**	5.680
		200	**TSXCSA200**	10.920
		500	**TSXCSA500**	30.000
Network Tee, M12 1M/2F A-coded, 5-pin	RS485 network	–	**TCSCTN011M11F**	0.035

Ethernet connection accessories

Description	End fittings	Length m	Reference	Weight kg
Copper connecting cables, straight	1 IP 67 4-pin M12 connector and 1 RJ45 connector	1	**XGSZ12E4501**	–
		3	**XGSZ12E4503**	–
		10	**XGSZ12E4510**	–
	2 IP 67 4-pin M12 connectors	1	**XGSZ12E1201**	–
		3	**XGSZ12E1203**	–
		10	**XGSZ12E1210**	–
		25	**XGSZ12E1225**	–
Copper connecting cables, elbowed	1 IP 67 4-pin M12 elbowed connector and 1 RJ45 connector	3	**XGSZ22E4503**	–
		10	**XGSZ22E4510**	–
Ethernet switch, M12 IP 67, ConneXium *(2)*	–	–	**TCSESU051F0**	0.210
Female M12/RJ45 adaptor	Ethernet connection	–	**TCSEAAF11F13F00**	–

"Do it Yourself" Ethernet copper cable and connectors

The "Do It Yourself" ConneXium range enables Ethernet copper connecting cables to be made up to the required length, on site. They are intended for connection to the Ethernet 110/100 Mbps network.
The maximum length of connecting cables made up in this way is 80 m.
They are quick to assemble using only a knife and ordinary wire cutters (no special tool is required).

Description	Characteristics	Length (m)	Reference	Weight kg
Ethernet copper cable 2 x 24 AWG shielded twisted pairs	Conforms to current standards and approvals	300	**TCSECN300R2**	–
RJ45 connector	Conforms to EIA/TIA-568-D	–	**TCSEK3MDS**	–
M12 connector	Conforms to IEC 60176-2-101	–	**TCSEK1MDRS**	–

Power supplies (Schneider Electric)

Description	Output voltage	Nominal power	Nominal current	Reference	Weight
	V ⎓	W	A		kg
100/240 V regulated power supply	24	7	0.3	**ABL8MEM24003**	0.180
		30	1.2	**ABL8MEM24012**	0.520

(1) Holder for identification legend included with product.
(2) Other ConneXium connection accessories: visit www.schneider-electric.com.

Presentation, description: page 7/6
Connections: page 7/24

Telemecanique Sensors

OsiSense XG
Radio frequency identification 13.56 MHz

106927

XGSZ24

Connection accessories

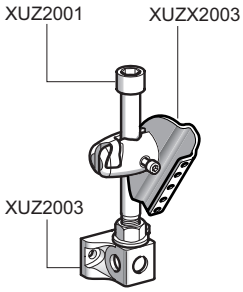
Description	For use with	Length m	Reference	Weight kg
Female M8 pre-wired supply connector, 4-pin	XGCS850C201 compact smart antenna	2	**XZCP0941L2**	0.080
		5	**XZCP0941L5**	0.180
		10	**XZCP0941L10**	0.360
Female M12 pre-wired supply connector, A-coded, 4-pin *(1)*	24 V ⎓ supply to XGSZ33ETH and TCSAMT31FP boxes	2	**XGSZ09L2**	0.115
		5	**XGSZ09L5**	0.270
		10	**XGSZ09L10**	0.520
Female M12 connector, 5-pin, A-coded	–	–	**XZCC12FDB50R**	0.050
Male M12 connector, 5-pin, A-coded	–	–	**XZCC12MDB50R**	0.050
M12 supply connector, straight, A-coded, screw terminal	–	–	**XZCC12FDM40B**	0.020
Protective cap (Sold in lots of 10)	Female M12 connector	–	**ASI67FACC1**	0.013
Network terminator, male M12, 120 Ω	–	–	**TM7ACTLA**	0.010
Line adaptor RS 232C/RS 485 without modem signals Power supply: 18…30 V ⎓ - Consumption: 20 mA Maximum transmission speed: 19,200 bauds Mounting on 35 mm ⎍ rail			**XGSZ24**	–

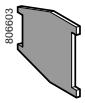
105922

XGSZ3P

Mounting accessories

Description	For use with	Reference	Weight kg
Clip-on 90° mounting bracket	Flat form 40 smart antenna: XGCS4901201 Flat form 40 tags: XGHB44●345	**XSZBC90**	0.060
	XGHB221346 tags	**XSZBE90**	0.060
Clip-on mounting plate	Flat form 40 smart antenna: XGCS4901201 Flat form 40 tags: XGHB44●345	**XSZBC00**	0.025
	XGHB221346 tags	**XSZBE00**	0.025
Mounting plate	TCSAMT31FP and XGSZ33ETH connection boxes	**XGSZ3P**	0.195
3D fixing system *(2)*	XGFEC2525 field expander		
Support for M12 rod		**XUZ2003**	0.220
M12 rod		**XUZ2001**	0.050
Ball-joint mounted fixing bracket		**XUZX2003**	0.220




806603

XGSZ05

105921

XGSZCNF01

Accessories

Description	Sold in lots of	Reference	Weight kg
Key for screwing in/unscrewing cylindrical tag Ø 18 mm XGHB211●●	5	**XGSZ05**	0.011
RFID card For RFID reader address configuration	1	**XGSZCNF01**	0.005
Identification legend for 23 x 4 mm connecting cables	200	**XGSZ08MKW**	0.056

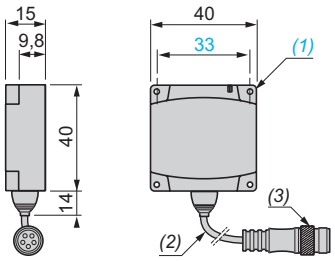
(1) Holder for identification legend included with product.

(2) To create a 3D fixing system, order: rod support **XUZ2003**, *M12 rod* **XUZ2001** *and ball-joint mounted fixing bracket* **XUZX2003**.

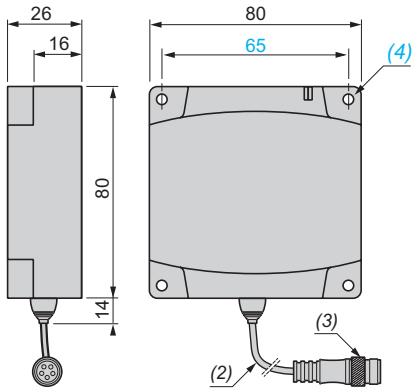
OsiSense XG
Radio frequency identification
13.56 MHz

RFID smart antennas

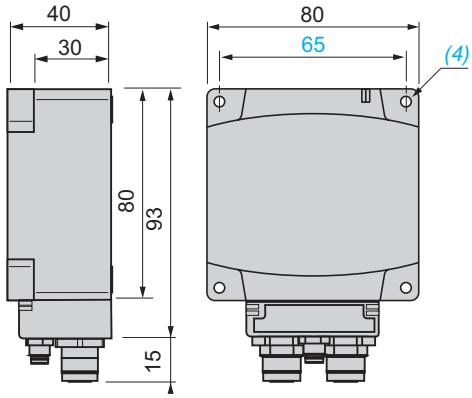
XGCS4901201



XGCS8901201



XGCS850C201

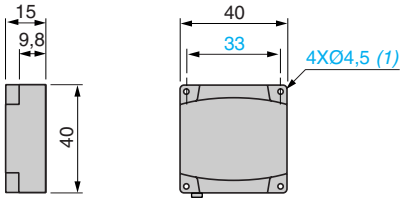


(1) 4 x Ø 4.5. For CHC type screws.
(2) Shielded cable (length: 20 cm).
(3) Male 5-pin M12 connector, A-coded.
(4) 4 x Ø 5.5. For CHC type screws.

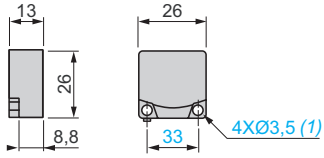
Updatable code electronic tags

Square format tags

XGHB44●●

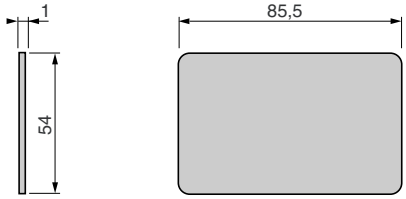


XGHB221346



Rectangular format tags

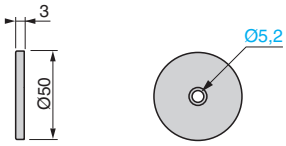
XGHB90E340



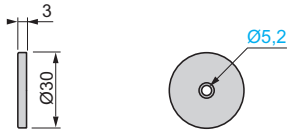
(1) For CHC type screws.

Cylindrical format tags

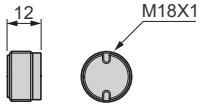
XGHB520246



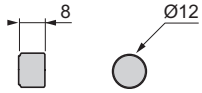
XGHB32●●



XGHB211345

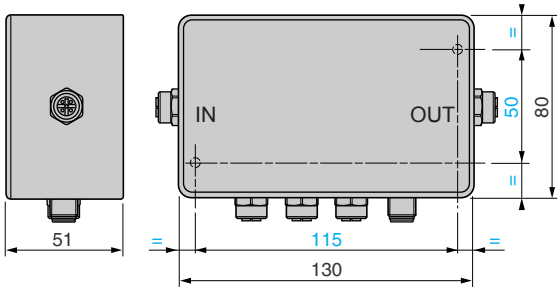


XGHB123345

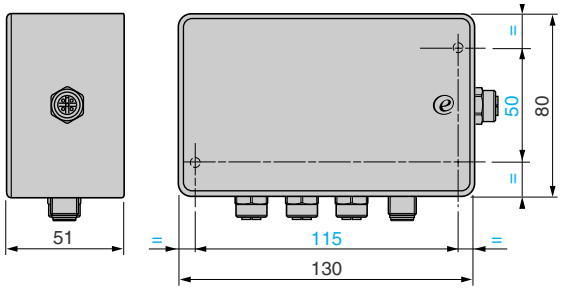


Connection boxes (1)

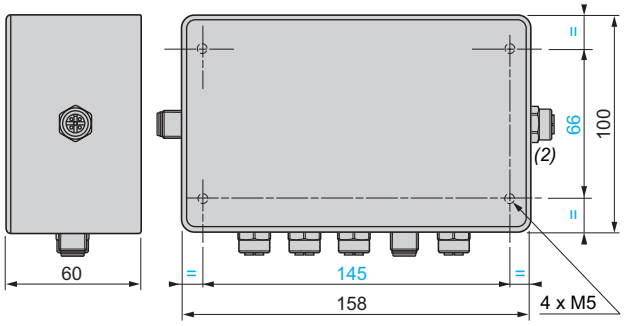
TCSAMT31FP tap-off box



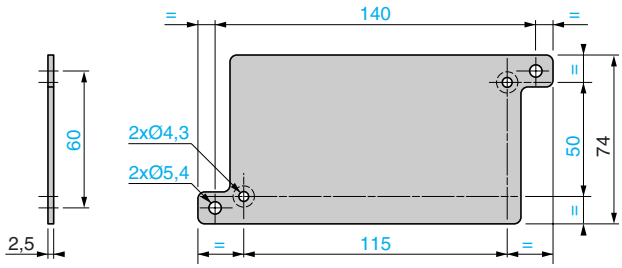
XGSZ33ETH (Ethernet) box



XGSZ33PDP (PROFIBUS DP) and XGSZ33EIP (EtherNet/IP) boxes



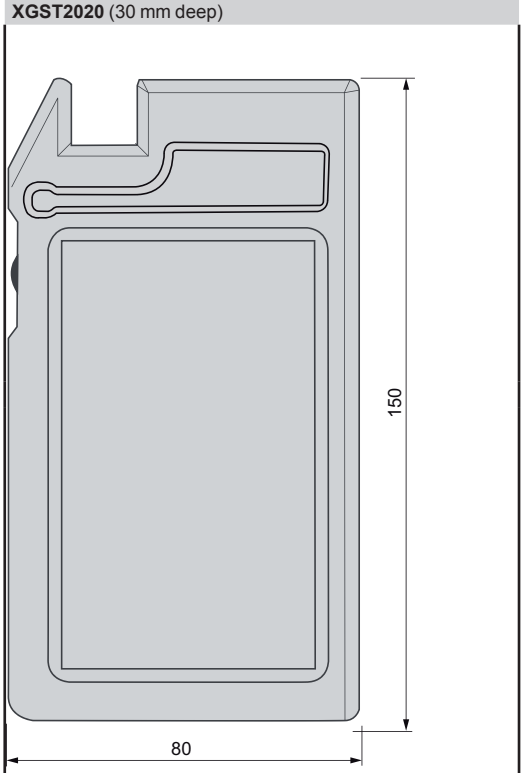
XGSZ3P mounting plate



(1) Allow a 110 mm clearance zone for connecting the cables.
(2) This connector is only present on the PROFIBUS-DP box.

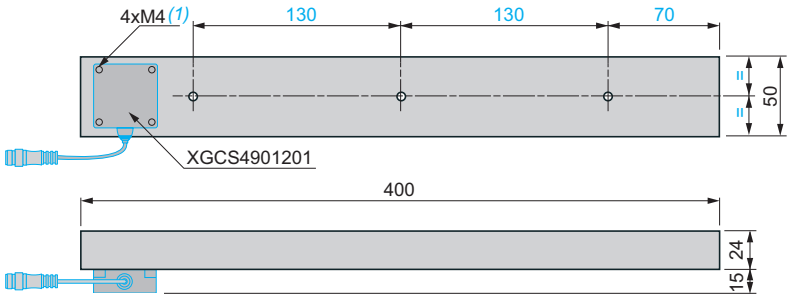
RFID handheld terminal

XGST2020 (30 mm deep)



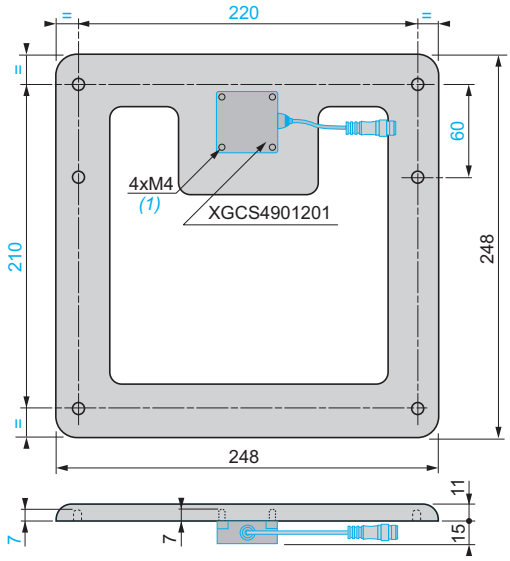
Field expanders

XGFEC540 conveying type



(1) 4 x M4 screws (included).

XGFEC2525 universal type

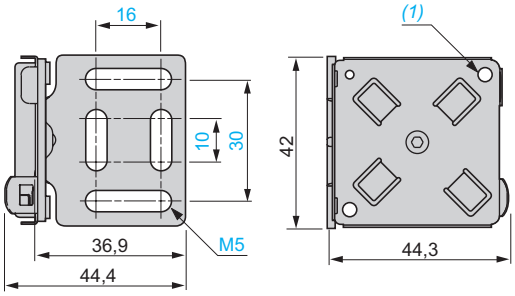


(1) 4 x M4 screws (included).

Mounting brackets

For XGCS49●● smart antennas and XGHB44●● tags

XSZBC90

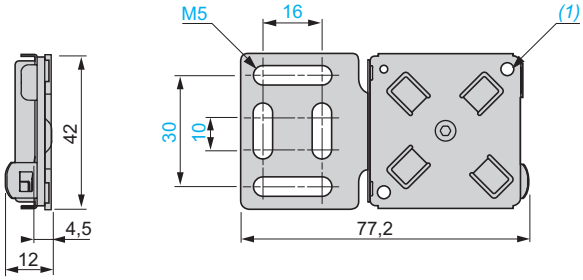


(1) 4 M4 x 14 screws (included).

Mounting plates

For XGCS49●● smart antennas and XGHB44●● tags

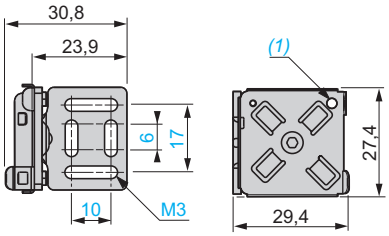
XSZBC00



(1) 4 M4 x 14 screws (included).

For XGHB221346 tags

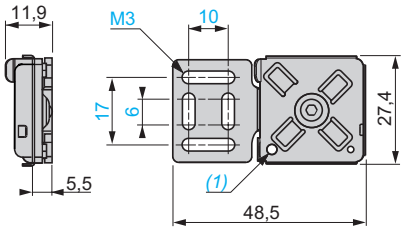
XSZBE90



(1) 2 M3 x 12 screws (included).

For XGHB221346 tags

XSZBE00

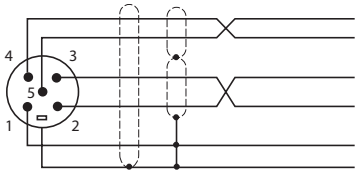


(1) 2 M3 x 12 screws (included).

OsiSense XG
Radio frequency identification
13.56 MHz

Modbus connections

XGCS●901201 smart antennas



Pin no.	Modbus smart antenna signal
1	Drain (Modbus-SHLD)
2	+ 24 V ⎓
3	0 V/Modbus-GND
4	D0
5	D1
Connector casing	Shielding

TCSAMT31FP tap-off box

Socket to smart antenna cabling

Pin no.	Signal
1 –	Drain (Modbus-SHLD)
2	+ 24 V ⎓
3	0 V/Modbus-GND
4	D0
5	D1

Socket to power supply cabling

Pin no.	Signal
1	+ 24 V ⎓
2	+ 24 V ⎓
3	0 V ⎓
4	0 V ⎓

Socket to another connection box cabling

Pin no.	Signal
1	Drain (Modbus-SHLD)
2	–
3	0 V/Modbus-GND
4	D0
5	D1

Socket to automation platform cabling

Pin no.	Signal
1	Drain (Modbus-SHLD)
2	–
3	0 V/Modbus-GND
4	D0
5	D1

Cable connections

TCSMCN1F● cables and pre-wired connectors

Pin no.	Signal
1 –	Drain (Modbus-SHLD)
2 Red	+ 24 V ⎓
3 Black	0 V/Modbus-GND
4 White	D0
5 Blue	D1
Connector casing	Shielding

XGSZ09L●● pre-wired connectors

Pin no.	Signal
1 Red	+ 24 V ⎓
2 NC	
3 Black	0 V ⎓
4 NC	

PROFIBUS-DP connections

PROFIBUS-DP box: XGSZ33PDP

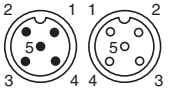
Socket to smart antenna cabling

Pin no.	Signal
1	Earth
2	+ 24 V ⎓
3	0 V
4	D0
5	D1

Socket to power supply cabling

Pin no.	Signal
1	+ 24 V ⎓
2	+ 24 V ⎓
3	0 V
4	0 V

PROFIBUS-DP network connections



Pin no.	Signal	Description
1	VP	Line terminator polarization
2	RxD/TxD-N	Receive/transmit data (-) (red wire)
3	DGND	GND PROFIBUS
4	RxD/TxD-P	Receive/transmit data (+) (green wire)
5	Shielding	Shielding or earth
Connector casing	Shielding	Shielding or earth

OsiSense XG

Radio frequency identification
13.56 MHz

Ethernet connections

XGSZ33ETH and XGSZ33EIP Ethernet boxes

Socket to smart antenna cabling

Pin no.	Signal
1	Earth
2	+ 24 V ⎓
3	0 V
4	D0
5	D1

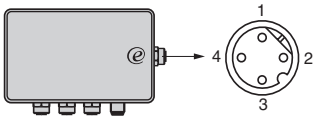
Socket to power supply cabling

Pin no.	Signal
1	+ 24 V ⎓
2	+ 24 V ⎓
3	0 V ⎓
4	0 V ⎓

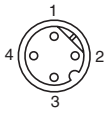
XGSZ09L●● pre-wired connectors

Pin no.		Signal
1	Red	+ 24 V ⎓
2	NC	
3	Black	0 V ⎓
4	NC	

Socket to Ethernet connection



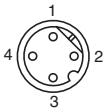
Socket to Ethernet cabling (M12 connectors)



Pin no.	Signal
1	TD +
2	TD -
3	RD +
4	RD -

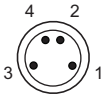
Ethernet compact smart antenna: XGCS850C201

Socket to Ethernet cabling (M12 connectors)



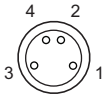
Pin no.	Signal
1	TD +
2	TD -
3	RD +
4	RD -

Socket to power supply cabling (M8 connector)



Pin no.	Signal
1	+ 24 V ⎓
2	NC
3	⎓ 0 V
4	NC

XZCP0941L●● pre-wired connectors (M8 connector)

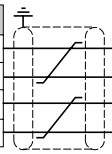


Pin no.		Signal
1	Brown	+ 24 V ⎓
2	White	NC
3	Blue	⎓ 0 V
4	Black	NC

Ethernet cable connections

XGSZ12E45●● and XGSZ22E45●● cables

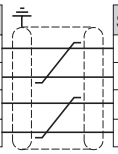
M12	Signal
1	TD +
3	TD –
2	RD +
4	RD –



Signal	RJ45
TD +	1
TD –	2
RD +	3
RD –	6

XGSZ12E12●● cables

M12	Signal
1	TD +
3	TD –
2	RD +
4	RD –

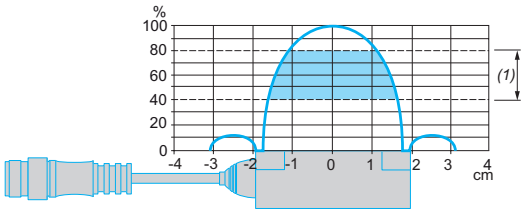


Signal	M12
TD +	1
TD –	3
RD +	2
RD –	4

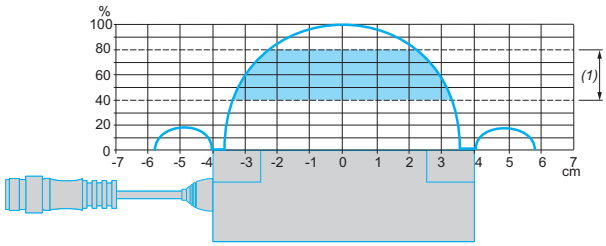
OsiSense XG
Radio frequency identification
13.56 MHz

Dialogue zones of RFID smart antennas

XGCS4901201



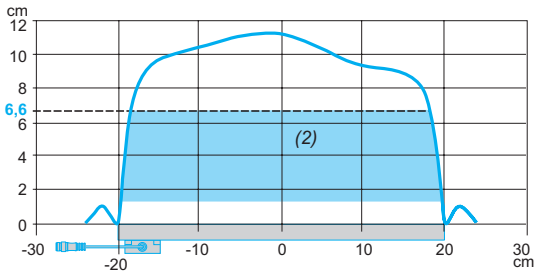
XGCS8901201 and XGCS850C201

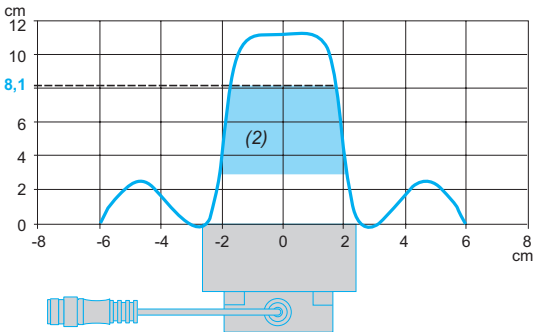


(1) Recommended movement zone: between 0.4 and 0.8 Pn.

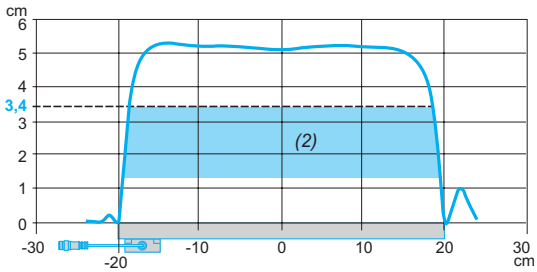
Dialogue zones for field expanders

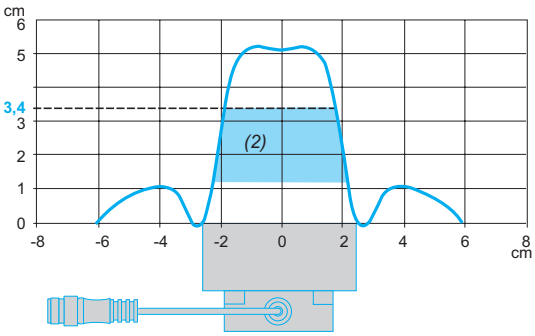
XGFEC540 + XGHB90E340 or XGHB520246 tag



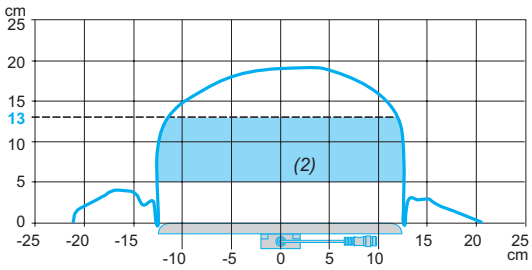


XGFEC540 + XGHB320345 tag

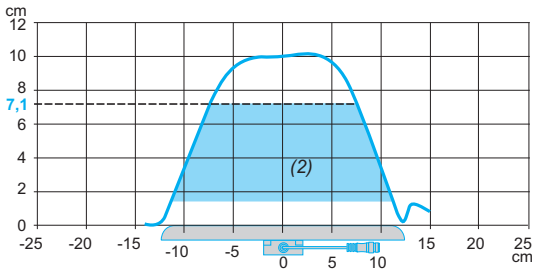




XGFEC2525 + XGHB90E340 or XGHB520246 tag

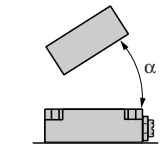


XGFEC2525 + XGHB320345 tag

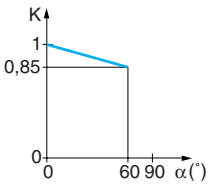


(2) Recommended working zone.

Angular positioning between smart antenna and tag



α ≤ 60°



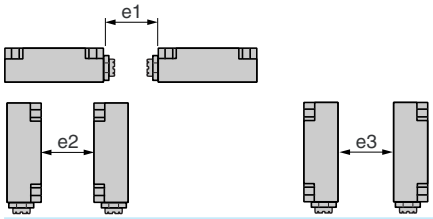
K = correction coefficient to be applied to the nominal sensing distance. Read distance = nominal sensing distance x K.

OsiSense XG
Radio frequency identification
13.56 MHz

Minimum mounting distances between system components

Distance between smart antennas

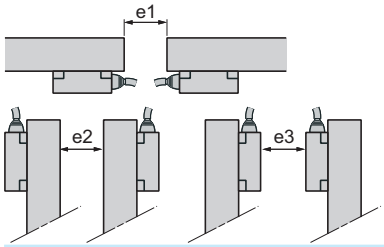
Minimum distance between 2 identical smart antennas according to their positioning and type of tag used (mm)



Tag	XGCS4901201 smart antenna (form 40)			XGCS8●● smart antennas (form 80)		
	e1	e2	e3	e1	e2	e3
XGHB90E340 XGHB520246	310	550	120	430	750	280
XGHB221346	200	320	100	280	530	260
XGHB320●●●	140	360	110	310	540	240
XGHB211345 XGHB123345	210	180	60	200	370	170
XGHB44●●●	90	190	30	310	400	160

Distance between field expanders

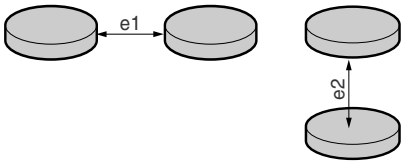
Minimum distance between 2 identical field expanders according to their positioning and type of tag used (mm)



Tag	XGFEC540 field expander			XGFEC2525 field expander		
	e1	e2	e3	e1	e2	e3
XGHB90E340 XGHB520246	195	285	195	570	890	960
XGHB320345	420	540	450	720	1275	1200

Distance between tags

Minimum distance between 2 identical tags according to their positioning and type of smart antenna used (mm)

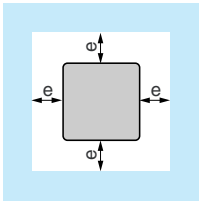


Tag	XGCS4901201 smart antenna (form 40)		XGCS8●● smart antenna (form 80)	
	e1	e2	e1	e2
XGHB90E340 XGHB520246	35	60	110	140
XGHB221346	50	10	120	50
XGHB320345 XGHB440245 XGHB320246	70	50	190	60
XGHB211345 XGHB123345	40	10	120	20
XGHB444345	20	10	70	40
XGHB440845 XGHB441645 XGHB443245	30	10	60	10

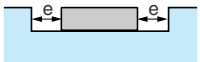
Minimum permissible mounting distances in a metal structure

Smart antennas and tags

XGCS49/XGCS89/XGCS85 smart antennas and XGHB221346/XGHB44●● tags



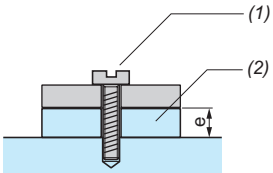
e ⩾ 20 mm.



e ⩾ 20 mm.

XGHB32●● and XGHB52●● tags

No metal parts within 15 mm of the tag.



e ⩾ 15 mm.

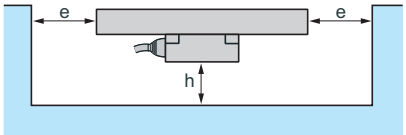
XGHB90E340, XGHB211345, XGHB123345 tags

No metal parts within 25 mm of the tag.

Tags	Nominal sensing distance Pn (mm)		Reduced sensing distance in the presence of metal (mm)	
	XGCS49	XGCS89/S85	XGCS49	XGCS89/S85
XGHB90E340 XGHB520246	70	100	58	80
XGHB221346	40	55	30	33
XGHB320345	48	65	45	56
XGHB211345 XGHB123345	18	20	16	15
XGHB444345	33	48	28	34
XGHB440245	45	65	30	45
XGHB440845 XGHB441645 XGHB443245	25	39	20	28

Field expanders

	e (mm)	h (mm)
XGFEC540	15	30
XGFEC2525	0	75



(1) Tightening torque ⩽ 1 Nm/0.74 lb-ft.
(2) Insulation material.

OsiSense XG

Radio frequency identification
13.56 MHz
Compact smart antennas, Ø 22 mm mounting

OsiSense XG

RFID is the abbreviated term used to designate radio frequency identification systems. Frequencies range between 50 kHz and 2.5 GHz. The most widely used is 13.56 MHz.

The OsiSense XG RFID system is used to identify operators on machines by means of contactless RFID cards or key fobs.

Operator ID information is stored in a memory that can be accessed using a simple radio frequency link. This memory is in the form of an electronic tag, which contains an antenna and an integrated circuit.

When a tag enters the field generated by the reader/smart antenna, it detects the signal and exchanges data (read or write) between its memory and the reader/smart antenna.

Telemecanique Sensors offers 2 smart antennas for mounting on a control panel. These OsiSense XG smart antennas are designed for identifying operators on systems such as:
- mobile access platforms for trucks and elevators
- car charging stations
- machine control panels
- automated tools, presses, and assembly lines, etc.

Mounted in a standard Ø 22 mm hole

Rapid and efficient access control

> OsiSense XG smart antennas identify operators by means of their RFID card or electronic key fob in order to determine which operations they are authorized to access.
> One model has 2 integrated LEDs on the front. These multi-color LEDs are used to guide the operator by means of visual indications controlled by the automation system via the smart antenna's Modbus serial link. There is a choice of 7 different colors that can also be combined with flashing.

Easy to install

> Less machining: The smart antenna is mounted on a panel through a standard Ø 22 mm hole and manually tightened to secure in place using a single locking nut.
> Less wiring: A single M12 connector is required for the smart antenna power supply and network connection. Dedicated accessories, such as network T-connectors and M12 cables, are available to facilitate daisy-chain connections *(1)*.

Easy to configure

> The network address can be set simply by presenting the RFID card supplied with the smart antenna.
> Integrated network and RFID functions
> No programming
> Automatic detection of RFID electronic tags (read or write)
> Automatic setting of communication parameters (speed, format, parity, protocol, etc.)
> Read/write compatibility with the majority of 13.56 MHz tags on the market
> Low sensitivity to metal environments

(1) Up to 15 OsiSense XG compact smart antennas can be connected to the same network. All connections are made via M12 connectors, using a complete range of cables and T-connectors. Please consult our website www.tesensors.com.

+ Easily integrate operator ID functionality into your machines

OsiSense XG
Radio frequency identification
13.56 MHz
Compact smart antennas, Ø 22 mm mounting

Rugged and compact

A monobloc device designed for harsh environments

> OsiSense XG smart antennas, with their sleek, clean design with no screws on the front face, are intended for use in industrial environments, particularly in cleaning applications in the medical and food and beverage sectors.
> The extended operating temperature range means that OsiSense XG smart antennas can operate in some of the harshest conditions.
> OsiSense XG smart antennas are highly compact, measuring just 40 x 40 x 40 mm, and have a simple mounting system via a nut on the rear, meaning they can be easily integrated into even the smallest of spaces.
> OsiSense XG compact smart antennas offer a tried-and-tested solution that has been validated through numerous laboratory and field tests.

Worldwide compatibility

With 13.56 MHz standards

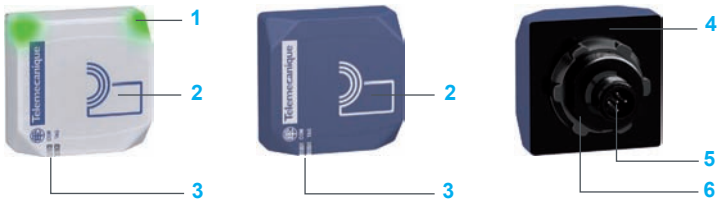
> The OsiSense XG identification system is open to the majority of ISO 18000-3, ISO 15693, and ISO 14443 electronic tags.
> With their low power consumption (< 60 mA) and a choice of suitable materials, OsiSense XG smart antennas are environmentally-friendly.

Use

> The **XGCS49LB201** compact smart antenna features integrated multi-color LEDs that can be controlled remotely by the automation system via the Modbus RTU communication network.
> These LEDs provide intuitive information to the operator when they present their RFID card to the reader and their profile is read by the automation system (for example, steady green light if they are authorized to use the control station, or flashing red if their profile is not accepted, etc.).
The 2 integrated LEDs are controlled in parallel via Modbus word write requests. They are visible from all angles regardless of the operator's viewing angle.

> The **XGCS490B201** compact smart antenna can be easily combined with any industrial terminal that supports Modbus RTU. No specific driver or dedicated function is required, since all exchanges are managed by standard word read or write requests.
> Example of use: A user or operator profile is contained in the RFID card. When the card is read, the terminal automatically selects the accessible pages. It is capable of differentiating between an inexperienced operator who is not authorized to access machine settings and a maintenance engineer who has access to these settings.

Description



1 LEDs for informing the operator (7 different colors can be selected and combined with flashing)
2 Network address configuration
3 RFID and communication diagnostic LEDs
4 Seal
5 M12 connector for power supply and connection to the Modbus RTU network
6 Locking nut for mounting in Ø 22 mm hole

OsiSense XG
Radio frequency identification
13.56 MHz
Compact smart antennas, Ø 22 mm mounting

Characteristics of OsiSense XG compact smart antennas

Smart antenna type			XGCS49LB201	XGCS490B201
Certification			cULus, FCC part 15, IC, CE	
Conforming to standards			EN 301489-1, EN 301489-3, EN 300330-1, and EN 300330-2	
Ambient air temperature	For operation	**°C**	-25…+70	
	For storage	**°C**	-40…+85	
Degree of protection	Conforming to IEC 60529		IP 69K (front) IP 65 (rear)	IP 65
Vibration resistance	Conforming to EN 60068.2.6		2 mm from 5 to 29.5 Hz/7 gn from 29.5 to 150 Hz	
Shock resistance	Conforming to EN 60068.2.27		30 gn/11 ms	
	Conforming to EN 50102		IK 04	
Resistance to interference	Conforming to IEC 61000		Resistance to electrostatic discharge, radiated electromagnetic fields, fast transients, electrical surges, conducted and induced interference, and network frequency magnetic fields	
Dimensions (W x H x D)		**mm**	40 x 40 x 40	40 x 40 x 40
RFID frequency		**MHz**	13.56	
Nominal sensing distance		**mm**	20 to 70 depending on associated tags	
Type of associated tag			ISO 15693 and ISO 14443 standardized tags Automatic detection of tag type	
Examples of RFID compatible chips			Fujitsu (MB89R118), INSIDE (MicroPass) NXP (I-Code SL2, SL1, Ultralight, Std 1K/4K, Desfire), STM (CRIX4K) Texas (Tag-it HFI), µEM4135	
Nominal supply voltage		**V**	24 ⎓ PELV (protective extra-low voltage)	
Supply voltage limits (including ripple)		**V**	19.2...29 ⎓	
Power consumption		**mA**	< 60	
Communication ports	Physical interface		RS485	
	Protocol		Modbus RTU	
	Data rate		9,600...115,000 baud (automatic detection)	
	Medium (see cable references on page 7/32)		2-pair shielded twisted pair cable with M12 connector, A-coded	
Display	To inform the operator		2 multi-color LEDs (choice of 7 colors) controlled by Modbus requests	–
	For communication		1 bi-color LED (Tag presence/Dialog between smart antenna and tag) 1 bi-color LED (Modbus network activity)	
Connections			1 male M12 5-pin connector (see connections on page 7/33)	
Tightening torque	Locking nut		2.2 Nm ± 0.2/*19.5 lb-in ± 1.8*	

OsiSense XG

Radio frequency identification
13.56 MHz
Compact smart antennas, Ø 22 mm mounting

Characteristics of electronic tags

Tag type			Electronic key fob XGHBPB3345	ISO RFID card XGHB90E340
Ambient air temperature	For operation	**°C**	-5…+80	-25…+50
	For storage	**°C**	-25…+80	-40…+55
Degree of protection			IP 67	IP 65
Standard supported			ISO 14443	ISO 15693
Vibration resistance	Conforming to EN 60068.2.6		2 mm from 5 to 29.5 Hz 7 gn from 29.5 to 150 Hz	2 mm from 5 to 29.5 Hz 7 gn from 29.5 to 150 Hz
Shock resistance	Conforming to EN 60068.2.27		30 gn/11 ms	30 gn/11 ms
	Conforming to EN 50102		IK02	IK02
Dimensions		**mm**	40 x 31 x 4.8	54 x 85.5 x 1
Housing material			PC	PVC
Memory capacity		**Bytes**	736	256
Type of memory			EEPROM	EEPROM
Type of operation			Read/Write	Read/Write
Nominal sensing distance (Read/Write)	With compact smart antennas, Ø 22 mm mounting	**mm**	30	70
Number of read cycles			Unlimited	Unlimited
Number of write cycles	Guaranteed minimum (per data bit, throughout the temperature range)		100,000	100,000

OsiSense XG
Radio frequency identification
13.56 MHz
Compact smart antennas, Ø 22 mm mounting

16001

XGCS49LB201

16003

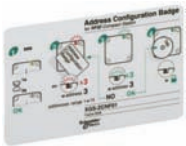
XGCS490B201

16005

XGHBPB3345

105914

XGHB90E340

105921

XGSZCNF01

107359

ZB5AZ905

XG_1471_6004

TCSMCN1M1F●

XG_1471_6003

TCSMCN1F●

106927

TCSCTN011M11F

Compact smart antennas, 13.56 MHz

Description	Protocol	Dimensions mm	Reference	Weight kg
Compact smart antenna for panel-mounting *(1)* M12 male connector	Modbus RTU	40 x 40 x 40	**XGCS49LB201**	0.257
Compact smart antenna for panel-mounting with LEDs *(1)* M12 male connector	Modbus RTU	40 x 40 x 40	**XGCS490B201**	0.257

Electronic tags

Tag type	Nominal sensing distance mm	Dimensions mm	Order in multiples of	Unit reference	Weight kg
Tag with EEPROM memory					
Electronic key fob 736 bytes	10	40 x 31 x 4.8	10	**XGHBPB3345**	0.005
ISO RFID card *(2)* 256 bytes	70	54 x 85.5 x 1	10	**XGHB90E340**	0.005

Configuration and mounting accessories

Description	Unit reference	Weight kg
RFID card For smart antenna address configuration (supplied with smart antenna)	**XGSZCNF01**	0.005
Locking nut tightening tool *(3)*	**ZB5AZ905**	0.016

Modbus network connection accessories

Description	Used for	Length m	Reference	Weight kg
Modbus shielded cable, black IP 67 M12 connectors, male/female, A-coded *(4)*	RS485 and power supply connection between 2 smart antennas or between a compact smart antenna and a tap-off box *(5)*	1	**TCSMCN1M1F1**	0.080
		2	**TCSMCN1M1F2**	0.115
		5	**TCSMCN1M1F5**	0.270
		10	**TCSMCN1M1F10**	0.520
Modbus IP 67 shielded pre-wired connector Female M12 connector/ bare wires, A-coded *(4)*	Connecting a smart antenna to a Modbus network and a power supply	2	**TCSMCN1F2**	0.115
		5	**TCSMCN1F5**	0.270
		10	**TCSMCN1F10**	0.520
M12 network T-connector 1M/2F A-coded, 5-pin For RS485 network	Daisy-chain connection between 2 smart antennas using TCSMCN1M1F● cables	–	**TCSCTN011M11F**	0.035
Male M12 connector 5-pin, A-coded	–	–	**XZCC12MDB50R**	0.050

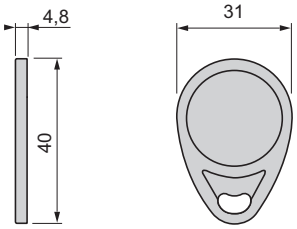
*(1) Supplied with configuration badge **XGSZCNF01**, a locking nut, and the User Guide.*
(2) Customized versions available on request.
(3) Schneider Electric product.
(4) Supplied with holder for identification legend included with product.
(5) Please consult the "OsiSense XG - Radio frequency identification" catalog.

OsiSense XG

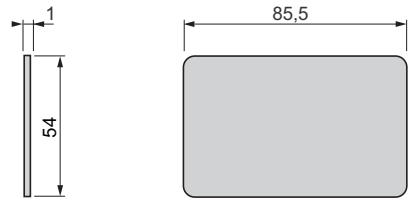
Radio frequency identification
13.56 MHz
Compact smart antennas, Ø 22 mm mounting

Dimensions

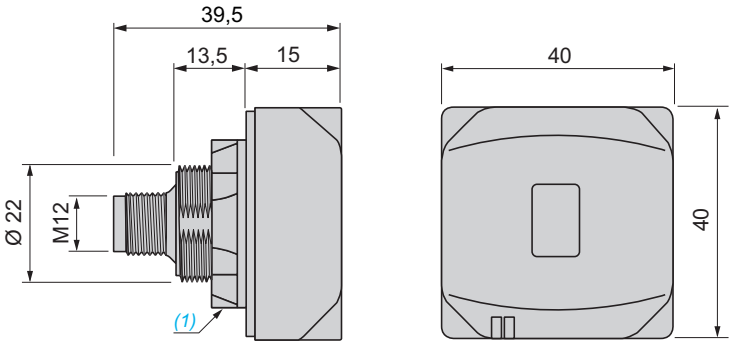
XGHBPB3345 electronic key fob



XGHB90E340 ISO RFID card

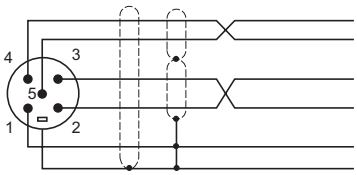


XGCS49LB201 and XGCS490B201 compact smart antennas



Modbus connections

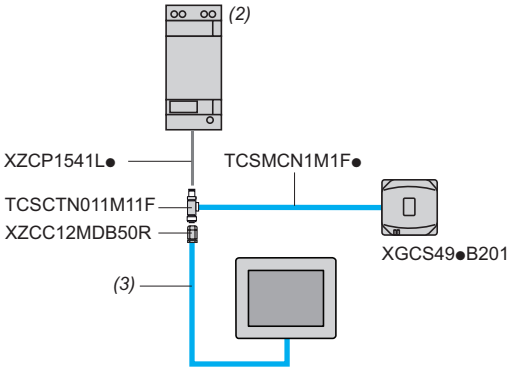
XGCS49LB201 and XGCS490B201 compact smart antennas



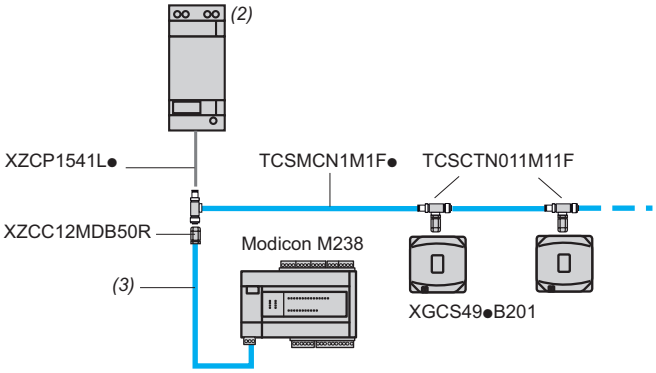
Pin no.	Modbus smart antenna signal
1	Drain (Modbus-SHLD)
2	+24 V⎓
3	0 V/Modbus-GND
4	D0
5	D1

Connection examples

Connection to a Schneider Electric Magelis terminal



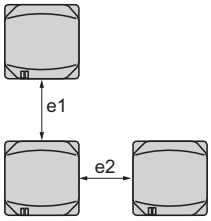
Daisy-chain connection to a Schneider Electric automation platform



Minimum mounting distances between system components

Distances between smart antennas

Minimum distance between 2 identical smart antennas according to their positioning and the type of tag used (mm)



Tag	XGCS49LB201 and XGCS490B201 smart antennas	
	e1	e2
XGHBPB3345	90	90
XGHB90E340	310	310

(1) Locking nut
(2) Schneider Electric ***ABL8●●*** *power supply*
(3) Schneider Electric ***VW3A8306R03*** *cable*

8

Contents

8 - Opto-electronic rotary encoders OsiSense XCC

Selection guide . . . . . *page 8/2*

- **General**
  - Incremental encoder, absolute coder: principle . . . . . *page 8/4*
  - Binary coding, Gray coding . . . . . *page 8/6*
  - Characteristics required to define an encoder . . . . . *page 8/7*
  - Installation precautions . . . . . *page 8/8*

Incremental encoders

- **Ø 40 mm encoders**
  - Characteristics and schemes. . . . . *page 8/10*
  - References . . . . . *page 8/11*
  - Dimensions and connections. . . . . *pages 8/18 to 8/20*
- **Ø 58 mm encoders, aluminium and stainless steel**
  - Characteristics and schemes. . . . . *page 8/12*
  - References . . . . . *page 8/14*
  - Dimensions and connections. . . . . *pages 8/18 to 8/20*
- **Ø 90 mm encoders**
  - Characteristics and schemes. . . . . *page 8/16*
  - References . . . . . *page 8/17*
  - Dimensions and connections. . . . . *pages 8/18 to 8/20*

Single turn absolute encoders

- **Ø 58 mm encoders, aluminium and stainless steel**
  - Characteristics and schemes. . . . . *page 8/22*
  - References . . . . . *page 8/23*
  - Dimensions and connections. . . . . *page 8/26*
- **Ø 90 mm encoders**
  - Characteristics and schemes. . . . . *page 8/24*
  - References . . . . . *page 8/25*
  - Dimensions and connections. . . . . *page 8/26*

Multiturn absolute encoders

- **Ø 58 mm encoders, aluminium and stainless steel**
  - Characteristics and schemes. . . . . *page 8/28*
  - References . . . . . *page 8/29*
  - Dimensions and connections. . . . . *page 8/32*
- **Ø 90 mm encoders**
  - Characteristics and schemes. . . . . *page 8/30*
  - References . . . . . *page 8/31*
  - Dimensions and connections. . . . . *page 8/32*

Rotary encoders

- Characteristics. . . . . *page 8/36*
- References . . . . . *page 8/37*
- Dimensions and connections. . . . . *page 8/38*

Multiturn absolute encoders on bus

- **CANopen Ø 58 mm encoders**
  - Presentation . . . . . *page 8/42*
  - References . . . . . *page 8/44*
  - Dimensions and connections. . . . . *page 8/45*
- **PROFIBUS-DP Ø 58 mm encoders**
  - Presentation . . . . . *page 8/46*
  - References . . . . . *page 8/48*
  - Dimensions and connections. . . . . *page 8/49*

Opto-electronic rotary encoders
OsiSense XCC

Encoder type			**Incremental encoders**			
Applications			**Counting indication**			
Diameter of housing			Ø 40 mm	Ø 58 mm	Ø 58 mm parameterable (multi-resolution) *(1)*	Ø 90 mm
Shaft		Solid	Ø 6 mm	Ø 6 mm and Ø 10 mm *(3)*	Ø 10 mm	Ø 12 mm
		Through	Ø 6 mm	Ø 14 mm Ø 6, 8, 10 and 12 mm (with reduction collar)	Ø 14 mm Ø 6, 8, 10 and 12 mm (with reduction collar)	Ø 30 mm Ø 12, 20 and 25 mm (with reduction collar)
Resolution	Incremental encoders	100 points	100 points	100 points	–	100 points
		256 points	–	–	256 to 4096 points	–
		360 points	360 points	360 points *(3)*	360 to 5760 points	360 points
		500 points	500 points	500 points	500 to 8000 points	500 points
		1000 points	1000 points	1000 points	–	1000 points
		1024 points	1024 points	1024 points *(3)*	1024 to 16,384 points	1024 points
		2500 points	–	2500 points	–	2500 points
		3600 points	–	–	–	3600 points
		4096 points	–	–	–	–
		5000 points	–	5000 points *(3)*	5000 to 80,000 points	5000 points
		10,000 points	–	–	–	10,000 points
	Absolute encoders	4096 points/8192 turns (12-bit/13-bit)	–	–	–	–
		8192 points (13-bit)	–	–	–	–
		8192 points/4096 turns (13-bit/12-bit)	–	–	–	–
Output stage Supply *(2)*	Incremental encoders	Type R (N)	5 V, RS 422, 4.5…5.5 V	–	–	–
		Type K (N)	Push-pull, 11…30 V	–	–	Push-pull, 11…30 V
		Type X	–	5 V, RS 422, 4.75…30 V	5 V, RS 422, 4.75…30 V	–
		Type Y	–	Push-pull, 5…30 V *(3)*	Push-pull, 5…30 V	–
	Absolute encoders	Type KB (N) or KG (N)	–	–	–	–
		Type SB (N) or SG (N)	–	–	–	–
		Type C	–	–	–	–
		Type F	–	–	–	–
Connection		Pre-cabled, radial or axial	●	● (for stainless steel versions only)	–	–
		Connector, radial, M23	–	●	●	●
		Terminal block, radial	–	–	–	–
Type reference			**XCC14●●●●●**	**XCC15●●●●●**	**XCC15●●●●M●●●**	**XCC19●●●●●**
Pages			8/11	8/13 to 8/15		8/17

(1) Parameterable version: multiplication of the basic resolution of the disc using dip switches, the factory setting being that of the lowest value.
(2) Characteristics of the output stage/supply types:
- ***Type R** (N): 5 V output driver, RS 422, 4.5…5,5 V. **Type K** (N): push-pull output driver, 11…30 V.*
- ***Type X**: 5 V output driver, RS 422, 4.75…30 V. **Type Y**: push-pull output driver, 5…30 V.*
- *KB (N) or KG (N) output: push-pull output driver, 11…30 V, binary code KB (N) or Gray code KG (N).*

Single turn absolute encoders		Multiturn absolute encoders			Accessories for encoders
Absolute position indication within a revolution		Absolute position indication within a revolution and indication of the number of revolutions		Fieldbus: CANopen, PROFIBUS-DP	
Ø 58 mm	Ø 90 mm	Ø 58 mm	Ø 90 mm	Ø 58 mm	- Shaft couplings with spring, - anti-rotation devices, - reduction collars, - pre-wired connectors, - etc.
Ø 6 mm and Ø 10 mm *(3)*	Ø 12 mm	Ø 6 mm and Ø 10 mm *(3)*	Ø 12 mm	Ø 10 mm	
Ø 14 mm	Ø 30 mm	Ø 14 mm	Ø 30 mm	Ø 15 mm (hollow shaft)	
Ø 6, 8, 10 and 12 mm (with reduction collar)	Ø 12, 20 and 25 mm (with reduction collar)	Ø 6, 8, 10 and 12 mm (with reduction collar)	Ø 16, 20 and 25 mm (with reduction collar)	Ø 6, 8, 10, 12 and 14 mm (with reduction collar)	
–	–	–	–	–	
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–	–	–	–	–	
–	–	–	–	–	
–	–	–	–	–	
–	–	–	–	–	
–	–	4096 points/8192 turns *(3)*	–	–	
8192 points *(3)*	8192 points	–	–	–	
–	–	8192 points/4096 turns	8192 points/4096 turns	8192 points/4096 turns	
–	–	–	–	–	
–	–	–	–	–	
–	–	–	–	–	
–	–	–	–	–	
Push-pull, binary or Gray, 5 …30 V or 11…30 V *(3)*	Push-pull, binary or Gray, 11…30 V,	–	–	–	
SSI, 13-bit, binary or Gray 5…30 V or 11…30 V *(3)*	SSI, 13-bit, binary or Gray 11…30 V	SSI, 25-bit, binary or Gray 5…30 V or 11…30 V *(3)*	SSI, 25-bit, binary or Gray 11…30 V	–	
–	–	–	–	11…30 V, CANopen	
–	–	–	–	11…30 V, PROFIBUS-DP	
● (for stainless steel encoders only)	–	● (for stainless steel encoders only)	–	–	
●	●	●	●	●	
–	–	–	–	●	
XCC25●●●●●	**XCC29●●●●●**	**XCC35●●●●●**	**XCC39●●●●●**	**XCC35●●●●●CBN** **XCC35●●●●●FBN**	**XCCR, XCCP, XZC**
8/23	8/25	8/29	8/31	8/44 and 8/48	8/35 to 8/37, 8/50 and 8/51

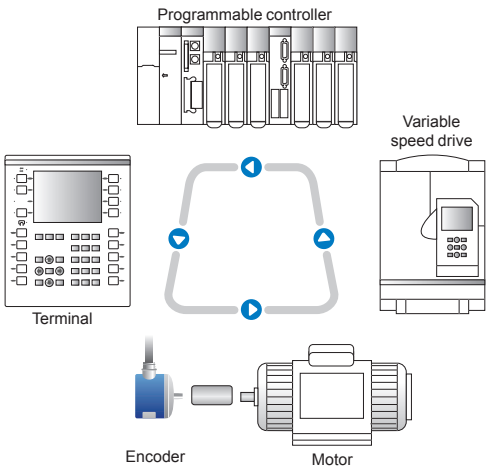
(2) Characteristics of the output stage/supply types (continued):
- ***Type SB*** *(N) or* ***SG*** *(N): SSI output without parity, 13-bit or 25-bit, 5…30 V or 11…30 V, binary code SB (N) or Gray code SG (N).*
- ***Type KB*** *(N) or* ***KG*** *(N): push-pull output driver, 5…30 V or 11…30 V, binary code KB (N) or Gray code KG (N) with multiturn connecting cable.*
- ***Type C****: binary CANopen serial link.* ***Type F****: binary PROFIBUS serial link, RS 485.*

(3) For all encoders versions (including stainless steel versions).

Opto-electronic rotary encoders
OsiSense XCC

Applications

The increase in the power of processing systems, coupled with the requirements for high productivity, has created the need for continuous information in all areas of production regarding:
- counting, positioning by counting,
- absolute positioning,
- speed control.



Example

The positioning of a moving part is fully controlled by the processing system via the encoder.

- Processing units
please refer to our “Premium automation platform” catalogue.

- Variable speed drives
please refer to our “Variable speed drives and starters” catalogue.

Principle of the opto-electronic rotary encoder

The opto-electronic rotary encoder is an angular position sensor.

Mechanically coupled to a driving spindle of a machine, the shaft of the encoder rotates a disc that comprises a succession of opaque and transparent sectors.

Light from light emitting diodes (LEDs) passes through the transparent sectors of the disc as they appear and is detected by photosensitive diodes.

The photosensitive diodes, in turn, generate an electrical signal which is amplified and converted into a digital signal before being transmitted to a processing system or an electronic variable speed drive.

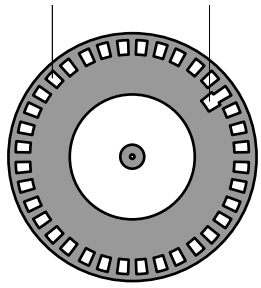
The electrical output of the encoder therefore represents, in digital form, the angular position of the input shaft.

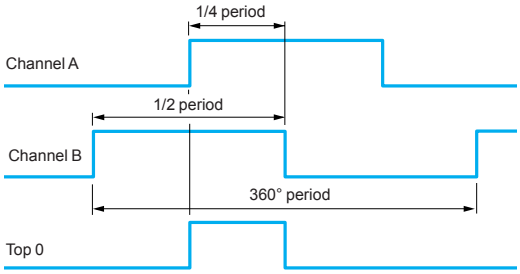
Types of opto-electronic rotary encoder

- Incremental encoders:
Counting, positioning by counting, speed.
- Parameterable incremental encoders:
Multiplication of the basic resolution of the disc using dip switches (the factory setting being that of the lowest value).
- Single turn and multiturn absolute encoders:
Absolute positioning.
- Fieldbus multiturn absolute encoders:
CANopen and PROFIBUS-DP.

Opto-electronic rotary encoders
OsiSense XCC

Incremental encoder





Principle

The disc of an incremental encoder comprises 2 types of track:
■ one or several outside tracks (channels A and B), comprising “n” equal angular steps that are alternately opaque and transparent, with “n” being the resolution or number of periods of the encoder,
■ an inside track comprising a single window, which serves as the reference point and enables reinitialisation at each revolution (top 0).

Schemes and settings

The operation of the photosensitive elements (LEDs + photosensitive diodes) is based on the real-time differential optical reading principle:
■ the photosensitive elements of tracks A and B are offset so that each will simultaneously read only its respective slot (channels A and B are 90° electrically offset),
■ the electronics operate following the principle of real-time differential measurement.

Channel B (rising edge) arriving before A in the clockwise direction viewed from base side.

Period: 360° electrical.
Cyclic ratio: 180° electrical ± 10%.
Phase displacement: 90° electrical ± 25%.

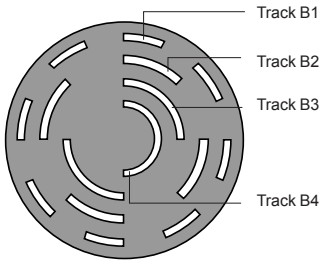
Advantages of real-time differential optical reading

Reading by offset photosensitive elements
■ Radial play of encoder shaft greater than 30%, which is higher than traditional optical reading encoders.
■ Maintains a phase displacement of channels A and B within the tolerance limits of the unit.

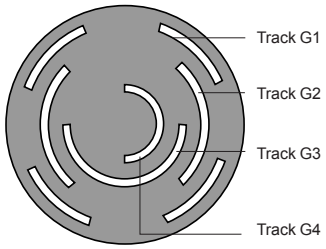
Triple light source emission
■ Maintains cyclic ratio, even in the event of:
- failure of one of the 3 light sources,
- diminishing efficiency of the light sources (up to 30%),
- fine dust deposit on the optical components, reducing signal strength of the photosensitive elements (up to 30%).

These advantages are the reliability factors of the XCC encoders.

Absolute encoder



Binary disc



Gray disc

Principle

The disc of an absolute encoder comprises “n” concentric tracks, equally divided into alternate opaque and transparent segments, and each track has its own transmitter and receiver.

The inside track is half opaque and half transparent. Reading of this MSB (Most Significant Bit) track determines in which half-turn the encoder is situated.

The next track is divided into 4 quarters, alternately opaque and transparent. The reading of this track, in conjunction with the previous track, determines in which quarter-turn the encoder is situated.

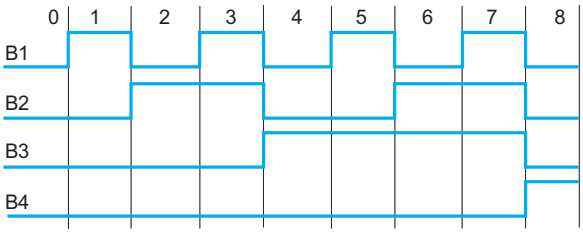
The following tracks enable successive determination of which eighth-turn, sixteenth-turn, etc. the encoder is situated.

The outside track corresponds to the LSB (Least Significant Bit) and provides the final accuracy. It has 2^n points corresponding to the resolution of the encoder. Therefore, for each angular position of the shaft, the disc provides a code. This code can either be binary or Gray.
Following one complete revolution of the encoder, the same coded values are repeated.
The multiturn absolute encoder, in addition to providing the digital position within the revolution, also provides the total number of revolutions.

Absolute encoder *(continued)*

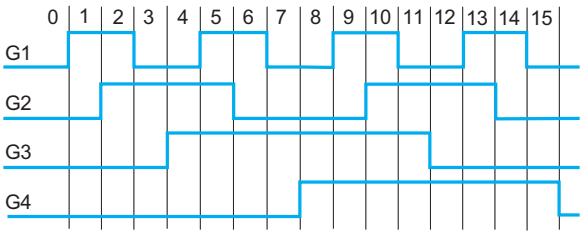
Binary coding

The binary code is directly usable by processing systems (programmable controllers for example) in order to execute calculations or comparisons, but has the disadvantage of having several bits which change state between 2 positions.



Gray coding

The Gray code offers the advantage of only changing one bit between 2 consecutive numbers.



Example of Gray code disc

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
2^0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0
2^2	0	0	1	1	1	1	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1	0	0	0
2^4	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1
2^8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
2^{16}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1

Representation of the first 24 decimal values corresponding to the reading of the first 5 tracks.

Advantages of position detection by an absolute encoder

An absolute encoder continuously provides a code that is an image of the actual position of the moving object being monitored.

On power-up, or restart following a supply failure, the encoder provides data that is directly exploitable by the processing system.

Opto-electronic rotary encoders
Characteristics required to define an encoder

7 characteristics to be established

1 Function

■ Incremental encoder
Provides counting indication.

■ Single turn absolute encoder
Provides absolute position within each revolution.

■ Multiturn absolute encoder
Provides absolute position within each revolution and indicates total number of revolutions.

2 Diameter of housing

■ Incremental encoders
Ø 40, 58 and 90

■ Single turn and multiturn absolute encoders
Ø 58 and 90

3 Diameter of shaft

■ Ø 6 mm to 30 mm, depending on model
■ Reduction collars
For Ø 58 and 90 mm encoders, with Ø 14, 15 and 30 mm through shaft, reduction collars are available to reduce the diameters:
- from 14 to 6, 8, 10 and 12
- from 15 to 6, 8, 10, 12 and 14
- from 30 to 12, 16, 20 and 25.

4 Type of shaft

■ Solid shaft
The shaft of the encoder is mechanically linked to a drive shaft using a flexible coupling, which eliminates alignment inaccuracies.

■ Through shaft/Hollow shaft
The encoder is mounted directly on the drive shaft. A flexible mounting kit prevents encoder rotation and compensates for alignment inaccuracies.

5 Connection method

■ Pre-cabled with 2 m long shielded cable or M23/M12 connector.
■ Radial type connection.

6 Resolution

■ Number of points per revolution.
■ Number of revolutions (for multiturn absolute encoders).
■ On Ø 58 parameterable incremental encoders, this resolution can be adjusted using dip switches (multiplication factor up to 16 times on 9 basic resolutions).

7 Type of output

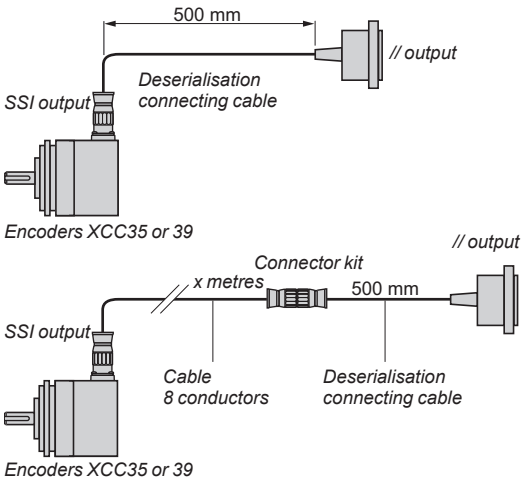
■ Incremental encoders
5 V output driver, RS 422, 4.75…30 V.
Push-pull output driver, 5…30 V, 11...30 V.

■ Single turn absolute encoders (depending on model)
Push-pull output driver, 11…30 V, binary code or Gray code.
SSI output without parity, 13-bit clock, 11…30 V, binary code or Gray code.

■ Multiturn absolute encoders (depending on model)
SSI output without parity, 25-bit clock, 11…30 V, binary code or Gray code.

■ Parallel outputs obtainable using converter connecting cables
The SSI versions can be converted to a parallel version by using the deserialisation connecting cable (see page 8/35).

■ Multiturn absolute encoders, communicating version, fieldbus:
□ CANopen: 11...30 V (see page 8/42).
□ PROFIBUS-DP: 11...30 V (see page 8/46).



Opto-electronic rotary encoders
Characteristics required to define an encoder

Installation precautions

Type of cables

In an environment subject to considerable electrical interference, it is recommended that cables with several twisted pairs, reinforced by general shielding, be used.

For the signals, it is recommended that standard 0.14 mm^2/0.22 mm^2 conductors be used.

For 5 V supply encoders.
Due to line voltage drops, it is recommended that the 0 V and + V supply cables have the following minimum cross-sectional areas:
- 0.14 mm^2 if the encoder-supply distance is less than 30 m,
- 0.22 mm^2 if the encoder-supply distance is greater than 30 m.

Cabling

Separate, by as much as possible, the connecting cables to encoders and power cables. Also, avoid parallel cable runs. Maintain a distance of at least 20 cm and, in the event of cables crossing, ensure that the crossovers are at right-angles.

When using cables with twisted pairs (shielded or non shielded) group signal cables in common pairs.

In environments subject to electrical interference, it is recommended to earth the encoder base using one of the fixing screws.

Connect the control inputs to a potential (absolute encoder).
Connect all 0 V connections back to a star point, i.e. only one and same referential.
Earth the shielding throughout 360° using tap-off braids. This is to be done at both ends of each cable. To earth the shielding use at least 4 mm^2 cable.
As much as possible, earth the 0 V of the supply to the encoders on the supply side.
Maximum frequency of signals for SSI depending on distance:
Indicative values that can vary depending on the cable characteristics.

Distance (m)	Frequency (kHz)
50	400
100	300
200	200
400	100

Supply

It is imperative that regulated and smoothed power supplies, with a ripple factor on 24 V of 500 mV and on 5 V of 200 mV, are used that are specifically for the encoder.
Schneider Electric ABL7 range power supplies are available. Please refer to the website: www.schneider-electric.com.
For 5…30 V encoders, the supply via a transformer with a 24 V rms rectified and smoothed secondary is prohibited, since the DC voltage obtained is higher than the supply voltage limits of the encoder.
Prior to powering-up for the first time, ensure that the rated supply voltage of the encoder is suitable for the supply.

Opto-electronic rotary encoders

Characteristics required to define an encoder, installation, powering-up

Connection and powering-up precautions

Connection

The plugging-in or unplugging of a connector version encoder must only be done whilst the supply is disconnected.

Encoder supplied by central unit:
- disconnect supply to central unit,
- proceed with connection or disconnection,
- re-establish supply to central unit.

Encoder supplied by source external to central unit:
- disconnect supply to central unit, then disconnect supply to encoder,
- proceed with connection or disconnection,
- re-establish supply to encoder, then re-establish supply to central unit.

Powering-up

For synchronisation reasons, the powering-up or switching-off of the encoder must coincide with that of its associated electronics.

Incremental encoders

OsiSense XCC

Ø 40 mm encoders

Environment

Encoder type			XCC1406P●●●●	XCC1406T●●●●
Conformity			CE	
Temperature	Operation (housing)	°C	- 20…+ 80	
	Storage	°C	- 30…+ 85	
Degree of protection	Conforming to IEC 60529		IP 54	IP 52
Vibration resistance	Conforming to IEC 60068-2-6		10 gn (f = 10…500 Hz)	
Shock resistance	Conforming to IEC 60068-2-27		30 gn, duration 11 ms	
Resistance to electromagnetic interference	Electrostatic discharges		Conforming to IEC 61000-4-2: level 3, 8 kV air; 4 kV contact	
	Radiated electromagnetic fields (electromagnetic waves)		Conforming to IEC 61000-4-3: level 3, 10 V/m	
	Fast transients (Start/Stop interference)		Conforming to IEC 61000-4-4: level 3, 2 kV (1 kV for inputs/outputs)	
	Surge withstand		Conforming to IEC 61000-4-5: level 2, 1 kV	
Materials	Base		Aluminium or Zamak	
	Housing		Aluminium or Zamak	
	Shaft		Stainless steel or aluminium	
	Ball bearings		688AZZ1	

Mechanical characteristics

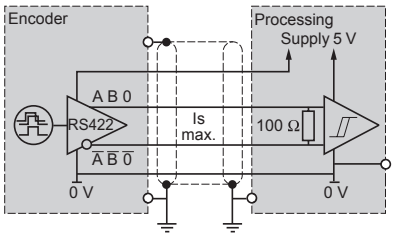
Shaft type		mm	Ø 6, solid shaft (g7)	Ø 6, through shaft (H7)
Maximum rotational speed	Continuous		9000 rpm	
Shaft moment of inertia		g.cm²	10	5
Torque		N.cm	0.2	0.25
Maximum load	Radial	daN	2	
	Axial	daN	1	

Electrical characteristics

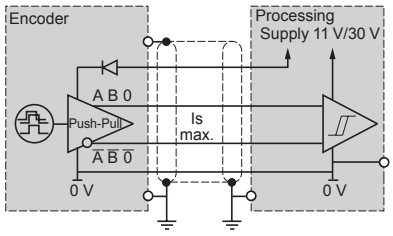
Connection			Radial: pre-cabled, 8 x 0.14 mm² shielded, Ø ext = 6 mm, length = 2 m Crimped metal cable entry	Pre-cabled 8 x 0.14 mm² shielded, Ø ext = 6 mm, length = 2 m Crimped metal cable entry
Frequency		kHz	100	
Number of channels			3 channels: A, B, top 0 and complements $\overline{A}$,$\overline{B}$, $\overline{0}$	
Encoders with type R output stage: 5 V output driver, RS 422, 4.5…5.5 V supply				
Supply voltage			⎓ 5 V ± 10% Maximum ripple: 200 mV	
Current consumption, no-load		mA	100 maximum	
Output current		mA	40 maximum	
Output levels	Low level		0.5 V maximum (Is = 20 mA)	
	High level		2.5 V minimum (Is = 20 mA)	
Encoders with type K output stage: push-pull output driver, 11…30 V supply				
Supply voltage			⎓ 11 V…30 V. Maximum ripple: 500 mV	
Current consumption, no-load		mA	75 maximum	
Protection			Against short-circuits and reverse polarity	
Output current		mA	40 maximum	
Output levels	Low level		1.5 V maximum (Is = 20 mA)	
	High level		V supply - 3 V minimum (Is = 20 mA)	

Schemes

Type R output stage



Type K output stage



References: page 8/11
Dimensions: page 8/18
Connections: pages 8/20 and 8/21

Telemecanique Sensors

Incremental encoders

OsiSense XCC

Ø 40 mm encoders

105160

XCC1406PR●●●

Solid shaft, Ø 6 mm

Resolution	Connection method	Output stage type *(1)*	Supply voltage	Reference	Weight kg
100 points	Pre-cabled, radial L = 2 m	5 V, RS 422	4.5…5.5 V	**XCC1406PR01R**	0.355
		Push-pull	11…30 V	**XCC1406PR01K**	0.355
360 points	Pre-cabled, radial L = 2 m	5 V, RS 422	4.5…5.5 V	**XCC1406PR03R**	0.355
		Push-pull	11…30 V	**XCC1406PR03K**	0.355
500 points	Pre-cabled, radial L = 2 m	5 V, RS 422	4.5…5.5 V	**XCC1406PR05R**	0.355
		Push-pull	11…30 V	**XCC1406PR05K**	0.355
1000 points	Pre-cabled, radial L = 2 m	5 V, RS 422	4.5…5.5 V	**XCC1406PR10R**	0.355
		Push-pull	11…30 V	**XCC1406PR10K**	0.355
1024 points	Pre-cabled, radial L = 2 m	5 V, RS 422	4.5…5.5 V	**XCC1406PR11R**	0.355
		Push-pull	11…30 V	**XCC1406PR11K**	0.355

105161

XCC1406TR●●●

Through shaft, Ø 6 mm *(2)*

Resolution	Connection method	Output stage type *(1)*	Supply voltage	Reference	Weight kg
100 points	Pre-cabled, radial L = 2 m	5 V, RS 422	4.5…5.5 V	**XCC1406TR01R**	0.405
		Push-pull	11…30 V	**XCC1406TR01K**	0.405
360 points	Pre-cabled, radial L = 2 m	5 V, RS 422	4.5…5.5 V	**XCC1406TR03R**	0.405
		Push-pull	11…30 V	**XCC1406TR03K**	0.405
500 points	Pre-cabled, radial L = 2 m	5 V, RS 422	4.5…5.5 V	**XCC1406TR05R**	0.405
		Push-pull	11…30 V	**XCC1406TR05K**	0.405
1000 points	Pre-cabled, radial L = 2 m	5 V, RS 422	4.5…5.5 V	**XCC1406TR10R**	0.405
		Push-pull	11…30 V	**XCC1406TR10K**	0.405
1024 points	Pre-cabled, radial L = 2 m	5 V, RS 422	4.5…5.5 V	**XCC1406TR11R**	0.405
		Push-pull	11…30 V	**XCC1406TR11K**	0.405

(1) For characteristics of the output stage type (indicated by last letter of the reference), see page 8/7.
(2) Anti-rotation device included with encoder.

Incremental encoders

OsiSense XCC

Ø 58 mm encoders, aluminium and stainless steel versions

Environment

Encoder type			XCC1506P●●●●	XCC1510P●●●●	XCC1510S●●●●	XCC1514T●●●●
Conformity			CE			
Temperature	Operation (housing)	°C	- 30...+ 100 (except XCCTSM●●X and XCCTSM●●Y: - 30...+ 70)			
	Storage	°C	- 30…+ 85	- 30…+ 85	- 40…+ 100	- 30…+ 85
Degree of protection	Conforming to IEC 60529		IP 65	IP 65 (IP 67 with collar option XCCRB3)	IP 68 / IP 69K	IP 65
Vibration resistance	Conforming to IEC 60068-2-6		10 gn (f = 55…2000 Hz)			
Shock resistance	Conforming to IEC 60068-2-27		50 gn, duration 6 ms			
Resistance to electromagnetic interference	Electrostatic discharges		Conforming to IEC 61000-4-2: level 3, 8 kV air, 4 kV contact			
	Radiated electromagnetic fields (electromagnetic waves)		Conforming to IEC 61000-4-3: level 3, 10 V/m			
	Fast transients (Start/Stop interference)		Conforming to IEC 61000-4-4: level 3, 2 kV (1 kV for inputs/outputs)			
	Surge withstand		Conforming to IEC 61000-4-5: level 2, 1 kV			
Materials	Base		Aluminium		Stainless steel 316L	Aluminium
	Housing		Zamak		Stainless steel 316L	Zamak
	Shaft		Stainless steel 303		Stainless steel 316L	Stainless steel 303
	Ball bearings		6000			6803ZZ
	Shaft seal		–		Teflon ring	–

Mechanical characteristics

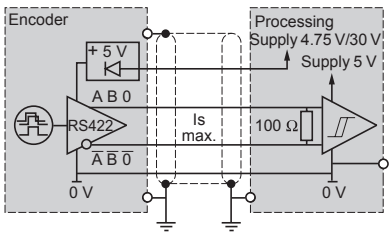
Shaft type			Ø 6, solid shaft (g7)	Ø 10 mm, solid shaft		Ø 14, through shaft (H7)
Maximum rotational speed	Continuous		9000 rpm	9000 rpm	3000 rpm	6000 rpm
Shaft moment of inertia		g.cm²	10	10	12	22
Torque		N.cm	0.4	0.4	9	0.6
Maximum load	Radial	daN	10	10	25	5
	Axial	daN	5	5	50	2

Electrical characteristics

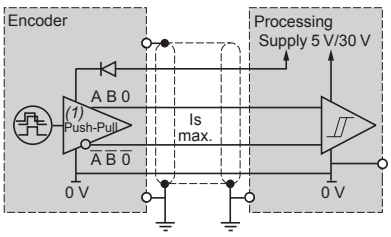
Connection	Connector		M23, 12-pin male connector (2 m silicone cable for XCC1510S●●●)
Frequency		kHz	300
Number of channels			3 channels: A, B, top 0 and complements $\overline{A}$,$\overline{B}$, $\overline{0}$
Encoders with type X output stage: 5 V output driver, RS 422, 4.75…30 V supply			
Supply voltage			⎓ 4.75…30 V Maximum ripple: 500 mV
Current consumption, no-load		mA	75 maximum
Protection			Against short-circuits and reverse polarity
Output current		mA	40 maximum
Output levels	Low level		0.5 V maximum (Is = 20 mA)
	High level		4.5 V minimum (Is = 20 mA)
Encoders with type Y output stage: push-pull output driver, 5…30 V supply			
Supply voltage			⎓ 5…30 V Maximum ripple: 500 mV
Current consumption, no-load		mA	75 maximum
Protection			Against short-circuits and reverse polarity
Output current		mA	40 maximum
Output levels (for U supply = 30 V) *(1)*	Low level		0.5 V maximum (Is = 20 mA)
	High level		V supply - 2.5 V minimum (Is = 20 mA)

Schemes

Type X output stage



Type Y output stage



(1) RS 422 compatible on 5 V supply.

References: pages 8/13 to 8/15
Dimensions: pages 8/18 and 8/19
Connections: pages 8/20 and 8/21

Incremental encoders

OsiSense XCC

Ø 58 mm encoders, aluminium and stainless steel versions

105163

XCC1506PS●●●

Solid shaft, Ø 6 mm

Resolution	Connection method *(1)*	Output stage type *(2)*	Supply voltage	Reference	Weight kg
100 points	Connector, radial M23 male	5 V, RS 422	4.75…30 V	**XCC1506PS01X**	0.495
		Push-pull	5…30 V	**XCC1506PS01Y**	0.495
360 points	Connector, radial M23 male	5 V, RS 422	4.75…30 V	**XCC1506PS03X**	0.495
		Push-pull	5…30 V	**XCC1506PS03Y**	0.495
500 points	Connector, radial M23 male	5 V, RS 422	4.75…30 V	**XCC1506PS05X**	0.495
		Push-pull	5…30 V	**XCC1506PS05Y**	0.495
1000 points	Connector, radial M23 male	5 V, RS 422	4.75…30 V	**XCC1506PS10X**	0.495
		Push-pull	5…30 V	**XCC1506PS10Y**	0.495
1024 points	Connector, radial M23 male	5 V, RS 422	4.75…30 V	**XCC1506PS11X**	0.495
		Push-pull	5…30 V	**XCC1506PS11Y**	0.495
2500 points	Connector, radial M23 male	5 V, RS 422	4.75…30 V	**XCC1506PS25X**	0.495
		Push-pull	5…30 V	**XCC1506PS25Y**	0.495
5000 points	Connector, radial M23 male	5 V, RS 422	4.75…30 V	**XCC1506PS50X**	0.495
		Push-pull	5…30 V	**XCC1506PS50Y**	0.495

120311B

XCC1510SPA●●●

105164

XCC1510PS●●●

Solid shaft, Ø 10 mm

Resolution	Connection method *(1)*	Output stage type *(2)*	Supply voltage	Reference	Weight kg
100 points	Connector, radial M23 male	5 V, RS 422	4.75…30 V	**XCC1510PS01X**	0.465
		Push-pull	5…30 V	**XCC1510PS01Y**	0.465
360 points	Connector, radial M23 male	5 V, RS 422	4.75…30 V	**XCC1510PS03X**	0.465
		Push-pull	5…30 V	**XCC1510PS03Y**	0.465
	Cable (2 m)	Push-pull	5…30 V	**XCC1510SPA03Y** *(3)*	0.860
500 points	Connector, radial M23 male	5 V, RS 422	4.75…30 V	**XCC1510PS05X**	0.465
		Push-pull	5…30 V	**XCC1510PS05Y**	0.465
1000 points	Connector, radial M23 male	5 V, RS 422	4.75…30 V	**XCC1510PS10X**	0.465
		Push-pull	5…30 V	**XCC1510PS10Y**	0.465
1024 points	Connector, radial M23 male	5 V, RS 422	4.75…30 V	**XCC1510PS11X**	0.465
		Push-pull	5…30 V	**XCC1510PS11Y**	0.465
	Cable (2 m)	Push-pull	5…30 V	**XCC1510SPA11Y** *(3)*	0.860
2500 points	Connector, radial M23 male	5 V, RS 422	4.75…30 V	**XCC1510PS25X**	0.465
		Push-pull	5…30 V	**XCC1510PS25Y**	0.465
5000 points	Connector, radial M23 male	5 V, RS 422	4.75…30 V	**XCC1510PS50X**	0.465
		Push-pull	5…30 V	**XCC1510PS50Y**	0.465
	Cable (2 m)	Push-pull	5…30 V	**XCC1510SPA50Y** *(3)*	0.860

*(1) For female connector use **XZCC23FDP120S** or pre-wired connectors (L = 2, 5 or 10 m), see page 8/35.*
(2) For characteristics of the output stage type (indicated by last letter of the reference), see page 8/12.
(3) Stainless steel 316L version.

Incremental encoders

OsiSense XCC

Ø 58 mm encoders

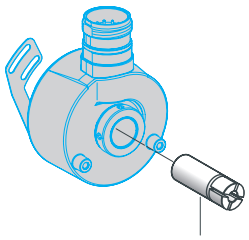
105166

XCC1514TS●●●

Through shaft, Ø 14 mm *(1)*

Resolution	Connection method *(2)*	Output stage type *(3)*	Supply voltage	Reference	Weight kg
100 points	Connector, radial M23 male	5 V, RS 422	4.75…30 V	**XCC1514TS01X**	0.435
		Push-pull	5…30 V	**XCC1514TS01Y**	0.435
360 points	Connector, radial M23 male	5 V, RS 422	4.75…30 V	**XCC1514TS03X**	0.435
		Push-pull	5…30 V	**XCC1514TS03Y**	0.435
500 points	Connector, radial M23 male	5 V, RS 422	4.75…30 V	**XCC1514TS05X**	0.435
		Push-pull	5…30 V	**XCC1514TS05Y**	0.435
1000 points	Connector, radial M23 male	5 V, RS 422	4.75…30 V	**XCC1514TS10X**	0.435
		Push-pull	5…30 V	**XCC1514TS10Y**	0.435
1024 points	Connector, radial M23 male	5 V, RS 422	4.75…30 V	**XCC1514TS11X**	0.435
		Push-pull	5…30 V	**XCC1514TS11Y**	0.435
2500 points	Connector, radial M23 male	5 V, RS 422	4.75…30 V	**XCC1514TS25X**	0.435
		Push-pull	5…30 V	**XCC1514TS25Y**	0.435
5000 points	Connector, radial M23 male	5 V, RS 422	4.75…30 V	**XCC1514TS50X**	0.435
		Push-pull	5…30 V	**XCC1514TS50Y**	0.435

514218



XCCR158RDA●●

Reduction collars for encoders with through shaft, Ø 14 mm

For use with	Diameter	Reference	Weight kg
Encoders with through shaft XCC1514TS●●●	Ø 6 mm	**XCCR158RDA06**	0.015
	Ø 8 mm	**XCCR158RDA08**	0.010
	Ø 10 mm	**XCCR158RDA10**	0.010
	Ø 12 mm	**XCCR158RDA12**	0.010

(1) Anti-rotation device included with encoder.
*(2) For female connector use **XZCC23FDP120S** or pre-wired connectors (L = 2, 5 or 10 m), see page 8/35.*
(3) For characteristics of the output stage type (indicated by last letter of the reference), see page 8/12.

Characteristics: page 8/12
Dimensions: pages 8/18 and 8/41
Connections: pages 8/20 and 8/21

Incremental encoders

OsiSense XCC

Ø 58 mm encoders

Parameterable versions *(1)*

105184

XCC1510PSM02X

Parameterable with solid shaft, Ø 10 mm

Resolution	Connection method *(2)*	Output stage type *(3)*	Supply voltage	Reference	Weight kg
256…4096 points	Connector, radial M23 male	5 V, RS 422	4.75…30 V	**XCC1510PSM02X**	0.465
		Push-pull	5…30 V	**XCC1510PSM02Y**	0.465
360…5760 points	Connector, radial M23 male	5 V, RS 422	4.75…30 V	**XCC1510PSM03X**	0.465
		Push-pull	5…30 V	**XCC1510PSM03Y**	0.465
500…8000 points	Connector, radial M23 male	5 V, RS 422	4.75…30 V	**XCC1510PSM05X**	0.465
		Push-pull	5…30 V	**XCC1510PSM05Y**	0.465
1024…16,384 points	Connector, radial M23 male	5 V, RS 422	4.75…30 V	**XCC1510PSM11X**	0.465
		Push-pull	5…30 V	**XCC1510PSM11Y**	0.465
5000…80,000 points	Connector, radial M23 male	5 V, RS 422	4.75…30 V	**XCC1510PSM50X**	0.465
		Push-pull	5…30 V	**XCC1510PSM50Y**	0.465

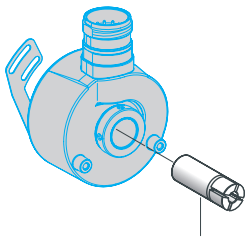
Parameterable with through shaft, Ø 14 mm *(4)*

Resolution	Connection method *(2)*	Output stage type *(3)*	Supply voltage	Reference	Weight kg
256…4096 points	Connector, radial M23 male	5 V, RS 422	4.75…30 V	**XCC1514TSM02X**	0.435
		Push-pull	5…30 V	**XCC1514TSM02Y**	0.435
360…5760 points	Connector, radial M23 male	5 V, RS 422	4.75…30 V	**XCC1514TSM03X**	0.435
		Push-pull	5…30 V	**XCC1514TSM03Y**	0.435
500…8000 points	Connector, radial M23 male	5 V, RS 422	4.75…30 V	**XCC1514TSM05X**	0.435
		Push-pull	5…30 V	**XCC1514TSM05Y**	0.435
1024…16,384 points	Connector, radial M23 male	5 V, RS 422	4.75…30 V	**XCC1514TSM11X**	0.435
		Push-pull	5…30 V	**XCC1514TSM11Y**	0.435
5000…80,000 points	Connector, radial M23 male	5 V, RS 422	4.75…30 V	**XCC1514TSM50X**	0.435
		Push-pull	5…30 V	**XCC1514TSM50Y**	0.435

Reduction collars for parameterable encoders with through shaft, Ø 14 mm

For use with	Diameter	Reference	Weight kg
Encoders with through shaft XCC1514TSM●●●	Ø 6	**XCCR158RDA06**	0.015
	Ø 8	**XCCR158RDA08**	0.010
	Ø 10	**XCCR158RDA10**	0.010
	Ø 12	**XCCR158RDA12**	0.010

514214



XCCR158RDA●●

(1) Parameter configuration: refer to table indicating position of dip switches on page 8/21.
*(2) For female connector use **XZCC23FDP120S** or pre-wired connectors (L = 2, 5 or 10 m), see page 8/35.*
(3) For characteristics of the output stage type (indicated by last letter of the reference), see page 8/12.
(4) Anti-rotation device included with encoder.

Incremental encoders

OsiSense XCC

Ø 90 mm encoders

Environment

Encoder type			XCC1912P●●●●	XCC1930T●●●●
Conformity			CE	
Temperature	Operation (housing)	**°C**	- 20…+ 80	
	Storage	**°C**	- 30…+ 85	
Degree of protection	Conforming to IEC 60529		IP 66	IP 65
Vibration resistance	Conforming to IEC 60068-2-6		10 gn (f = 10…1 kHz)	
Shock resistance	Conforming to IEC 60068-2-27		30 gn, duration 11 ms	
Resistance to electromagnetic interference	Electrostatic discharges		Conforming to IEC 61000-4-2: level 3, 8 kV air; 4 kV contact	
	Radiated electromagnetic fields (electromagnetic waves)		Conforming to IEC 61000-4-3: level 3, 10 V/m	
	Fast transients (Start/Stop interference)		Conforming to IEC 61000-4-4: level 3, 2 kV (1 kV for inputs/outputs)	
	Surge withstand		Conforming to IEC 61000-4-5: level 2, 1 kV	
Materials	Base		Aluminium	
	Housing		Zamak	
	Shaft		Stainless steel	
	Ball bearings		6001ZZ	6807

Mechanical characteristics

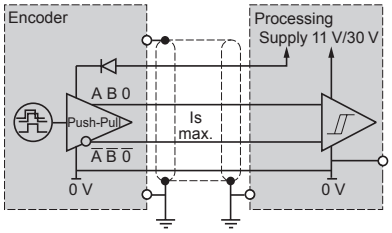
Shaft type			Ø 12, solid shaft (g6)	Ø 30, through shaft (H7)
Maximum rotational speed	Continuous		6000 rpm	3600 rpm
Shaft moment of inertia		**g.cm²**	150	500
Torque		**N.cm**	1	2.5
Maximum load	Radial	**daN**	20	8
	Axial	**daN**	10	5

Electrical characteristics

Encoders with type K (N) output stage: push-pull output driver, 11…30 V supply

Connection	Connector		M23, 12-pin male connector
Frequency		**kHz**	100
Number of channels			3 channels: A, B, top 0 and complements $\overline{A}$, $\overline{B}$, $\overline{0}$
Supply voltage			⎓ 11 V…30 V Maximum ripple: 500 mV
Current consumption, no-load		**mA**	75 maximum
Protection			Against short-circuits and reverse polarity
Output current		**mA**	40 maximum
Output levels	Low level		1.5 V maximum (Is = 20 mA)
	High level		V supply - 3 V minimum (Is = 20 mA)

Scheme
Type K (N) output stage



Characteristics: pages 8/7 and 8/12
References: pages 8/11, 8/13 to 8/15
Connections: pages 8/20 and 8/21

Telemecanique Sensors

Incremental encoders

OsiSense XCC

Ø 90 mm encoders

105168

XCC1912PS●●KN

Solid shaft, Ø 12 mm

Resolution	Connection method *(1)*	Output stage type *(2)*	Supply voltage	Reference	Weight kg
360 points	Connector, radial M23 male	Push-pull	11…30 V	**XCC1912PS03KN**	1.360
500 points	Connector, radial M23 male	Push-pull	11…30 V	**XCC1912PS05KN**	1.360
1000 points	Connector, radial M23 male	Push-pull	11…30 V	**XCC1912PS10KN**	1.360
1024 points	Connector, radial M23 male	Push-pull	11…30 V	**XCC1912PS11KN**	1.360
2500 points	Connector, radial M23 male	Push-pull	11…30 V	**XCC1912PS25KN**	1.360
3600 points	Connector, radial M23 male	Push-pull	11…30 V	**XCC1912PS36KN**	1.360
5000 points	Connector, radial M23 male	Push-pull	11…30 V	**XCC1912PS50KN**	1.360
10,000 points	Connector, radial M23 male	Push-pull	11…30 V	**XCC1912PS00KN**	1.360

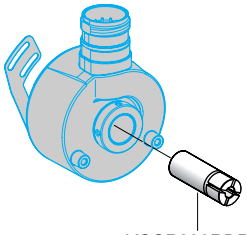
105171

XCC1930TS●●KN

Through shaft, Ø 30 mm *(3)*

Resolution	Connection method *(1)*	Output stage type *(2)*	Supply voltage	Reference	Weight kg
360 points	Connector, radial M23 male	Push-pull	11…30 V	**XCC1930TS03KN**	0.960
500 points	Connector, radial M23 male	Push-pull	11…30 V	**XCC1930TS05KN**	0.960
1000 points	Connector, radial M23 male	Push-pull	11…30 V	**XCC1930TS10KN**	0.960
1024 points	Connector, radial M23 male	Push-pull	11…30 V	**XCC1930TS11KN**	0.960
2500 points	Connector, radial M23 male	Push-pull	11…30 V	**XCC1930TS25KN**	0.960
3600 points	Connector, radial M23 male	Push-pull	11…30 V	**XCC1930TS36KN**	0.960
5000 points	Connector, radial M23 male	Push-pull	11…30 V	**XCC1930TS50KN**	0.960

523200



XCCR290RDP●●

Reduction collars for encoders with hrough shaft, Ø 30 mm

For use with	Diameter	Reference	Weight kg
Encoders with through shaft XCC1930TS●●●●N	Ø 12 mm	**XCCR290RDP12**	0.060
	Ø 16 mm	**XCCR290RDP16**	0.060
	Ø 20 mm	**XCCR290RDP20**	0.030
	Ø 25 mm	**XCCR290RDP25**	0.025

*(1) For female connector use **XZCC23FDP120S** or pre-wired connectors (L = 2, 5 or 10 m), see page 8/35.*
(2) For characteristics of the output stage type (indicated by last letter of the reference), see page 8/16.
(3) Anti-rotation device included with encoder.

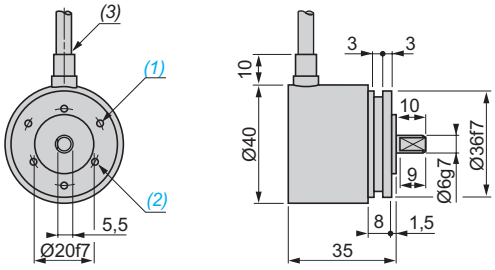
Incremental encoders

OsiSense XCC

Ø 40 mm and Ø 58 mm encoders

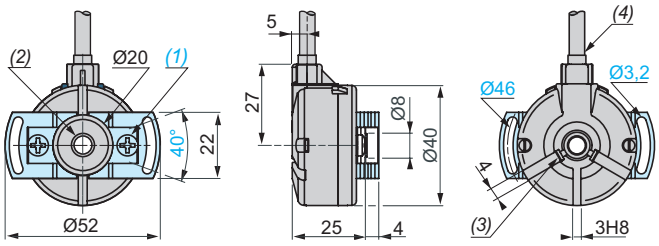
Ø 40 mm encoders

XCC1406PR●●●N



(1) 3 holes M3 x 0.5 at 120° on 28 PCD, depth: 5 mm.
(2) 3 holes M3 x 0.5 at 120° on 24 PCD, depth: 5 mm.
(3) Ø 6 cable, length 2 m, minimum bend radius: 30 mm.

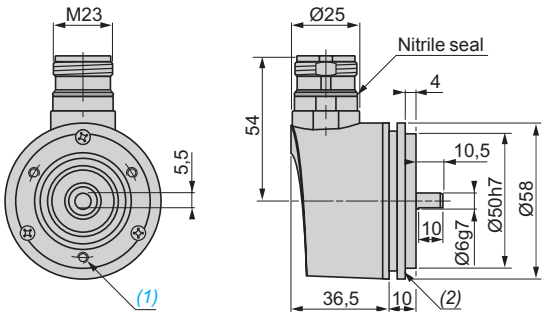
XCC1406TR●●●N



(1) 2 M4 holes at 120° for cross-headed screws on 30 PCD, depth: 6 mm.
(2) Through shaft, Ø 6 (H7).
(3) 2 M2 x 3 flat cross-headed locking screws.
(4) Ø 6 cable, length 2 m, minimum bend radius: 30 mm.

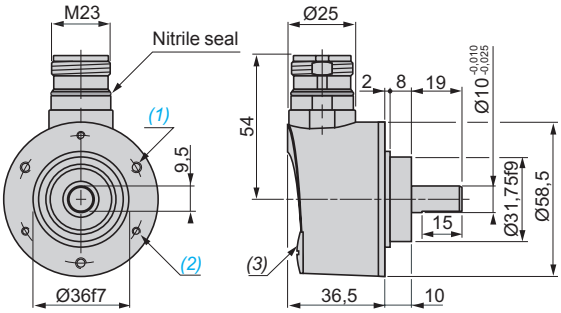
Ø 58 mm encoders

XCC1506PS●●X, XCC1506PS●●Y



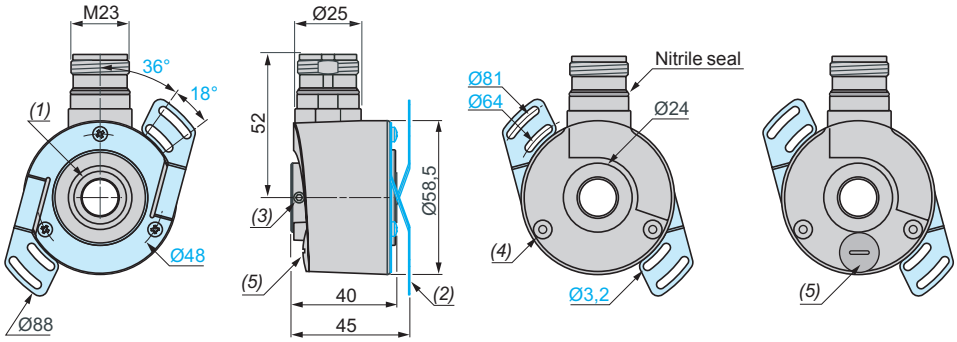
(1) 3 holes M3 x 4 at 120° on 42 PCD, depth: 10 mm.
(2) Collar XCCRB1 mounted.

XCC1510PS●●X, 1510PS●●Y / XCC1510PSM●●X, 1510PSM●●Y



(1) 3 M4 holes at 120° on 48 PCD, depth: 8 mm.
(2) 3 M3 holes at 120° on 48 PCD, depth: 8 mm.
(3) Blanking plug, for encoders XCC1510PSM●●X and 1510PSM●●Y only.

XCC1514TS●●X, 1514TS●●Y / XCC1514TSM●●X, 1514TSM●●Y

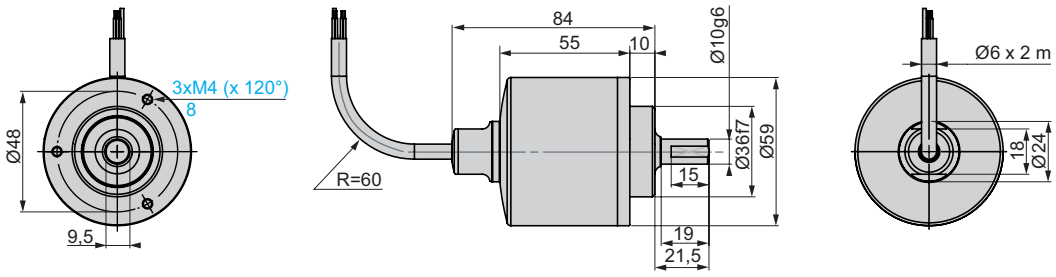


(1) Through shaft, Ø 14 (H7).
(2) Flexible mounting kit, 1 x XCCRF5N mounted.
(3) 2 HC M4 x 4 locking screws.
(4) Hole for M3 x 6 self-threading screw.
(5) Blanking plug, for encoders XCC1514TSM●●X and 1514TSM●●Y only.

Characteristics: pages 8/7 and 8/12
References: pages 8/11, 8/13 to 8/15
Connections: pages 8/20 and 8/21

Ø 58 mm encoders (continued)

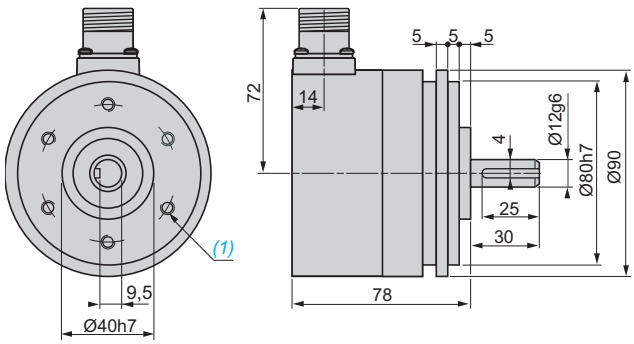
XCC1510SPA●●Y



R: minimum bend radius = 60 mm.

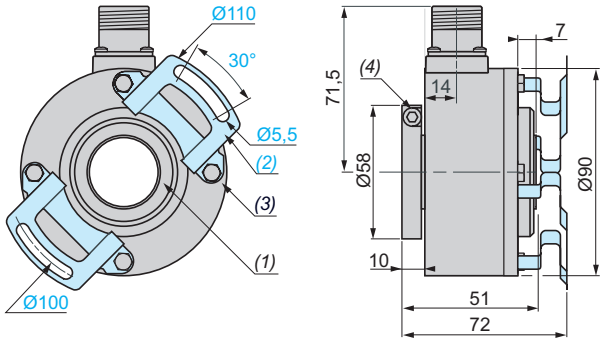
Ø 90 mm encoders

XCC1912PS●●●N



(1) 6 holes M6 x 1 at 120° on 60 PCD, maximum depth: 12 mm.

XCC1930TS●●●N



(1) Through shaft, Ø 30 (H7).
(2) Anti-rotation device, 1 x XCCRF9, mounted.
(3) 4 M5 x 6 on 78 PCD.
(4) 1 CHC M5 x 12 stainless steel A2 locking screw.

Incremental encoders

OsiSense XCC

Ø 40 mm, Ø 58 mm and Ø 90 mm encoders

Pre-cabled version encoders *(1)*

8 x 0.14 mm² shielded cable connections for Ø 58 encoders stainless steel version

Wire colour	PK	BN	GY	RD	YE	BU	GN	WH
Signal Supply	$\overline{A}$	+ V	0	$\overline{0}$	B	$\overline{B}$	A	0 V

PK = Pink
BN = Brown
GY = Grey
RD = Red
YE = Yellow
BU = Blue
GN = Green
WH = White

8 x 0.14 mm² shielded cable connections for Ø 40 encoders

Wire colour	BN	RD	VT	BU	YE	OG	GN	BK
Signal Supply	A	+ V	0	$\overline{0}$	B	$\overline{B}$	A	0 V

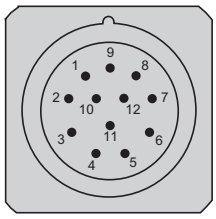
BN = Brown
RD = Red
VT = Violet
BU = Blue
YE = Yellow
OG = Orange
GN = Green
BK = Black

Note: *In environments subject to electrical interference, it is recommended to earth the encoder base using one of the fixing screws.*

Connector version encoders *(1)*

M23, 12-pin connector connections

Male connector on encoder (pin view)



Pin number	1	2	3	4	5	6	7	8	9	10	11	12
Signal Supply	A	+ V	0	0	B	B	R	A	R	0 V	0 V	+ V

Note: *In environments subject to electrical interference, it is recommended to earth the encoder base using one of the fixing screws.*
R = reserved, do not connect.

(1) Connect each unused channel to 0 V in series with a 10 kΩ resistor.

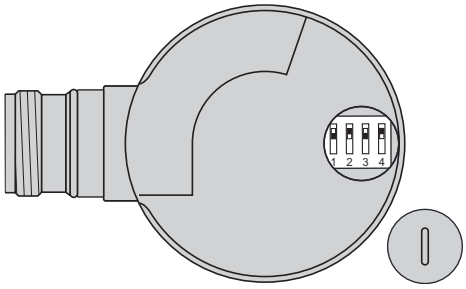
Incremental encoders

OsiSense XCC

Ø 40 mm, Ø 58 mm and Ø 90 mm encoders

Resolutions

Resolutions for parameterable Ø 58 mm encoders XCC1510PSM●●● and XCC1514TSM●●●



Simple multiplication of the basic resolution of the disc using dip switches *(1)* (Plastic Ø 2.5 screwdriver recommended).

The factory setting is for factor X1.

Interpolation factor		Basic resolution					Position of dip switches			
Counting	Speed	**256**	**360**	**500**	**1024**	**5000**	**1**	**2**	**3**	**4**
x 1	**x 1**	256	360	500	1024	5000				
x 2	**x 2**	512	720	1000	2048	10,000				
x 3	**x 3**	768	1080	1500	3072	15,000				
x 4	**x 4**	1024	1440	2000	4096	20,000				
x 5	**–**	1280	1800	2500	5120	25,000				
x 8	**–**	2048	2880	4000	8192	40,000				
x 10	**–**	2560	3600	5000	10,240	50,000				
x 12	**–**	3072	4320	6000	12,288	60,000				
x 16	**–**	4096	5760	8000	16,384	80,000				

(1) Setting the switches to other configurations will result in the encoder providing an unpredictable resolution.

Single turn absolute encoders

OsiSense XCC

Ø 58 mm encoders, aluminium and stainless steel versions

Environment

Encoder type			XCC2506P●●●●●	XCC2510P●●●●●	XCC2510S●●●●●	XCC2514T●●●●●
Conformity			CE			
Temperature	Operation (housing)	**°C**	- 20…+ 90	- 20…+ 90	- 20…+ 90	- 20…+ 90
	Storage	**°C**	- 30…+ 95	- 30…+ 95	- 40…+ 100	- 30…+ 95
Degree of protection	Conforming to IEC 60529		IP 65	IP 65 (IP 67 with collar option XCCRB3)	IP 68 / IP 69K	IP 65
Vibration resistance	Conforming to IEC 60068-2-6		10 gn (f = 55…2 kHz)			
Shock resistance	Conforming to IEC 60068-2-27		30 gn, duration 11 ms			
Resistance to electromagnetic interference	Electrostatic discharges		Conforming to IEC 61000-4-2: level 3, 8 kV air; 4 kV contact			
	Radiated electromagnetic fields (electromagnetic waves)		Conforming to IEC 61000-4-3: level 3, 10 V/m			
	Fast transients (Start/Stop interference)		Conforming to IEC 61000-4-4: level 3, 2 kV (1 kV for inputs/outputs)			
	Surge withstand		Conforming to IEC 61000-4-5: level 2, 1 kV			
Materials	Base		Aluminium		Stainless steel 316L	Aluminium
	Housing		Zamak		Stainless steel 316L	Zamak
	Shaft		Stainless steel 303		Stainless steel 316L	Stainless steel 303
	Ball bearings		6000			6803ZZ
	Shaft seal		–		Teflon ring	–

Mechanical characteristics

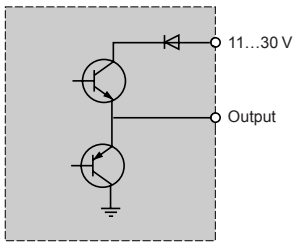
Shaft type			Ø 6, solid shaft (g7)	Ø 10 mm, solid shaft	Ø 10 mm, solid shaft	Ø 14, through shaft (H7)
Maximum rotational speed	Continuous		9000 rpm	9000 rpm	3000 rpm	6000 rpm
Shaft moment of inertia		**g.cm²**	10	10	12	22
Torque		**N.cm**	0.4	0.4	9	0.6
Maximum load	Radial	**daN**	10	10	25	5
	Axial	**daN**	5	5	50	2

Electrical characteristics

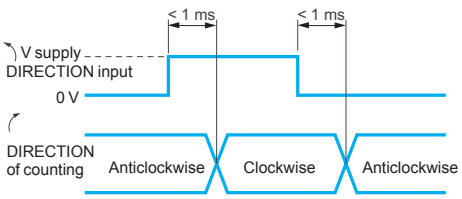
Connection	Connector		**Encoders with parallel output stage types KG (N), KB:** M23, 16-pin male connector (2 m TPU cable for XCC2510S●●●). **Encoders with SSI output stage types SB (N), SG (N):** M23, 12-pin male connector. (2 m PUR cable for XCC2510S●●●).
Frequency		**kHz**	**Encoders with parallel output stage types KG (N), KB:** 100 kHz on LSB (Least Significant Bit) **Encoders with SSI output stage types SB (N), SG (N):** 100 kHz to 1 MHz clock
Encoders with type KB and KG (N) output stage: push-pull output driver, Gray code			
Supply voltage			⎓ 11…30 V Maximum ripple: 500 mV. (For XCC2510SPA81●●●: 5…30 V. Maximum ripple 200 mV, if supply voltage < 6 V; 500 mV, if supply voltage ⩾ 6V).
Current consumption, no-load		**mA**	100 maximum
Protection			Against short-circuits and reverse polarity
Output current		**mA**	20 maximum
Output levels (for U supply = 30 V)	Low level		0.5 V maximum (Is = 20 mA)
	High level		V supply - 2.5 V minimum (Is = 20 mA)

Schemes

Type KB and KG (N) output stage



KB and KG (N) DIRECTION input



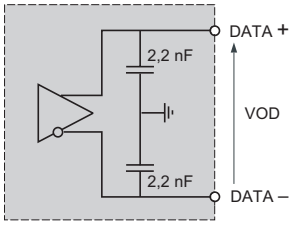
References: page 8/23
Dimensions: page 8/26
Connections: page 8/27

Electrical characteristics *(continued)*

Encoders with type SB (N) or SG (N) output stage: SSI output without parity, 13-bit clock, 11…30 V supply, binary code (SB) or Gray code (SG)		
Supply voltage		⎓ 11…30 V. Maximum ripple: 500 mV
Current consumption, no-load	**mA**	100
Protection		Against short-circuits and reverse polarity
Output level		Idata = 20 mA |VOD| > 2 V

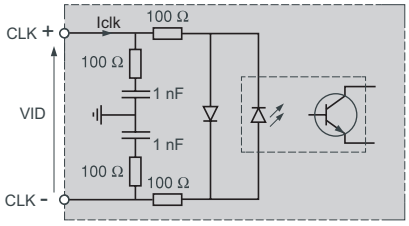
Schemes

RS 422 data output



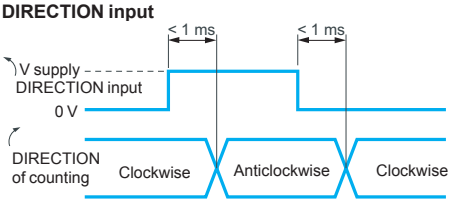
Idata = 20 mA |VOD| > 2 V

Isolated clock input



|VID| maximum: 5 V
|Iclk| maximum: 15 mA

DIRECTION input



References

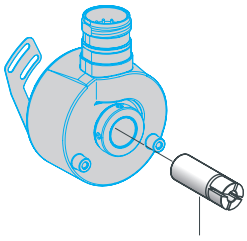
105173

XCC2506PS81●●●

120311B

XCC2510SPA81●GN

514214



XCCR158RDA●●

Resolution	Connection method *(1)*	Output stage type *(2)*	Supply voltage	Reference	Weight kg
Solid shaft, Ø 6 mm					
8192 points	Connector, radial M23 male	Push-pull, 13-bit, binary	11…30 V	**XCC2506PS81KB**	0.495
		Push-pull, 13-bit, Gray	11…30 V	**XCC2506PS81KGN**	0.495
		SSI, 13-bit, binary	11…30 V	**XCC2506PS81SBN**	0.490
		SSI, 13-bit, Gray	11…30 V	**XCC2506PS81SGN**	0.490
Solid shaft, Ø 10 mm					
8192 points	Connector, radial M23 male	Push-pull, 13-bit, binary	11…30 V	**XCC2510PS81KB**	0.465
		Push-pull, 13-bit, Gray	11…30 V	**XCC2510PS81KGN**	0.465
		SSI, 13-bit, binary	11…30 V	**XCC2510PS81SBN**	0.460
		SSI, 13-bit, Gray	11…30 V	**XCC2510PS81SGN**	0.460
	Cable (2 m)	Push-pull, Gray	5…30 V	**XCC2510SPA81KGN** *(4)*	0.915
		SSI, 13-bit, Gray	5…30 V	**XCC2510SPA81SGN** *(4)*	0.925
Through shaft, Ø 14 mm *(3)*					
8192 points	Connector, radial M23 male	Push-pull, 13-bit, binary	11…30 V	**XCC2514TS81KB**	0.435
		Push-pull, 13-bit, Gray	11…30 V	**XCC2514TS81KG**	0.435
		SSI, 13-bit, binary	11…30 V	**XCC2514TS81SB**	0.430
		SSI, 13-bit, Gray	11…30 V	**XCC2514TS81SG**	0.430

Reduction collars for encoders with through shaft, Ø 14 mm

For use with	Diameter	Reference	Weight kg
Encoders with through shaft XCC2514TS81●●	Ø 6 mm	**XCCR158RDA06**	0.015
	Ø 8 mm	**XCCR158RDA08**	0.010
	Ø 10 mm	**XCCR158RDA10**	0.010
	Ø 12 mm	**XCCR158RDA12**	0.010

(1) For female connector use:
*- **XZCC23FDP120S** for encoders type SBN and SGN*
*- **XZCC23FDP160S** for encoders type KB and KGN,*
or pre-wired connectors (L = 2, 5 and 10 m), see page 8/35.
(2) For characteristics of the output stage type (indicated by last letter of the reference), see page 8/22.
(3) Anti-rotation device included with encoder.
(4) Stainless steel 316L version.

Single turn absolute encoders

OsiSense XCC

Ø 90 mm encoders

Environment

Encoder type			XCC2912P●●●●●	XCC2930T●●●●●
Conformity			CE	
Temperature	Operation (housing)	**°C**	- 20…+ 85	
	Storage	**°C**	- 40…+ 85	
Degree of protection	Conforming to IEC 60529		IP 66	IP 65
Vibration resistance	Conforming to IEC 60068-2-6		10 gn (f = 10…2 kHz)	
Shock resistance	Conforming to IEC 60068-2-27		30 gn, duration 11 ms	
Resistance to electromagnetic interference	Electrostatic discharges		Conforming to IEC 61000-4-2: level 3, 8 kV air; 4 kV contact	
	Radiated electromagnetic fields (electromagnetic waves)		Conforming to IEC 61000-4-3: level 3, 10 V/m	
	Fast transients (Start/Stop interference)		Conforming to IEC 61000-4-4: level 3, 2 kV (1 kV for inputs/outputs)	
	Surge withstand		Conforming to IEC 61000-4-5: level 2, 1 kV	
Materials	Base		Aluminium	
	Housing		Zamak	
	Shaft		Stainless steel	
	Ball bearings		6001ZZ	6807

Mechanical characteristics

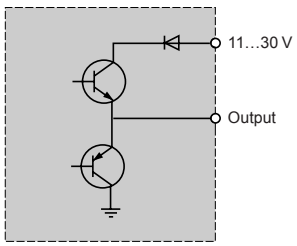
Shaft type			Ø 12, solid shaft (g6)	Ø 30, through shaft (H7)
Maximum rotational speed	Continuous		6000 rpm	3600 rpm
Shaft moment of inertia		**g.cm²**	150	500
Torque		**N.cm**	1	2.5
Maximum load	Radial	**daN**	20	8
	Axial	**daN**	10	5

Electrical characteristics

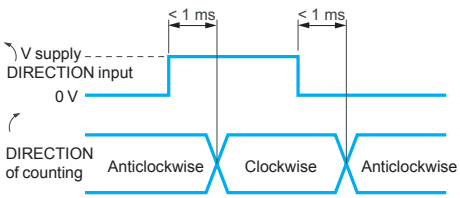
Connection	Connector		**Encoders with parallel output stage types KB (N), KG (N):** M23, 16-pin male connector. **Encoders with SSI output stage types SB (N), SG (N):** M23, 12-pin male connector
Frequency			**Encoders with parallel output stage types KB (N), KG (N):** 100 kHz on LSB (Least Significant Bit) **Encoders with SSI output stage types SB (N), SG (N):** 100 kHz to 1 MHz clock
Encoders with type KB (N) or KG (N) output stage: push-pull output driver, 11…30 V supply, binary code KB (N) or Gray code KG (N)			
Supply voltage			⎓ 11…30 V. Maximum ripple: 500 mV (For XCC2510S●●●: 5…30 V. Maximum ripple 200 mV, if supply voltage < 6 V; 500 mV, if supply voltage ⩾ 6V).
Current consumption, no-load		**mA**	100 maximum
Protection			Against short-circuits and reverse polarity
Output current		**mA**	20 maximum
Output levels (for U supply = 30 V)	Low level		0.5 V maximum (Is = 20 mA)
	High level		V supply - 3 V minimum (Is = 20 mA)

Schemes

Type KB (N) and KG (N) output stage



KB (N) and KG (N) DIRECTION input



References: page 8/25
Dimensions: page 8/26
Connections: page 8/27

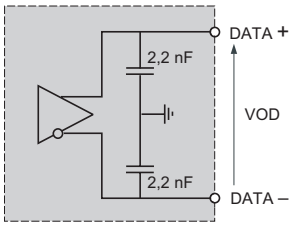
Electrical characteristics (continued)

Encoders with type SB (N) or SG (N) output stage: SSI output without parity, 13-bit clock, 11…30 V supply, binary code SB (N) or Gray code SG (N)

Supply voltage		⎓ 11…30 V Maximum ripple: 500 mV
Current consumption, no-load	**mA**	100
Protection		Against short-circuits and reverse polarity
Output level		Idata = 20 mA |VOD| > 2 V

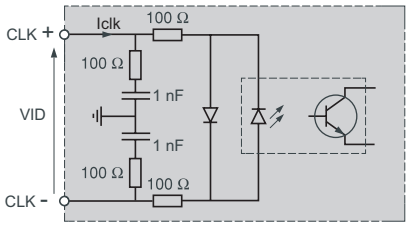
Schemes

RS 422 data output



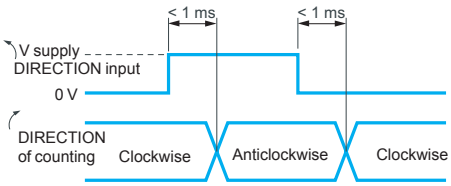
Idata = 20 mA |VOD| > 2 V

Isolated clock input



|VID| maximum: 5 V
|Iclk| maximum: 15 mA

DIRECTION input



References

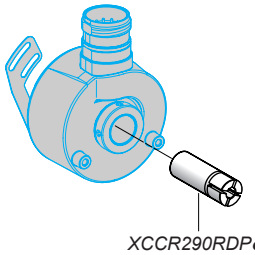
105168

XCC2912PS●●●●

105171

XCC2930TS●●●●

5232001



XCCR290RDP●●

Resolution	Connection method *(1)*	Output stage type *(2)*	Supply voltage	Reference	Weight kg
Solid shaft, Ø 12 mm					
8192 points	Connector, radial M23 male	Push-pull, 13-bit, binary	11…30 V	**XCC2912PS81KBN**	1.365
		Push-pull, 13-bit, Gray	11…30 V	**XCC2912PS81KGN**	1.365
		SSI, 13-bit, Gray	11…30 V	**XCC2912PS81SGN**	1.370
Through shaft, Ø 30 mm *(3)*					
8192 points	Connector, radial M23 male	Push-pull, 13-bit, binary	11…30 V	**XCC2930TS81KBN**	0.975
		Push-pull, 13-bit, Gray	11…30 V	**XCC2930TS81KGN**	0.975
		SSI, 13-bit, binary	11…30 V	**XCC2930TS81SBN**	0.980
		SSI, 13-bit, Gray	11…30 V	**XCC2930TS81SGN**	0.980

Reduction collars for encoders with through shaft, Ø 30 mm

For use with	Diameter	Reference	Weight kg
Encoders with through shaft XCC2930TS81●●●	Ø 12 mm	**XCCR290RDP12**	0.060
	Ø 16 mm	**XCCR290RDP16**	0.060
	Ø 20 mm	**XCCR290RDP20**	0.030
	Ø 25 mm	**XCCR290RDP25**	0.020

(1) For female connector use:
*- **XZCC23FDP120S** for encoders type SB (N) and SG (N)*
*- **XZCC23FDP160S** for encoders type KB (N) and KG (N),*
or pre-wired connectors (L = 2, 5 and 10 m), see page 8/35.
(2) For characteristics of the output stage type (indicated by last letter of the reference), see page 8/24.
(3) Anti-rotation device included with encoder.

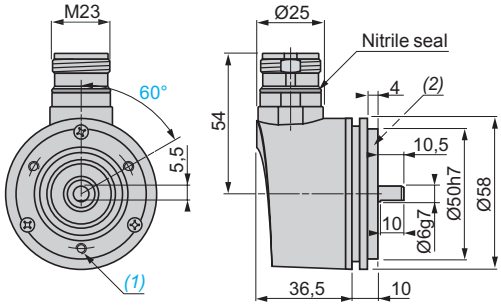
Single turn absolute encoders

OsiSense XCC

Ø 58 mm and Ø 90 mm encoders

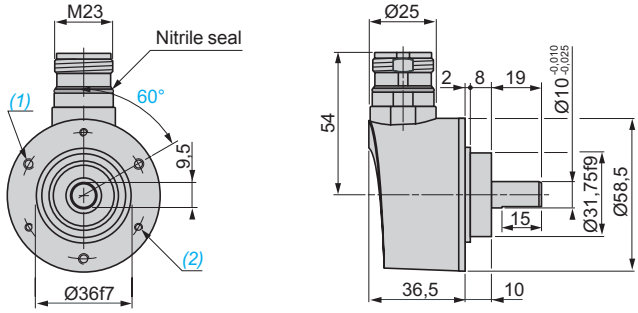
Ø 58 mm encoders

XCC2506PS81KB, XCC2506PS81KGN, XCC2506PS81SBN, XCC2506PS81SGN



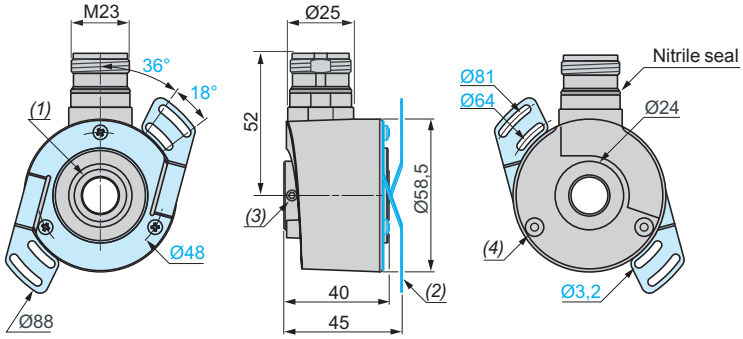
(1) 3 M4 holes at 120° on 42 PCD, depth: 10 mm.
(2) Collar XCCRB1 mounted.

XCC2510PS81KB, XCC2510PS81KGN, XCC2510PS81SBN, XCC2510PS81SGN



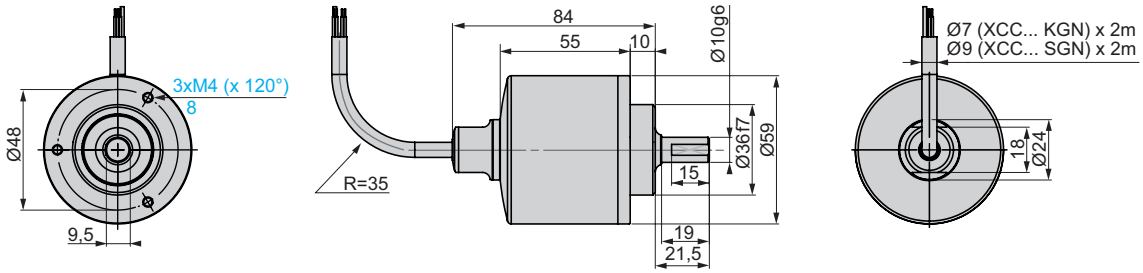
(1) 3 M4 holes at 120° on 48 PCD, depth: 8 mm.
(2) 3 M3 holes at 120° on 48 PCD, depth: 8 mm.

XCC2514TS81KB, XCC2514TS81KGN, XCC2514TS81SB, XCC2514TS81SG



(1) Through shaft, Ø 14 (H7).
(2) Flexible mounting kit, 1 x XCCRF5N mounted.
(3) 2 HC M4 x 4 locking screws.
(4) Hole for M3 x 6 self-threading screw.

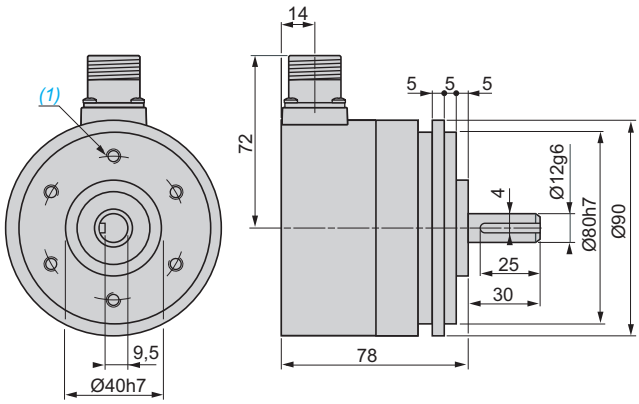
XCC2510SPA81KGN, XCC2510SPA81SGN



R: minimum bend radius = 35 mm for XCC2510SPA81KGN, 65 mm for XCC2510SPA81SGN.

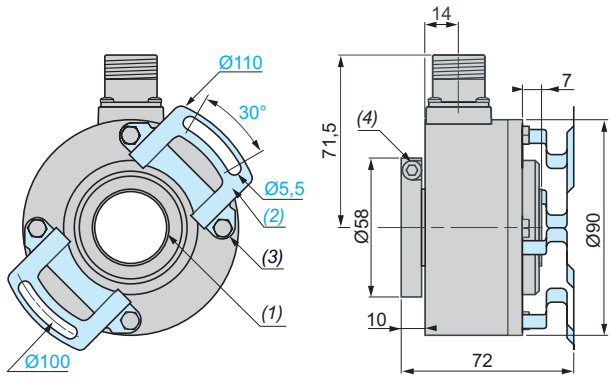
Ø 90 mm encoders

XCC2912PS81KBN, XCC2912PS81KGN



(1) 6 holes M6 x 1 at 120° on 60 PCD, depth: 12 mm maximum.

XCC2930TS81SBN, XCC2930TS81SGN



(1) Through shaft, Ø 30 (H7).
(2) Anti-rotation device, 1 x XCCRF9, mounted.
(3) 4 M5 x 6 on 78 PCD.
(4) 1 CHC M5 x 12 stainless steel A2 locking screw.

Characteristics:
pages 8/22 and 8/24

References:
pages 8/23 and 8/25

Single turn absolute encoders

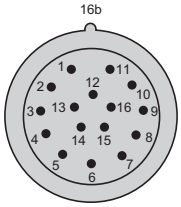
OsiSense XCC

Ø 58 mm and Ø 90 mm encoders

Connector version encoders

Encoders type KB (N) and KG (N)
M23, 16-pin connector, anticlockwise connections

Male connector on encoder (pin view)

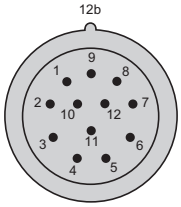


Pin number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Signal/Supply If a resolution less than 13 bits (8192 points) is required, only the corresponding number of bits need to be connected: Example: - D5 to D12 for 8 bits (256 points) - D3 to D12 for 10 bits (1024 points) - D2 to D12 for 11 bits (2048 points)	0 V	+ V	d0	d1	d2	d3	d4	d5	d6	d7	d8	d9	d10	d11	d12	Direction ↻ ↺ *(1)*

(1) ↻ : Clockwise direction, 16 to + V.
↺ : Anticlockwise direction, 16 to 0 V.

Encoders type SB (N) and SG (N)
M23, 12-pin connector, anticlockwise connections

Male connector on encoder (pin view)



Pin number	1	2	3	4	5	6	7	8	9	10	11	12
Signal/Supply	0 V	Data +	Clk +	R	Direction ↻ ↺ *(2)*	R	R	+ V	R	Data –	Clk –	R

R = Reserved (do not connect).

(2) ↻ : Clockwise direction, 5 to 0 V.
↺ : Anticlockwise direction, 5 to + V.

Cable version encoders

XCC2510SPA81KGN

Wire colour	WH White	BN Brown	GN Green	YE Yellow	GY Grey	OG Orange	BU Blue	RD Red
Signal/Supply	0 V	+ V	d0	d1	d2	d3	d4	d5

	BK Black	VT Violet	WH/BN White/ brown	WH/GN White/ green	WH/YE White/ yellow	WH/BK White/ black	WH/OG White/ orange	WH/RD White/ red
	d6	d7	d8	d9	d10	d11	d12	Direction ↻ ↺ *(3)*

(3) ↻ : Clockwise direction, to + V.
↺ : Anticlockwise direction, to 0 V.

XCC2510SPA81SGN

Wire colour	BK Black	BN Brown	GN Green	VT Violet	BU Blue	RD Red	OG Orange	YE Yellow
Signal/Supply	0 V	Data +	Clock +	Direction ↻ ↺ *(4)*	Reset to zero	+ V	Data -	Clock -

(4) ↻ : Clockwise direction, to 0 V.
↺ : Anticlockwise direction, to + V.

Multiturn absolute encoders

OsiSense XCC

Ø 58 mm encoders, aluminium and stainless steel versions

Environment

Encoder type	Multiturn absolute		XCC3506P●●●●●	XCC3510P●●●●●	XCC3510SPA48●●●	XCC3514T●●●●●
Conformity			CE			
Temperature	Operation (housing)	**°C**	- 20…+ 85			
	Storage	**°C**	- 20…+ 85			
Degree of protection	Conforming to IEC 60529		IP 65	IP 65 (IP 67 with collar option XCCRB3)	IP 68 / IP 69K	IP 65
Vibration resistance	Conforming to IEC 60068-2-6		10 gn (f = 10…2 kHz)			
Shock resistance	Conforming to IEC 60068-2-27		30 gn, duration 11 ms			
Resistance to electromagnetic interference	Electrostatic discharges		Conforming to IEC 61000-4-2: level 3, 8 kV air; 4 kV contact			
	Radiated electromagnetic fields (electromagnetic waves)		Conforming to IEC 61000-4-3: level 3, 10 V/m			
	Fast transients (Start/Stop interference)		Conforming to IEC 61000-4-4: level 3, 2 kV (1 kV for inputs/outputs)			
	Surge withstand		Conforming to IEC 61000-4-5: level 2, 1 kV			
Materials	Base		Aluminium		Stainless steel 316L	Aluminium
	Housing		Steel		Stainless steel 316L	Steel
	Shaft		Stainless steel 303		Stainless steel 316L	Stainless steel 303
	Ball bearings		6000		6000	6803ZZ
	Shaft seal		–		Teflon ring	–

Mechanical characteristics

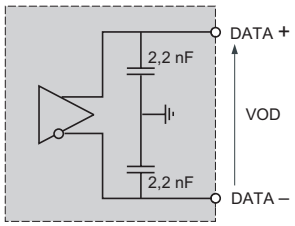
Shaft type			Ø 6, solid shaft (g7)	Ø 10 mm, solid shaft		Ø 14, through shaft (H7)
Maximum rotational speed	Continuous		6000 rpm		3000 rpm	6000 rpm
Shaft moment of inertia		**g.cm²**	10		12	22
Torque		**N.cm**	0.4		9	0.6
Maximum load	Radial	**daN**	10		25	5
	Axial	**daN**	5		25	2

Electrical characteristics

Connection	Connector		**Encoders with SSI output stage types SB (N), SG (N):** M23, 12-pin male connector, (2 m PUR cable for XCC3510SPA48●●●).
Frequency			**Encoders with SSI output stage types SB (N), SG (N):** 100 to 500 kHz clock
Supply voltage			⎓ 11…30 V. Maximum ripple: 500 mV (For XCC3510SPA48●●●: 5…30 V. Maximum ripple 200 mV, if supply voltage < 6 V; 500 mV, if supply voltage ⩾ 6V).
Current consumption, no-load		**mA**	100 maximum
Protection			Against short-circuits and reverse polarity
Output level			Idata = 20 mA |VOD| > 2 V

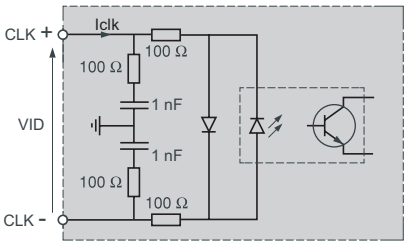
Schemes

RS 422 data output



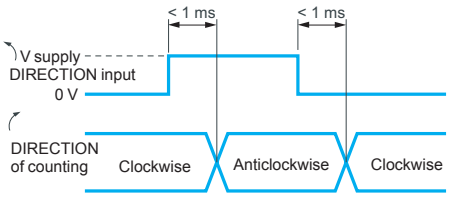
Idata = 20 mA |VOD| > 2 V

Isolated clock input

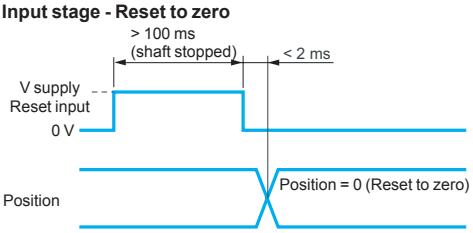


|VID| maximum: 5 V
|Iclk| maximum: 15 mA

DIRECTION input



Input stage - Reset to zero



References: page 8/29
Dimensions: page 8/32
Connections: page 8/33

Multiturn absolute encoders

OsiSense XCC

Ø 58 mm encoders, aluminium and stainless steel versions

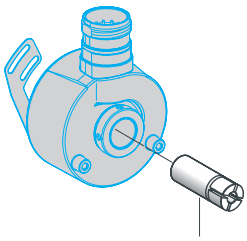
105174

XCC3506PS84SBN

120311B

XCC3510SPA48SGN

514215



XCCR158RDA●●

Ø 58 mm multiturn absolute encoders with SSI output convertible to parallel output

The SSI versions can be converted to a parallel version using the deserialisation connecting cable XCCRM23SUB37●●, see pages 8/34 and 8/35.

Solid shaft, Ø 6 mm

Resolution	Connection method *(1)*	Output stage type *(2)*	Supply voltage	Reference	Weight kg
4096 points 8192 turns	Connector, radial M23 male	SSI, 25-bit, binary	11…30 V	**XCC3506PS48SBN**	0.725
8192 points 4096 turns	Connector, radial M23 male	SSI, 25-bit, binary	11…30 V	**XCC3506PS84SBN**	0.725
		SSI, 25-bit, Gray	11…30 V	**XCC3506PS84SGN**	0.725

Solid shaft, Ø 10 mm

Resolution	Connection method *(1)*	Output stage type *(2)*	Supply voltage	Reference	Weight kg
4096 points 8192 turns	Connector, radial M23 male	SSI, 25-bit, binary	11…30 V	**XCC3510PS48SBN**	0.685
	Cable (2 m)	SSI, 25-bit, binary	5…30 V	**XCC3510SPA48SGN** *(3)*	0.935
8192 points 4096 turns	Connector, radial M23 male	SSI, 25-bit, binary	11…30 V	**XCC3510PS84SBN**	0.685
		SSI, 25-bit, Gray	11…30 V	**XCC3510PS84SGN**	0.685

Through shaft, Ø 14 mm *(4)*

Resolution	Connection method *(1)*	Output stage type *(2)*	Supply voltage	Reference	Weight kg
8192 points 4096 turns	Connector, radial M23 male	SSI, 25-bit, binary	11…30 V	**XCC3514TS84SB**	0.655

Reduction collars for encoders with through shaft, Ø 14 mm

For use with	Diameter	Reference	Weight kg
Encoders with through shaft XCC3514TS84●●	Ø 6 mm	**XCCR158RDA06**	0.015
	Ø 8 mm	**XCCR158RDA08**	0.010
	Ø 10 mm	**XCCR158RDA10**	0.010
	Ø 12 mm	**XCCR158RDA12**	0.010
	0.375”	**XCCR158RDAU37**	0.011
	0.5”	**XCCR158RDAU50**	0.007

*(1) For female connector use **XZCC23FDP120S** or pre-wired connectors (L = 2, 5 or 10 m), see page 8/35.*
(2) For characteristics of the output stage type (indicated by last letter of the reference), see page 8/28.
(3) Stainless steel 316L version.
(4) Anti-rotation device included with encoder.

Multiturn absolute encoders

OsiSense XCC

Ø 90 mm encoders

Environment

Encoder type			XCC3912P●●●●●	XCC3930T●●●●●
Conformity			CE	
Temperature	Operation (housing)	°C	- 20…+ 85	- 10…+ 75
	Storage	°C	- 30…+ 85	- 20…+ 85
Degree of protection	Conforming to IEC 60529		IP 66	IP 65
Vibration resistance	Conforming to IEC 60068-2-6		10 gn (f = 10…2 kHz)	
Shock resistance	Conforming to IEC 60068-2-27		30 gn, duration 11 ms	
Resistance to electromagnetic interference	Electrostatic discharges		Conforming to IEC 61000-4-2: level 3, 8 kV air; 4 kV contact	
	Radiated electromagnetic fields (electromagnetic waves)		Conforming to IEC 61000-4-3: level 3, 10 V/m	
	Fast transients (Start/Stop interference)		Conforming to IEC 61000-4-4: level 3, 2 kV (1 kV for inputs/outputs)	
	Surge withstand		Conforming to IEC 61000-4-5: level 2, 1 kV	
Materials	Base		Aluminium	
	Housing		Zamak	
	Shaft		Stainless steel	
	Ball bearings		6001ZZ	6807ZZ

Mechanical characteristics

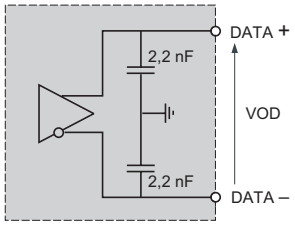
Shaft type			Ø 12, solid shaft (g6)	Ø 30, through shaft (H7)
Maximum rotational speed	Continuous		6000 rpm	3600 rpm
Shaft moment of inertia		g.cm²	150	56
Torque		N.cm	1	0.8
Maximum load	Radial	daN	20	8
	Axial	daN	10	5

Electrical characteristics

Connection	Connector		**Encoders with SSI output stage types SB (N), SG (N):** M23, 12-pin male connector
Frequency			**Encoders with SSI output stage types SB (N), SG (N):** 100 to 500 kHz clock
Encoders with type SBN or SGN (Gray) output stage: SSI output without parity, 25-bit clock, 11…30 V supply, binary code (SB) or Gray code (SG)			
Supply voltage			⎓ 11…30 V Maximum ripple: 500 mV
Current consumption, no-load		mA	100 maximum
Protection			Against short-circuits and reverse polarity
Output level			Idata = 20 mA |VOD| > 2 V

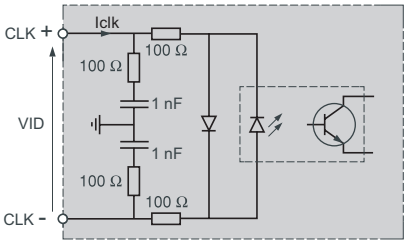
Schemes

RS 422 data output



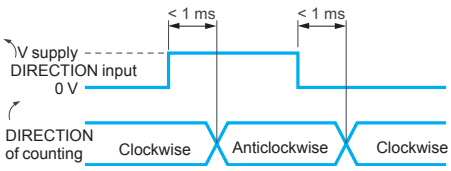
Idata = 20 mA |VOD| > 2 V

Isolated clock input



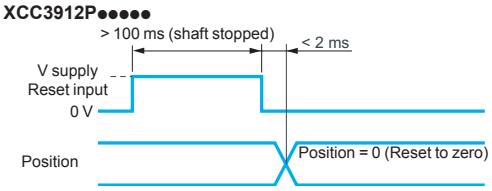
|VID| maximum: 5 V
|Iclk| maximum: 15 mA

DIRECTION input

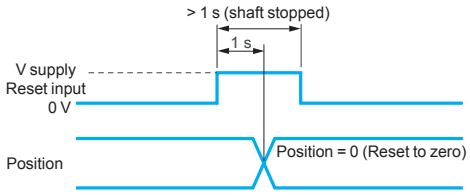


Input stage - Reset to zero

XCC3912P●●●●●



XCC3930T●●●●●



References: page 8/31
Dimensions: page 8/33
Connections: page 8/33

Multiturn absolute encoders

OsiSense XCC

Ø 90 mm encoders

Ø 90 mm multiturn absolute encoders with SSI output convertible to parallel output

The SSI versions can be converted to a parallel version using the deserialisation connecting cable **XCCRM23SUB37●●**, see pages 8/34 and 8/35.

105178

XCC3912PS●●●●

Solid shaft, Ø 12 mm

Resolution	Connection method *(1)*	Output stage type *(2)*	Supply voltage	Reference	Weight kg
8192 points 4096 turns	Connector, radial M23 male	SSI, 25-bit, binary	11…30 V	**XCC3912PS84SBN**	1.840
		SSI, 25-bit, Gray	11…30 V	**XCC3912PS84SGN**	1.840

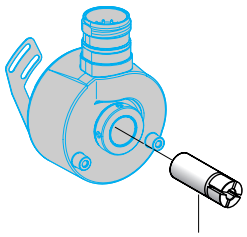
105179

XCC3930TS●●●●

Through shaft, Ø 30 mm *(3)*

Resolution	Connection method *(1)*	Output stage type *(2)*	Supply voltage	Reference	Weight kg
8192 points 4096 turns	Connector, radial M23 male	SSI, 25-bit, binary	11…30 V	**XCC3930TS84SBN**	1.060
		SSI, 25-bit, Gray	11…30 V	**XCC3930TS84SGN**	1.060

523200



XCCR290RDP●●

Reduction collars for encoders with through shaft, Ø 30 mm

For use with	Diameter	Reference	Weight kg
Encoders with through shaft XCC3930TS84●●●	Ø 12 mm	**XCCR290RDP12**	0.060
	Ø 16 mm	**XCCR290RDP16**	0.060
	Ø 20 mm	**XCCR290RDP20**	0.030
	Ø 25 mm	**XCCR290RDP25**	0.020

*(1) For female connector use **XZCC23FDP120S** or pre-wired connectors (L = 2, 5 or 10 m), see page 8/35.*
(2) For characteristics of the output stage type (indicated by last letter of the reference), see page 8/30.
(3) Anti-rotation device included with encoder.

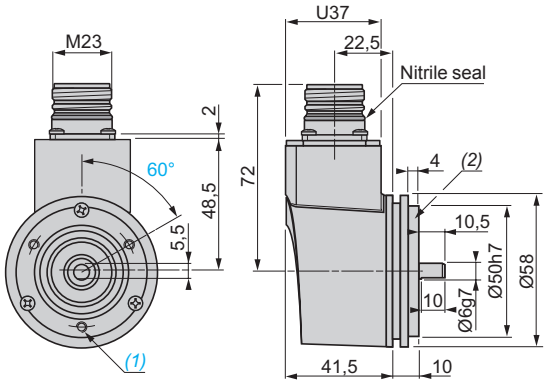
Multiturn absolute encoders

OsiSense XCC

Ø 58 mm encoders

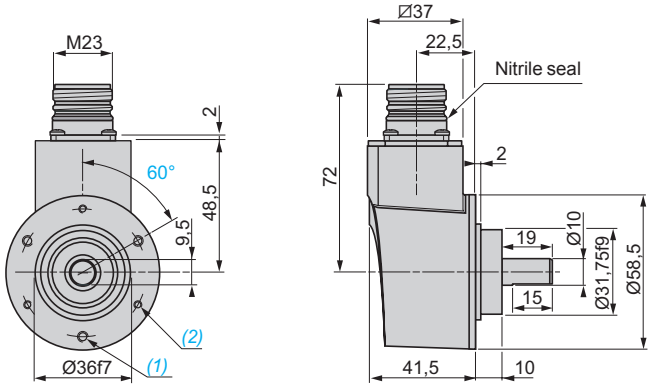
Ø 58 mm encoders

XCC3506PS84SBN, XCC3506PS84SGN



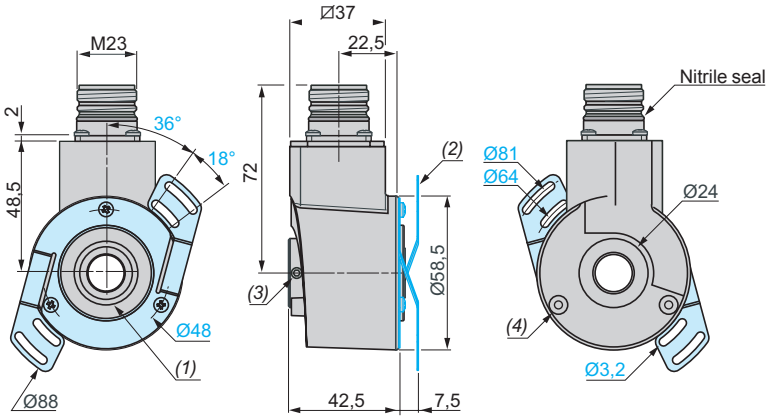
(1) 3 M4 holes at 120° on 42 PCD, depth: 10 mm.
(2) Collar XCCRB1 mounted.

XCC3510PS84SBN, XCC3510PS84SGN



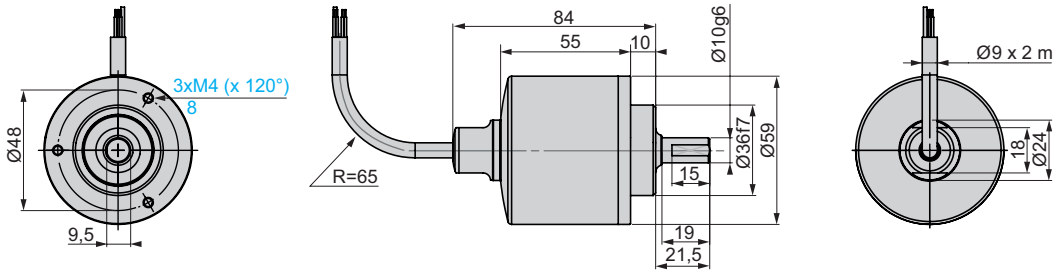
(1) 3 M4 holes at 120° on 48 PCD, depth: 8 mm.
(2) 3 M3 holes at 120° on 48 PCD, depth: 8 mm.

XCC3514TS84SB, XCC3514TS84SG



(1) Through shaft, Ø 14 (H7).
(2) Flexible mounting kit, 1 x XCCRF5N mounted.
(3) 2 HC M4 x 4 locking screws.
(4) Hole for M3 x 6 self-threading screw.

XCC3510SPA48SGN



R: minimum bend radius = 65 mm.

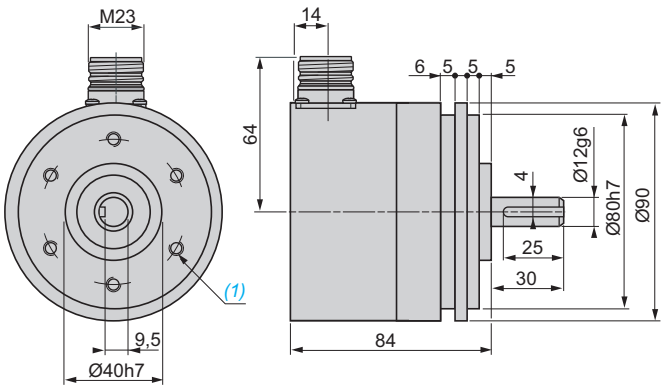
Multiturn absolute encoders

OsiSense XCC

Ø 58 mm encoders

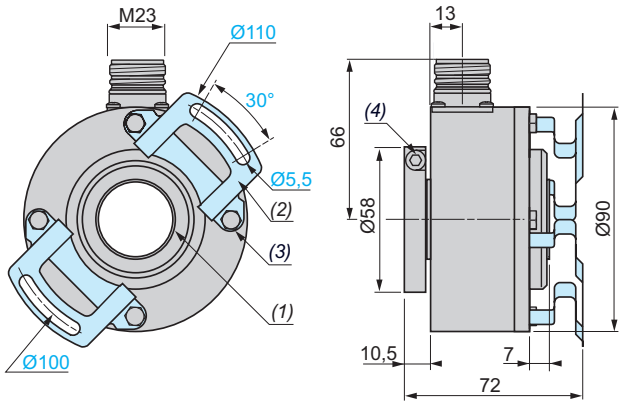
Ø 90 mm encoders

XCC3912PS84S●N



(1) 6 holes M6 x 1 at 120° on 60 PCD, depth: 12 mm maximum.

XCC3930TS84S●N

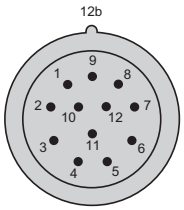


(1) Through shaft, Ø 30 (H7).
(2) Anti-rotation device, 1 x XCCRF9, mounted.
(3) 4 M5 x 6 on 78 PCD.
(4) 3 HC M5 x 6 stainless steel A2 locking screws.

Connector version encoders

Encoder with SSI output (types SBN and SGN)
M23, 12-pin connector, anticlockwise connections

Male connector on encoder (pin view)



Twisted cable pairs + general shielding must be used.

Pin number	1	2	3	4	5	6	7	8	9	10	11	12
Signal/Supply	0 V	Data +	Clk +	R	Direction ↻ ↺ (1)	Reset to zero	R	+ V	R	Data –	Clk –	R

R = Reserved (do not connect).
(1) ↻ : Clockwise direction, ↺ : Anticlockwise direction.

Selection of code progression direction

The DIRECTION input enables the code progression to match the rotational direction of the encoder shaft (clockwise or anticlockwise).
Clockwise direction: connect pin 5 to 0 V.
Anticlockwise direction: connect pin 5 to + V.

Reset to zero

The RESET input enables the encoder to be set to the zero position.
It is actuated by applying an 11…30 V DC supply to pin 6, whilst the shaft is stopped, for the following times:
- over 100 ms for XCC3506, XCC3510 and XCC3912,
- over 1 s for XCC3930T.

Following a reset to zero, the pin 6 connection must be re-established to 0 V.

Note: *In environments subject to electrical interference, it is recommended to earth the encoder base using one of the fixing screws.*

Cable version encoder

XCC3510SPA48SGN

Wire colour	BK Black	BN Brown	GN Green	VT Violet	BU Blue	RD Red	OG Orange	YE Yellow
Signal/Supply	0 V	Data +	Clock +	Direction ↻ ↺ (2)	Reset to zero	+ V	Data -	Clock -

(2) ↻ : Clockwise direction, to 0 V.
↺ : Anticlockwise direction, to + V.

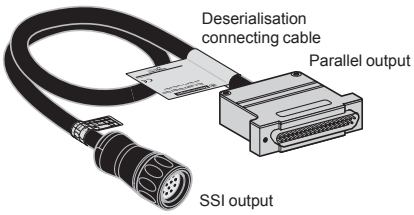
Multiturn absolute encoders

OsiSense XCC

Ø 58 mm and Ø 90 mm encoders

Connection accessories

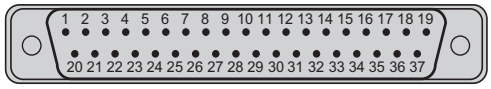
Connector version multiturn absolute encoders



The deserialisation connecting cable **XCCRM23SUB37●●** (see page 8/35) enables conversion, by simple connection, of encoders **XCC35●●** and **XCC39●●** with SSI output to parallel output.

Characteristics

Supply	⎓ 11 to 30 V
Encoder input/output	Levels RS 422
Parallel outputs	Push-pull protection against short-circuits
Operating temperature	0 to 50 °C



Male connector (pin view)

■ **Selection of code progression direction**
The DIRECTION input enables the code progression to match the rotational direction of the encoder shaft (clockwise or anticlockwise).
Clockwise direction: connect pin 30 to an 11…30 V DC supply.
Anticlockwise direction: connect pin 30 to 0 V.

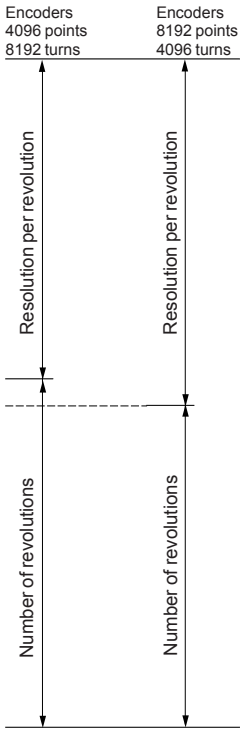
■ **Reset to zero**
The RESET input enables the encoder to be set to the zero position. It is actuated by applying an 11…30 V DC supply to pin 27 for more than 1 second.

■ **Encoder selection**
The SELECT input enables encoder selection when several units are connected in parallel on the same data bus.
Encoder selected: apply 0 V potential to pin 28.
Encoder not selected: apply 11…30 V DC to pin 28.

■ **Data locking**
The LATCH input, particularly useful for high speed applications, enables the freezing of the encoder data output whilst reading the code.
Function not actuated: apply 0 V potential to pin 29.
Function actuated: apply 11…30 V DC to pin 29.

36 x 0.14 mm² shielded cable and SUB-D 37-pin end connector connections

Pin number	Signal
1	2^0 (LSB)
2	2^1
3	2^2
4	2^3
5	2^4
6	2^5
7	2^6
8	2^7
9	2^8
10	2^9
11	2^{10}
12	2^{11}
13	2^{12}
14	2^{13}
15	2^{14}
16	2^{15}
17	2^{16}
18	2^{17}
19	2^{18}
20	2^{19}
21	2^{20}
22	2^{21}
23	2^{22}
24	2^{23}
25	2^{24} (MSB)
26	R
27	Reset to zero
28	Select
29	Latch
30	Direction *(1)* ↻ ↺
31, 32, 33, 34, 35	R
36	+ V
37	0 V



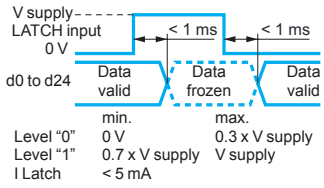
R = Reserved, do not connect

(1) ↻ : clockwise direction, ↺ : anticlockwise direction.

***Note:** In environments subject to electrical interference, it is recommended to earth the encoder base using one of the fixing screws.*

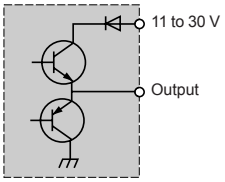
Schemes

LATCH input



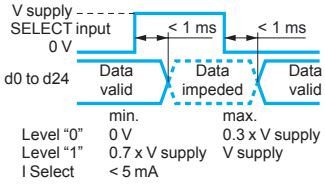
PUSH-PULL

Supply: 11 to 30 V ⎓
Maximum ripple: 500 mV
Protection against reverse polarity
Max. no-load consumption: 50 mA (30 mA typical on 24 V)

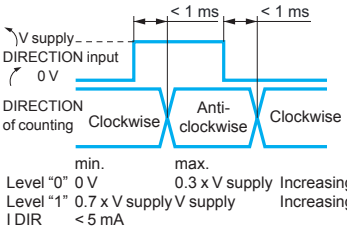


Max. current: 20 mA
Level "0" max.: 1.5 V
Level "1" min.: V supply - 2.5 V
Protection against short-circuits
NPN/PNP compatible

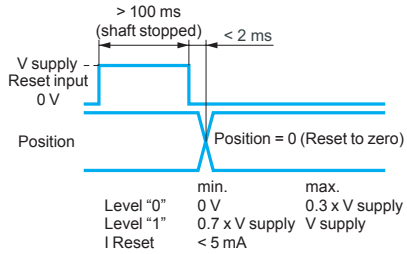
SELECT input



DIRECTION input



Input stage - Reset to zero



***Note:** Do not neglect the LATCH and SELECT inputs. Connecting them to 0 V makes the outputs active.*

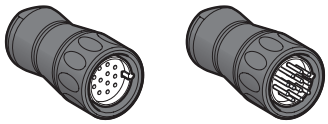
General:
page 8/7

Rotary encoders

OsiSense XCC

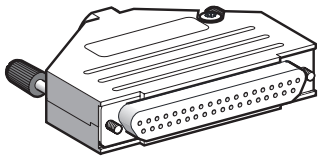
Connection accessories

566466



XZCC23FMDP120S

566467



XZCCHFDM370S

105193

XCCRM23SUB37PG

105194

XCCPM23161L2

Cables

Description	For encoders	Number of wires/c.s.a.	Ø mm	Reference	Weight kg
Shielded cables Length: 100 m UL/CSA	Incremental	10 wires/0.14 mm²	6	**XCCRX10**	5.000
	Absolute, single turn //	16 wires/0.14 mm²	6.8	**XCCRX16**	5.600
	Absolute, single turn and multiturn SSI, and incremental	1 twisted pair of 0.50 mm² wires and 3 twisted pairs of 0.14 mm² wires	8.6	**XCCRXS8**	11.750

Connectors

Description	For use with	Number of pins	Type	Reference	Weight kg
M23 female connectors	Encoders Incremental, absolute SSI	12	Straight	**XZCC23FDP120S**	0.040
	Absolute encoders, single turn parallel	16	Straight	**XZCC23FDP160S**	0.040
Connector kit 1 female + 1 male	SSI jumper cable or incremental encoders	–	–	**XZCC23FMDP120S**	0.090
SUB-D 37-pin female connector	Absolute encoders, multiturn parallel	37	Straight	**XZCCHFDM370S**	0.115

Deserialisation jumper cables *(1)*

Description	Type	Reference	Weight kg
M23 F - SUB-D37 M jumper cables, straight M23, cable length 0.5 m	SSI Gray//Gray PNP (PG)	**XCCRM23SUB37PG**	0.225
	SSI Gray//Gray NPN (NG)	**XCCRM23SUB37NG**	0.225
	SSI Binary//Binary PNP (PB)	**XCCRM23SUB37PB**	0.225
	SSI Binary//Binary NPN (NB)	**XCCRM23SUB37NB**	0.225

Pre-wired connectors

Description	Number of wires	Length	Reference	Weight kg
M23 F straight	8 wires Absolute SSI	2 m	**XCCPM23122L2**	0.190
		5 m	**XCCPM23122L5**	0.470
		10 m	**XCCPM23122L10**	0.900
	10 wires Incremental	2 m	**XCCPM23121L2**	0.160
		5 m	**XCCPM23121L5**	0.330
		10 m	**XCCPM23121L10**	0.620
	16 wires Absolute single turn //	2 m	**XCCPM23161L2**	0.175
		5 m	**XCCPM23161L5**	0.415
		10 m	**XCCPM23161L10**	0.790

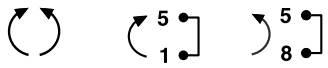
(1) See General, page 8/7.

Pre-wired connector connections

XCCPM23122L●

Pin	Function	Colour
1	0V	BK
2	Data (+)	BN
3	Clk (+)	GN
4	R	–
5	⟲	VT
6	Reset	BU
7	R	–
8	+ V	RD
9	R	–
10	Data (-)	OG
11	Clk (-)	YE
12	R	–

Direction of rotation for pin 5



XCCPM23121L●

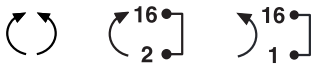
Pin	Function	Colour
1	A/	BN
2	V Supply	RD
3	Top 0	VT
4	Top 0/	BU
5	B	YE
6	B/	OG
7	R	–
8	A	GN
9	R	–
10	Gnd	BK
11	Gnd	WH
12	V Supply	GY

R: reserved, do not connect

XCCPM23161L●

Pin	Function	Colour
1	Gnd	WH
2	V Supply	BN
3	d0	GN
4	d1	YE
5	d2	GY
6	d3	OG
7	d4	BU
8	d5	RD
9	d6	BK
10	d7	VT
11	d8	WH/BN
12	d9	WH/GN
13	d10	WH/YE
14	d11	WH/BK
15	d12	WH/OG
16	⟲	WH/RD

Direction of rotation for pin 16



Rotary encoders

OsiSense XCC

Mounting and fixing accessories

Shaft couplings with spring *(1)*

Maximum torque		**N.cm**	300
Maximum angular misalignment			5°
Maximum radial misalignment		**mm**	± 1.5
Materials	Collars		Zamak
	Spring		Nickel plated steel
Compression/Expansion		**mm**	± 1 maximum

Homokinetic (flexible) shaft couplings with bellows

Maximum torque		**N.cm**	80
Maximum angular misalignment			4°
Maximum lateral misalignment		**mm**	± 0.3
Maximum axial misalignment		**mm**	± 0.5
Materials	Bellows		Stainless steel
	Fixing collar		Aluminium
	Screws		Stainless steel

Elastic monobloc shaft couplings

Maximum torque	**N.cm**	20
Maximum angular misalignment		± 2.5°
Maximum radial misalignment	**mm**	± 0.3
Compression/Expansion	**mm**	± 2 maximum
Materials		Glass fibre reinforced polyamide

References

105191

XCCRAR●●●

105192

XCCRAS●●●●

806309

XCCRAE0606

Shaft couplings (for encoders with solid shaft)

Type	Bore diameter (encoder side)	Bore diameter (machine side)	Reference	Weight kg
With spring *(1)*	6 mm	6 mm	**XCCRAR0606**	0.125
		8 mm	**XCCRAR0608**	0.125
		10 mm	**XCCRAR0610**	0.125
		12 mm	**XCCRAR0612**	0.120
		14 mm	**XCCRAR0614**	0.120
		16 mm	**XCCRAR0616**	0.120
	10 mm	8 mm	**XCCRAR1008**	0.120
		10 mm	**XCCRAR1010**	0.120
		12 mm	**XCCRAR1012**	0.110
		14 mm	**XCCRAR1014**	0.110
		16 mm	**XCCRAR1016**	0.105
	12 mm	8 mm	**XCCRAR1208**	0.110
		12 mm	**XCCRAR1212**	0.110
		14 mm	**XCCRAR1214**	0.105
		16 mm	**XCCRAR1216**	0.100
Homokinetic (flexible) with bellows	6 mm	6 mm	**XCCRAS0606**	0.020
		8 mm	**XCCRAS0608**	0.020
		10 mm	**XCCRAS0610**	0.020
		12 mm	**XCCRAS0612**	0.015
		0.25”	**XCCRAS06U25**	0.018
		0.375”	**XCCRAS06U37**	0.016
	10 mm	8 mm	**XCCRAS1008**	0.015
		10 mm	**XCCRAS1010**	0.015
			XCCRAS1010S *(2)*	0.015
		12 mm	**XCCRAS1012**	0.015
			XCCRAS1012S *(2)*	0.015
		0.25”	**XCCRAS10U25**	0.016
		0.375”	**XCCRAS10U37**	0.014
			XCCRAS10U37S *(2)*	0.014
	12 mm	8 mm	**XCCRAS1208**	0.010
		12 mm	**XCCRAS1212**	0.010
		0.25”	**XCCRAS12U25**	0.015
		0.375”	**XCCRAS12U37**	0.013
		0.5”	**XCCRAS12U50**	0.012
Elastic, monobloc	6 mm	6 mm	**XCCRAE0606**	0.010

(1) Not recommended for resolutions higher than 500 points.
(2) Stainless steel 316L version.

Rotary encoders

OsiSense XCC

Mounting and fixing accessories

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XCCRF●

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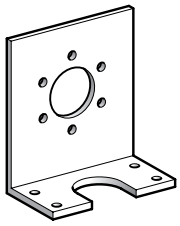
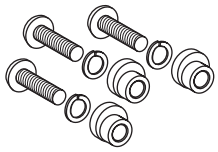


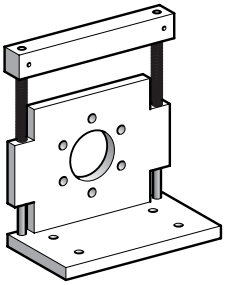
XCCRE9SN

DF600268



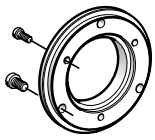
XCCRG●

566462



XCCRE●R

566463



XCCRB1

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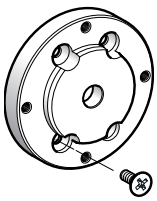


XCCRB2

105188

XCCR158RDA08

105190

XCCR290RDP20

Anti-rotation devices (for encoders with through shaft)

Description	Features	For encoders		Reference	Weight kg
Flexible mounting kit	Set of 2 flexible fixings + screws	Ø 40	XCC1406T	**XCCRF4**	0.010
	1 flexible fixing + screws	Ø 58	XCC15●●T, XCC25●●T, XCC3514T	**XCCRF5N**	0.020
	Set of 2 flexible fixings + screws	Ø 90	XCC19●●T, XCC29●●T, XCC39●●T	**XCCRF9**	0.030

Mounting and fixing accessories (for encoders with solid shaft)

Description	For encoders	Reference	Weight kg
Set of 3 eccentric clamps + 3 fixing screws *(1)* + 3 washers	XCC15●●P, XCC25●●P, XCC35●●P	**XCCRG5**	0.010
	XCC1912P, XCC2912P, XCC3912P	**XCCRG9**	0.030
Plain brackets for Ø 58 *(2)*	XCC1506, XCC2506	**XCCRE5S**	1.300
	XCC1510P, XCC2510P, XCC3510P	**XCCRE5SN**	0.130
Fixing collar (2”) for Ø 58 mm	XCC1510, XCC2510, XCC3510	**XCCRB6**	0.060
Plain brackets for Ø 90 *(2)*	XCC1912P, XCC2912P, XCC3912P	**XCCRE9SN**	0.290
Brackets with play compensator *(2)*	XCC1510P, XCC2510P, XCC3510PS●●S●●	**XCCRE5RN**	0.345
	XCC1912P, XCC2912P, XCC3912P	**XCCRE9RN**	0.890
Collar for synchro mounting, for Ø 58 *(2)*	XCC1510P, XCC2510P, XCC3510P	**XCCRB1**	0.040
Substitution interface collar for Ø 90 *(2)*	XCC1912P, XCC2912P, XCC3912P	**XCCRB2**	0.175
IP 67 sealed collar for Ø 58 *(2)*	XCC1510P, XCC2510P, XCC3510PS●●S●N	**XCCRB3**	0.030

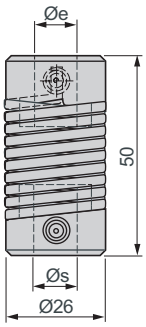
Reduction collars for encoders with through shaft

Description	For use with	Reduction	Reference	Weight kg
Reduction collars	Incremental encoders Ø 58 Absolute single turn encoders Ø 58 Absolute multiturn encoders Ø 58	14 mm to 6 mm	**XCCR158RDA06**	0.015
		14 mm to 8 mm	**XCCR158RDA08**	0.010
		14 mm to 10 mm	**XCCR158RDA10**	0.010
		14 mm to 12 mm	**XCCR158RDA12**	0.010
		14 mm to 0.375”	**XCCR158RDAU37**	0.011
		14 mm to 0.5”	**XCCR158RDAU50**	0.007
	Incremental encoders Ø 90 Absolute single turn and multiturn encoders Ø 90	30 mm to 12 mm	**XCCR290RDP12**	0.060
		30 mm to 16 mm	**XCCR290RDP16**	0.060
		30 mm to 20 mm	**XCCR290RDP20**	0.030
		30 mm to 25 mm	**XCCR290RDP25**	0.020
		30 mm to 0.375”	**XCCR290RDPU37**	0.080
		30 mm to 0.5”	**XCCR290RDPU50**	0.060
		30 mm to 0.75”	**XCCR290RDPU75**	0.030
		30 mm to 1”	**XCCR290RDPU1**	0.018

(1) 3 M3 x 12 screws for XCCRG5, 3 M4 x 25 screws for XCCRG9.
(2) Screws included with brackets and collars.

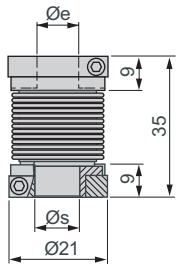
Shaft couplings

XCCRAR●●●●



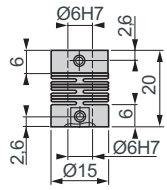
Reference	Ø e	Ø s
XCCRAR0606	6 mm	6 mm
XCCRAR0608	6 mm	8 mm
XCCRAR0610	6 mm	10 mm
XCCRAR0612	6 mm	12 mm
XCCRAR0614	6 mm	14 mm
XCCRAR0616	6 mm	16 mm
XCCRAR1008	10 mm	8 mm
XCCRAR1010	10 mm	10 mm
XCCRAR1012	10 mm	12 mm
XCCRAR1014	10 mm	14 mm
XCCRAR1016	10 mm	16 mm
XCCRAR1208	12 mm	8 mm
XCCRAR1212	12 mm	12 mm
XCCRAR1214	12 mm	14 mm
XCCRAR1216	12 mm	16 mm

XCCRAS●●●●



Reference	Ø e	Ø s
XCCRAS0606	6 mm	6 mm
XCCRAS0608	6 mm	8 mm
XCCRAS0610	6 mm	10 mm
XCCRAS0612	6 mm	12 mm
XCCRAS1008	10 mm	8 mm
XCCRAS1010	10 mm	10 mm
XCCRAS1010S	10 mm	10 mm
XCCRAS1012	10 mm	12 mm
XCCRAS1012S	10 mm	12 mm
XCCRAS1208	12 mm	8 mm
XCCRAS1212	12 mm	12 mm
XCCRAS06U25	6 mm to 0.25”	
XCCRAS06U37	6 mm to 0.375”	
XCCRAS10U25	10 mm to 0.25”	
XCCRAS10U37	10 mm to 0.375”	
XCCRAS10U37S	10 mm to 0.375”	
XCCRAS12U25	12 mm to 0.25”	
XCCRAS12U37	12 mm to 0.375”	
XCCRAS12U50	12 mm to 0.5”	

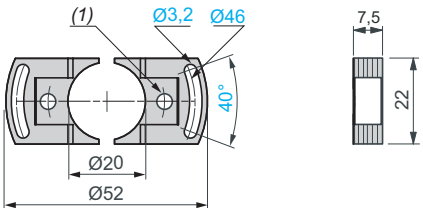
XCCRAE0606



Anti-rotation devices (flexible mounting kit)

XCCRF4

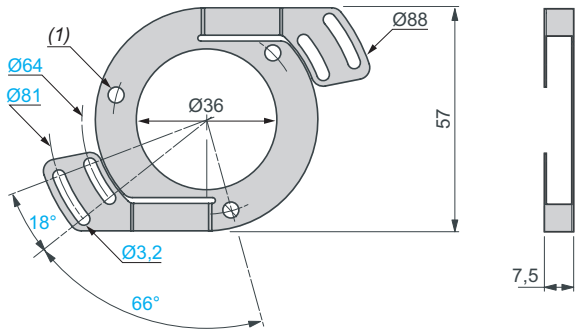
Mounting on Ø 40 mm encoder XCC1406T



(1) 2 holes Ø 4 at 180° on 30 PCD. TC M4 x 5 screw fixings.

XCCRF5N

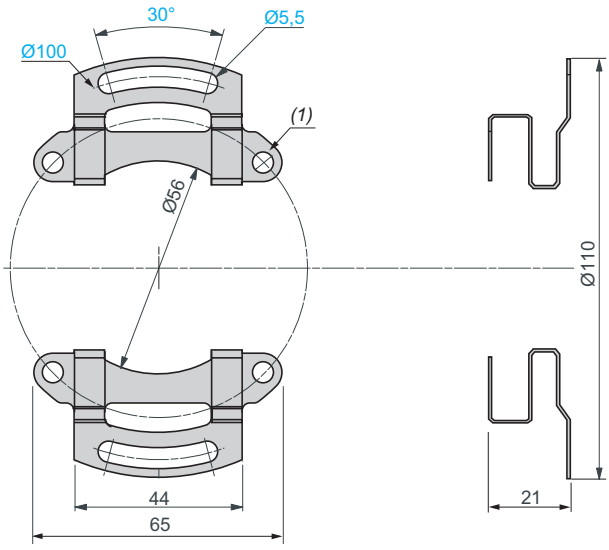
Mounting on Ø 58 mm encoders XCC1514T, XCC2514T and XCC3514T



(1) 3 holes Ø 4.1 at 120° on 48 PCD. TC M3 x 6 screw fixings.

XCCRF9

Mounting on Ø 90 mm encoders XCC1930T, XCC2930T and XCC3930T

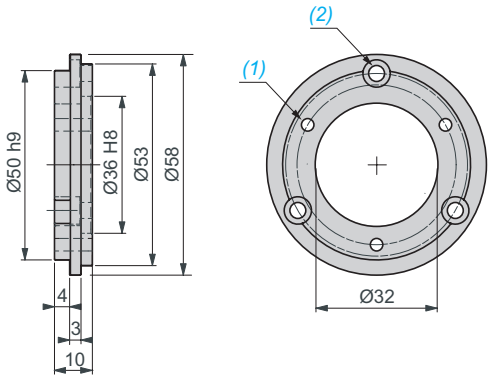


(1) 4 holes Ø 5.2 at 90° on 78 PCD. TH M5 x 6 screw fixings.

Collar kits

XCCRB1

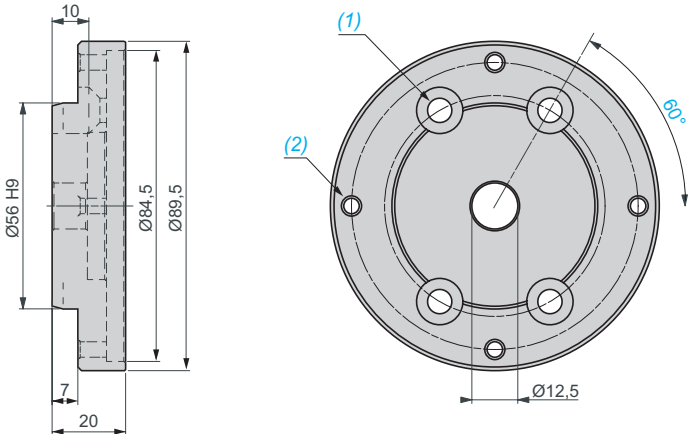
Collar for synchro mounting, for Ø 58 encoders:
XCC15●●P, XCC25●●P and XCC35●●P



(1) 3 holes M4 x 0.7 at 120° on 42 PCD. TC M3 x 8 screw fixings.
(2) 3 counterbored holes for TC M4 x 8 screws at 120° on 48 PCD.

XCCRB2

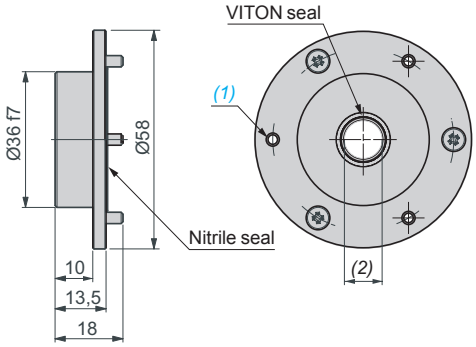
Interface collar for Ø 90 encoders:
XCC1912P, XCC2912P, XCC3912P



(1) 4 holes Ø 6.6 at 120° on 60 PCD. Countersunk for TZ M6 x 16 screws.
(2) 4 holes M5 x 0.8 at 90° on 78 PCD.

XCCRB3

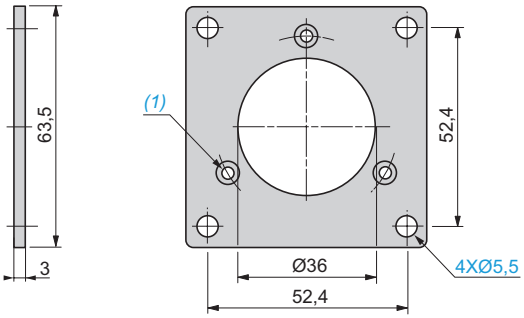
IP 67 sealed collar for Ø 58 encoders:
XCC1510P, XCC2510P and XCC3510PS●●S●N



(1) 3 holes M3 x 0.5 at 120°on 48 PCD. TZ M3 x 8 screw fixings.
(2) Shaft Ø 10 mm.

Fixing collar XCCRB6

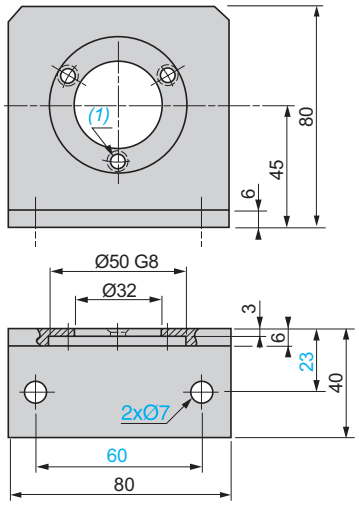
Fixing collar fixation 2" for Ø 58 encoders:
XCC1510, XCC2510 and XCC3510



(1) 3 holes M3.2 at 120° on Ø 48 mm.

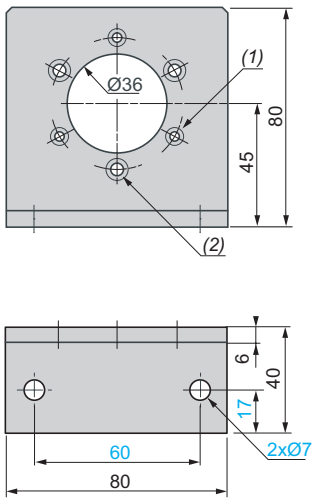
Plain brackets

XCCRE5S



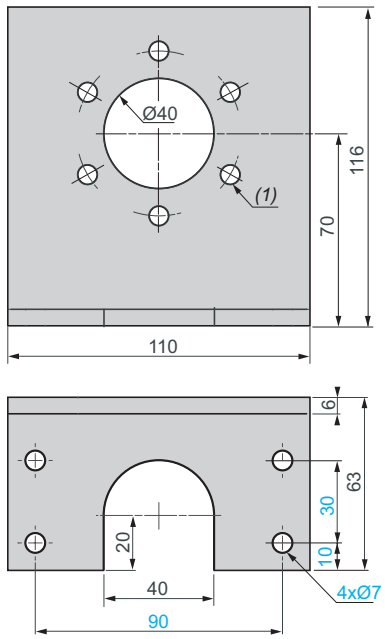
(1) 3 holes Ø 4.5 at 120° on 42 PCD.

XCCRE5SN



3 CHC M3 x 8 screws included.
(1) 3 counterbored holes for CHC M3 screws at 120° on 48 PCD.
(2) 3 counterbored holes for CHC M4 screws at 120° on 48 PCD.

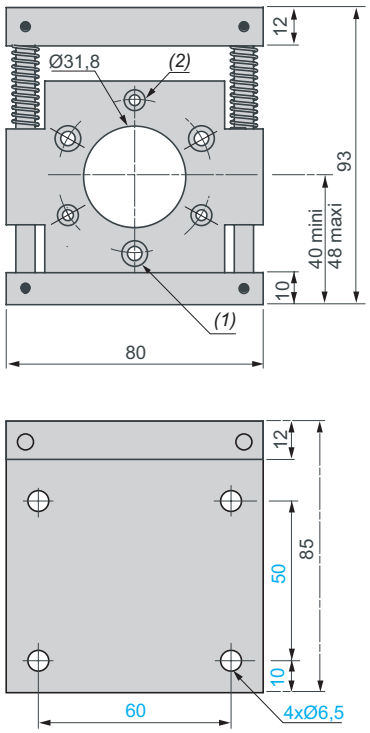
XCCRE9SN



(1) 6 holes Ø 7 for CHC M6 screws at 60° on 60 PCD.

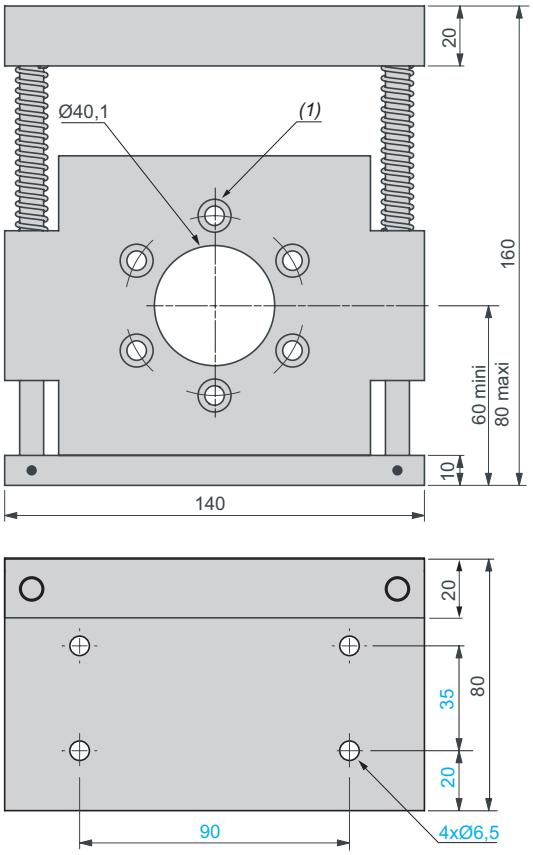
Brackets with play compensator

XCCRE5RN



CHC M3 x 12 screws included
(1) 3 counterbored holes for CHC M3 screws at 120° on 48 PCD.
(2) 3 counterbored holes for CHC M4 screws at 120° on 48 PCD.

XCCRE9RN

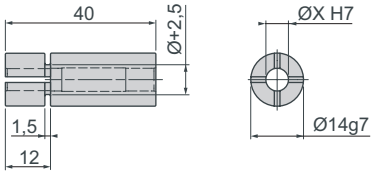


(1) 6 counterbored holes for CHC M6 screws at 120° on 60 PCD.

Reduction collars for through shaft

XCCR158RDA●●

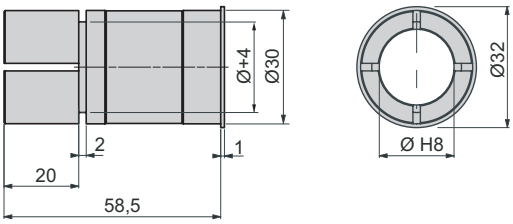
For Ø 58 incremental and absolute single turn and multiturn encoders



Reference	Ø
XCCR158RDA06	6 mm
XCCR158RDA08	8 mm
XCCR158RDA10	10 mm
XCCR158RDA12	12 mm
XCCR158RDAU37	0.375”
XCCR158RDAU50	0.5”

XCCR290RDP●●

For Ø 90 incremental and absolute single turn and multiturn encoders

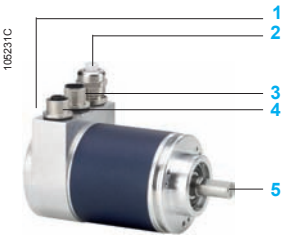


Reference	Ø
XCCR290RDP12	12 mm
XCCR290RDP16	16 mm
XCCR290RDP20	20 mm
XCCR290RDP25	25 mm
XCCR290RDPU37	0.375”
XCCR290RDPU50	0.5”
XCCR290RDPU75	0.75”
XCCR290RDPU1	1”

Multiturn absolute encoders on bus

OsiSense XCC

CANopen Ø 58 mm encoders



1 2 LEDs
2 PG9 cable gland for supply cable
3 M12 male connector (CANopen incoming bus)
4 M12 female connector (CANopen outgoing bus)
5 Encoder shaft

Presentation

The OsiSense XCC CANopen multiturn absolute Ø 58 mm encoder is designed to meet the requirements for configurations encountered in communicating industrial installations. Models **XCC3510PS84CBN** and **XCC3515CS84CBN** integrate CANopen communication protocols as standard.

The CAN-Bus interface integrated in the absolute rotary encoder supports all CANopen functions. The following modes can be programmed and made operational or stopped: Pooling mode, Cyclic mode and Sync mode. The application specific protocol supports the programming of the following additional functions:
- code sequence,
- resolution per revolution,
- global resolution,
- presets,
- speed and address.

The connection housing ensures simple assembly and addressing. It performs the function of a T coupler and has M12 connectors for the bus incoming and outgoing signals.
The rotary encoder can be supplied via the CANopen bus or by using the dedicated PG9 cable gland. The address of the equipment is adjusted from the rotary switches.
Encoders **XCC3510PS84CBN** and **XCC3515CS84CBN** have 2 LEDs located on the rear face of the housing to facilitate monitoring and diagnostics conforming to standard DR303-3 v1.3.0 (CIA). The LEDs provide information regarding the operative mode, bus errors, supply problems.

Standards

Encoders **XCC3510PS84CBN** and **XCC3515CS84CBN** conform to:
- standard ISO 11898,
- specifications DS301 V4.02/CAN2.A, DS406 V3.2, DR303-1 V1.7 (cabling and connector), DR303-3 V1.3 (light indicator).

They are CiA certified and meet the requirements of the Schneider Electric interoperability standards.

Encoder setting-up/configuration software

The CANopen bus is configured with the aid of SyCon version 2.9 software, reference SYC SPU LF, to be ordered separately.
The EDS file, reference TEXCC35CBN_0101E.eds, required for encoder configuration can be downloaded from our website www.tesensors.com.

Configurable parameters

■ **Transmission speed**
Default value: 250 Kbaud, configurable from 10 Kbaud (distance 6700 m) to 1 Mbaud (distance 12 m).
■ **Address**
defines encoder identification on the bus, 1 to 99. Default value: id = 1. It is defined using 2 coding wheels located in the housing.
■ **Resolution**
defines the number of points per revolution (0 to 8191).
■ **Global resolution**
defines the total number of codes of the encoder (0 to 33,554,431).
■ **Direction**
enables defining of the counting direction of the encoder (increasing clockwise or anticlockwise) in relation to its mechanical position.
■ **Reset to X**
defines the value of its actual position (reset to X or reset to amount).

Communication modes

■ **Pooling mode**
The encoder responds to requests from the master. This mode enables programming and reading to the encoder parameters whilst in position.
■ **Cyclic mode**
The encoder transmits its data cyclically. The transmission period is programmable from 0 to 65,535 ms.
■ **Sync mode**
The encoder transmits its data when the master sends a synchro.

Characteristics: page 8/43
References: page 8/44
Dimensions: page 8/45
Connections: page 8/45

Multiturn absolute encoders on bus

OsiSense XCC

CANopen Ø 58 mm encoders

Characteristics				
Encoder type			**XCC3510PS84CBN**	**XCC3515CS84CBN**
Conformity			CE	
Temperature	Operation (housing)	**°C**	- 40…+ 85	
	Storage	**°C**	- 40…+ 85	
Degree of protection	Conforming to IEC 60529		IP 64	
Vibration resistance	Conforming to IEC 60068-2-6		10 gn (f = 10…2 kHz)	
Shock resistance	Conforming to IEC 60068-2-27		100 gn (6 ms, 1/2 sine wave)	
Resistance to electromagnetic interference	Electrostatic discharges		Conforming to IEC 61000-4-2: level 2, 4 kV air; 2 kV contact	
	Radiated electromagnetic fields (electromagnetic waves)		Conforming to IEC 61000-4-3: level 3, 10 V/m	
	Fast transients (Start/Stop interference)		Conforming to IEC 61000-4-4: level 3, 2 kV (1 kV for inputs/outputs)	
	Surge withstand		Conforming to IEC 61000-4-5: level 1, 500 V	
Materials	Base		Aluminium	
	Housing		Aluminium	
	Shaft		Stainless steel	
	Ball bearings		6000ZZ1	6803ZZ
Mechanical characteristics				
Shaft type		**mm**	Ø 10, solid shaft (h8)	Ø 15, hollow shaft (F7)
Maximum rotational speed	Continuous		6000 rpm	
Shaft moment of inertia		**g.cm²**	30	
Torque		**N.cm**	3	
Maximum load	Radial	**daN**	11	
Electrical characteristics				
Connection	Connector		CANopen bus network by M12 connector (input: male; output: female), 5-pin, A coding. Supply via PG9 of the encoder	
Frequency		**kHz**	800	
Supply	Nominal voltage	**V**	⎓ 24 (10-30) Recommended PELV supply (Protective Extra Low Voltage)	
Current consumption, no-load		**mA**	100 maximum	
Protection			Against reverse polarity and voltage surges	
Signalling			Green LED: CAN_RUN; red LED: CAN_ERR	
Communication				
CANopen service	Conformity class		S10 (Transparent Ready)	
	Profile		DS406 V3.1, class C2	
	Specifications		ISO 11898, DS301 V4.02/CAN2.A, DR303-1 V1.7, DR303-3 V1.3.	
Structure	Speed	**Kbps**	10, 20, 50, 125, 250, 500, 800 and 1000	
Product certification			CiA Schneider Electric interoperability standards	
Distance depending on speed			250 m at 250 kbps, 100 m at 500 kbps, 30 m at 800 kbps, 12 m at 1000 kbps	

Multiturn absolute encoders on bus

OsiSense XCC

CANopen Ø 58 mm encoders

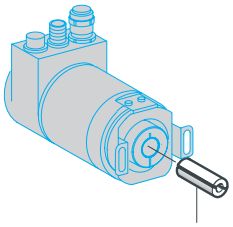
105231C

XCC3510PS84CBN

105232C

XCC3515CS84CBN

514216



XCCR358RDL●●

CANopen Ø 58 mm encoders

Description	Connection method	Output stage type	Supply voltage	Reference	Weight kg
Solid shaft, Ø 10 mm					
Ø 58 mm multiturn absolute CANopen bus encoder Resolution 8192 pts/ 4096 turns	Radial 2 x M12 connectors A coding 1 x PG9	CANopen, 25-bit, binary	11…30 V	**XCC3510PS84CBN**	0.560
Hollow shaft, Ø 15 mm *(1)*					
Ø 58 mm multiturn absolute CANopen bus encoder Resolution 8192 pts/ 4096 turns	Radial 2 x M12 connectors A coding 1 x PG9	CANopen, 25-bit, binary	11…30 V	**XCC3515CS84CBN**	0.570

Reduction collars for encoders with hollow shaft, Ø 15 mm

For use with	Diameter	Reference	Weight kg
Encoder with hollow shaft XCC3515CS84CBN	Ø 6 mm	**XCCR358RDL06**	0.040
	Ø 8 mm	**XCCR358RDL08**	0.030
	Ø 10 mm	**XCCR358RDL10**	0.025
	Ø 12 mm	**XCCR358RDL12**	0.020
	Ø 14 mm	**XCCR358RDL14**	0.010
	0.375”	**XCCR358RDLU37**	0.011
	0.5”	**XCCR358RDLU50**	0.007

Connection accessories for CANopen bus

Connecting cables for CANopen bus

Description	Length m	Reference	Weight kg
Connecting cables fitted with 2 straight type M12 connectors, A coding	1	**TCSMCN1M1F1**	0.080
	2	**TCSMCN1M1F2**	0.115
	5	**TCSMCN1M1F5**	0.520
	10	**TCSMCN1M1F10**	0.520

CANopen cables

Description	Length	Unit reference	Weight kg
Standard CANopen cables conforming to IEC 60332-1	50 m	**TSXCANCA50**	4.930
	100 m	**TSXCANCA100**	8.800
	300 m	**TSXCANCA300**	24.560
CANopen cables for severe environments *(2)* **or moving installations,** CE marking: low smoke emission. Halogen free. No flame propagation (IEC 60332-1). Resistance to oils.	50 m	**TSXCANCD50**	3.510
	100 m	**TSXCANCD100**	7.770
	300 m	**TSXCANCD300**	21.760

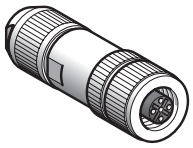
105507

TSXCANCA●●

Shielded connectors, cabled by user

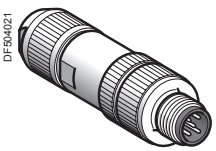
Description	Type	Unit reference	Weight kg
M12 female connector 5 spring terminals	Straight	**XZCC12FDB50R**	0.020
M12 male connector 5 spring terminals	Straight	**XZCC12MDB50R**	0.025

DF504022



XZCC12FDB50R

DF504021



XZCC12MDB50R

(1) Anti-rotation device included with encoder.

(2) Severe environment:
- *resistance to hydrocarbons, industrial oils, detergents, weld spatter,*
- *relative humidity up to 100 %,*
- *saline atmosphere,*
- *extreme variations in temperature,*
- *operating temperature between - 10 °C and + 70 °C,*
- *moving installation.*

Characteristics: page 8/43
Dimensions: page 8/45
Connections: page 8/45

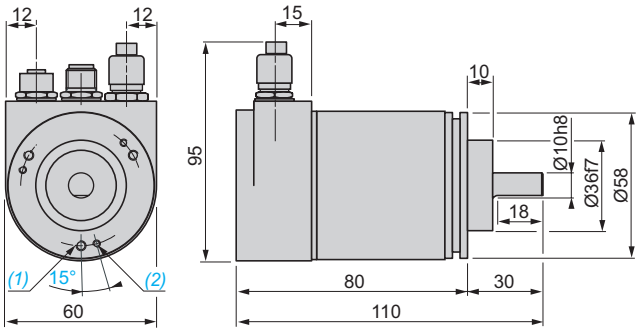
Multiturn absolute encoders on bus

OsiSense XCC

CANopen Ø 58 mm encoders

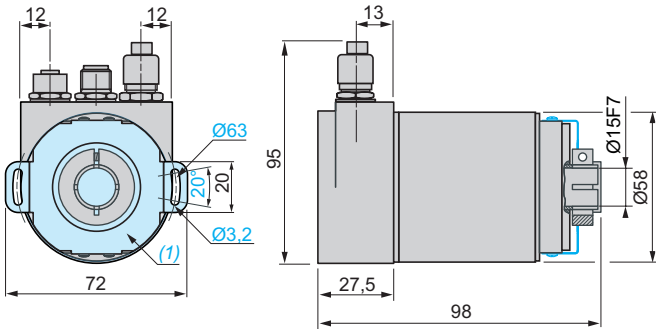
Dimensions

XCC3510PS84CBN



(1) 3 M4 holes at 120° on 48 PCD, depth: 6 mm.
(2) 3 M3 holes at 120° on 48 PCD, depth: 6 mm.

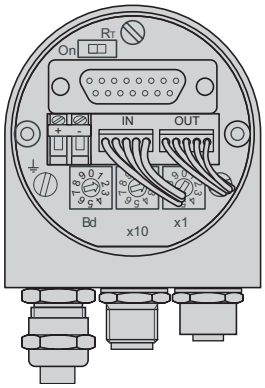
XCC3515CS84CBN



(1) Flexible mounting kit, 1 x XCCRF5B mounted.

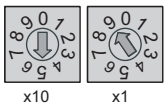
Connections

CANopen



Bus termination resistor

Permissible address range



1 => 99
0 => reserve

Example: 59

Bus IN
M12 male connector

Bus OUT
M12 female connector

Pin	1	2	3	4	5
Function	CAN_SHLD	(CAN_V+)	CAN_GND	CAN_H	CAN_L

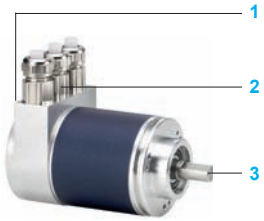
Terminal	+	–
Function	24 V	0 V

Multiturn absolute encoders on bus

OsiSense XCC

PROFIBUS-DP Ø 58 mm encoders

105233



1 2 LEDs
2 PG9 cable gland for supply cable
3 Encoder shaft

Presentation

The OsiSense XCC PROFIBUS-DP multiturn absolute Ø 58 mm encoder is designed to meet the requirements for configurations encountered in communicating industrial installations. Models **XCC3510PV84FBN** and **XCC3515CV84FBN** integrate PROFIBUS-DP communication protocols as standard.

The PROFIBUS-DP bus interface integrated in the absolute rotary encoder is based on RS 485 transmission and enables speeds of up to 12 Mbps. Exchanges are possible from the master to the encoder. The application specific protocol DP-V0 conforms to the class 2 profile for encoders and supports the following functions:
- code sequence,
- resolution per revolution,
- global resolution,
- presets,
- soft stops,
- speed and address.

The housing of the encoders provides easy access to 2 coding wheels for configuration of the address. 2 LEDs are integrated to facilitate diagnostics. It performs the function of a T coupler with 3 x PG9 cable glands (2 for the bus incoming and outgoing signals, 1 for the encoder supply).
PROFIBUS-DP encoders have 2 LEDs to indicate the encoder status:
- Green LED: “Sta”
- Red LED: “Err”.

Standards

PROFIBUS-DP encoders **XCC3510PV84FBN** and **XCC3515CV84FBN** conform to:
- international standards IEC 61158 and IEC 61784 for PROFIBUS-DP communication
- the PROFIBUS-DP standard EN 50170 Class 2 in accordance with profile 3.062 V 1.1 for the encoder application.
They are certified by the PNO organisation and meet the requirements of the Schneider Electric interoperability standards.

Encoder setting-up/configuration software

The PROFIBUS-DP bus is configured with the aid of SyCon version 2.9 software, reference SYC SPU LF, to be ordered separately.
The GSD “gsd file” required for encoder configuration can be downloaded from our website www.tesensors.com, under reference TELE4711.GSD.

Configurable parameters

■ **Speed**
defines the instantaneous speed in 16-bit binary. It can be data according to 1 of 4 modes:
□ Steps/10 ms,
□ Steps/100 ms,
□ Steps/s or rpm.

■ **Address**
Addressing is performed using 2 coding wheels located in the housing. The addresses possible are 1 to 99.

■ **Resolution**
defines the number of points per revolution (0 to 8191)

■ **Global resolution**
defines the total number of codes of the encoder (0 to 33,554,431)

■ **Direction**
enables defining of the counting direction of the encoder (increasing clockwise or anticlockwise) in relation to its mechanical position

■ **2 soft stops**
one high stop and one low stop can be defined and extracted from the position word

■ **Reset to X**
defines the value of its actual position (reset to X or reset to amount).

Communication modes

2 communication modes are possible:
- simple and fast, cyclic and deterministic exchanges between the master and the encoder,
- acyclic exchanges.

Characteristics: page 8/47
References: page 8/48
Dimensions: page 8/49
Connections: page 8/49

Multiturn absolute encoders on bus

OsiSense XCC

PROFIBUS-DP Ø 58 mm encoders

Characteristics

Encoder type			XCC3510PV84FBN	XCC3515CV84FBN
Conformity			DIN VDE 0160	
Temperature	Operation (housing)	**°C**	- 40…+ 85	
	Storage	**°C**	- 40…+ 85	
Degree of protection	Conforming to IEC 60529		IP 64	
Vibration resistance	Conforming to IEC 60068-2-6		10 gn (f = 10…2 kHz)	
Shock resistance	Conforming to IEC 60068-2-27		100 gn (6 ms, 1/2 sine wave)	
Resistance to electromagnetic interference	Electrostatic discharges		Conforming to IEC 61000-4-2: level 2, 4 kV air; 2 kV contact	
	Radiated electromagnetic fields (electromagnetic waves)		Conforming to IEC 61000-4-3: level 3, 10 V/m	
	Fast transients (Start/Stop interference)		Conforming to IEC 61000-4-4: level 3, 2 kV (1 kV for inputs/outputs)	
	Surge withstand		Conforming to IEC 61000-4-5: level 1, 500 V	
Materials	Base		Aluminium	
	Housing		Aluminium	
	Shaft		Stainless steel	
	Ball bearings		6000ZZ1	6803ZZ

Mechanical characteristics

Shaft type		**mm**	Ø 10, solid shaft (h8)	Ø 15, hollow shaft (F7)
Maximum rotational speed			6000 rpm	
Shaft moment of inertia		**g.cm²**	30	
Torque		**N.cm**	3	
Maximum load	Radial	**daN**	11	

Electrical characteristics

Connection	Via PG9		3 x PG9 entries: - 2 x PG9 entries for the PROFIBUS-DP bus - 1 x PG9, positioned in middle, for external supply (10-30 V) Due to the T integrated in the housing, the supply can be distributed on the bus. Connections are made using screw terminals.
Frequency		**kHz**	800
Supply	Nominal voltage	**V**	⎓ 24 (10-30) Recommended PELV supply (Protective Extra Low Voltage)
Current consumption, no-load		**mA**	100
Protection			Against reverse polarity and voltage surges
Signalling			Green LED: “Sta”; red LED: “Err”

Communication

PROFIBUS-DP V0 service	Profile for encoder		3.062 V1.1.
	Specifications		IEC 61158, IEC 61784, EN 50170 class 2, EN 50254
Interface			RS 485
Speed			9.6 Kbps…12 Mbps maximum
Product certification			PNO Schneider Electric interoperability standards

Multiturn absolute encoders on bus

OsiSense XCC

PROFIBUS-DP Ø 58 mm encoders

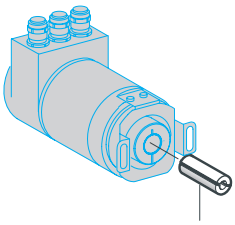
105233

XCC3510PV84FBN

105236

XCC3515CV84FBN

514217



XCCR358RDL●●

References

Description	Connection method	Output stage type	Supply voltage	Reference	Weight kg
Solid shaft, Ø 10 mm					
Ø 58 mm multiturn absolute PROFIBUS-DP encoder Resolution 8192 pts/ 4096 turns	3 x PG9 radial	PROFIBUS-DP, 25-bit, binary	11…30 V	**XCC3510PV84FBN**	0.560
Hollow shaft, Ø 15 mm *(1)*					
Ø 58 mm multiturn absolute PROFIBUS-DP encoder Resolution 8192 pts/ 4096 turns	3 x PG9 radial	PROFIBUS-DP, 25-bit, binary	11…30 V	**XCC3515CV84FBN**	0.570

Reduction collars for encoders with hollow shaft, Ø 15 mm

For use with	Diameter	Reference	Weight kg
Encoder with hollow shaft XCC3515CV84FBN	Ø 6 mm	**XCCR358RDL06**	0.040
	Ø 8 mm	**XCCR358RDL08**	0.030
	Ø 10 mm	**XCCR358RDL10**	0.025
	Ø 12 mm	**XCCR358RDL12**	0.020
	Ø 14 mm	**XCCR358RDL14**	0.010
	Ø 0.375”	**XCCR358RDLU37**	0.011
	Ø 0.5”	**XCCR358RDLU50**	0.007

(1) Anti-rotation device included with encoder.

Presentation: page 8/46
Characteristics: page 8/47
Dimensions: page 8/49
Connections: page 8/49

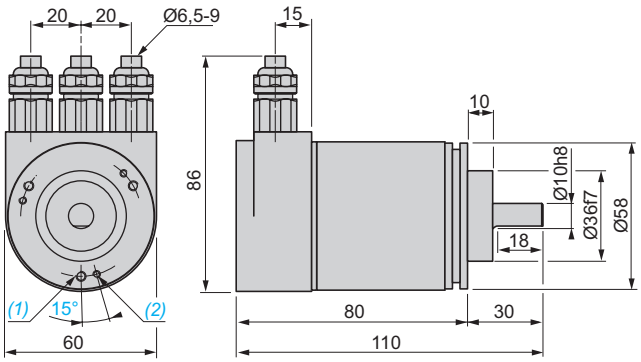
Multiturn absolute encoders on bus

OsiSense XCC

PROFIBUS-DP Ø 58 mm encoders

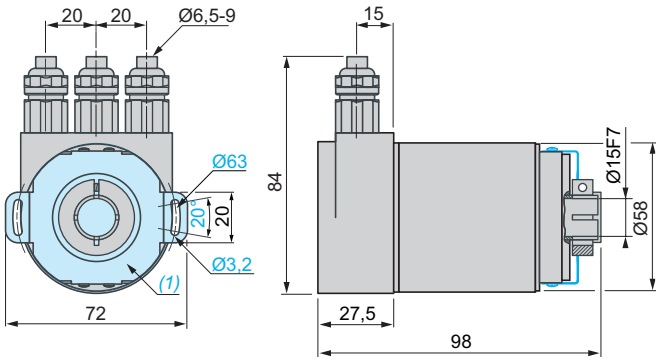
PROFIBUS-DP Ø 58 mm encoders

XCC3510PV84FBN



(1) 3 M4 holes at 120° on 48 PCD, depth: 6 mm.
(2) 3 M3 holes at 120° on 48 PCD, depth: 6 mm.

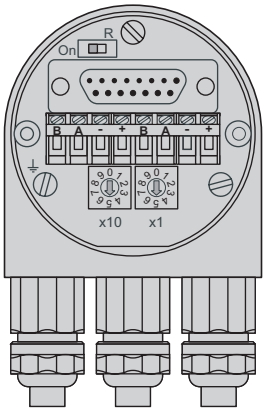
XCC3515CV84FBN



(1) Flexible mounting kit, 1 x XCCRF5B mounted.

Connections

PROFIBUS-DP

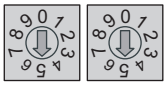


Bus termination resistor

1st or last encoder

Encoder X

Permissible address range



0 => 99

x10 x1

Example: 55

Terminal	⏚	**B** (left)	**A** (left)	**–**	**+**
Function	Earth	Bus line B (Bus in)	Bus line A (Bus in)	0 V	11-30 V
Terminal		**B** (right)	**A** (right)	**–**	**+**
Function		Bus line B (Bus out)	Bus line A (Bus out)	0 V	11-30 V

Homokinetic (flexible) shaft couplings with bellows

Maximum torque		**N.cm**	80
Maximum angular misalignment			4°
Maximum lateral misalignment		**mm**	± 0.3
Maximum axial misalignment		**mm**	± 0.5
Materials	Bellows		Stainless steel
	Fixing collar		Aluminium
	Screws		Stainless steel

References

105192

XCCRAS●●●●

Shaft couplings (for encoders with solid shaft)

Type	Bore diameter (encoder side)	Bore diameter (machine side)	Reference	Weight kg
Homokinetic (flexible) with bellows	10 mm	8 mm	**XCCRAS1008**	0.015
		10 mm	**XCCRAS1010**	0.015
		12 mm	**XCCRAS1012**	0.015

Anti-rotation devices (for encoders with hollow shaft)

Description	Features	For encoders	Reference	Weight kg
Flexible mounting kit	1 flexible fixing + screws	CANopen and PROFIBUS-DP	**XCCRF5B**	0.010

105189

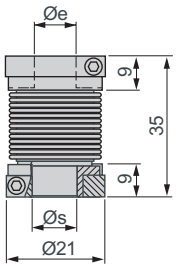
XCCR358RDL06

Reduction collars for encoders with hollow shaft

Description	For use with	Reduction	Reference	Weight kg
Reduction collars	CANopen and PROFIBUS-DP encoders	15 mm to 6 mm	**XCCR358RDL06**	0.040
		15 mm to 8 mm	**XCCR358RDL08**	0.030
		15 mm to 10 mm	**XCCR358RDL10**	0.025
		15 mm to 12 mm	**XCCR358RDL12**	0.020
		15 mm to 14 mm	**XCCR358RDL14**	0.010
		15 mm to 0.375”	**XCCR358RDLU37**	0.011
		15 mm to 0.5”	**XCCR358RDLU50**	0.007

Shaft couplings

XCCRAS●●●●

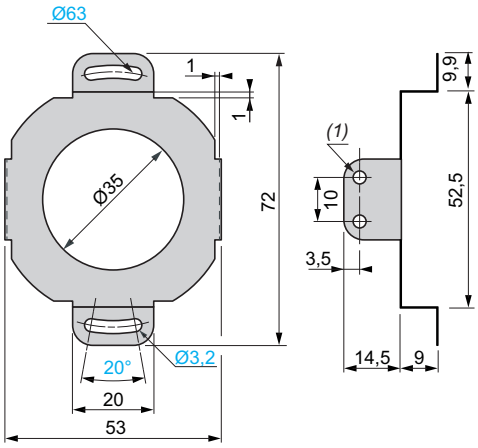


Reference	Ø e	Ø s
XCCRAS1008	10	8
XCCRAS1010	10	10
XCCRAS1012	10	12

Anti-rotation device

XCCRF5B

Mounting on Ø 58 mm CANopen and PROFIBUS-DP encoders XCC3510●●●FBN, XCC3510●●●CBN, XCC3515C●●●FBN, XCC3515C●●●CBN

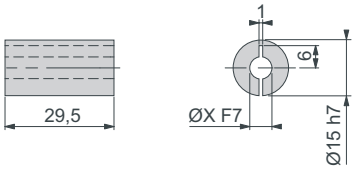


(1) 4 holes Ø 3.2. M3 x 6 screw fixings.

Reduction collars

XCCR358RDL●●

For CANopen and PROFIBUS-DP encoders



Reference	Ø
XCCR358RDL06	6 mm
XCCR358RDL08	8 mm
XCCR358RDL10	10 mm
XCCR358RDL12	12 mm
XCCR358RDL14	14 mm
XCCR358RDLU37	0.375”
XCCR358RDLU50	0.5”

Product reference index

A

AB1FU10135U 3/116, 5/161
AB1R11 1/86
ABL8MEM24003 7/20
ABL8MEM24012 7/20
ACW10M119012 2/125
ACW10M129012 2/125
ACW1M119012 2/124
ACW1M129012 2/124
ACW20M119012 2/125
ACW20M129012 2/125
ACW21M119012 2/124
ACW21M129012 2/124
ACW22M119012 2/125
ACW22M129012 2/125
ACW23M119012 2/124
ACW23M129012 2/124
ACW24M119012 2/124
ACW24M129012 2/124
ACW25M119012 2/124
ACW25M129012 2/124
ACW26M119012 2/125
ACW26M129012 2/125
ACW27M129012 2/125
ACW28M119012 2/125
ACW28M129012 2/125
ACW29M129012 2/125
ACW2M119012 2/125
ACW2M129012 2/125
ACW3M119012 2/124
ACW3M129012 2/124
ACW4M119012 2/124
ACW4M129012 2/124
ACW5M119012 2/124
ACW5M129012 2/124
ACW6M119012 2/125
ACW6M129012 2/125
ACW7M119012 2/125
ACW7M129012 2/125
ACW8M119012 2/125
ACW8M129012 2/125
ACW9M119012 2/125
ACW9M129012 2/125
ADW23M129012 2/126
ADW24M129012 2/126
ADW25M129012 2/127
ADW26M129012 2/127
ADW27M129012 2/126
ADW3M119012 2/126
ADW3M129012 2/126
ADW4M119012 2/126
ADW4M129012 2/126
ADW5M119012 2/127
ADW5M129012 2/127
ADW6M119012 2/127
ADW6M129012 2/127
ADW7M119012 2/126
ADW7M129012 2/126
ADW7S1M129012 2/127
ASI67FACC1 7/21

D

DE9PEM20010 1/196
DE9PL116044 1/220
DE9PM1201 2/134, 2/152
DE9PM1202 2/134, 2/152
DE9PM1203 2/134, 2/152
DE9RA1012 1/50, 1/64, 1/65, 1/71
DE9RA1212 1/99, 1/93
DE9RA2012 1/99, 1/93
DE9RP13520 1/190, 1/192

F

FSG2 2/139
FSG2NE 2/139
FSG9 2/139
FSG9NE 2/139
FTG2 2/138
FTG2NE 2/138
FTG9 2/138
FTG9NE 2/138
FYG22 2/140
FYG22NE 2/140
FYG32 2/140
FYG32NE

T

TCSAMT31FP 7/19
TCSCTN011M11F 7/20, 7/32
TCSEAAF11F13F00 7/20
TCSECN300R2 7/20
TCSEK1MDRS 7/20
TCSEK3MDS 7/20
TCSESU051F0 7/20
TCSMCN1F10 7/20, 7/32
TCSMCN1F2 7/20, 7/32
TCSMCN1F5 7/20, 7/32
TCSMCN1F9M2P 7/20
TCSMCN1FQM2 7/20
TCSMCN1M1F1 7/20, 7/32, 8/44
TCSMCN1M1F10 7/20, 7/32, 8/44
TCSMCN1M1F2 7/20, 7/32, 8/44
TCSMCN1M1F5 7/20, 7/32, 8/44
TM7ACTLA 7/21
TSXCANCA100 8/44
TSXCANCA300 8/44
TSXCANCA50 8/44
TSXCANCD100 8/44
TSXCANCD300 8/44
TSXCANCD50 8/44
TSXCSA100 7/20
TSXCSA200 7/20
TSXCSA500 7/20

X

XALZ09 1/50
XC010L2 1/204
XC011L2 1/204
XC1AC111 1/182
XC1AC115 1/182
XC1AC116 1/182
XC1AC117 1/182
XC1AC118 1/182
XC1AC119 1/182
XC1AC121 1/182
XC1AC125 1/182
XC1AC126 1/182
XC1AC127 1/182
XC1AC128 1/182
XC1AC129 1/182
XC1AC131 1/182
XC1AC135 1/182
XC1AC136 1/182
XC1AC137 1/182
XC1AC138 1/182
XC1AC139 1/182
XC1AC141 1/182
XC1AC145 1/182
XC1AC146 1/182
XC1AC147 1/182
XC1AC148 1/182
XC1AC149 1/182
XC1AC151 1/182
XC1AC155 1/182
XC1AC156 1/182
XC1AC157 1/182
XC1AC158 1/182
XC1AC159 1/182
XC1AC161 1/182
XC1AC165 1/182
XC1AC166 1/182
XC1AC167 1/182
XC1AC168 1/182
XC1AC169 1/182
XC1AC171 1/182
XC1AC175 1/182
XC1AC176 1/182
XC1AC177 1/182
XC1AC178 1/182
XC1AC179 1/182
XCC1406PR01K 8/11
XCC1406PR01R 8/11
XCC1406PR03K 8/11
XCC1406PR03R 8/11
XCC1406PR05K 8/11
XCC1406PR05R 8/11
XCC1406PR10K 8/11
XCC1406PR10R 8/11
XCC1406PR11K 8/11
XCC1406PR11R 8/11
XCC1406TR01K 8/11
XCC1406TR01R 8/11
XCC1406TR03K 8/11
XCC1406TR03R 8/11
XCC1406TR05K 8/11
XCC1406TR05R 8/11
XCC1406TR10K 8/11
XCC1406TR10R 8/11
XCC1406TR11K 8/11
XCC1406TR11R 8/11
XCC1506PS01X 8/13
XCC1506PS01Y 8/13
XCC1506PS03X 8/13
XCC1506PS03Y 8/13
XCC1506PS05X 8/13
XCC1506PS05Y 8/13
XCC1506PS10X 8/13
XCC1506PS10Y 8/13
XCC1506PS11X 8/13
XCC1506PS11Y 8/13
XCC1506PS25X 8/13
XCC1506PS25Y 8/13
XCC1506PS50X 8/13
XCC1506PS50Y 8/13
XCC1510PS01X 8/13
XCC1510PS01Y 8/13
XCC1510PS03X 8/13
XCC1510PS03Y 8/13
XCC1510PS05X 8/13
XCC1510PS05Y 8/13
XCC1510PS10X 8/13
XCC1510PS10Y 8/13
XCC1510PS11X 8/13
XCC1510PS11Y 8/13
XCC1510PS25X 8/13
XCC1510PS25Y 8/13
XCC1510PS50X 8/13
XCC1510PS50Y 8/13
XCC1510PSM02X 8/15
XCC1510PSM02Y 8/15
XCC1510PSM03X 8/15
XCC1510PSM03Y 8/15
XCC1510PSM05X 8/15
XCC1510PSM05Y 8/15
XCC1510PSM11X 8/15
XCC1510PSM11Y 8/15
XCC1510PSM50X 8/15
XCC1510PSM50Y 8/15
XCC1510SPA03Y 8/13
XCC1510SPA11Y 8/13
XCC1510SPA50Y 8/13
XCC1514TS01X 8/14
XCC1514TS01Y 8/14
XCC1514TS03X 8/14
XCC1514TS03Y 8/14
XCC1514TS05X 8/14
XCC1514TS05Y 8/14
XCC1514TS10X 8/14
XCC1514TS10Y 8/14
XCC1514TS11X 8/14
XCC1514TS11Y 8/14
XCC1514TS25X 8/14
XCC1514TS25Y 8/14
XCC1514TS50X 8/14
XCC1514TS50Y 8/14
XCC1514TSM02X 8/15
XCC1514TSM02Y 8/15
XCC1514TSM03X 8/15
XCC1514TSM03Y 8/15
XCC1514TSM05X 8/15
XCC1514TSM05Y 8/15
XCC1514TSM11X 8/15
XCC1514TSM11Y 8/15
XCC1514TSM50X 8/15
XCC1514TSM50Y 8/15
XCC1912PS00KN 8/17
XCC1912PS03KN 8/17
XCC1912PS05KN 8/17
XCC1912PS10KN 8/17
XCC1912PS11KN 8/17
XCC1912PS25KN 8/17
XCC1912PS36KN 8/17
XCC1912PS50KN 8/17
XCC1930TS03KN 8/17
XCC1930TS05KN 8/17
XCC1930TS10KN 8/17
XCC1930TS11KN 8/17
XCC1930TS25KN 8/17
XCC1930TS36KN 8/17
XCC1930TS50KN 8/17
XCC2506PS81KB 8/23
XCC2506PS81KGN 8/23
XCC2506PS81SBN 8/23
XCC2506PS81SGN 8/23
XCC2510PS81KB 8/23
XCC2510PS81KGN 8/23
XCC2510PS81SBN 8/23
XCC2510PS81SGN 8/23
XCC2510SPA81KGN 8/23
XCC2510SPA81SGN 8/23
XCC2514TS81KB 8/23
XCC2514TS81KG 8/23
XCC2514TS81SB 8/23
XCC2514TS81SG 8/23
XCC2912PS81KBN 8/25
XCC2912PS81KGN 8/25
XCC2912PS81SGN 8/25
XCC2930TS81KBN 8/25
XCC2930TS81KGN 8/25
XCC2930TS81SBN 8/25
XCC2930TS81SGN 8/25
XCC3506PS48SBN 8/29
XCC3506PS84SBN 8/29
XCC3506PS84SGN 8/29
XCC3510PS48SBN 8/29
XCC3510PS84CBN 8/44
XCC3510PS84SBN 8/29
XCC3510PS84SGN 8/29
XCC3510PV84FBN 8/48
XCC3510SPA48SGN 8/29
XCC3514TS84SB 8/29
XCC3515CS84CBN 8/44
XCC3515CV84FBN 8/48
XCC3912PS84SBN 8/31
XCC3912PS84SGN 8/31
XCC3930TS84SBN 8/31
XCC3930TS84SGN 8/31
XCCPM23121L10 8/35
XCCPM23121L2 8/35
XCCPM23121L5 8/35
XCCPM23122L10 8/35
XCCPM23122L2 8/35
XCCPM23122L5 8/35
XCCPM23161L10 8/35
XCCPM23161L2 8/35
XCCPM23161L5 8/35
XCCR158RDA06 8/14, 8/15
XCCR158RDA06 8/23, 8/29
XCCR158RDA06 8/37
XCCR158RDA08 8/14, 8/15
XCCR158RDA08 8/23, 8/29
XCCR158RDA08 8/37
XCCR158RDA10 8/14, 8/15, 8/23, 8/29, 8/37
XCCR158RDA12 8/14, 8/15, 8/23, 8/29, 8/37
XCCR158RDAU37 8/29, 8/37
XCCR158RDAU50 8/29, 8/37
XCCR290RDP12 8/17, 8/25, 8/31, 8/37
XCCR290RDP16 8/17, 8/25, 8/31, 8/37
XCCR290RDP20 8/17, 8/25, 8/31, 8/37
XCCR290RDP25 8/17, 8/25, 8/31, 8/37
XCCR290RDPU1 8/37
XCCR290RDPU37 8/37
XCCR290RDPU50 8/37
XCCR290RDPU75 8/37
XCCR358RDL06 8/44, 8/48, 8/50
XCCR358RDL08 8/44, 8/48, 8/50
XCCR358RDL10 8/44, 8/48, 8/50
XCCR358RDL12 8/44, 8/48, 8/50
XCCR358RDL14 8/44, 8/48, 8/50
XCCR358RDLU37 8/44, 8/48, 8/50
XCCR358RDLU50 8/44, 8/48, 8/50
XCCRAE0606 8/36
XCCRAR0606 8/36
XCCRAR0608 8/36
XCCRAR0610 8/36
XCCRAR0612 8/36
XCCRAR0614 8/36
XCCRAR0616 8/36
XCCRAR1008 8/36
XCCRAR1010 8/36
XCCRAR1012 8/36
XCCRAR1014 8/36
XCCRAR1016 8/36
XCCRAR1208 8/36
XCCRAR1212 8/36
XCCRAR1214 8/36
XCCRAR1216 8/36
XCCRAS0606 8/36
XCCRAS0608 8/36
XCCRAS0610 8/36
XCCRAS0612 8/36
XCCRAS06U25 8/36
XCCRAS06U37 8/36
XCCRAS1008 8/36, 8/50
XCCRAS1010 8/36, 8/50
XCCRAS1010S 8/36
XCCRAS1012 8/36, 8/50
XCCRAS1012S 8/36
XCCRAS10U25 8/36

Product reference index

XCCRAS10U37 8/36
XCCRAS10U37S 8/36
XCCRAS1208 8/36
XCCRAS1212 8/36
XCCRAS12U25 8/36
XCCRAS12U37 8/36
XCCRAS12U50 8/36
XCCRB1 8/37
XCCRB2 8/37
XCCRB3 8/37
XCCRB6 8/37
XCCRE5RN 8/37
XCCRE5S 8/37
XCCRE5SN 8/37
XCCRE9RN 8/37
XCCRE9SN 8/37
XCCRF4 8/37
XCCRF5B 8/50
XCCRF5N 8/37
XCCRF9 8/37
XCCRG5 8/37
XCCRG9 8/37
XCCRM23SUB37NB 8/35
XCCRM23SUB37NG 8/35
XCCRM23SUB37PB 8/35
XCCRM23SUB37PG 8/35
XCCRX10 8/35
XCCRX16 8/35
XCCRXS8 8/35
XCDR21••P20 1/56
XCDR25••P20 1/56
XCKD2101G11 1/50
XCKD2101M12 1/50
XCKD2101P16 1/50
XCKD2102M12 1/42
XCKD2102P16 1/38
XCKD2106M12 1/43
XCKD2106P16 1/39
XCKD2110M12 1/42
XCKD2110P16 1/38
XCKD2111M12 1/42
XCKD2111P16 1/38
XCKD2118M12 1/43
XCKD2118P16 1/39
XCKD2121M12 1/42
XCKD2121P16 1/38
XCKD2127M12 1/42
XCKD2127P16 1/38
XCKD2128M12 1/42
XCKD2128P16 1/38
XCKD2139M12 1/43
XCKD2139P16 1/39
XCKD2145M12 1/43
XCKD2145P16 1/39
XCKD2149M12 1/43
XCKD2149P16 1/39
XCKD21H0M12 1/43
XCKD21H0P16 1/39
XCKD21H2M12 1/43
XCKD21H2P16 1/39
XCKD2501G11 1/50
XCKD2501P16 1/50
XCKD2502P16 1/38
XCKD2506P16 1/39
XCKD2510P16 1/38
XCKD2511P16 1/38
XCKD2518P16 1/39
XCKD2521P16 1/38
XCKD2527P16 1/38
XCKD2528P16 1/38
XCKD2539P16 1/39
XCKD2545P16 1/39
XCKD2549P16 1/39
XCKD25H0P16 1/39
XCKD25H2P16 1/39
XCKJ10511A 1/110
XCKJ10511D 1/108
XCKJ10511H29 1/104
XCKJ10513A 1/110
XCKJ10513D 1/108
XCKJ10513H29 1/104
XCKJ10541A 1/110
XCKJ10541D 1/108
XCKJ10541H29 1/104
XCKJ10559A 1/110
XCKJ10559D 1/108
XCKJ10559H29 1/104
XCKJ1105••H29 1/106
XCKJ1161H29 1/106
XCKJ1167H29 1/106
XCKJ161A 1/110
XCKJ161D 1/108
XCKJ161H29 1/104
XCKJ167A 1/110
XCKJ167D 1/108
XCKJ167H29 1/104
XCKJ505••H29 1/104
XCKJ561H29 1/104
XCKJ567H29 1/104
XCKL1•• 1/78
XCKL5•• 1/78
XCKM1••H29 1/76
XCKM5••H29 1/76
XCKML1•• 1/80
XCKML1••H29 1/80
XCKML5•• 1/80
XCKML5••H29 1/80
XCKMR24SR1H29 1/196
XCKMR44D1H29 1/196
XCKMR44D2H29 1/196
XCKMR54D1H29 1/196
XCKMR54D2H29 1/196
XCKN21••P20 1/62
1/63
XCKN25••P20 1/62
1/63
XCKN27••P20 1/62
1/63
XCKN29••P20 1/62
1/63
XCKP2101G11 1/50
XCKP2101M12 1/50
XCKP2101P16 1/50
XCKP2102M12 1/36
XCKP2102P16 1/32
XCKP2106M12 1/37
XCKP2106P16 1/33
XCKP2110M12 1/36
XCKP2110P16 1/32
XCKP2111M12 1/36
XCKP2111P16 1/32
XCKP2118M12 1/37
XCKP2118P16 1/33
XCKP2121M12 1/36
XCKP2121P16 1/32
XCKP2127M12 1/36
XCKP2127P16 1/32
XCKP2128M12 1/36
XCKP2128P16 1/32
XCKP2139M12 1/37
XCKP2139P16 1/33
XCKP2145M12 1/37
XCKP2145P16 1/33
XCKP2149M12 1/37
XCKP2149P16 1/33
XCKP21H0M12 1/37
XCKP21H0P16 1/33
XCKP21H2M12 1/37
XCKP21H2P16 1/33
XCKP2501G11 1/50
XCKP2501P16 1/50
XCKP2502P16 1/32
XCKP2506P16 1/33
XCKP2510P16 1/32
XCKP2511P16 1/32
XCKP2518P16 1/33
XCKP2521P16 1/32
XCKP2527P16 1/32
XCKP2528P16 1/32
XCKP2539P16 1/33
XCKP2545P16 1/33
XCKP2549P16 1/33
XCKP25H0P16 1/33
XCKP25H2P16 1/33
XCKS131H29 1/92
XCKS133H29 1/92
XCKS139H29 1/92
XCKS141H29 1/92
XCKS143H29 1/92
XCKS149H29 1/92
XCKS159H29 1/92
XCKS1••H29 1/92
XCKS501H29 1/92
XCKS502H29 1/92
XCKS531H29 1/92
XCKS533H29 1/92
XCKS539H29 1/92
XCKS541H29 1/92
XCKS543H29 1/92
XCKS549H29 1/92
XCKS559H29 1/92
XCKT2101G11 1/50
XCKT2101P16 1/50
XCKT2102P16 1/44
XCKT2106P16 1/44
XCKT2110P16 1/44
XCKT2111P16 1/44
XCKT2118P16 1/45
XCKT2121P16 1/44
XCKT2139P16 1/45
XCKT2145P16 1/45
XCKT21H0P16 1/45
XCKT21H2P16 1/45
XCKT2501G11 1/50
XCKT2501P16 1/50
XCKVR24SR1H29 1/196
XCKVR44D1H29 1/196
XCKVR44D2H29 1/196
XCKVR54D1H29 1/196
XCKVR54D2H29 1/196
XCKW101 1/140
XCKW102 1/140
XCKW131 1/140
XCKW133 1/140
XCKW139 1/140
XCKW141 1/140
XCKW143 1/140
XCKW149 1/140
XCKW159 1/140
XCKWD02 1/145
XCKWD31 1/145
XCKZ01 1/152
XCKZ01 1/174
XCKZ015 1/178
XCKZ018 1/152
XCKZ09 1/86
XCMD2101C12 1/25
XCMD2101L1 1/25
XCMD2101M12 1/25
XCMD2102C12 1/16
XCMD2102L1 1/12
XCMD2102M12 1/16
XCMD2106C12 1/17
XCMD2106L1 1/13
XCMD2106M12 1/17
XCMD2110C12 1/16
XCMD2110L1 1/12
XCMD2110M12 1/16
XCMD2111C12 1/16
XCMD2111L1 1/12
XCMD2111M12 1/16
XCMD2115C12 1/17
XCMD2115L1 1/13
XCMD2115M12 1/17
XCMD2116C12 1/17
XCMD2116L1 1/13
XCMD2116M12 1/17
XCMD2117C12 1/17
XCMD2117L1 1/13
XCMD2117M12 1/17
XCMD2124C12 1/16
XCMD2124L1 1/12
XCMD2124M12 1/16
XCMD2145C12 1/17
XCMD2145L1 1/13
XCMD2145M12 1/17
XCMD21F0C12 1/16
XCMD21F0L1 1/12
XCMD21F0M12 1/16
XCMD21F2C12 1/16
XCMD21F2L1 1/12
XCMD21F2M12 1/16
XCMD21G1C12 1/16
XCMD21G1L1 1/12
XCMD21G1M12 1/16
XCMD2501L1 1/25
XCMD2502L1 1/12
XCMD2506L1 1/13
XCMD2510L1 1/12
XCMD2511L1 1/12
XCMD2515L1 1/13
XCMD2516L1 1/13
XCMD2517L1 1/13
XCMD2524L1 1/12
XCMD2545L1 1/13
XCMD25F0L1 1/12
XCMD25F2L1 1/12
XCMD25G1L1 1/12
XCMN2102L1 1/28
XCMN2103L1 1/28
XCMN2106L1 1/29
XCMN2107L1 1/29
XCMN2110L1 1/28
XCMN2115L1 1/29
XCMN2121L1 1/28
XCMN2145L1 1/29
XCMN2159L1 1/29
XCMN21F•L1 1/28
XCMZ06 1/25
XCMZ07 1/25
1/50
XCNR21••P20 1/70
XCNR25••P20 1/70
XCNR27••P20 1/70
XCNR29••P20 1/70
XCNT21••P16 1/64
XCNT25••P16 1/64
XCNT27••P16 1/64
XCNTR21••P16 1/71
XCNTR25••P16 1/71
XCNTR27••P16 1/71
XCPR21••P20 1/54
XCPR25••P20 1/54
XCPR29••P20 1/54
XCRA11 1/190
XCRA12 1/190
XCRA15 1/190
XCRA51 1/190
XCRA52 1/190
XCRA55 1/190
XCRB11 1/190
XCRB12 1/190
XCRB15 1/190
XCRB51 1/190
XCRB52 1/190
XCRB55 1/190
XCRE18 1/190
XCRE58 1/190
XCRF17 1/190
XCRF57 1/190
XCRT115 1/192
XCRT215 1/192
XCRT315 1/192
XCRZ02 1/190
XCRZ03 1/190
1/196
XCRZ03R 1/196
XCRZ04 1/190
XCRZ05 1/190
XCRZ09 1/190
1/192
XCRZ12 1/190
XCRZ15 1/190
XCRZ42 1/192
XCRZ901 1/192
XCRZ902 1/192
XCRZ903 1/192
XCTR21••P16 1/51
1/58
XCTR25••P16 1/58
XE3NP2141 1/86
1/99
1/118
1/93
XE3NP21•1 1/51
XEP3S1W2 1/202
XEP3S1W2B•• 1/202
XEP3S1W3 1/202
XEP3S1W3B••• 1/202
XEP3S1W6 1/202
XEP3S1W6B••• 1/202
XEP3S2W2 1/202
XEP3S2W2B••• 1/202
XEP3S2W3 1/202
XEP3S2W3B••• 1/202
XEP3S2W6 1/202
XEP3S2W6B••• 1/202
XEP4E1FD 1/200
XEP4E1FDA••• 1/200
XEP4E1W7 1/200
XEP4E1W7A••• 1/200
XEP5P1W2 1/200
XEP5P1W2Z55B 1/200
XEPA1081D64 1/220
XESP1021 1/152
1/174
XESP10215 1/178
XESP1028 1/152
XESP1031 1/152
1/174
XESP10315 1/178
XESP1038 1/152
XESP2021 1/126
XESP20215 1/129
XESP2031 1/118
1/126
XESP20315 1/129
XESP20•1 1/118
XESP3021 1/99
1/93
XGCS4901201 7/18
XGCS490B201 7/32
XGCS49LB201 7/32
XGCS850C201 7/18
XGCS8901201 7/18
XGFEC2525 7/19
XGFEC540 7/19
XGHB123345 7/18
XGHB211345 7/18
XGHB221346 7/18
XGHB320246 7/18
XGHB320345 7/18
XGHB440245 7/18
XGHB440845 7/18
XGHB441645 7/18
XGHB443245 7/18
XGHB444345 7/18
XGHB520246 7/18
XGHB90E340 7/18
7/32
XGHBPB3345 7/32
XGST2020 7/19
XGST2422 7/19
XGST2BA 7/19
XGST2FP 7/19
XGSZ05 7/21
XGSZ08MKW 7/21
XGSZ09L10 7/21
XGSZ09L2 7/21
XGSZ09L5 7/21
XGSZ12E1201 7/20
XGSZ12E1203 7/20
XGSZ12E1210 7/20
XGSZ12E1225 7/20
XGSZ12E4501 7/20
XGSZ12E4503 5/189
7/20
XGSZ12E4510 5/189
7/20
XGSZ22E4503 5/189
7/20
XGSZ22E4510 5/189
7/20
XGSZ24 7/21
XGSZ33EIP 7/19
XGSZ33ETH 7/19
XGSZ33PDP 7/19
XGSZ3P 7/21
XGSZCNF01 7/21
7/32
XGSZK1 7/19
XGW4F111 7/18
XL1DB0111 1/230
XL1DB04 1/230
XL1DB05 1/230

Product reference index

XMAH06L2135 2/133
XMAH06L2435 2/133
XMAH12L2135 2/133
XMAH12L2435 2/133
XMAH25L2135 2/133
XMAH25L2435 2/133
XMAV06L2135 2/133
XMAV06L2435 2/133
XMAV12L2135 2/133
XMAV12L2435 2/133
XMAV25L2135 2/133
XMAV25L2435 2/133
XMAZL001 2/134
2/152
XMLA001R2C11 2/78
XMLA001R2S12 2/78
XMLA001S2C11 2/78
XMLA001S2S12 2/78
XMLA001S2S13 2/78
XMLA002A2C11 2/81
XMLA002A2S12 2/81
XMLA002A2S13 2/81
XMLA002B2C11 2/81
XMLA002B2S12 2/81
XMLA002C2C11 2/81
XMLA002C2S12 2/81
XMLA004A2C11 2/84
XMLA004A2S12 2/84
XMLA004A2S13 2/84
XMLA004B2C11 2/84
XMLA004B2S12 2/84
XMLA004C2C11 2/84
XMLA004C2S12 2/84
XMLA004P2C11 2/84
XMLA004P2S12 2/84
XMLA010A2C11 2/88
XMLA010A2S12 2/88
XMLA010A2S13 2/88
XMLA010B2C11 2/88
XMLA010B2S12 2/88
XMLA010C2C11 2/88
XMLA010C2S12 2/88
XMLA010C2S13 2/88
XMLA010P2C11 2/88
XMLA010P2S12 2/88
XMLA020A2C11 2/92
XMLA020A2S12 2/92
XMLA020A2S13 2/92
XMLA020B2C11 2/92
XMLA020B2S12 2/92
XMLA020C2C11 2/92
XMLA020C2S12 2/92
XMLA020P2C11 2/92
XMLA020P2S12 2/92
XMLA035A2C11 2/96
XMLA035A2S12 2/96
XMLA035A2S13 2/96
XMLA035B2C11 2/96
XMLA035B2S12 2/96
XMLA035C2C11 2/96
XMLA035C2S12 2/96
XMLA035P2C11 2/96
XMLA035P2S12 2/96
XMLA070D2C11 2/100
XMLA070D2S12 2/100
XMLA070D2S13 2/100
XMLA070E2C11 2/100
XMLA070E2S12 2/100
XMLA070E2S13 2/100
XMLA070N2C11 2/100
XMLA070N2S12 2/100
XMLA160D2C11 2/108
XMLA160D2S12 2/108
XMLA160D2S13 2/108
XMLA160E2C11 2/108
XMLA160E2S12 2/108
XMLA160E2S13 2/108
XMLA160N2C11 2/108
XMLA160N2S12 2/108
XMLA300D2C11 2/108
XMLA300D2S12 2/108
XMLA300D2S13 2/108
XMLA300E2C11 2/108
XMLA300E2S12 2/108
XMLA300E2S13 2/108
XMLA300N2C11 2/108
XMLA300N2S12 2/108
XMLA500D2C11 2/112
XMLA500D2S12 2/112
XMLA500D2S13 2/112
XMLA500E2C11 2/112
XMLA500E2S12 2/112
XMLA500E2S13 2/112
XMLA500N2C11 2/112
XMLA500N2S12 2/112
XMLAM01T2C11 2/64
XMLAM01T2S12 2/64
XMLAM01V2C11 2/64
XMLAM01V2S12 2/64
XMLAM01V2S13 2/64
XMLB001P2S12 2/79
XMLB001R2C11 2/79
XMLB001R2S12 2/79
XMLB001R2S13 2/79
XMLB001S2C11 2/79
XMLB001S2S12 2/79
XMLB001S2S13 2/79
XMLB002A2C11 2/82
XMLB002A2S12 2/82
XMLB002A2S13 2/82
XMLB002B2C11 2/82
XMLB002B2S12 2/82
XMLB002C2C11 2/82
XMLB002C2S12 2/82
XMLB004A2C11 2/85
XMLB004A2S12 2/85
XMLB004A2S13 2/85
XMLB004B2C11 2/85
XMLB004B2S12 2/85
XMLB004C2C11 2/85
XMLB004C2S12 2/85
XMLB010A2C11 2/89
XMLB010A2S12 2/89
XMLB010A2S13 2/89
XMLB010B2C11 2/89
XMLB010B2S12 2/89
XMLB010B2S13 2/89
XMLB010C2C11 2/89
XMLB010C2S12 2/89
XMLB010C2S13 2/89
XMLB010P2C11 2/89
XMLB010P2S12 2/89
XMLB020A2C11 2/93
XMLB020A2S12 2/93
XMLB020A2S13 2/93
XMLB020B2C11 2/93
XMLB020B2S12 2/93
XMLB020B2S13 2/93
XMLB020C2C11 2/93
XMLB020C2S12 2/93
XMLB020P2C11 2/93
XMLB020P2S12 2/93
XMLB035A2C11 2/97
XMLB035A2S12 2/97
XMLB035A2S13 2/97
XMLB035B2C11 2/97
XMLB035B2S12 2/97
XMLB035C2C11 2/97
XMLB035C2S12 2/97
XMLB035P2S12 2/97
XMLB070D2C11 2/107
XMLB070D2S12 2/107
XMLB070D2S13 2/107
XMLB070E2C11 2/107
XMLB070E2S12 2/107
XMLB070N2C11 2/107
XMLB070N2S12 2/107
XMLB160D2C11 2/107
XMLB160D2S12 2/107
XMLB160D2S13 2/107
XMLB160E2C11 2/107
XMLB160E2S12 2/107
XMLB160N2C11 2/107
XMLB160N2S12 2/107
XMLB300D2C11 2/109
XMLB300D2S12 2/109
XMLB300D2S13 2/109
XMLB300E2C11 2/109
XMLB300E2S12 2/109
XMLB300N2C11 2/109
XMLB300N2S12 2/109
XMLB500D2C11 2/113
XMLB500D2S12 2/113
XMLB500D2S13 2/113
XMLB500E2C11 2/113
XMLB500E2S12 2/113
XMLB500N2C11 2/113
XMLB500N2S12 2/113
XMLBL05R2S12 2/69
XMLBL05S2S12 2/69
XMLBL35P2C11 2/74
XMLBL35P2S12 2/74
XMLBL35R2C11 2/74
XMLBL35R2S12 2/74
XMLBL35R2S13 2/74
XMLBL35S2C11 2/74
XMLBL35S2S12 2/74
XMLBM02T2C11 2/65
XMLBM02T2S12 2/65
XMLBM02T2S13 2/65
XMLBM02V2C11 2/65
XMLBM02V2S12 2/65
XMLBM02V2S13 2/65
XMLBM03R2S12 2/68
XMLBM03R2S13 2/68
XMLBM05A2C11 2/70
2/72
XMLBM05A2S12 2/70
2/72
XMLBM05A2S13 2/70
2/72
XMLBM05B2C11 2/70
2/72
XMLBM05B2S12 2/70
2/72
XMLBM05C2C11 2/70
2/72
XMLBM05C2S12 2/70
2/72
XMLBM05P2C11 2/70
2/72
XMLBM05P2S12 2/70
2/72
XMLBS02B2S12 2/82
XMLBS04B2S12 2/85
XMLBS10A2S12 2/89
XMLBS20A2S12 2/93
XMLBS35R2S12 2/75
XMLC001R2S12 2/80
XMLC001R2S13 2/80
XMLC001S2S12 2/80
XMLC001S2S13 2/80
XMLC002B2S12 2/83
XMLC002B2S13 2/83
XMLC004B2S12 2/86
XMLC004B2S13 2/86
XMLC004C2S12 2/86
XMLC004C2S13 2/86
XMLC010B2S12 2/90
XMLC010B2S13 2/90
XMLC010C2S12 2/90
XMLC010C2S13 2/90
XMLC020B2S12 2/94
XMLC020B2S13 2/94
XMLC020C2S12 2/94
XMLC020C2S13 2/94
XMLC035B2S12 2/98
XMLC035B2S13 2/98
XMLC035C2S12 2/98
XMLC035C2S13 2/98
XMLC070D2S12 2/108
XMLC070D2S13 2/108
XMLC070E2S12 2/108
XMLC070N2S12 2/108
XMLC160D2S12 2/108
XMLC160D2S13 2/108
XMLC160E2S12 2/108
XMLC160N2S12 2/108
XMLC300D2S12 2/110
XMLC300E2S12 2/110
XMLC300N2S12 2/110
XMLC500D2S12 2/114
XMLC500N2S12 2/114
XMLCL35R2S12 2/76
XMLCL35S2S12 2/76
XMLCL35S2S13 2/76
XMLCM02T2S12 2/66
XMLCM02V2S12 2/66
XMLCM05B2S12 2/71
2/73
XMLCM05C2S12 2/71
2/73
XMLCS02B2S12 2/83
XMLCS02B2S13 2/83
XMLCS04B2S12 2/86
XMLCS10A2S12 2/90
XMLCS20A2S12 2/94
XMLCS35R2S12 2/76
XMLCS35R2S13 2/76
XMLD004B1S12 2/87
XMLD010B1S11 2/91
XMLD010B1S12 2/91
XMLD010C1S11 2/91
XMLD020B1S12 2/95
XMLD020B1S13 2/95
XMLD020C1S12 2/95
XMLD035B1S12 2/99
XMLD070D1S12 2/107
XMLD070D1S13 2/107
XMLD070N1S12 2/107
XMLD160D1S12 2/107
XMLD160D1S13 2/107
XMLD160E1S12 2/107
XMLD300D1S12 2/111
XMLD300D1S13 2/111
XMLD300E1S12 2/111
XMLD300N1S12 2/111
XMLD500D1S12 2/115
XMLDL35R1S12 2/77
XMLDM02T1S12 2/67
XMLDM02V1S12 2/67
XMLEZ001 2/37
XMLEZ010 2/37
XMLEZ025 2/37
XMLEZ060 2/37
XMLEZ100 2/37
XMLEZ250 2/37
XMLEZ600 2/37
XMLEZM01 2/37
XMLG001D21 2/17
XMLG001D23 2/17
XMLG001D31TQ 2/20
XMLG001D41TQ 2/20
XMLG001D71 2/17
XMLG001D73TQ 2/17
XMLG006D21 2/17
XMLG006D23 2/17
XMLG006D71 2/17
XMLG006D73TQ 2/17
XMLG010D21 2/18
XMLG010D23 2/18
XMLG010D31TQ 2/20
XMLG010D41TQ 2/20
XMLG010D71 2/18
XMLG010D73 2/18
XMLG010D73TQ 2/18
XMLG010Q21TQ 2/18
XMLG010Q71TQ 2/18
XMLG016D21 2/18
XMLG016D23 2/18
XMLG016D71 2/18
XMLG025D21 2/18
XMLG025D23 2/18
XMLG025D31TQ 2/20
XMLG025D41TQ 2/20
XMLG025D71 2/18
XMLG025D73TQ 2/18
XMLG025Q21TQ 2/18
XMLG100D21 2/19
XMLG100D23 2/19
XMLG100D31TQ 2/20
XMLG100D41TQ 2/20
XMLG100D71 2/19
XMLG100D73TQ 2/19
XMLG100Q21TQ 2/19
XMLG250D21 2/19
XMLG250D23 2/19
XMLG250D31TQ 2/20
XMLG250D41TQ 2/20
XMLG250D71 2/19
XMLG250D73TQ 2/19
XMLG400D21 2/19
XMLG400D23 2/19
XMLG400D31TQ 2/20
XMLG400D41TQ 2/20
XMLG400D71 2/19
XMLG400D73TQ 2/19
XMLGM01D21 2/17
XMLGM01D23 2/17
XMLGM01D31TQ 2/20
XMLGM01D41TQ 2/20
XMLGM01D71 2/17
XMLGM01D73TQ 2/17
XMLGZ001 2/21
XMLK006B2C21 2/13
XMLK006B2C71 2/13
XMLK006B2D21 2/13
XMLK006B2D71 2/13
XMLK010B2C21 2/13
XMLK010B2C71 2/13
XMLK010B2D21 2/13
XMLK010B2D71 2/13
XMLK016B2C21 2/13
XMLK016B2C71 2/13
XMLK016B2D21 2/13
XMLK016B2D71 2/13
XMLK025B2C21 2/13
XMLK025B2D21 2/13
XMLK025B2D71 2/13
XMLK100P2C23 2/14
XMLK100P2C73 2/14
XMLK100P2D23 2/14
XMLK100P2D73 2/14
XMLK100P2P23 2/14
XMLK150P2C23 2/14
XMLK150P2C73 2/14
XMLK150P2D23 2/14
XMLK150P2D73 2/14
XMLK150P2P23 2/14
XMLK200P2C23 2/14
XMLK200P2C73 2/14
XMLK200P2D23 2/14
XMLK200P2D73 2/14
XMLK200P2P23 2/14
XMLK300P2C23 2/14
XMLK300P2C73 2/14
XMLK300P2D23 2/14
XMLK300P2D73 2/14
XMLK300P2P23 2/14
XMLP001GC11F 2/26
XMLP001GC21F 2/26
XMLP001GC2BF 2/26
XMLP001GC71F 2/26
XMLP001GC7BF 2/26
XMLP001GD11F 2/26
XMLP001GD21F 2/26
XMLP001GD2BF 2/26
XMLP001GD71F 2/26
XMLP001GD7BF 2/26
XMLP001GL21F 2/26
XMLP001GL71F 2/26
XMLP004GC11F 2/27
XMLP004GC21F 2/27
XMLP004GC71F 2/27
XMLP004GD11F 2/27
XMLP004GD21F 2/27
XMLP004GD71F 2/27
XMLP006GC11F 2/27
XMLP006GC21F 2/27
XMLP006GC71F 2/27
XMLP006GD11F 2/27
XMLP006GD21F 2/27
XMLP006GD71F 2/27
XMLP006GL21F 2/27
XMLP006GL71F 2/27
XMLP010BC11V 2/28
XMLP010BC21V 2/28
XMLP010BC27 2/28
XMLP010BC29 2/28
XMLP010BC71V 2/28
XMLP010BC79 2/28
XMLP010BD11V 2/28
XMLP010BD19 2/28
XMLP010BD21V 2/28
XMLP010BD27 2/28

Product reference index

XMLP010BD29 2/28
XMLP010BD71V 2/28
XMLP010BD79 2/28
XMLP015RC23F 2/33
XMLP015RC73F 2/33
XMLP015RD23F 2/33
XMLP015RD73F 2/33
XMLP015RP23F 2/33
XMLP015RP73F 2/33
XMLP016BC11V 2/28
XMLP016BC21V 2/28
XMLP016BC27 2/28
XMLP016BC29 2/28
XMLP016BC71V 2/28
XMLP016BD11V 2/28
XMLP016BD19 2/28
XMLP016BD21V 2/28
XMLP016BD27 2/28
XMLP016BD29 2/28
XMLP016BD71V 2/28
XMLP016BD79 2/28
XMLP025BC11V 2/29
XMLP025BC21V 2/29
XMLP025BC27 2/29
XMLP025BC29 2/29
XMLP025BC71V 2/29
XMLP025BD11V 2/29
XMLP025BD21V 2/29
XMLP025BD27 2/29
XMLP025BD29 2/29
XMLP025BD71V 2/29
XMLP025BD77 2/29
XMLP025BD79 2/29
XMLP030RC23F 2/33
XMLP030RC73F 2/33
XMLP030RD23F 2/33
XMLP030RD73F 2/33
XMLP030RP23F 2/33
XMLP030RP73F 2/33
XMLP040BC11V 2/29
XMLP040BC21V 2/29
XMLP040BC27 2/29
XMLP040BC29 2/29
XMLP040BC71V 2/29
XMLP040BD11V 2/29
XMLP040BD19 2/29
XMLP040BD21V 2/29
XMLP040BD27 2/29
XMLP040BD29 2/29
XMLP040BD71V 2/29
XMLP040BD79 2/29
XMLP050RC23F 2/33
XMLP050RD23F 2/33
XMLP050RD73F 2/33
XMLP050RP23F 2/33
XMLP060BC11V 2/30
XMLP060BC21V 2/30
XMLP060BC29 2/30
XMLP060BC71V 2/30
XMLP060BD11V 2/30
XMLP060BD21V 2/30
XMLP060BD27 2/30
XMLP060BD29 2/30
XMLP060BD71V 2/30
XMLP060BD79 2/30
XMLP100BC12 2/30
XMLP100BC22 2/30
XMLP100BC72 2/30
XMLP100BD12 2/30
XMLP100BD22 2/30
XMLP100BD72 2/30
XMLP100PD13 2/34
XMLP100PD23 2/34
XMLP100PD73 2/34
XMLP100PP13 2/34
XMLP100PP23 2/34
XMLP100PP73 2/34
XMLP100RD23F 2/33
XMLP100RD73F 2/33
XMLP150PD13 2/34
XMLP150PD23 2/34
XMLP150PD73 2/34
XMLP150PP23 2/34
XMLP150PP73 2/34
XMLP160BC22 2/31
XMLP160BC72 2/31
XMLP160BD12 2/31
XMLP160BD22 2/31
XMLP160BD72 2/31
XMLP1K0PD13 2/35
XMLP1K0PD23 2/35
XMLP1K0PD73 2/35
XMLP1K0PP23 2/35
XMLP1K0PP73 2/35
XMLP200PD13 2/34
XMLP200PD23 2/34
XMLP200PD73 2/34
XMLP200PP23 2/34
XMLP200PP73 2/34
XMLP250BC12 2/31
XMLP250BC22 2/31
XMLP250BC72 2/31
XMLP250BD12 2/31
XMLP250BD22 2/31
XMLP250BD72 2/31
XMLP250MC11F 2/26
XMLP250MC21F 2/26
XMLP250MC71F 2/26
XMLP250MD11F 2/26
XMLP250MD21F 2/26
XMLP250MD71F 2/26
XMLP2D5GC11F 2/27
XMLP2D5GC21F 2/27
XMLP2D5GC71F 2/27
XMLP2D5GD11F 2/27
XMLP2D5GD21F 2/27
XMLP2D5GD71F 2/27
XMLP2D5GL21F 2/27
XMLP2D5GL71F 2/27
XMLP2K0PD13 2/36
XMLP2K0PD23 2/36
XMLP2K0PD73 2/36
XMLP300PD13 2/35
XMLP300PD23 2/35
XMLP300PD73 2/35
XMLP300PP13 2/35
XMLP300PP23 2/35
XMLP300PP73 2/35
XMLP3K0PD13 2/36
XMLP3K0PD23 2/36
XMLP3K0PD73 2/36
XMLP3K0PP23 2/36
XMLP3K0PP73 2/36
XMLP400BC12 2/31
XMLP400BC22 2/31
XMLP400BC72 2/31
XMLP400BD12 2/31
XMLP400BD22 2/31
XMLP400BD72 2/31
XMLP500MC11F 2/26
XMLP500MC21F 2/26
XMLP500MC71F 2/26
XMLP500MD11F 2/26
XMLP500MD21F 2/26
XMLP500MD71F 2/26
XMLP600BC22 2/31
XMLP600BC72 2/31
XMLP600BD12 2/31
XMLP600BD22 2/31
XMLP600BD72 2/31
XMLP600PD13 2/35
XMLP600PD23 2/35
XMLP600PP13 2/35
XMLP600PP23 2/35
XMLP6K0PD13 2/36
XMLP6K0PD23 2/36
XMLP6K0PD73 2/36
XMLP6K0PP13 2/36
XMLP6K0PP73 2/36
XMLPM00GC11F 2/24
XMLPM00GC21F 2/24
XMLPM00GC2BF 2/24
XMLPM00GC71F 2/24
XMLPM00GC7BF 2/24
XMLPM00GD11F 2/24
XMLPM00GD21F 2/24
XMLPM00GD2BF 2/24
XMLPM00GD71F 2/24
XMLPM00GD7BF 2/24
XMLPM00GL21F 2/24
XMLPM00GL71F 2/24
XMLPM00RC13F 2/32
XMLPM00RC23F 2/32
XMLPM00RC73F 2/32
XMLPM00RD13F 2/32
XMLPM00RD23F 2/32
XMLPM00RD73F 2/32
XMLPM00RP13F 2/32
XMLPM00RP23F 2/32
XMLPM00RP73F 2/32
XMLPM01GC21F 2/24
XMLPM01GC71F 2/24
XMLPM01GD21F 2/24
XMLPM01GD71F 2/24
XMLPM05GC21F 2/24
XMLPM05GC71F 2/24
XMLPM05GD21F 2/24
XMLPM05GD71F 2/24
XMLPM09BC21V 2/25
XMLPM09BC71V 2/25
XMLPM09BD11V 2/25
XMLPM09BD21V 2/25
XMLPM09BD71V 2/25
XMLPM15RC23F 2/32
XMLPM15RD23F 2/32
XMLPM15RD73F 2/32
XMLPM15RP23F 2/32
XMLPM25BD21V 2/25
XMLPM60RC23F 2/32
XMLPM60RD23F 2/32
XMLPM60RD73F 2/32
XMLPM60RP23F 2/32
XMLPZLH01 2/39
XMLPZLV01 2/39
XMLR001G0T25 2/43
XMLR001G0T26 2/43
XMLR001G0T75 2/43
XMLR001G0T76 2/43
XMLR001G1N25 2/43
XMLR001G1N26 2/43
XMLR001G1N75 2/43
XMLR001G1P25 2/43
XMLR001G1P26 2/43
XMLR001G1P75 2/43
XMLR001G2N05 2/43
XMLR001G2N06 2/43
XMLR001G2P05 2/43
XMLR001G2P06 2/43
XMLR010G0T25 2/44
XMLR010G0T26 2/44
XMLR010G0T75 2/44
XMLR010G0T76 2/44
XMLR010G1N25 2/44
XMLR010G1N26 2/44
XMLR010G1N75 2/44
XMLR010G1N76 2/44
XMLR010G1P25 2/44
XMLR010G1P26 2/44
XMLR010G1P75 2/44
XMLR010G1P76 2/44
XMLR010G2N05 2/44
XMLR010G2N06 2/44
XMLR010G2N09 2/44
XMLR010G2N25 2/44
XMLR010G2N26 2/44
XMLR010G2P05 2/44
XMLR010G2P06 2/44
XMLR010G2P09 2/44
XMLR010G2P25 2/44
XMLR010G2P26 2/44
XMLR016G0T25 2/44
XMLR016G0T26 2/44
XMLR016G0T75 2/44
XMLR016G1N25 2/44
XMLR016G1N26 2/44
XMLR016G1P25 2/44
XMLR016G1P26 2/44
XMLR016G1P75 2/44
XMLR016G2N06 2/44
XMLR016G2P05 2/44
XMLR016G2P06 2/44
XMLR016G2P25 2/44
XMLR025G0T25 2/44
XMLR025G0T26 2/44
XMLR025G0T75 2/44
XMLR025G1N25 2/44
XMLR025G1N26 2/44
XMLR025G1N75 2/44
XMLR025G1P25 2/44
XMLR025G1P26 2/44
XMLR025G1P75 2/44
XMLR025G2N05 2/44
XMLR025G2N06 2/44
XMLR025G2P05 2/44
XMLR025G2P06 2/44
XMLR040G0T25 2/45
XMLR040G0T26 2/45
XMLR040G0T75 2/45
XMLR040G1N25 2/45
XMLR040G1N26 2/45
XMLR040G1N75 2/45
XMLR040G1P25 2/45
XMLR040G1P26 2/45
XMLR040G1P75 2/45
XMLR040G2N05 2/45
XMLR040G2N06 2/45
XMLR040G2N25 2/45
XMLR040G2P05 2/45
XMLR040G2P06 2/45
XMLR040G2P25 2/45
XMLR100M0T25 2/45
XMLR100M0T26 2/45
XMLR100M0T75 2/45
XMLR100M1N25 2/45
XMLR100M1N26 2/45
XMLR100M1N75 2/45
XMLR100M1P25 2/45
XMLR100M1P26 2/45
XMLR100M1P75 2/45
XMLR100M2N05 2/45
XMLR100M2N06 2/45
XMLR100M2P05 2/45
XMLR100M2P06 2/45
XMLR160M0T25 2/45
XMLR160M0T75 2/45
XMLR160M1N25 2/45
XMLR160M1N75 2/45
XMLR160M1P25 2/45
XMLR160M1P75 2/45
XMLR160M2N05 2/45
XMLR160M2N09 2/45
XMLR160M2P05 2/45
XMLR160M2P09 2/45
XMLR250M0T25 2/46
XMLR250M0T26 2/46
XMLR250M0T75 2/46
XMLR250M1N25 2/46
XMLR250M1N26 2/46
XMLR250M1N75 2/46
XMLR250M1P25 2/46
XMLR250M1P26 2/46
XMLR250M1P75 2/46
XMLR250M1P76 2/46
XMLR250M2N05 2/46
XMLR250M2N06 2/46
XMLR250M2N09 2/46
XMLR250M2N25 2/46
XMLR250M2P05 2/46
XMLR250M2P06 2/46
XMLR250M2P09 2/46
XMLR250M2P25 2/46
XMLR2D5G0T25 2/43
XMLR2D5G0T75 2/43
XMLR2D5G1N25 2/43
XMLR2D5G1N26 2/43
XMLR2D5G1N75 2/43
XMLR2D5G1P25 2/43
XMLR2D5G1P26 2/43
XMLR2D5G1P75 2/43
XMLR2D5G2N05 2/43
XMLR2D5G2N06 2/43
XMLR2D5G2P05 2/43
XMLR2D5G2P06 2/43
XMLR400M0T25 2/46
XMLR400M0T26 2/46
XMLR400M0T75 2/46
XMLR400M1N25 2/46
XMLR400M1N26 2/46
XMLR400M1N75 2/46
XMLR400M1P25 2/46
XMLR400M1P26 2/46
XMLR400M1P75 2/46
XMLR400M2N05 2/46
XMLR400M2N06 2/46
XMLR400M2N25 2/46
XMLR400M2P05 2/46
XMLR400M2P06 2/46
XMLR400M2P25 2/46
XMLR600M0T25 2/46
XMLR600M0T75 2/46
XMLR600M1P25 2/46
XMLR600M1P75 2/46
XMLR600M2P05 2/46
XMLRM01G0T25 2/43
XMLRM01G0T26 2/43
XMLRM01G0T75 2/43
XMLRM01G1N25 2/43
XMLRM01G1N26 2/43
XMLRM01G1N75 2/43
XMLRM01G1P25 2/43
XMLRM01G1P26 2/43
XMLRM01G1P75 2/43
XMLRM01G2N05 2/43
XMLRM01G2N06 2/43
XMLRM01G2N25 2/43
XMLRM01G2N26 2/43
XMLRM01G2P05 2/43
XMLRM01G2P06 2/43
XMLRM01G2P25 2/43
XMLRM01G2P26 2/43
XMLZA024 2/116
XMLZA120 2/116
XMLZB024 2/116
XMLZB120 2/116
XMLZL001 2/116
XMLZL002 2/116
XMLZL003 2/116
XMLZL003 2/134
XMLZL004 2/116
XMLZL005 2/116
XMLZL006 2/116
XMLZL009 2/47
XMLZL010 2/116
XMLZL011 2/116
XMLZL012 2/116
XMLZL013 2/116
XMLZL014 2/116
XMLZL015 2/116
XMLZL016 2/37
XMLZL017 2/37
XMLZL017 2/47
XMLZZ024 2/116
XMLZZ120 2/116
XMPA06B2131 2/144
XMPA06B2242 2/145
XMPA06C2131 2/144
XMPA06C2242 2/145
XMPA12B2131 2/146
XMPA12B2242 2/147
XMPA12C2131 2/146
XMPA12C2242 2/147
XMPA25B2131 2/148
XMPA25C2131 2/149
XMPB06B2131 2/144
XMPB06B2242 2/145
XMPB12B2131 2/146
XMPB12B2242 2/147
XMPB25B2131 2/148
XMPC06B2131 2/144
XMPC06B2242 2/145
XMPC06C2131 2/144
XMPC06C2242 2/145
XMPC12B2131 2/146
XMPC12B2242 2/147
XMPC12B2431 2/147
XMPC12C2131 2/146
XMPC12C2242 2/147
XMPC25B2131 2/148
XMPC25C2131 2/149
XMPD06B2131 2/144
XMPD06B2242 2/145
XMPD06C2131 2/144
XMPD06C2242 2/145
XMPD12B2131 2/146
XMPD12B2242 2/147

Product reference index

XMPD12C2131 2/146
XMPD12C2242 2/147
XMPD12C2431 2/147
XMPE06B2131 2/144
XMPE06C2131 2/144
XMPE06C2242 2/145
XMPE06C2431 2/145
XMPE12B2131 2/146
XMPE12B2242 2/147
XMPE12B2431 2/147
XMPE12C2131 2/146
XMPE12C2242 2/147
XMPE12C2431 2/147
XMPMDR01 2/152
XMPR06B2133 2/150
XMPR06B2433 2/151
XMPR06C2133 2/150
XMPR06C2433 2/151
XMPR12B2131 2/146
XMPR12B2133 2/150
XMPR12B2433 2/151
XMPR12C2131 2/146
XMPR12C2133 2/150
XMPR12C2433 2/151
XMPR25B2131 2/148
XMPR25B2133 2/150
XMPR25B2433 2/151
XMPR25C2131 2/149
XMPR25C2133 2/150
XMPR25C2433 2/151
XMPZ31 2/134
XMPZ31 2/152
XMPZ33 2/134
XMPZ33 2/152
XMXA06L2135 2/132
XMXA06L2435 2/132
XMXA12L2135 2/132
XMXA12L2435 2/132
XMXA25L2135 2/132
XMXA25L2435 2/132
XR2AA03K●● 1/229
XR2AB04K●● 1/229
XR2AB06K●● 1/229
XR2AB10K●● 1/229
XR2AB14K●● 1/229
XR2AB20K●● 1/229
XR2AB24K●● 1/229
XR2AB28K●● 1/229
XR2AZ001 1/228
XR2AZ002 1/230
XR2AZ003 1/230
XR2AZ212 1/228
XR2AZ216 1/228
XR2AZ224 1/228
XR2AZ236 1/228
XR2AZ248 1/228
XR2AZ256 1/228
XR2AZ302 1/220
XR2AZ302 1/228
XR2AZ305 1/220
XR2AZ305 1/228
XR2AZ310 1/220
XR2AZ310 1/228
XR2AZ31225 1/228
XR2AZ31625 1/228
XR2AZ32425 1/228
XR2AZ32435 1/228
XR2AZ34825 1/228
XR2AZ41625 1/228
XR2AZ42425 1/228
XR2AZ42435 1/228
XR2AZ43625 1/228
XR2AZ52450 1/228
XR2AZ804 1/228
XR2AZ808 1/228
XR2AZ810 1/228
XR2AZ816 1/228
XR2AZ820 1/228
XR2AZ83 1/228
XR2AZ840 1/228
XR2AZ86 1/228
XR2AZ880 1/228
XR2BB03K●● 1/229
XR2BB05K●● 1/229
XR2BB09K●● 1/229
XR2BB13K●● 1/229
XR2BB19K●● 1/229
XR2BB23K●● 1/229
XR2BB27K●● 1/229
XRBA4●●●● 1/220
XRBA6●●●● 1/220
XRBA901 1/220
XRBA902 1/220
XRBA903 1/220
XRBZ9100 1/220
XRBZ912 1/220
XRBZ914 1/220
XRBZ916 1/220
XS106B3NAL2 3/34
XS106B3NAM8 3/34
XS106B3NBL2 3/34
XS106B3NBM8 3/34
XS106B3PAL2 3/34
XS106B3PAL2TQ 3/34
XS106B3PAM12 3/34
XS106B3PAM8 3/34
XS106B3PAM8TQ 3/34
XS106B3PBL2 3/34
XS106B3PBM8 3/34
XS108B3NAL2 3/34
XS108B3NAL2TQ 3/34
XS108B3NAM12 3/34
XS108B3NAM8 3/34
XS108B3NAM8TQ 3/34
XS108B3NBL2 3/34
XS108B3NBM12 3/34
XS108B3NBM8 3/34
XS108B3PAL2 3/34
XS108B3PAL2TQ 3/34
XS108B3PAM12 3/34
XS108B3PAM12TQ 3/34
XS108B3PAM8 3/34
XS108B3PAM8TQ 3/34
XS108B3PBL2 3/34
XS108B3PBM12 3/34
XS108B3PBM8 3/34
XS108BLNAL2 3/62
XS108BLNAM12 3/62
XS108BLPAL2 3/62
XS108BLPAL5 3/62
XS108BLPAM12 3/62
XS108BLPAM8 3/62
XS112B3NAL2 3/34
XS112B3NAL2TQ 3/34
XS112B3NAM12 3/34
XS112B3NAM12TQ 3/34
XS112B3NBL2 3/34
XS112B3NBM12 3/34
XS112B3PAL2 3/34
XS112B3PAL2TQ 3/34
XS112B3PAM12 3/34
XS112B3PAM12TQ 3/34
XS112B3PBL2 3/34
XS112B3PBM12 3/34
XS112B3PBM12TQ 3/34
XS112BLNAL2 3/62
XS112BLNAM12 3/62
XS112BLPAL2 3/62
XS112BLPAL3 3/62
XS112BLPAL5 3/62
XS112BLPAM12 3/62
XS112BLPBL2 3/62
XS112BLPBM12 3/62
XS118B3NAL2 3/35
XS118B3NAL2TQ 3/35
XS118B3NAM12 3/35
XS118B3NAM12TQ 3/35
XS118B3NBL2 3/35
XS118B3NBM12 3/35
XS118B3PAL2 3/35
XS118B3PAL2TQ 3/35
XS118B3PAM12 3/35
XS118B3PAM12TQ 3/35
XS118B3PBL2 3/35
XS118B3PBM12 3/35
XS118BLNAL2 3/63
XS118BLNAL5 3/63
XS118BLNAM12 3/63
XS118BLPAL2 3/63
XS118BLPAL5 3/63
XS118BLPAM12 3/63
XS118BLPBL2 3/63
XS118BLPBM12 3/63
XS130B3NAL2 3/35
XS130B3NAM12 3/35
XS130B3NAM12TQ 3/35
XS130B3NBL2 3/35
XS130B3NBM12 3/35
XS130B3PAL2 3/35
XS130B3PAL2TQ 3/35
XS130B3PAM12 3/35
XS130B3PAM12TQ 3/35
XS130B3PBL2 3/35
XS130B3PBM12 3/35
XS130BLNAL2 3/63
XS130BLNAL3 3/63
XS130BLNAM12 3/63
XS130BLPAL2 3/63
XS130BLPAM12 3/63
XS130BLPBL2 3/63
XS130BLPBM12 3/63
XS1L04NA310 3/68
XS1L04NA310S 3/68
XS1L04NA311 3/68
XS1L04NA311S 3/68
XS1L04NB310 3/68
XS1L04NB310S 3/68
XS1L04NB311 3/68
XS1L04NB311S 3/68
XS1L04PA310 3/68
XS1L04PA310S 3/68
XS1L04PA311 3/68
XS1L04PA311S 3/68
XS1L04PB310 3/68
XS1L04PB310S 3/68
XS1L04PB311 3/68
XS1L04PB311S 3/68
XS1L06NA349 3/66
XS1L06NA349D 3/66
XS1L06NA349S 3/66
XS1L06NB349 3/66
XS1L06NB349S 3/66
XS1L06NC410 3/54
XS1L06PA349 3/66
XS1L06PA349D 3/66
XS1L06PA349S 3/66
XS1L06PB349 3/66
XS1L06PB349S 3/66
XS1L06PC410 3/54
XS1M08NC410 3/54
XS1M08NC410D 3/54
XS1M08PC410 3/54
XS1M08PC410D 3/54
XS1M12AB120 3/79
XS1M12KP340 3/58
XS1M12KP340D 3/58
XS1M12MA250 3/52
XS1M12MA250K 3/52
XS1M12MB250 3/52
XS1M12MB250K 3/52
XS1M18AB120 3/80
XS1M18KP340 3/58
XS1M18KP340D 3/58
XS1M18KPM40 3/110
XS1M18KPM40D 3/110
XS1M18MA250 3/52
XS1M18MA250K 3/52
XS1M18MB250 3/52
XS1M18MB250K 3/52
XS1M18PAS20 3/114
XS1M18PAS20D 3/115
XS1M18PAS40 3/114
XS1M18PAS40D 3/115
XS1M30AB120 3/81
XS1M30KP340 3/58
XS1M30KP340D 3/58
XS1M30KPM40 3/111
XS1M30KPM40LD 3/111
XS1M30MA250 3/52
XS1M30MA250K 3/52
XS1M30MB250 3/52
XS1M30MB250K 3/52
XS1N05NA310 3/68
XS1N05NA311 3/68
XS1N05NA311S 3/68
XS1N05NB310 3/68
XS1N05NB311 3/68
XS1N05NB311S 3/68
XS1N05PA310 3/68
XS1N05PA311 3/68
XS1N05PA311S 3/68
XS1N05PB310 3/68
XS1N05PB311 3/68
XS1N05PB311S 3/68
XS1N08NA349 3/66
XS1N08NA349D 3/66
XS1N08NA349S 3/66
XS1N08NB349 3/66
XS1N08NB349D 3/66
XS1N08NB349S 3/66
XS1N08PA349 3/66
XS1N08PA349D 3/66
XS1N08PA349S 3/66
XS1N08PB349 3/66
XS1N08PB349D 3/66
XS1N08PB349S 3/66
XS1N12NA349 3/66
XS1N12NA349D 3/66
XS1N12NB349 3/66
XS1N12NB349D 3/66
XS1N12NC410 3/54
XS1N12NC410D 3/54
XS1N12PA349 3/66
XS1N12PA349D 3/66
XS1N12PB349 3/66
XS1N12PB349D 3/66
XS1N12PC410 3/54
XS1N12PC410D 3/54
XS1N18NA349 3/66
XS1N18NA349D 3/66
XS1N18NB349 3/66
XS1N18NB349D 3/66
XS1N18NC410 3/55
XS1N18NC410D 3/55
XS1N18PA349 3/66
XS1N18PA349D 3/66
XS1N18PB349 3/66
XS1N18PB349D 3/66
XS1N18PC410 3/55
XS1N18PC410D 3/55
XS1N30NA349 3/66
XS1N30NA349D 3/66
XS1N30NB349 3/66
XS1N30NB349D 3/66
XS1N30NC410 3/55
XS1N30NC410D 3/55
XS1N30PA349 3/66
XS1N30PA349D 3/66
XS1N30PB349 3/66
XS1N30PB349D 3/66
XS1N30PC410 3/55
XS1N30PC410D 3/55
XS208BLNAL2 3/62
XS208BLNAM12 3/62
XS208BLPAL2 3/62
XS208BLPAL5 3/62
XS208BLPAM12 3/62
XS208BLPAM8 3/62
XS212AANAL2 3/94
XS212AANAM12 3/94
XS212AAPAL2 3/94
XS212AAPAM12 3/94
XS212BLNAL2 3/62
XS212BLNAL7 3/62
XS212BLNAM12 3/62
XS212BLNBL2 3/62
XS212BLPAL2 3/62
XS212BLPAL5 3/62
XS212BLPAM12 3/62
XS212BLPBL2 3/62
XS212BLPBL5 3/62
XS212SANAL2 3/90
XS212SANAM12 3/90
XS212SAPAL2 3/90
XS212SAPAM12 3/90
XS218AAMAL2 3/96
XS218AAMAU20 3/96
XS218AANAL2 3/94
XS218AANAM12 3/94
XS218AAPAL2 3/94
XS218AAPAM12 3/94
XS218BLNAL2 3/63
XS218BLNAL5 3/63
XS218BLNAL7 3/63
XS218BLNAM12 3/63
XS218BLNBL2 3/63
XS218BLPAL2 3/63
XS218BLPAL5 3/63
XS218BLPAM12 3/63
XS218BLPBL2 3/63
XS218SAMAL2 3/92
XS218SAMAU20 3/92
XS218SANAL2 3/90
XS218SANAM12 3/90
XS218SAPAL2 3/90
XS218SAPAM12 3/90
XS230AAMAL2 3/96
XS230AAMAU20 3/96
XS230AANAL2 3/94
XS230AANAM12 3/94
XS230AAPAL2 3/94
XS230AAPAM12 3/94
XS230BLNAL2 3/63
XS230BLNAL7 3/63
XS230BLNAM12 3/63
XS230BLPAL2 3/63
XS230BLPAL5 3/63
XS230BLPAM12 3/63
XS230BLPBL2 3/63
XS230SAMAL2 3/92
XS230SAMAU20 3/92
XS230SANAL2 3/90
XS230SANAM12 3/90
XS230SAPAL2 3/90
XS230SAPAM12 3/90
XS2L06NA340 3/68
XS2L06NA340D 3/68
XS2L06NA340S 3/68
XS2L06NB340 3/68
XS2L06NB340D 3/68
XS2L06NB340S 3/68
XS2L06PA340 3/68
XS2L06PA340D 3/68
XS2L06PA340S 3/68
XS2L06PB340 3/68
XS2L06PB340D 3/68
XS2L06PB340S 3/68
XS2L2SANAL2 3/90
XS2L2SANAM12 3/90
XS2L2SAPAL2 3/90
XS2L2SAPAM12 3/90
XS2M08NC410 3/54
XS2M08NC410D 3/54
XS2M08PC410 3/54
XS2M08PC410D 3/54
XS2M12KP340 3/58
XS2M12KP340D 3/58
XS2M12MA250 3/52
XS2M12MA250K 3/52
XS2M12MB250 3/52
XS2M18KP340 3/58
XS2M18KP340D 3/58
XS2M18MA250 3/52
XS2M18MA250K 3/52
XS2M18MB250 3/52
XS2M18MB250K 3/52
XS2M30KP340 3/58
XS2M30KP340D 3/58
XS2M30MA250 3/52
XS2M30MA250K 3/52
XS2M30MB250 3/52
XS2M30MB250K 3/52
XS4P08MA230 3/60
XS4P08MA230K 3/60
XS4P08MB230 3/60
XS4P08MB230K 3/60
XS4P08NA340 3/60
XS4P08NA370 3/60
XS4P08NB340 3/60
XS4P08NB370 3/60
XS4P08PA340 3/60
XS4P08PA370 3/60
XS4P08PB340 3/60
XS4P08PB370 3/60
XS4P08PC410 3/54

Product reference index

XS4P12AB110 3/79
XS4P12AB120 3/79
XS4P12KP340 3/58
XS4P12KP340D 3/58
XS4P12MA230 3/60
XS4P12MA230K 3/60
XS4P12MB230 3/60
XS4P12MB230K 3/60
XS4P12NA340 3/60
XS4P12NA370 3/60
XS4P12NB340 3/60
XS4P12NB370 3/60
XS4P12PA340 3/60
XS4P12PA370 3/60
XS4P12PB340 3/60
XS4P12PB370 3/60
XS4P12PC410 3/54
XS4P12PC410D 3/54
XS4P18AB110 3/80
XS4P18AB120 3/80
XS4P18KP340 3/58
XS4P18KP340D 3/58
XS4P18MA230 3/60
XS4P18MA230K 3/60
XS4P18MB230 3/60
XS4P18MB230K 3/60
XS4P18NA340 3/60
XS4P18NA370 3/60
XS4P18NB340 3/60
XS4P18NB370 3/60
XS4P18PA340 3/60
XS4P18PA370 3/60
XS4P18PB340 3/60
XS4P18PB370 3/60
XS4P18PC410 3/55
XS4P18PC410D 3/55
XS4P30AB110 3/81
XS4P30AB120 3/81
XS4P30KP340 3/58
XS4P30KP340D 3/58
XS4P30MA230 3/60
XS4P30MA230K 3/60
XS4P30MB230 3/60
XS4P30MB230K 3/60
XS4P30NA340 3/60
XS4P30NA370 3/60
XS4P30NB340 3/60
XS4P30NB370 3/60
XS4P30PA340 3/60
XS4P30PA370 3/60
XS4P30PB340 3/60
XS4P30PB370 3/60
XS4P30PC410 3/55
XS4P30PC410D 3/55
XS506B1NAL2 3/24
XS506B1NAM8 3/24
XS506B1NBL2 3/24
XS506B1NBM8 3/24
XS506B1PAL2 3/24
XS506B1PAM12 3/24
XS506B1PAM8 3/24
XS506B1PBL2 3/24
XS506B1PBM8 3/24
XS506BLNAL2 3/25
XS506BLPAL2 3/25
XS506BSCAL01M12 3/28
XS506BSCAL2 3/28
XS506BSCBL2 3/28
XS508B1CAL08M12 3/29
XS508B1CAM12 3/29
XS508B1DAL08M12 3/29
XS508B1DAL2 3/29
XS508B1DAM12 3/29
XS508B1DBL2 3/29
XS508B1DBM12 3/29
XS508B1NAL2 3/24
XS508B1NAM12 3/24
XS508B1NAM8 3/24
XS508B1NBL2 3/24
XS508B1NBM12 3/24
XS508B1NBM8 3/24
XS508B1PAL2 3/24
XS508B1PAM12 3/24
XS508B1PAM8 3/24
XS508B1PBL2 3/24
XS508B1PBM12 3/24
XS508B1PBM8 3/24
XS508BLNAL2 3/25
XS508BLNAM12 3/25
XS508BLNBL2 3/25
XS508BLNBM12 3/25
XS508BLPAL2 3/25
XS508BLPAM12 3/25
XS508BLPBL2 3/25
XS508BLPBM12 3/25
XS508BSCAL01M12 3/28
XS508BSCAL08M12 3/28
XS508BSCAL2 3/28
XS508BSCBL01M12 3/28
XS508BSCBL2 3/28
XS512B1CAL08M12 3/29
XS512B1CAM12 3/29
XS512B1DAL08U78 3/29
XS512B1DAL2 3/29
XS512B1DAM12 3/29
XS512B1DBL08M12 3/29
XS512B1DBL2 3/29
XS512B1DBM12 3/29
XS512B1MAL2 3/32
XS512B1MAU20 3/32
XS512B1MBL2 3/32
XS512B1MBU20 3/32
XS512B1NAL2 3/24
XS512B1NAM12 3/24
XS512B1NBL2 3/24
XS512B1NBM12 3/24
XS512B1PAL2 3/24
XS512B1PAM12 3/24
XS512B1PBL2 3/24
XS512B1PBM12 3/24
XS512BLNAL2 3/25
XS512BLNAM12 3/25
XS512BLNBL2 3/25
XS512BLNBM12 3/25
XS512BLPAL2 3/25
XS512BLPAM12 3/25
XS512BLPBL2 3/25
XS512BLPBM12 3/25
XS512BSCAL08M12 3/28
XS512BSCAM12 3/28
XS512BSDAL2 3/28
XS512BSDAM12 3/28
XS512BSDBL2 3/28
XS512BSDBM12 3/28
XS518B1CAL08M12 3/29
XS518B1CAM12 3/29
XS518B1DAL01B 3/29
XS518B1DAL01C 3/29
XS518B1DAL01G 3/29
XS518B1DAL2 3/29
XS518B1DAL2TF 3/29
XS518B1DAM12 3/29
XS518B1DBL01B 3/29
XS518B1DBL08M12 3/29
XS518B1DBL2 3/29
XS518B1DBM12 3/29
XS518B1MAL2 3/32
XS518B1MAU20 3/32
XS518B1MBL2 3/32
XS518B1MBU20 3/32
XS518B1NAL2 3/24
XS518B1NAM12 3/24
XS518B1NBL2 3/24
XS518B1NBM12 3/24
XS518B1PAL2 3/24
XS518B1PAM12 3/24
XS518B1PBL2 3/24
XS518B1PBM12 3/24
XS518BLNAL2 3/25
XS518BLNAM12 3/25
XS518BLNBL2 3/25
XS518BLNBM12 3/25
XS518BLPAL2 3/25
XS518BLPAM12 3/25
XS518BLPBL2 3/25
XS518BLPBM12 3/25
XS518BSCAL08M12 3/28
XS518BSCAM12 3/28
XS518BSDAL2 3/28
XS518BSDAM12 3/28
XS518BSDBL2 3/28
XS518BSDBM12 3/28
XS530B1CAL08M12 3/29
XS530B1CAM12 3/29
XS530B1DAL01B 3/29
XS530B1DAL01C 3/29
XS530B1DAL01G 3/29
XS530B1DAL2 3/29
XS530B1DAL2TF 3/29
XS530B1DAM12 3/29
XS530B1DBL01B 3/29
XS530B1DBL2 3/29
XS530B1DBM12 3/29
XS530B1MAL2 3/32
XS530B1MAU20 3/32
XS530B1MBL2 3/32
XS530B1MBU20 3/32
XS530B1NAL2 3/24
XS530B1NAM12 3/24
XS530B1NBL2 3/24
XS530B1NBM12 3/24
XS530B1PAL2 3/24
XS530B1PAM12 3/24
XS530B1PBL2 3/24
XS530B1PBM12 3/24
XS530BLNAL2 3/25
XS530BLNAM12 3/25
XS530BLNBL2 3/25
XS530BLNBM12 3/25
XS530BLPAL2 3/25
XS530BLPAM12 3/25
XS530BLPBL2 3/25
XS530BLPBM12 3/25
XS530BSCAL08M12 3/28
XS530BSCAM12 3/28
XS530BSDAL2 3/28
XS530BSDAM12 3/28
XS530BSDBL2 3/28
XS530BSDBM12 3/28
XS606B1DAL2 3/38
XS606B1DBL2 3/38
XS606B3CAL01M12 3/38
XS606B3CAL2 3/38
XS606B3CBL2 3/38
XS608B1DAL2 3/38
XS608B1DAM12 3/38
XS608B1DBL2 3/38
XS608B1DBM12 3/38
XS608B1NAL2 3/36
XS608B1NAM12 3/36
XS608B1NBL2 3/36
XS608B1NBM12 3/36
XS608B1PAL2 3/36
XS608B1PAM12 3/36
XS608B1PBL2 3/36
XS608B1PBM12 3/36
XS608B3CAL01M12 3/38
XS608B3CAL2 3/38
XS608B3CBL01M12 3/38
XS608B3CBL2 3/38
XS612B1DAL2 3/38
XS612B1DAM12 3/38
XS612B1DBL2 3/38
XS612B1DBM12 3/38
XS612B1MAL2 3/40
XS612B1MAU20 3/40
XS612B1MBL2 3/40
XS612B1MBU20 3/40
XS612B1NAL2 3/36
XS612B1NAM12 3/36
XS612B1NBL2 3/36
XS612B1NBM12 3/36
XS612B1PAL2 3/36
XS612B1PAM12 3/36
XS612B1PBL2 3/36
XS612B1PBM12 3/36
XS612B2NAL01M12 3/70
XS612B2NBL01M12 3/70
XS612B2PAL01M12 3/70
XS612B2PBL01M12 3/70
XS612B3DAL2 3/38
XS612B3DAM12 3/38
XS612B3DBL2 3/38
XS612B3DBM12 3/38
XS612B4NAL2 3/42
XS612B4NAM12 3/42
XS612B4NBL2 3/42
XS612B4NBM12 3/42
XS612B4PAL2 3/42
XS612B4PAM12 3/42
XS612B4PBL2 3/42
XS612B4PBM12 3/42
XS618B1DAL2 3/38
XS618B1DAM12 3/38
XS618B1DBL2 3/38
XS618B1DBM12 3/38
XS618B1MAL01B 3/40
XS618B1MAL01C 3/40
XS618B1MAL01G 3/40
XS618B1MAL2 3/40
XS618B1MAU20 3/40
XS618B1MBL01B 3/40
XS618B1MBL01C 3/40
XS618B1MBL01G 3/40
XS618B1MBL2 3/40
XS618B1MBU20 3/40
XS618B1NAL01B 3/36
XS618B1NAL01C 3/36
XS618B1NAL2 3/36
XS618B1NAM12 3/36
XS618B1NBL01B 3/36
XS618B1NBL01C 3/36
XS618B1NBL2 3/36
XS618B1NBM12 3/36
XS618B1PAL01B 3/36
XS618B1PAL01C 3/36
XS618B1PAL01G 3/36
XS618B1PAL2 3/36
XS618B1PAM12 3/36
XS618B1PBL01B 3/36
XS618B1PBL01C 3/36
XS618B1PBL2 3/36
XS618B1PBM12 3/36
XS618B2NAL01M12 3/70
XS618B2NBL01M12 3/70
XS618B2PAL01M12 3/70
XS618B2PBL01M12 3/70
XS618B3DAL2 3/38
XS618B3DAM12 3/38
XS618B3DBL2 3/38
XS618B3DBM12 3/38
XS618B4NAL2 3/42
XS618B4NAM12 3/42
XS618B4NBL2 3/42
XS618B4NBM12 3/42
XS618B4PAL2 3/42
XS618B4PAM12 3/42
XS618B4PBL2 3/42
XS618B4PBM12 3/42
XS630B1DAL2 3/38
XS630B1DAM12 3/38
XS630B1DBL2 3/38
XS630B1DBM12 3/38
XS630B1MAL01B 3/40
XS630B1MAL01C 3/40
XS630B1MAL01G 3/40
XS630B1MAL2 3/40
XS630B1MAU20 3/40
XS630B1MBL01B 3/40
XS630B1MBL01C 3/40
XS630B1MBL01G 3/40
XS630B1MBL2 3/40
XS630B1MBU20 3/40
XS630B1NAL01B 3/36
XS630B1NAL01C 3/36
XS630B1NAL2 3/36
XS630B1NAM12 3/36
XS630B1NBL01B 3/36
XS630B1NBL01C 3/36
XS630B1NBL2 3/36
XS630B1NBM12 3/36
XS630B1PAL01B 3/36
XS630B1PAL01C 3/36
XS630B1PAL01G 3/36
XS630B1PAL2 3/36
XS630B1PAM12 3/36
XS630B1PBL01B 3/36
XS630B1PBL01C 3/36
XS630B1PBL01G 3/36
XS630B1PBL2 3/36
XS630B1PBM12 3/36
XS630B2NAL01M12 3/70
XS630B2NBL01M12 3/70
XS630B2PAL01M12 3/70
XS630B2PBL01M12 3/70
XS630B3DAL2 3/38
XS630B3DAM12 3/38
XS630B3DBL2 3/38
XS630B3DBM12 3/38
XS630B5NAL2 3/42
XS630B5NAM12 3/42
XS630B5NBL2 3/42
XS630B5PAL2 3/42
XS630B5PAM12 3/42
XS630B5PBL2 3/42
XS630B5PBM12 3/42
XS7C1A1CAL01M12 3/46
XS7C1A1CAL08M12 3/46
XS7C1A1DAL01M12 3/46
XS7C1A1DAL2 3/46
XS7C1A1DAM8 3/46
XS7C1A1DBL01M12 3/46
XS7C1A1DBL2 3/46
XS7C1A1DBM8 3/46
XS7C1A1NAL01M12 3/46
XS7C1A1NAL2 3/46
XS7C1A1NAM8 3/46
XS7C1A1NBL01M12 3/46
XS7C1A1NBL2 3/46
XS7C1A1NBM8 3/46
XS7C1A1PAL01M12 3/46
XS7C1A1PAL2 3/46
XS7C1A1PAM8 3/46
XS7C1A1PBL01M12 3/46
XS7C1A1PBL2 3/46
XS7C1A1PBM8 3/46
XS7C2A1DAM12 3/48
XS7C2A1DBM12 3/48
XS7C2A1MAU20 3/48
XS7C2A1MBU20 3/48
XS7C2A1NAM12 3/48
XS7C2A1NBM12 3/48
XS7C2A1PAM12 3/48
XS7C2A1PBM12 3/48
XS7C4A1DPP20 3/50
XS7C4A1MPP20 3/50
XS7D1A1CAM12 3/46
XS7D1A1DAL2 3/46
XS7D1A1DAM12 3/46
XS7D1A1DBL2 3/46
XS7D1A1DBM12 3/46
XS7D1A1NAL2 3/46
XS7D1A1NAM12 3/46
XS7D1A1NBL2 3/46
XS7D1A1NBM12 3/46
XS7D1A1PAL2 3/46
XS7D1A1PAM12 3/46
XS7D1A1PBL2 3/46
XS7D1A1PBM12 3/46
XS7D1A3CAM12DIN 3/104
XS7E1A1CAL01M12 3/46
XS7E1A1CAL08M12 3/46
XS7E1A1DAL01M12 3/46
XS7E1A1DAL2 3/46
XS7E1A1DAM8 3/46
XS7E1A1DBL01M12 3/46
XS7E1A1DBL2 3/46
XS7E1A1DBM8 3/46
XS7E1A1NAL01M12 3/46
XS7E1A1NAL2 3/46
XS7E1A1NAM8 3/46
XS7E1A1NBL01M12 3/46
XS7E1A1NBL2 3/46
XS7E1A1NBM8 3/46
XS7E1A1PAL01M12 3/46
XS7E1A1PAL2 3/46
XS7E1A1PAM8 3/46
XS7E1A1PBL01M12 3/46
XS7E1A1PBL2 3/46
XS7E1A1PBM8 3/46
XS7F1A1DAL01M8 3/44
XS7F1A1DAL2 3/44
XS7F1A1DBL01M8 3/44
XS7F1A1DBL2 3/44
XS7F1A1NAL01M8 3/44

Product reference index

XS7F1A1NAL2 3/44
XS7F1A1NBL01M8 3/44
XS7F1A1NBL2 3/44
XS7F1A1PAL01M8 3/44
XS7F1A1PAL2 3/44
XS7F1A1PBL01M8 3/44
XS7F1A1PBL2 3/44
XS7G12MA230 3/102
XS7G12MB230 3/102
XS7G12NA140 3/100
XS7G12NA140S 3/100
XS7G12NC440 3/100
XS7G12PA140 3/100
XS7G12PA140S 3/100
XS7G12PC440 3/100
XS7J1A1DAL01M8 3/44
XS7J1A1DAL2 3/44
XS7J1A1DBL01M8 3/44
XS7J1A1DBL2 3/44
XS7J1A1NAL01M8 3/44
XS7J1A1NAL2 3/44
XS7J1A1NBL01M8 3/44
XS7J1A1NBL2 3/44
XS7J1A1PAL01M8 3/44
XS7J1A1PAL2 3/44
XS7J1A1PBL01M8 3/44
XS7J1A1PBL2 3/44
XS8C1A1MAL01U20 3/72
XS8C1A1MAL2 3/72
XS8C1A1MBL01U20 3/72
XS8C1A1MBL2 3/72
XS8C1A1NAL01M12 3/72
XS8C1A1NAL2 3/72
XS8C1A1NAM8 3/72
XS8C1A1NBL01M12 3/72
XS8C1A1NBL2 3/72
XS8C1A1NBM8 3/72
XS8C1A1PAL01M12 3/72
XS8C1A1PAL2 3/72
XS8C1A1PAM8 3/72
XS8C1A1PBL01M12 3/72
XS8C1A1PBL2 3/72
XS8C1A1PBM8 3/72
XS8C2A1DAM12 3/48
XS8C2A1DBM12 3/48
XS8C2A1MAU20 3/48
XS8C2A1MBU20 3/48
XS8C2A1NCM12 3/48
XS8C2A1PCM12 3/48
XS8C2A4DAM12 3/48
XS8C2A4DBM12 3/48
XS8C2A4MAU20 3/48
XS8C2A4MBU20 3/48
XS8C2A4NCM12 3/48
XS8C2A4PCM12 3/48
XS8C4A1DPP20 3/50
XS8C4A1MPP20 3/50
XS8C4A1NCP20 3/50
XS8C4A1PCP20 3/50
XS8C4A4DPP20 3/50
XS8C4A4MPP20 3/50
XS8C4A4NCP20 3/50
XS8C4A4PCP20 3/50
XS8D1A1MAL2 3/72
XS8D1A1MAU20 3/72
XS8D1A1MBL2 3/72
XS8D1A1MBU20 3/72
XS8D1A1NAL2 3/72
XS8D1A1NAM12 3/72
XS8D1A1NBL2 3/72
XS8D1A1NBM12 3/72
XS8D1A1PAL2 3/72
XS8D1A1PAM12 3/72
XS8D1A1PBL2 3/72
XS8D1A1PBM12 3/72
XS8E1A1MAL01U20 3/72
XS8E1A1MAL2 3/72
XS8E1A1MBL01U20 3/72
XS8E1A1MBL2 3/72
XS8E1A1NAL01M12 3/72
XS8E1A1NAL2 3/72
XS8E1A1NAM8 3/72
XS8E1A1NBL01M12 3/72
XS8E1A1NBL2 3/72
XS8E1A1NBM8 3/72
XS8E1A1PAL01M12 3/72
XS8E1A1PAL2 3/72
XS8E1A1PAM8 3/72
XS8E1A1PBL01M12 3/72
XS8E1A1PBL2 3/72
XS8E1A1PBM8 3/72
XS8G12MA230 3/102
XS8G12MB230 3/102
XS8G12NA140 3/100
XS8G12NA140S 3/100
XS8G12NC440 3/100
XS8G12PA140 3/100
XS8G12PA140S 3/100
XS8G12PC440 3/100
XS908R1PAM12 3/98
3/99
XS908R4PAM12 3/98
3/99
XS912R1PAM12 3/98
3/99
XS912R4PAM12 3/98
3/99
XS912RWPAM12 3/106
3/107
XS912S1PAM12 3/88
3/89
XS912S4PAM12 3/88
3/89
XS918R1PAM12 3/98
3/99
XS918R4PAM12 3/98
3/99
XS918RWPAM12 3/106
3/107
XS918S1PAM12 3/88
3/89
XS918S4PAM12 3/88
3/89
XS930R1PAM12 3/98
3/99
XS930R4PAM12 3/98
3/99
XS930S1PAM12 3/88
3/89
XS930S4PAM12 3/88
3/89
XS9C111A1L01M12 3/83
XS9C111A1L2 3/83
XS9C111A2L01M12 3/85
XS9C111A2L2 3/85
XS9C11RMBL01U20 3/77
XS9C11RPBL01M12 3/77
XS9C2A1NCM12 3/112
XS9C2A1PCM12 3/112
XS9C2A2A1M12 3/86
XS9C2A2A2M12 3/86
XS9C4A1NCP20 3/112
XS9C4A1PCP20 3/112
XS9C4A2A1P20 3/86
XS9C4A2A2P20 3/86
XS9D111A1L2 3/83
XS9D111A1M12 3/83
XS9D111A2L2 3/85
XS9D111A2M12 3/85
XS9E111A1L01M12 3/83
XS9E111A1L2 3/83
XS9E111A2L01M12 3/85
XS9E111A2L2 3/85
XS9E11RMBL01U20 3/77
XS9E11RPBL01M12 3/77
XS9F111A1L01M8 3/83
XS9F111A1L2 3/83
XS9F111A2L01M8 3/85
XS9F111A2L2 3/85
XSAV11373 3/75
XSAV11801 3/75
XSAV12373 3/75
XSAV12801 3/75
XSAZ108 5/98
XSAZ108 5/160
XSAZ118 5/160
XSCZ01 3/116
XSZA020 3/116
XSZA034 3/116
XSZB104 3/116
XSZB105 3/116
XSZB108 3/24
3/25
3/28
3/29
3/35
3/36
3/38
3/55
3/63
3/66
3/116
5/98
5/160
XSZB112 3/24
3/25
3/28
3/29
3/32
3/35
3/36
3/38
3/40
3/42
3/52
3/55
3/58
3/63
3/66
3/70
3/94
3/116
6/24
XSZB118 3/24
3/25
3/28
3/29
3/32
3/35
3/36
3/38
3/40
3/42
3/52
3/55
3/58
3/63
3/66
3/70
3/94
3/96
3/116
5/160
6/24
XSZB130 3/24
3/25
3/28
3/29
3/32
3/35
3/36
3/38
3/40
3/42
3/52
3/55
3/58
3/63
3/66
3/70
3/94
3/96
3/116
6/24
XSZB165 3/24
3/25
3/28
3/35
3/38
3/66
3/116
XSZBC00 3/116
7/21
XSZBC10 3/116
XSZBC90 3/116
XSZBC90 7/21
XSZBD10 3/116
6/24
XSZBE00 3/116
7/21
XSZBE10 3/116
XSZBE90 3/116
7/21
XSZBF00 3/116
XSZBF90 3/116
XSZBJ00 3/116
XSZBJ90 3/116
XSZBPM12 3/70
3/77
3/116
XSZBS12 3/88
3/90
XSZBS30 3/88
3/90
3/92
XSZE105 3/116
XSZE108 3/116
XSZE112 3/116
XSZE118 3/116
5/160
XSZE130 3/116
XSZE208 3/116
XSZE212 3/116
XSZE218 3/116
5/94
5/160
XSZE230 3/116
XSZE308 3/116
XSZE312 3/116
XSZE318 3/116
5/94
5/160
XSZE330 3/116
XSZF10 3/116
XSZMCR03 5/91
XSZMCR10 5/91
XSZP112 3/116
XSZP118 3/116
XSZP130 3/116
XSZPE13 3/116
XSZPKC2 3/113
XSZPSC2 3/113
XSZVF03 3/116
XSZVF04 3/116
XSZVF05 3/116
XT112S1NAL2 4/8
XT112S1PAL2 4/8
XT112S1PCL2 4/8
XT112S1PCM12 4/8
XT118B1FAL2 4/8
XT118B1FBL2 4/8
XT118B1NAL2 4/8
XT118B1PAL2 4/8
XT118B1PCL2 4/8
XT118B1PCM12 4/8
XT130B1FAL2 4/8
XT130B1FBL2 4/8
XT130B1NAL2 4/8
XT130B1PAL2 4/8
XT130B1PCL2 4/8
XT130B1PCM12 4/8
XT132B1FAL2 4/8
XT132B1FBL2 4/8
XT218A1FAL2 4/12
XT218A1NAL2 4/12
XT218A1PAL2 4/12
XT218A1PCM12 4/12
XT230A1FAL2 4/12
XT230A1FBL2 4/12
XT230A1NAL2 4/12
XT230A1PAL2 4/12
XT230A1PCM12 4/12
XT232A1FAL2 4/12
XT232A1FBL2 4/12
XT7C40FP262 4/16
XT7C40NC440 4/16
XT7C40PC440 4/16
XTAZ30 3/116
XU1N18NP341 5/94
XU1N18NP341D 5/94
XU1N18NP341W 5/94
XU1N18NP341WD 5/94
XU1N18PP341 5/94
XU1N18PP341D 5/94
XU1N18PP341W 5/94
XU1N18PP341WD 5/94
XU2M18AP20D 5/120
XU2M18MA230 5/152
XU2M18MA230K 5/152
XU2M18MA230W 5/152
XU2M18MA230WK 5/152
XU2M18MB230 5/152
XU2M18MB230K 5/152
XU2M18MB230W 5/152
XU2M18MB230WK 5/152
XU2N18NP341 5/94
XU2N18NP341D 5/94
XU2N18NP341W 5/94
XU2N18NP341WD 5/94
XU2N18PP341 5/94
XU2N18PP341D 5/94
XU2N18PP341W 5/94
XU2N18PP341WD 5/94
XU5M18AB20D 5/116
XU5M18MA230 5/152
XU5M18MA230K 5/152
XU5M18MA230W 5/152
XU5M18MA230WK 5/152
XU5M18MB230 5/152
XU5M18MB230K 5/152
XU5M18MB230W 5/152
XU5M18MB230WK 5/152
XU5M18U1D 5/80
XU5N18NP341 5/94
XU5N18NP341D 5/94
XU5N18NP341W 5/94
XU5N18NP341WD 5/94
XU5N18PP341 5/94
XU5N18PP341D 5/94
XU5N18PP341W 5/94
XU5N18PP341WD 5/94
XU8M18MA230 5/152
XU8M18MA230K 5/152
XU8M18MA230W 5/152
XU8M18MA230WK 5/152
XU8M18MB230 5/152
XU8M18MB230K 5/152
XU8M18MB230W 5/152
XU8M18MB230WK 5/152
XU9M18MA230 5/152
XU9M18MA230K 5/152
XU9M18MA230W 5/152
XU9M18MA230WK 5/152
XU9M18MB230 5/152
XU9M18MB230K 5/152
XU9M18MB230W 5/152
XU9M18MB230WK 5/152
XU9N18NP341 5/94
XU9N18NP341D 5/94
XU9N18NP341W 5/94
XU9N18NP341WD 5/94
XU9N18PP341 5/94
XU9N18PP341D 5/94
XU9N18PP341W 5/94
XU9N18PP341WD 5/94
XUAH02●● 5/98
XUAH02●●S 5/98
XUAH05●● 5/98
XUAH05●●S 5/98
XUAJ02●● 5/98
XUAJ02●●S 5/98
XUAJ05●● 5/98
XUAJ05●●S 5/98
XUB0AKSNL2T 5/32
XUB0AKSNM12T 5/32
XUB0AKSWL2T 5/32
XUB0AKSWM12T 5/32
XUB0ANSNL2 5/32
XUB0ANSNM12 5/32
XUB0ANSWL2 5/32
XUB0ANSWM12 5/32
XUB0APSNL2 5/32
XUB0APSNM12 5/32
XUB0APSWL2 5/32
XUB0APSWM12 5/32

Product reference index

XUB0BKSNL2T 5/32
XUB0BKSNM12T 5/32
XUB0BKSWL2T 5/32
XUB0BKSWM12T 5/32
XUB0BNSNL2 5/32
XUB0BNSNM12 5/32
XUB0BNSWL2 5/32
XUB0BNSWM12 5/32
XUB0BPSNL2 5/32
XUB0BPSNM12 5/32
XUB0BPSWL2 5/32
XUB0BPSWM12 5/32
XUB0SKSNL2T 5/92
XUB0SKSNM12T 5/92
XUB0SKSWL2T 5/92
XUB0SKSWM12T 5/92
XUB0SNSNL2 5/92
XUB0SNSNM12 5/92
XUB0SNSWL2 5/92
XUB0SNSWM12 5/92
XUB0SPSNL2 5/92
XUB0SPSNM12 5/92
XUB0SPSWL2 5/92
XUB0SPSWM12 5/92
XUB1AN••M12 5/28
XUB1AP••M12 5/28
XUB1BN••M12 5/30
XUB1BPAWM12 5/30
XUB1BP••M12 5/30
XUB2AKS•M12T 5/28
XUB2A•••M12R 5/28
XUB2BKS•M12T 5/30
XUB2BKSWM12T 5/30
XUB2BN••M12R 5/30
XUB2BP••M12R 5/30
XUB4AN••M12 5/28
XUB4AP••M12 5/28
XUB4BN••M12 5/30
XUB4BP••M12 5/30
XUB5AN••M12 5/28
XUB5AP••M12 5/28
XUB5BN••M12 5/30
XUB5BP••M12 5/30
XUB9AN••M12 5/28
XUB9AP••M12 5/28
XUB9BN••M12 5/30
XUB9BPAWM12 5/30
XUB9BPBNM12 5/30
XUB9BPBWM12 5/30
XUB9BP••M12 5/30
XUBLAKCNL2T 5/112
XUBLAKCNM12T 5/112
XUBLANCNL2 5/112
XUBLANCNL2R 5/112
XUBLANCNM12 5/112
XUBLANCNM12R 5/112
XUBLAPCNL2 5/112
XUBLAPCNL2R 5/112
XUBLAPCNM12 5/112
XUBLAPCNM12R 5/112
XUBLBKCNL2T 5/112
XUBLBKCNM12T 5/112
XUBLBNCNL2 5/112
XUBLBNCNL2R 5/112
XUBLBNCNM12 5/112
XUBLBNCNM12R 5/112
XUBLBPCNL2 5/112
XUBLBPCNL2R 5/112
XUBLBPCNM12 5/112
XUBLBPCNM12R 5/112
XUBT1•SNL2 5/84
XUBT1•SNM12 5/84
XUBTANS•L2 5/84
XUBTANS•M12 5/84
XUBTSNS•L2 5/84
XUBTSNS•M12 5/84
XUBTSPS•L2 5/84
XUBTSPS•M12 5/84
XUDA1•SML2 5/128
XUDA1•SMM8 5/128
XUDA2•SML2 5/128
XUDA2•SMM8 5/128
XUE5AA2NM12 5/118
XUE•AA2NM12 5/118
XUFN01321 5/133
XUFN01331 5/133
XUFN02323 5/133
XUFN04331 5/133
XUFN05321 5/132
XUFN05321L10 5/132
XUFN05323 5/132
XUFN05331 5/132
XUFN12301 5/130
XUFN12301L10 5/130
XUFN12311 5/130
XUFN2•01L10 5/131
XUFN2•01L2 5/131
XUFN35301 5/130
XUFN35311 5/131
XUFN5P01L10 5/133
XUFN5P01L2 5/133
XUFN5S01L10 5/133
XUFN5S01L2 5/133
XUFS••20 5/134
XUFZ08 5/136
XUFZ08 5/161
XUFZ0• 5/136
XUFZ1• 5/136
XUFZ210 5/136
XUFZ310 5/136
XUFZ910 5/135
XUFZ911 5/135
XUFZ920 5/135
XUFZ921 5/135
XUJB06031H60 5/156
XUJK803538 5/114
XUJZ01 5/160
XUK0AKSAL2 5/44
XUK0AKSAL2T 5/44
XUK0AKSAM12 5/44
XUK0AKSAM12T 5/44
XUK0ARCTL2 5/44
XUK0ARCTL2T 5/44
XUK1AN•NL2 5/42
XUK1AN•NM12 5/42
XUK1APBNL2 5/42
XUK1APBNM12 5/42
XUK1AP•NL2 5/42
XUK1AP•NM12 5/42
XUK1ARCNL2 5/42
XUK1ARCNL2H6• 5/154
XUK2AKSNL2T 5/42
XUK2AKSNM12T 5/42
XUK2A••NL2R 5/42
XUK2A••NM12R 5/42
XUK2ARCNL2T 5/42
XUK2LAKSMM12T 5/104
XUK2LAPSMM12R 5/104
XUK5AN•NL2 5/42
XUK5AN•NM12 5/42
XUK5APANL2 5/42
XUK5APANM12 5/42
XUK5APBNL2 5/42
XUK5APBNM12 5/42
XUK5ARCNL2 5/42
XUK5LAPSMM12 5/104
XUK8AKSNL2 5/46
XUK8AKSNM12 5/46
XUK8ARCTL2 5/48
XUK8LAPPNM12 5/104
XUK8TAE1MM12 5/181
XUK8TAE2MM12 5/181
XUK8TAKDMM12 5/181
XUK8TAKSMM12 5/181
XUK9A••NL2 5/42
XUK9A••NM12 5/42
XUK9ARCNL2 5/42
XUK9LAPSMM12 5/104
XUK9TAH2MM12 5/181
XUKC1•SMM12 5/90
XUKR1•SMM12 5/74
XUKT1KSML2 5/88
XUKT1KSMM12 5/88
XULA040•19 5/148
XULA040•19K 5/148
XULA060•1 5/148
XULA060•1K 5/148
XULA700•15 5/148
XULA700•15K 5/148
XULZ41 5/160
XUM0AKSAL2T 5/38
XUM0AKSAM8T 5/38
XUM0A•SAL2 5/38
XUM0A•SAM8 5/38
XUM2AKCN••T 5/34
XUM2ANCNM8R 5/34
XUM2A•CNL2 5/34
XUM2A•CNL2R 5/34
XUM2A•CNM8 5/34
XUM5A•CNL2 5/34
XUM5A•CNM8 5/34
XUM8ANCNM8 5/40
5/41
XUM8APCNL03M12 5/40
5/41
XUM8A•CNL2 5/40
XUM8APCNL2 5/41
XUM8APCNM8 5/40
5/41
XUM9A•CNL2 5/34
XUM9A•CNM8 5/34
XUMTAPCNL03M12 5/86
5/87
XUMTA•CNL2 5/86
XUMTAPCNL2 5/87
XUMTA•CNM8 5/86
XUMTAPCNM8 5/87
XURK1KSMM12 5/78
XURZ0• 5/161
XUVA0505PANM8 5/56
XUVK0252S 5/66
XUVK0252VS 5/66
XUV•0312 5/70
XUVR0605NANM8 5/56
XUVR0605NBNM8 5/56
XUVR0605PANM8 5/56
XUVR0605PBNM8 5/56
XUVR0608NANM8 5/56
XUVR0608NBNM8 5/56
XUVR0608PANM8 5/56
XUVR0608PBNM8 5/56
XUVR1212NANM8 5/56
XUVR1212NBNM8 5/56
XUVR1212PANM8 5/56
XUVR1212PBNM8 5/56
XUVR1218NANM8 5/56
XUVR1218NBNM8 5/56
XUVR1218PANM8 5/56
XUVR1218PBNM8 5/56
XUWSA06R 5/196
XUWSA06W 5/196
XUWSA12R 5/196
XUWSA12W 5/196
XUX0AKSAM12 5/52
XUX0AKSAM12T 5/50
5/52
XUX0AKSAT16 5/52
XUX0AKSAT16T 5/50
5/52
XUX0ARCTT16 5/52
XUX0ARCTT16T 5/50
5/52
XUX1ANANM12 5/50
XUX1ANANT16 5/50
XUX1ANBNM12 5/50
XUX1ANBNT16 5/50
XUX1APANM12 5/50
XUX1APANT16 5/50
XUX1APBNM12 5/50
XUX1APBNT16 5/50
XUX1ARCNT16 5/50
XUX2ANANM12R 5/50
XUX2ANANT16R 5/50
XUX2ANBNM12R 5/50
XUX2ANBNT16R 5/50
XUX2APANM12R 5/50
XUX2APANT16R 5/50
XUX2APBNM12R 5/50
XUX2APBNT16R 5/50
XUX2ARCNT16R 5/50
XUX5ANANM12 5/50
XUX5ANANT16 5/50
XUX5ANBNM12 5/50
XUX5ANBNT16 5/50
XUX5APANM12 5/50
XUX5APANT16 5/50
XUX5APBNM12 5/50
XUX5APBNT16 5/50
XUX5ARCNT16 5/50
XUX8AKSAM12 5/54
XUX8AKSAT16 5/54
XUX8ARCTT16 5/54
XUX9ANANM12 5/50
XUX9ANANT16 5/50
XUX9ANBNM12 5/50
XUX9ANBNT16 5/50
XUX9APANM12 5/50
XUX9APANT16 5/50
XUX9APBNM12 5/50
XUX9APBNT16 5/50
XUX9ARCNT16 5/50
XUY1111 5/102
XUY11•• 5/100
XUY380NA5D03M8 5/109
XUY410NC3H1M12 5/109
XUY450NB3N03M8 5/109
XUY474NB4H03M12 5/108
XUY600NC5H2 5/109
XUY707ND4P2 5/109
XUY929 5/102
XUY9291 5/102
XUY9292 5/102
XUYA005 5/82
5/144
XUYA00510 5/144
XUYA00550 5/144
XUYA110 5/144
XUYA210 5/144
XUYA211 5/144
XUYA212 5/145
XUYA213 5/145
XUYA220 5/145
XUYA310 5/145
XUYAFP946S 5/146
XUYAFP966S 5/146
XUYAFPCO946S 5/146
XUYAFPCO966S 5/146
XUYAFV946S 5/146
XUYAFV966S 5/146
XUYAFVCO946S 5/146
XUYAFVCO966S 5/146
XUYAU005 5/145
XUYB952R 5/150
XUYB952S 5/150
XUYB954R 5/150
XUYB954S 5/150
XUYB989S• 5/100
XUYBCO929LSP 5/102
XUYBCO929LSP 5/103
XUYBCO989SN 5/100
XUYBCO989SP 5/100
XUYDCFCO966S 5/76
XUYE989 5/100
XUYECO989 5/100
XUYFALNEP1000•• 5/60
XUYFALNEP100120 5/60
XUYFALNEP400•• 5/60
XUYFALNEP40120 5/60
XUYFALNEP600•• 5/60
XUYFALNEP60120 5/60
XUYFANEP100002 5/58
XUYFANEP100005 5/58
XUYFANEP100015 5/58
XUYFANEP100030 5/58
XUYFANEP100050 5/58
XUYFANEP100080 5/58
XUYFANEP100120 5/58
XUYFANEP40002 5/58
XUYFANEP40005 5/58
XUYFANEP40015 5/58
XUYFANEP40030 5/58
XUYFANEP40050 5/58
XUYFANEP40080 5/58
XUYFANEP40120 5/58
XUYFANEP60002 5/58
XUYFANEP60005 5/58
XUYFANEP60015 5/58
XUYFANEP60030 5/58
XUYFANEP60050 5/58
XUYFANEP60080 5/58
XUYFANEP60120 5/58
XUYFLNEP100002 5/60
XUYFLNEP100005 5/60
XUYFLNEP100015 5/60
XUYFLNEP100030 5/60
XUYFLNEP100050 5/60
XUYFLNEP100080 5/60
XUYFLNEP100120 5/60
XUYFLNEP40002 5/60
XUYFLNEP40005 5/60
XUYFLNEP40015 5/60
XUYFLNEP40030 5/60
XUYFLNEP40050 5/60
XUYFLNEP40080 5/60
XUYFLNEP40120 5/60
XUYFLNEP60002 5/60
XUYFLNEP60005 5/60
XUYFLNEP60015 5/60
XUYFLNEP60030 5/60
XUYFLNEP60050 5/60
XUYFLNEP60080 5/60
XUYFLNEP60120 5/60
XUYFNEP1000•• 5/58
XUYFNEP400•• 5/58
XUYFNEP40120 5/58
XUYFNEP600•• 5/58
XUYFNEP60120 5/58
XUYFP2BRINA005B 5/145
XUYFPDC101 5/76
XUYFPDC61 5/76
XUYFPDCM8101 5/76
XUYFPDCM861 5/76
XUYFVERM•61 5/141
XUYFVERS•61 5/141
XUYFVERT•61 5/141
XUYFVPMD61 5/138
XUYFVPM•61 5/139
XUYFVPSD61 5/138
XUYFVPS•61 5/139
XUYFVPTC61 5/139
XUYFVPT•61 5/139
XUYP95•• 5/150
XUYP989S• 5/100
XUYPCCO929LSP 5/102
XUYPCO925L•ANSP 5/122
XUYPCO989S• 5/100
XUYPS1LCO965S 5/124
XUYPS2945S 5/126
XUYPS2CO945S 5/126
XUYPS989S• 5/100
XUYPSCO929L•SP 5/102
XUYPSCO929L•SP 5/103
XUYPSCO989S• 5/100
XUYR989S• 5/100
XUYRCO989S• 5/100
XUZ2001 5/30
5/32
5/38
5/42
5/44
5/50
5/52
5/84
5/152
5/161
7/21
6/24
XUZ2003 7/21
6/24
XUZ200• 5/28
XUZA118 3/90
3/92
4/12
5/28
5/30
5/32
5/84
5/92
5/94
5/112
5/116
5/120
5/152
5/160
6/24

Product reference index

XUZA41 5/160
XUZA49 5/150
5/160
XUZA50 5/34
5/38
5/160
XUZA51 5/42
5/44
5/75
5/91
5/160
XUZA51S 5/105
5/122
5/160
5/181
5/181
XUZA618 5/119
XUZAM01 5/34
XUZAM●● 5/34
XUZA●18 3/88
XUZASB001 5/160
XUZASK001 5/105
5/160
5/181
XUZASK002 5/105
5/160
XUZASK003 5/160
XUZASK004 5/181
5/181
XUZASM001 5/160
XUZASW001 5/181
5/196
XUZASW002 5/181
5/196
XUZASW003 5/196
XUZASW005 5/196
XUZASW006 5/196
XUZASW008 5/196
XUZASW009 5/196
XUZASY01A 5/109
XUZASY01H 5/109
XUZB2003 5/28
5/30
5/32
5/84
5/152
5/161
6/24
XUZB2005 3/90
5/92
5/160
XUZB2012 6/24
XUZB2030 6/24
XUZB32 3/116
XUZC08 5/34
5/158
XUZC16 5/158
XUZC21 5/158
XUZC250 5/119
5/181
XUZC31 5/158
XUZC39 5/158
XUZC40S22 5/158
XUZC50 5/28
5/30
5/32
5/34
5/38
5/42
5/44
5/50
5/52
5/84
5/86
5/92
5/158
XUZC50CR 5/86
5/158
XUZC50HP 5/84
5/105
XUZC80 5/158
XUZCR0201CR 5/158
XUZCR0401CRHP 5/158
XUZCR0401HP 5/158
XUZCR0402 5/158
XUZCR0402CR 5/158
XUZD15 5/160
XUZD25 5/160
XUZE04 3/116
5/161
XUZE06 3/116
XUZE08 3/116
XUZK2000 5/91
5/42
5/44
5/161
XUZK200● 5/75
XUZLR001 5/196
XUZLR002 5/196
XUZLR033 5/196
XUZLR063 5/196
XUZLR103 5/196
XUZLW001 5/196
XUZLW002 5/196
XUZM2003 5/161
5/38
XUZM200● 5/38
XUZMSH05 5/34
XUZMSH10 5/34
XUZMSH15 5/34
XUZMSH20 5/34
XUZMSV05 5/34
XUZMSV10 5/34
XUZMSV15 5/34
XUZMSV20 5/34
XUZMU01 5/34
XUZSW003 5/189
XUZX2000 5/50
5/52
5/160
XUZX2001 5/52
5/161
XUZX2002 5/52
5/161
XUZX2003 5/50
5/52
5/161
XUZX2004 5/50
5/52
5/161
XX218A3NFM12 6/24
XX218A3NHM12 6/24
XX218A3PFM12 6/24
XX218A3PHM12 6/24
XX230A10PA00M12 6/24
XX230A11PA00M12 6/24
XX230A12NA00M12 6/24
XX230A12PA00M12 6/24
XX230A20PA00M12 6/24
XX230A21PA00M12 6/24
XX230A22NA00M12 6/24
XX230A22PA00M12 6/24
XX512A1KAM8 6/14
XX512A2NAM8 6/14
XX512A2PAM8 6/14
XX518A1KAM12 6/14
XX518A3NAL2 6/14
XX518A3NAM12 6/14
XX518A3PAL2 6/14
XX518A3PAM12 6/14
XX630A1KAM12 6/14
XX630A1NCM12 6/14
XX630A1PCM12 6/14
XX630A2NCM12 6/14
XX630A2PCM12 6/14
XX630A3NCM12 6/14
XX630A3PCM12 6/14
XX630S1NCM12 6/14
XX630S1PCM12 6/14
XX6V3A1NAM12 6/14
XX6V3A1PAM12 6/14
XX7F1A2NAL01M12 6/18
XX7F1A2PAL01M12 6/18
XX7K1A2NAM12 6/18
XX7K1A2PAM12 6/18
XX7V1A1NAM12 6/18
XX7V1A1PAM12 6/18
XX8D1A1NAM12 6/18
XX8D1A1PAM12 6/18
XX918A3C2M12 6/20
XX918A3F1M12 6/20
XX930A1A1230M12 6/20
XX930A1A1M12 6/20
XX930A1A2230M12 6/20
XX930A1A2M12 6/20
XX930A2A1230M12 6/20
XX930A2A1M12 6/20
XX930A2A2230M12 6/20
XX930A2A2M12 6/20
XX930A3A1M12 6/20
XX930A3A2M12 6/20
XX930S1A1M12 6/20
XX930S1A2M12 6/20
XX9D1A1C2M12 6/20
XX9D1A1F1M12 6/20
XX9V1A1C2M12 6/20
XX9V1A1F1M12 6/20
XX9V3A1C2M12 6/20
XX9V3A1F1M12 6/20
XXB18A3PAM12 6/15
XXBD1A1PAM12 6/18
XXBV1A1PAM12 6/18
XXBV3A1PAM12 6/15
XXR12A8KAM8 6/15
XXR12A8KBM8 6/15
XXR18A3KAM12 6/15
XXR18A3KBM12 6/15
XXR18A4KAM12 6/15
XXR18A4KBM12 6/15
XXRF1A8KAM12L 6/18
XXRF1A8KBM12L 6/18
XXRK1A3KAM12 6/18
XXRK1A3KBM12 6/18
XXRK1A4KAM12 6/18
XXRK1A4KBM12 6/18
XXT12A8M8 6/15
XXT18A3M12 6/15
XXT18A4M12 6/15
XXTF1A8M12L 6/18
XXTK1A3M12 6/18
XXTK1A4M12 6/18
XXV18B1NAL10 6/14
XXV18B1NAL2 6/14
XXV18B1NAL5 6/14
XXV18B1NAM12 6/14
XXV18B1NBL10 6/14
XXV18B1NBL2 6/14
XXV18B1NBL5 6/14
XXV18B1NBM12 6/14
XXV18B1PAL10 6/14
XXV18B1PAL2 6/14
XXV18B1PAL5 6/14
XXV18B1PAM12 6/14
XXV18B1PBL10 6/14
XXV18B1PBL2 6/14
XXV18B1PBL5 6/14
XXV18B1PBM12 6/14
XXZ12 4/12
XXZ12 6/24
XXZ1933 6/24
XXZ30 6/24
XXZ3074F 6/24
XXZ3074S 6/24
XXZPB100 6/15
6/20
4/12
6/18
XZBWR2STT24 1/145
XZCC12FCM40B 2/15
2/21
2/37
2/39
2/47
6/24
XZCC12FCM50B 2/47
5/119
XZCC12FCP40B 6/24
XZCC12FDB50R 7/21
8/44
XZCC12FDM40B 2/15
2/21
2/37
2/39
2/47
7/21
6/24
XZCC12FDM50B 2/47
5/119
XZCC12FDP40B 6/24
XZCC12MCM40B 2/39
XZCC12MDB50R 7/21
7/32
8/44
XZCC12MDM40B 2/39
XZCC23FDP120S 8/35
XZCC23FDP160S 8/35
XZCC23FMDP120S 8/35
XZCC43FCP40B 2/15
2/37
2/116
XZCC8FCM30V 6/24
XZCC8FCM40V 6/24
XZCC8FDM30V 6/24
XZCC8FDM40V 6/24
XZCCHFDM370S 8/35
XZCP0166L2 6/24
XZCP0266L2 6/24
XZCP0566L2 5/56
XZCP0566L5 5/56
XZCP0666L2 5/56
XZCP0666L5 5/56
XZCP0941L1● 7/21
XZCP0941L2 5/58
5/60
5/62
5/64
5/76
5/82
5/102
5/124
5/126
5/146
7/21
XZCP1041L2 5/60
5/62
5/64
5/76
5/82
5/102
5/124
5/126
5/146
XZCP1041L● 5/58
XZCP1141L10 2/21
2/37
2/39
2/47
3/49
3/98
3/106
XZCP1141L1● 2/15
XZCP1141L2 6/24
2/21
2/37
2/39
2/47
3/49
3/98
3/106
5/122
XZCP1141L20 2/39
XZCP1141L● 2/15
XZCP1164L10 1/18
1/108
1/117
XZCP1164L2 1/108
1/117
5/122
XZCP1164L● 1/18
XZCP1169L10 1/18
XZCP1169L● 1/18
XZCP1241L10 2/21
2/37
2/39
2/47
3/49
3/98
3/106
XZCP1241L2 6/24
2/21
2/37
2/39
2/47
3/49
3/98
3/106
XZCP1241L20 2/39
XZCP1241L● 2/15
XZCP1241L●● 2/15
XZCP1264L10 1/18
1/108
XZCP1264L2 1/18
1/108
XZCP1264L5 1/18
1/108
XZCP1764L10 1/110
XZCP1764L2 1/110
XZCP1764L5 1/110
XZCP1771L10 1/18
XZCP1771L2 1/18
XZCP1771L5 1/18
XZCP1865L10 3/49
XZCP1865L5 3/49
XZCP1965L10 3/49
XZCP1965L5 3/49
XZCP29P12L10 5/181
XZCP29P12L2 5/181
XZCP29P12L5 5/181
XZCPA1141L10 3/88
3/90
3/94
XZCPA1141L2 3/88
3/90
3/94
XZCPA1141L5 3/88
3/90
3/94
5/105
XZCPA1241L10 3/88
3/90
3/94
XZCPA1241L2 3/88
3/90
3/94
XZCPA1241L5 3/88
3/90
3/94
5/105
XZCPA1865L10 3/92
3/96
XZCPA1865L5 3/92
3/96
XZCPA1965L10 3/92
3/96
XZCPA1965L5 3/92
3/96
XZCPB44P14L10 5/189
XZCPB44P14L5 5/189
XZCPB45P14L10 5/189
XZCPB45P14L5 5/189
XZCPV1141L10 2/37
3/63
XZCPV1141L2 2/37
XZCPV1141L5 2/37
3/63
XZCPV11V12L10 2/47
5/181
XZCPV11V12L2 2/47
5/181
XZCPV11V12L5 2/47
5/181
XZCPV1241L10 2/37
XZCPV1241L2 2/37
XZCPV1241L5 2/37
XZCPV12V12L10 2/47
5/181
XZCPV12V12L2 2/47
5/181
XZCPV12V12L5 2/47
5/181
XZCR1511040A1 2/39
XZCR1511040A2 2/39
XZCR1511041C1 2/47
5/109

Product reference index

XZCR1511041C2 2/47
5/109
XZCR1511064D1 2/47
XZCR1511064D2 2/47
XZCR1512040A1 2/39
XZCR1512040A2 2/39
XZCR1512041C1 2/47
5/109
XZCR1512041C2 2/47
5/109
XZCR1512064D1 2/47
XZCR1512064D2 2/47
XZCRA151140A2 3/90
3/94
XZCRA151140A5 3/90
3/94
XZCRB4444P14L05 5/189
XZCRB4444P14L2 5/189
XZCRB4545P14L05 5/189
XZCRB4545P14L2 5/189

Z

ZB5AZ905 7/32
ZBRA1 1/143
ZBRA2 1/143
ZBRCETH 1/143
ZBRN1 1/142
ZBRN2 1/142
ZBRRC 1/141
ZBRRD 1/141
ZC1AC001 1/184
ZC1AC005 1/184
ZC1AC006 1/184
ZC1AC007 1/184
ZC1AC008 1/184
ZC1AC009 1/184
ZC1AZ11 1/184
ZC1AZ12 1/184
ZC1AZ13 1/184
ZC1AZ14 1/184
ZC1AZ15 1/184
ZC1AZ16 1/184
ZC1AZ17 1/184
ZC1AZ8 1/184
ZC1ZB211 1/228
ZC2JC1 1/172
ZC2JC1 1/155
ZC2JC15 1/176
ZC2JC16 1/174
ZC2JC18 1/187
ZC2JC2 1/187
ZC2JC25 1/176
ZC2JC26 1/174
ZC2JC28 1/187
ZC2JC4 1/187
ZC2JC45 1/176
ZC2JC46 1/174
ZC2JC48 1/187
ZC2JD1 1/187
ZC2JD16 1/174
ZC2JD2 1/187
ZC2JD26 1/174
ZC2JD4 1/187
ZC2JD46 1/174
ZC2JE01 1/172
ZC2JE01 1/168
ZC2JE015 1/178
ZC2JE016 1/174
ZC2JE02 1/168
ZC2JE025 1/178
ZC2JE026 1/174
ZC2JE03 1/168
ZC2JE035 1/178
ZC2JE036 1/174
ZC2JE04 1/168
ZC2JE045 1/178
ZC2JE046 1/174
ZC2JE05 1/172
ZC2JE05 1/168
ZC2JE056 1/174
ZC2JE06 1/168
ZC2JE065 1/178
ZC2JE066 1/174
ZC2JE07 1/168
ZC2JE075 1/178
ZC2JE076 1/174
ZC2JE09 1/168
ZC2JE095 1/178
ZC2JE096 1/174
ZC2JE61 1/152
1/172
ZC2JE615 1/176
ZC2JE616 1/174
ZC2JE62 1/172
1/152
ZC2JE625 1/176
ZC2JE626 1/174
ZC2JE63 1/172
1/152
ZC2JE635 1/176
ZC2JE636 1/174
ZC2JE64 1/152
ZC2JE645 1/176
ZC2JE646 1/174
ZC2JE65 1/152
ZC2JE655 1/176
ZC2JE656 1/174
ZC2JE66 1/152
ZC2JE665 1/176
ZC2JE666 1/174
ZC2JE70 1/168
ZC2JE705 1/178
ZC2JE706 1/174
ZC2JE81 1/152
ZC2JE815 1/176
ZC2JE816 1/174
ZC2JE82 1/152
ZC2JE825 1/176
ZC2JE826 1/174
ZC2JE83 1/152
ZC2JE835 1/176
ZC2JE836 1/174
ZC2JE84 1/152
ZC2JE845 1/176
ZC2JE846 1/174
ZC2JE85 1/152
ZC2JE855 1/176
ZC2JE856 1/174
ZC2JY11 1/172
1/152
1/174
ZC2JY115 1/178
ZC2JY12 1/152
1/174
1/178
ZC2JY13 1/152
1/174
1/178
ZC2JY215 1/178
ZC2JY31 1/172
1/152
1/174
ZC2JY315 1/178
ZC2JY415 1/178
ZC2JY51 1/172
1/152
1/174
1/178
ZC2JY61 1/152
1/174
ZC2JY615 1/178
ZC2JY71 1/152
1/174
ZC2JY715 1/178
ZC2JY81 1/152
1/174
ZC2JY815 1/178
ZC2JY91 1/152
1/174
ZC2JY915 1/178
ZC4CB2 1/228
ZCD29M12 1/42
1/43
ZCD2● 1/39
1/48
ZCD31 1/48
ZCD35 1/48
ZCD37 1/38
1/39
1/48
ZCD39 1/38
1/39
1/48
ZCDEP16 1/38
1/39
ZCE01 1/13
1/17
1/33
1/37
1/39
1/43
1/45
ZCE02 1/12
1/16
ZCE02 1/32
1/36
1/38
1/42
1/44
ZCE05 1/25
1/50
ZCE06 1/13
1/17
1/33
1/37
1/39
1/43
1/44
1/12
1/16
1/32
1/36
1/38
1/42
1/44
ZCE11 1/12
1/16
1/32
1/36
1/38
1/42
1/44
ZCE21 1/32
1/36
1/38
1/42
1/44
ZCE24 1/12
1/16
ZCE27 1/32
1/36
1/38
1/42
ZCE28 1/32
1/36
1/38
1/42
ZCEF0 1/12
1/16
ZCEF2 1/12
1/16
ZCEG1 1/12
1/16
ZCEH0 1/33
1/37
1/39
1/43
1/45
ZCEH2 1/33
1/37
1/39
1/43
1/45
ZCKD●● 1/76
1/78
1/93
1/104
ZCKE61 1/104
ZCKE67 1/104
ZCKE●●● 1/125
1/128
ZCKJ01 1/115
ZCKJ0121 1/119
ZCKJ0134 1/119
ZCKJ02 1/115
ZCKJ04 1/115
ZCKJ1 1/114
1/124
1/127
ZCKJ11 1/115
1/124
ZCKJ1121 1/116
ZCKJ1121H29 1/116
ZCKJ1134 1/116
ZCKJ1134H29 1/116
ZCKJ115 1/127
ZCKJ115H29 1/127
ZCKJ115H7 1/127
ZCKJ11H29 1/115
ZCKJ11H29 1/124
ZCKJ11H7 1/115
1/124
ZCKJ120 1/116
ZCKJ121 1/116
ZCKJ121H29 1/116
ZCKJ134 1/116
ZCKJ134H29 1/116
ZCKJ1D 1/117
ZCKJ1H29 1/114
1/124
1/127
ZCKJ1H7 1/114
1/124
1/127
ZCKJ2 1/114
1/124
ZCKJ21 1/115
1/124
ZCKJ215 1/127
ZCKJ215H29 1/127
ZCKJ215H7 1/127
ZCKJ21H29 1/115
1/124
ZCKJ21H7 1/115
1/124
ZCKJ25 1/127
ZCKJ25H29 1/127
ZCKJ25H7 1/127
ZCKJ2H29 1/114
1/124
ZCKJ2H7 1/114
1/124
ZCKJ4 1/114
1/124
ZCKJ404 1/115
ZCKJ4045 1/127
ZCKJ4045H29 1/127
ZCKJ4045H7 1/127
ZCKJ4046 1/124
ZCKJ4046H29 1/124
ZCKJ4046H7 1/124
ZCKJ404H29 1/115
ZCKJ404H7 1/115
ZCKJ41 1/115
1/124
ZCKJ4104 1/115
ZCKJ41045 1/127
ZCKJ41045H29 1/127
ZCKJ41045H7 1/127
ZCKJ41046 1/124
ZCKJ41046H29 1/124
ZCKJ41046H7 1/124
ZCKJ4104H29 1/115
ZCKJ4104H7 1/115
ZCKJ415 1/127
ZCKJ415H29 1/127
ZCKJ415H7 1/127
ZCKJ41H29 1/115
1/124
ZCKJ41H7 1/115
1/124
ZCKJ45 1/127
ZCKJ45H29 1/127
ZCKJ45H7 1/127
ZCKJ4H29 1/114
1/124
ZCKJ4H7 1/114
1/124
ZCKJ5 1/114
1/124
1/127
ZCKJ520 1/116
ZCKJ521 1/116
ZCKJ521H29 1/116
ZCKJ534 1/116
ZCKJ534H29 1/116
ZCKJ5D 1/117
ZCKJ5H29 1/114
1/124
1/127
ZCKJ5H7 1/114
1/124
1/127
ZCKJ6 1/114
1/124
1/127
ZCKJ6D 1/117
ZCKJ6H29 1/114
1/124
1/127
ZCKJ6H7 1/114
1/124
1/127
ZCKJ7 1/114
1/124
1/127
ZCKJ7D 1/117
ZCKJ7H29 1/104
1/114
1/124
1/127
ZCKJ7H7 1/114
1/124
1/127
ZCKJ8 1/114
1/124
1/127
ZCKJ82A 1/119
ZCKJ8D 1/117
ZCKJ8H29 1/114
1/124
1/127
ZCKJ8H7 1/114
1/124
1/127
ZCKJ9 1/114
1/124
1/127
ZCKJ902 1/119
ZCKJ904 1/119
ZCKJ906 1/119
ZCKJ9H29 1/104
1/114
1/124
1/127
ZCKJ9H7 1/114
1/124
1/127
ZCKJD31 1/114
ZCKJD31H29 1/114
ZCKJD31H7 1/114
ZCKJD35 1/114
ZCKJD35H29 1/114
ZCKJD35H7 1/114
ZCKJD37 1/114
ZCKJD37H29 1/104
1/114
ZCKJD37H7 1/114
ZCKJD39 1/114
ZCKJD39H29 1/104
1/114
ZCKJD39H7 1/114
ZCKLD3● 1/85
ZCKLD3●H7 1/85
ZCKL● 1/78
1/84
ZCKL●H7 1/84
ZCKM1●29 1/84
ZCKM1●7 1/84
ZCKMD31●29 1/85
ZCKMD31●7 1/85
ZCKMD3● 1/85
ZCKM● 1/84
ZCKS1 1/93
ZCKS1●29 1/93

Product reference index

	1/98
ZCKS404	1/93
	1/98
ZCKS404H29	1/98
ZCKS●	1/98
ZCKY11	1/126
	1/129
ZCKY●●	1/104
ZCKY●●●	1/129
ZCKZ0●●	1/119
ZCMC21E1	1/24
ZCMC21E10	1/24
ZCMC21E2	1/24
ZCMC21E3	1/24
ZCMC21E5	1/24
ZCMC21E7	1/24
ZCMC21T1	1/24
ZCMC21T2	1/24
ZCMC21T5	1/24
ZCMC25T06	1/24
ZCMD21L08R12	1/16
	1/17
ZCMD21L08U78	1/16
	1/17
ZCMD29C12	1/16
	1/17
ZCMD29L1	1/12
	1/13
ZCMD37L1	1/12
	1/13
ZCMD39L1	1/12
	1/13
ZCMD41L1	1/12
	1/13
ZCMD61	1/24
ZCMD61C12	1/25
ZCMD61M12	1/25
ZCMD65	1/24
ZCMD69	1/24
ZCMD69C12	1/25
ZCMD77	1/24
ZCMD79	1/24
ZCMD81L1	1/24
ZCMD81L2	1/24
ZCMD81L5	1/24
ZCP21	1/48
ZCP21D44	1/48
ZCP25	1/48
ZCP26	1/48
ZCP27	1/32
	1/33
	1/48
ZCP28	1/48
ZCP29	1/32
	1/33
	1/48
ZCP29M12	1/36
	1/37
ZCP31	1/48
ZCP35	1/48
ZCP37	1/32
	1/33
	1/48
ZCP39	1/32
	1/33
	1/48
ZCPED44	1/48
ZCPEP16	1/32
	1/33
ZCT21G11	1/49
ZCT21N12	1/49
ZCT21P16	1/49
ZCT25G11	1/49
ZCT25N12	1/49
ZCT25P16	1/43
	1/44
	1/45
	1/49
ZCT26G11	1/49
ZCT26N12	1/49
ZCT26P16	1/44
	1/45
	1/49
ZCT27G11	1/49
ZCT27N12	1/49
ZCT27P16	1/44
	1/45
	1/49
ZCT28G11	1/49
ZCT28N12	1/49
ZCT28P16	1/44
	1/45
	1/49
ZCY15	1/13
	1/17
ZCY16	1/13
	1/17
ZCY17	1/13
	1/17
ZCY18	1/33
	1/37
	1/39
	1/43
	1/45
ZCY39	1/33
	1/37
	1/39
	1/43
	1/45
ZCY45	1/13
	1/17
	1/33
	1/37
	1/39
	1/43
	1/45
ZCY49	1/33
	1/37
	1/39
	1/43
ZEP3L524	1/202
ZEP3L529	1/202
ZEP4L326	1/200
ZEP4L454	1/200
ZMLPA1N2SH	2/37
ZMLPA1N2SH	2/39
ZMLPA1N2SW	2/37
	2/39
ZMLPA1P2SH	2/37
	2/39
ZMLPA1P2SW	2/37
	2/39
ZMLPA2N0SH	2/37
	2/39
ZMLPA2P0SH	2/37
	2/39
ZR2FA005	1/233
ZR2FA1	1/233
ZR2FA2	1/233
	6/24

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