

Proximity Sensors

File 9006



- Merlin Gerin**
- Modicon**
- Square D**
- Telemecanique**

Schneider Electric Brands

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Proximity Sensors

Inductive Sensors

Interpretation of Catalog Numbers



Proximity Sensors Example **X S 8 C 1 A 1 P A L 2**

Inductive Sensor																				
TYPE																				
Cylindrical Optimum		5																		
Cylindrical Universal		6																		
Optimum Rectangular		7																		
Universal Rectangular		8																		
Application Specific		9																		
FORMAT OR MODE																				
Rectangular 8x8x20			J	1																
Rectangular 8x15x32			F	1																
Rectangular 13x26x26			E	1																
Rectangular 15x40x40			C	1																
Rectangular 26x80x80			D	1																
Cylindrical smooth 4mm			L	4																
Cylindrical 5mm			0	5																
Cylindrical smooth 6mm			L	6																
Cylindrical 8mm			0	8																
Cylindrical 12mm			1	2																
Cylindrical 18mm			1	8																
Cylindrical 30mm			3	0																
FAMILY TYPE OR MATERIAL																				
Applications						1...9														
Plastic						A														
Metal						B														
Stainless Steel						S														
APPLICATION																				
Operating Mode							1...9													
Food & Beverage							A													
Namur							E													
Ferrous only							F													
Light industry							L													
Ferrous/Non-ferrous							M													
Non-ferrous only							N													
Speed Control							R													
Serdac							S													
Weld Field Immune							W													
OUTPUTS																				
DC 3 wire PNP										P										
DC 3 wire NPN										N										
DC 3 wire PNP/NPN										K										
DC 2 wire (3/4)										D										
DC 2 wire automobile (1/4)										C										
DC analog output										A										
AC 2 wire										F										
AC/DC 2 wire										M										
AC/DC 2 wire SCP protect										S										
AC/DC relay output										R										
BUS										B										
FUNCTION																				
Analog 0...10mA											1									
Analog 4.20mA											2									
N.O.											A									
N.C.											B									
N.O. + N.C.											C									
Programmable/wiring											P									
Programmable											S									
CABLING OR CONNECTION																				
M8X1 Nano (S)											M	8								
M12x1 Micro (D)											M	1	2							
7/8 16UN Mini (A)											U	7	8							
1/2 20 UNF Micro (K)											U	2	0							
Cable 0.1m											L	0	1							
Cable 2m											L	2								
Cable 5m											L	5								
Cable 10m											L	1	0							
M12 micro on0.1m pigtail											L	0	1	M	1	2				
PG 16 cable gland											T	1	6							

Proximity Sensors

NOTE: This table is intended to understand catalog number designations. It is NOT to be used to create numbers which may not exist. Consult your local field office

Rectangular Example	X	S	7	C	4	0	P	C	4	4	0	R30	H*
SENSOR TYPE													
Self Contained Component	X												
SENSING TECHNOLOGY													
Inductive Proximity		S											
Capacitive Proximity		T											
BODY STYLE													
Miniature			5										
Shielded			7										
Non-Shielded			8										
Block Style			D										
FAMILY TYPE													
Limit Switch Style - Plastic Body				C									
Compact Block				G									
Sub Compact Block				H									
Miniature				L									
Cubic				T									
MANUFACTURING CODES													
					.	.							
OUTPUT TYPE													
NPN							N	P					
PNP							P	P					
AC/DC Universal							M	A					
2 wire N.O./N.C.							D	P					
NPN N.O.+N.C.							N	C					
PNP N.O.+N.C.							P	C					
MANUFACTURING CODES													
									.	.	.		
SUFFIX													
2 Meter Cable or Conduit Opening												Blank	
Micro Connector -- DC												D	
Alternate Frequency												F	
Micro Connector -- AC/DC												K	
5 Meter Cable												L2	
10 Meter Cable												L10	
Mini Connector, Normally Open												R30	
Mini Connector, Normally Closed												R31	
Nano Connector -- DC												S	
Bulk Pack												TQ	

* H suffix, which MAY appear on device or carton label, is for manufacturing purposes only. It designates compliance with specific national standards. EX: H7 = UL and CSA approval, 0.5" conduit opening (where applicable). H suffixes should not be used when ordering (except when non US standards are required)

Tubular Example	X	S	1	M	1	8	P	A	3	7	0	D
SENSOR TYPE												
Self Contained	X											
SENSING TECHNOLOGY												
Inductive Proximity		S										
Capacitive Proximity		T										
BODY TYPE												
Shielded -- Metal Body			1									
Non-shielded -- Metal Body			2									
Non-shielded -- Plastic Body			4									
TYPE OF ENCLOSURE OR FAMILY												
Economy D				D								
Standard Length -- Threaded Metal CaseM				M								
Short Length -- Threaded Metal CaseN				N								
Unthreaded Metal CaseL				L								
Threaded Plastic CaseP				P								
BARREL DIAMETER												
4mm Diameter					0	4						
5mm Diameter					0	5						
6mm Diameter					0	6						
8mm Diameter					0	8						
12mm Diameter					1	2						
18mm Diameter					1	8						
30mm Diameter					3	0						
32mm Diameter					3	2						
MODEL TYPE												
Analogue								AB				
DC PNP								P				
DC NPN								N				
DC PNP/NPN, N.O./N.C. (Selectable)								K				
DC 2 Wire								D				
AC/DC 2 Wire (Universal)								M				
OUTPUT MODE												
N.O. (Normally Open)									A			
N.C. (Normally Closed)									B			
N.O. + N.C. Complementary									C			
N.O. or N.C. Selectable									P			
MANUFACTURING CODES												
									.	.	.	
CONNECTORS												
Nano (M8) DC OnlyS												S
Micro DC OnlyD												D
Micro AC OnlyK												K
Mini AC or DCA												A
Micro DC PigtailLD												LD
Mini AC or DC PigtailLA												LA
EXTENDED CABLE LENGTH												
5 Meter CableL1												L1
10 Meter CableL2												L2

Proximity Sensors

Proximity Sensors Selection Guide Cylindrical



Description	Metal Fully Shielded Fixed Sensing Range								Metal Fully Shielded/Non-Shielded		
	Standard Sensing Range				Extended Sensing Range				Auto Adaptable Adjustable Range		
	XS5				XS6				XS6		
Diameter (mm)	Ø 8	Ø 12	Ø 18	Ø 30	Ø 8	Ø 12	Ø 18	Ø 30	Ø 12	Ø 18	Ø 30
Nominal Sensing Distance Sn (mm)	1.5	2	5	10	2.5	4	8	15	4	8	15
Supply (Voltage Limits)											
DC 3 wire	10 - 36 V	10 - 36 V	10 - 36 V	10 - 36 V	10 - 58 V	10 - 36 V	10 - 36 V	10 - 36 V			
Maximum Load	200 mA	200 mA	200 mA	200 mA	200 mA	200 mA	200 mA	200 mA	100 mA	100 mA	100 mA
Dimension (mm)	Cable	M8x33	M12x33	M18x36.5	M30x40.6	M8x50	M12x50	M18x60	M18x60	-	-
	Connector	M8x42	M12x48	M18x48.6	M30x50.7	M8x61	M12x61	M18x72.2	M30x72.2	M12x50	M18x60
DC 2 wire	10 - 58 V	10 - 58 V	10 - 58 V	10 - 58 V	-	-	-	-	-	-	-
Maximum Load	100 mA	100 mA	100 mA	100 mA	-	-	-	-	-	-	-
Dimension (mm)	Cable	M8x50	M12x50	M18x52.5	M30x50	-	-	-	-	-	-
	Connector	M8x61	M12x61	M18x64.6	M30x64.2	-	-	-	-	-	-
DC 4 wire	-	-	-	-	-	-	-	-	-	-	-
Maximum Load	-	-	-	-	-	-	-	-	-	-	-
Dimension (mm)	Cable	-	-	-	-	-	-	-	-	-	-
	Connector	-	-	-	-	-	-	-	-	-	-
AC/DC 2 wire	-	-	-	-	-	20 - 264 V	20 - 264 V	20 - 264 V	-	-	-
Maximum Load	-	-	-	-	-	100 mA	100 mA	100 mA	-	-	-
Dimension (mm)	Cable	-	-	-	-	-	M12x50	M18x60	M30x60	-	-
	Connector	-	-	-	-	-	M12x61	M18x72.2	M30x72.2	-	-
Enclosure Rating											
Cable	IP67	IP68	IP68	IP68	IP67	IP68	IP68	IP68	-	-	-
Connector	IP67	IP67	IP67	IP67	IP67	IP67	IP67	IP67	IP67	IP67	IP67
Connection											
Cable Version	2 m (6.6')	2 m (6.6')	2 m (6.6')	2 m (6.6')	2 m (6.6')	2 m (6.6')	2 m (6.6')	2 m (6.6')	-	-	-
Connector Version	M8	M12	M12	M12	M8	M12/U20	M12/U20	M12/U20	-	-	-
Operating Temperature Rating	-13°F to +158°F (-25°C to +70°C)	-13°F to +158°F (-25°C to +70°C)	-13°F to +158°F (-25°C to +70°C)	-13°F to +158°F (-25°C to +70°C)	-13°F to +158°F (-25°C to +70°C)	-13°F to +158°F (-25°C to +70°C)	-13°F to +158°F (-25°C to +70°C)	-13°F to +158°F (-25°C to +70°C)	-13°F to +158°F (-25°C to +70°C)	-13°F to +158°F (-25°C to +70°C)	-13°F to +158°F (-25°C to +70°C)
Page Number	212	212	212	212	210	210	210	210	210	210	210

Proximity Sensors

Description	Plastic Unshielded				Metal Shielded/Non-Shielded Fixed Sensing Range							
	Standard Sensing Range				Standard Sensing Range (Classic)				Nominal Range, Miniature			
	XS4.P				XS1, 2M (N)				XS1, 2 L(N)			
												
Diameter (mm)	Ø 8	Ø 12	Ø 18	Ø 30	Ø 8	Ø 12	Ø 18	Ø 30	Ø 4	Ø 5	Ø 6.5	
Nominal Sensing Distance Shielded Sn (mm)	–	–	–	–	1.5	2	5	10	1	1	1.5	
Nominal Sensing Distance Unshielded Sn (mm)	2.5	4	8	15	2.5	4	8	15	–	–	2.5	
Supply (Voltage Limits)												
DC 3 wire	10 – 38 V	10 – 58 V	10 – 58 V	10 – 58 V	10 – 58 V	5 – 30 V	5 – 30 V	10 – 38 V				
Maximum Load	200 mA	200 mA	200 mA	200 mA	100 mA	200 mA	200 mA	200 mA	100 mA	100 mA	200 mA	
Dimension (mm)	Cable	M8x33	M12x33	M18x33	M30x40	M8x50	M12x50	M18x60	M30x60	M4x29	M5x29	M6.5x33
	Connector	M8x45	M12x45	M18x45	M30x50	M8x61	M12x61	M18x70	M30x70	M4x41	M5x41	M6.5x45
DC 2 wire	–	–	–	–	10 – 58 V	10 – 58 V	10 – 58 V	10 – 58 V	–	–	–	
Maximum Load	–	–	–	–	100 mA	100 mA	100 mA	100 mA	–	–	–	
Dimension (mm)	Cable	–	–	–	–	–	–	–	–	–	–	
	Connector	–	–	–	–	–	–	–	–	–	–	
DC 4 wire	10 – 38 V	–	–	–	–	–	–	10 – 38 V				
Maximum Load	200 mA	200 mA	200 mA	200 mA	–	–	–	–	–	–	200 mA	
Dimension (mm)	Cable	M8x50	M12x50	M18x60	M30x60	–	–	–	–	–	M6.5x50	
	Connector	M8x61	M12x61	M18x70	M30x70	–	–	–	–	–	–	
AC/DC 2 wire	20 - 264 V	20 - 264 V	–	–	–							
Maximum Load	100 mA	200 mA	200 mA	200 mA	100 mA	200 mA	200 mA	200 mA	–	–	–	
Dimension (mm)	Cable	M8x50	M12x50	M18x60	M30x60	2 m(6.6')	2 m(6.6')	2 m(6.6')	2 m(6.6')	–	–	–
	Connector	M8x61	M12x61	M18x70	M30x70	U20	U20	U20/U78	U20/U78	–	–	–
Enclosure Rating												
Cable	IP67	IP68	IP68	IP68	IP67	IP68	IP68	IP68	IP67	IP67	IP67	
Connector	IP67	IP67	IP67	IP67	IP67							
Connection												
Cable	2 m (6.6')	2 m (6.6')	2 m (6.6')	2 m (6.6')	2 m (6.6')							
Connector	M8 / U20	M12/U20	M12/U20	M12/U20	M12/U20	M12/U20	M12/U20	M12/U20	M8	M8	M8/M12	
Operating Temperature Rating	-13°F to +158°F (-25°C to +70°C)	-13°F to +176°F (-25°C to +80°C)	-13°F to +176°F (-25°C to +80°C)	-13°F to +176°F (-25°C to +80°C)	-13°F to +176°F (-25°C to +80°C)	-13°F to +158°F (-25°C to +70°C)	-13°F to +158°F (-25°C to +70°C)	-13°F to +158°F (-25°C to +70°C)	-13°F to +158°F (-25°C to +70°C)			
Page Number	226	236	240	248	224	232	240	248	218	220	222	

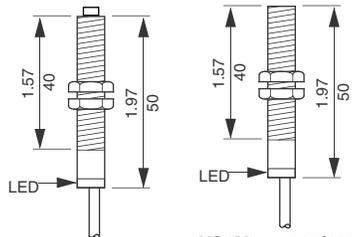
Proximity Sensors

XS Tubular, Inductive Sensors

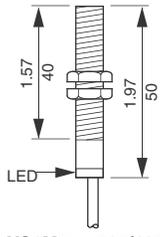
8 mm Diameter, DC; Universal Standard Length



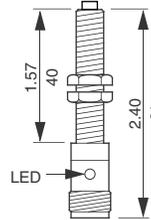
Proximity Sensors



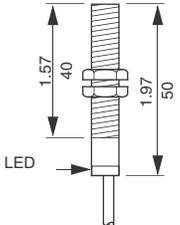
XS2M08PC410
XS2M08NC410



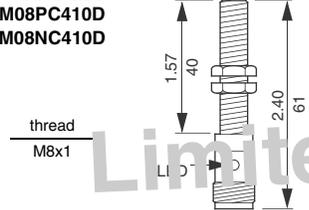
XS1M08



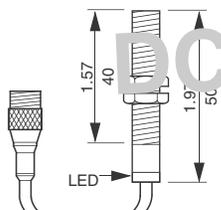
XS2M08PC410D
XS2M08NC410D



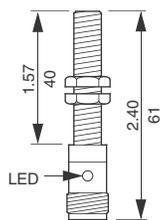
XS1M08



XS1M08



XSM08DA210LD



XS1M08

Dual Dimensions $\frac{\text{inches}}{\text{mm}}$

Features

- Faster troubleshooting aided by high visibility 360° indicators
- 2-wire versions simplify wiring
- Rugged case designed for very aggressive environments – cutting oils, grease, etc.
- Pigtail connectors maintain the cutting oil enclosure rating while removing the connector from the aggressive environment
- Worry-free replacement: standard length, extended temperature and supply voltage range, improved enclosure rating
- Significant replacement time savings using patented plastic mounting bracket (no gauging) or connectors
- Trouble-free operation ensured by extensive protective circuitry
- Works with unfiltered rectified power supply
- Metal mounting lock nuts included
- Normally closed (N.C.) output available on versions marked ★
- UL Listed, CSA Certified and CE Mark

Nominal Sensing Distance	Circuit Type	Output Mode ★	Voltage Range	Max. Load	Operating Frequency	Indicator LED ①	Mating Connector Style (see p. 518)	Catalog Number
--------------------------	--------------	---------------	---------------	-----------	---------------------	-----------------	-------------------------------------	----------------

Stainless steel case

Shielded, 2m (6.6') cable

1.5 mm	2-wire	N.O.★	12-24 V	100 mA	4000 Hz	A	-	XS1M08DA210
1.5 mm	2-wire	N.C.★	12-24 V	100 mA	4000 Hz	A	-	XS1M08PA370
1.5 mm	PNP	N.O.★	12-48 V	200 mA	5000 Hz	A	-	XS1M08NA370
1.5 mm	PNP	N.O.	12-48 V	200 mA	5000 Hz	A	-	XS1M08PA371③

Shielded, connector - micro style

1.5 mm	2-wire	N.O.★	12-24 V	100 mA	4000 Hz	B	11,12,15,16	XS1M08DA210D
1.5 mm	2-wire	N.O.★	12-48 V	100 mA	4000 Hz	A	11,12,15,16	XS1M08DA210LD②
1.5 mm	PNP	N.O.★	12-48 V	200 mA	5000 Hz	A	11,12,15,16	XS1M08PA370D
1.5 mm	NPN	N.O.★	12-48 V	200 mA	5000 Hz	A	11,12,15,16	XS1M08NA370D
1.5 mm	2-wire	N.C.★	12-24 V	100 mA	4000 Hz	A	11,12,15,16	XS1M08DA214LD②

Plastic Case

Non-shielded, 2m (6.6') cable

2.5 mm	PNP	N.O.★	12-48 V	200 mA	5000 Hz	A	-	XS4P08PA370
2.5 mm	NPN	N.O.★	12-48 V	200 mA	5000 Hz	A	-	XS4P08NA370
2.5 mm	PNP	N.O.+N.C.★	12-24 V	200 mA	5000 Hz	A	-	XS4P08PC410
2.5 mm	NPN	N.O.+N.C.★	12-24 V	200 mA	5000 Hz	A	-	XS4P08NC410

Nickel plated brass case, complementary N.O.+N.C. outputs

Shielded, 2m (6.6') cable

1.5 mm	PNP	N.O.+N.C.	12-24 V	200 mA	5000 Hz	A	-	XS1M08PC410
1.5 mm	NPN	N.O.+N.C.	12-24 V	200 mA	5000 Hz	A	-	XS1M08NC410

Shielded, connector - micro style

1.5 mm	PNP	N.O.+N.C.	12-24 V	200 mA	5000 Hz	B	11,12,15,16	XS1M08PC410D
1.5 mm	NPN	N.O.+N.C.	12-24 V	200 mA	5000 Hz	B	11,12,15,16	XS1M08NC410D

Non-shielded, 2m (6.6') cable

2.5 mm	PNP	N.O.+N.C.	12-24 V	200 mA	5000 Hz	A	-	XS2M08PC410
2.5 mm	NPN	N.O.+N.C.	12-24 V	200 mA	5000 Hz	A	-	XS2M08NC410

Non-shielded, connector - micro style

2.5 mm	PNP	N.O.+N.C.	12-24 V	200 mA	5000 Hz	B	11,12,15,16	XS2M08PC410D
2.5 mm	NPN	N.O.+N.C.	12-24 V	200 mA	5000 Hz	B	11,12,15,16	XS2M08NC410D

① See next page under specifications for LED function.

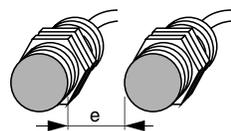
② Connector is attached to an 0.8 meter (2.6 foot) pigtail cable.

③ With stainless steel mounting nuts and washers.

★ To order a normally closed (N.C.) version, change **A** to **B**, example; XS1M08PA370 to XS1M08PB370.

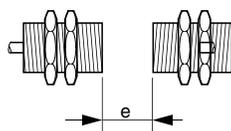
Minimum Mounting Clearances (mm/inches)

Side by side



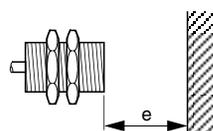
XS1Shielded e:3/11
XS2/XS4 Non-shielded e:10/39

Face to face



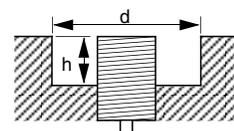
e:18/71
e:30/118

Facing a metal object



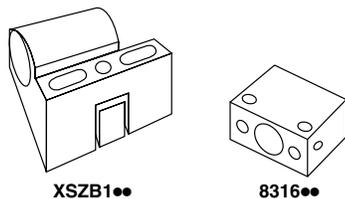
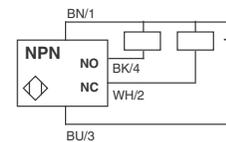
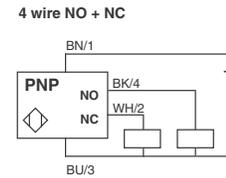
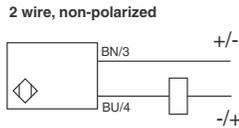
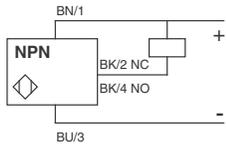
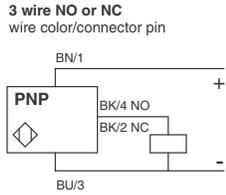
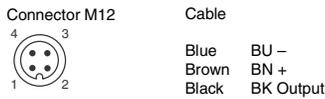
e:4.5/18
e:7.5/30

Mounting in a metal support



D:8/31, H:0/0
D:24/94, H:5/20

Wiring



Connector Cables (M12 or D suffix)

XSZCD101Y	Micro Conn., 4 pin, 2 m, straight
XSZCD111Y	Micro Conn., 4 pin, 2 m, 90°

For additional cable options and lengths see p. 518
 Accessories page 298, 317

Specifications

Mechanical		
Usable sensing range	Shielded	0 to 1.2 mm
	Non-shielded	0 to 2 mm
Standard temperature range	-25° C to +80° C (-13° F to +176° F)	
Enclosure rating -cable (for connector, see page 518)	NEMA Type	3, 4X, 6P, 12, 13
	IEC Type	IP67
Enclosure material	Stainless Steel case	stainless steel
	Nickel plated Brass	Case: Nickel plated Brass Sensing face: PBT
	Plastic	PBT
Max. tightening torque	Stainless Steel	9 N•m (6.7 lb-ft)
	Plastic	1 N•m (.74 lb-ft)
	Nickel plated Brass	9 N•m
Vibration resistance	(IEC 60068.2.6)	25 G, amplitude +/- 2 mm, f = 10-55Hz
Shock resistance	(IEC 60068.2.27)	50 G duration 11 ms
Standard target size (steel)	8 mm x 8 mm	
Differential (% of Sr)	15%	
Repeatability (% of Sr)	3%	
LED indicator type	A	360° ring LED: Shows output status
	B	One LED visible from 4 quadrants: Shows output status
Cable	2 or 3 wire	27AWG (0.11 mm ²), PvR
Electrical		
Voltage range – nominal	12 to 48 Vdc (12-24 complementary output)	
Voltage limit (including ripple)	10 to 58 Vdc (10-38 complementary output)	
Voltage drop (across switch), closed state	2 wire	4 V
	3 wire	2 V
Maximum load current	2 wire	1.5-100 mA
	3 wire	100 mA
	4 wire complementary output	200 mA
Current consumption (no load)	3 wire	10 mA
Residual (leakage) current, open state, 2 wire	0.6 mA	
On delay (max.)	2 wire	0.2 ms
	3 wire	0.1 ms
Off delay (max.)	2 wire	0.2 ms
	3 wire	0.1 ms
Power-up delay (max.)	2 wire	5 ms
	3 wire	5 ms
Protective circuitry		
Short circuit protection	Yes	
Overload	Yes	
Radio frequency immunity (RFI)	IEC 61000-4-3 L3	
Electrostatic; transients; impulse	2 wire IEC 61000-4-2 L3, IEC 61000-4-4 L4; 60947.5.2 L2 3 wire IEC 61000-4-2 L2, IEC 61000-4-4 L3; 60947.5.2 L2	
Reverse polarity protection	Yes	
Agency Listings	E164869 CCN NRRKH CR 44087 Class 3211 03	

Options

Description		Suffix
Extended temperature range (cable type only)	Down to -40° C (-40° F)	TF
Extended cable length	16.4 ft. (5 meter) cable	L1
	32.8 ft. (10 meter) cable	L2

Accessories

Description	Catalog Number
Plastic mounting nuts	XSZE208
Metal mounting nuts and lock washers	XSZE108
Mounting bracket, plastic	XSZB108
Mounting bracket, diecast zinc	8316 08
Stainless steel mounting nuts	XSZE208
Stainless steel lock washers	XSZE908

Note: Refer to page 351, for target material correction coefficient Km.

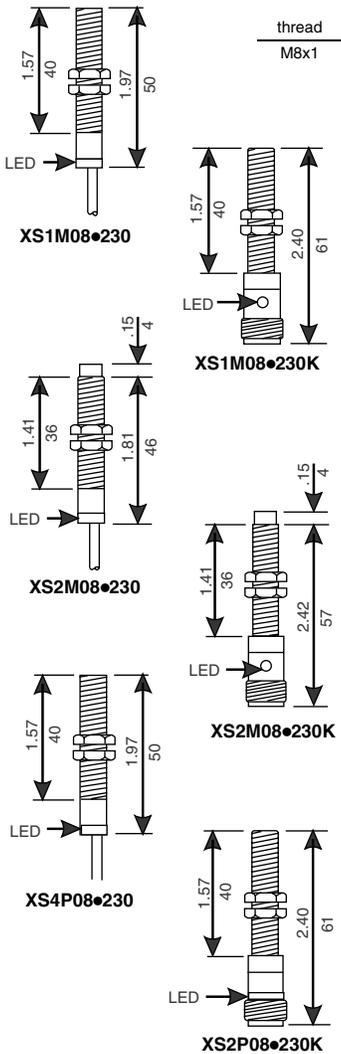
Proximity Sensors

XS Tubular, Inductive Sensors

8 mm Diameter, AC/DC; Universal Standard Length



Proximity Sensors



Features

- Faster troubleshooting aided by high visibility 360° indicator
- Rugged case designed for aggressive environments.
- Worry-free replacement: standard length, extended temperature range, AC or DC power supply
- Significant replacement time savings using patented plastic mounting bracket (no gauging) or connectors
- Trouble-free operation ensured by extensive protective circuitry
- Normally closed (N.C.) output available on versions marked★
- Plastic mounting nuts for plastic and lock nuts for metal housing included
- UL Listed, CSA Certified and CE Mark

Nominal Sensing Distance	Output Mode	Voltage Range		Operating Frequency		Indicator LED (see next page)	Mating Connector Style (see p. 518)	Catalog Number
		AC	DC	AC	DC			
Nickel plated brass case								
Shielded, 2m (6.6') cable								
1.5 mm	N.O. ★	24-240 V	24-210 V	25 Hz	4000 Hz	A	—	XS1M08MA230
Shielded, connector - micro style AC								
1.5 mm	N.O. ★	24-240 V	24-210 V	25 Hz	4000 Hz	B	17,18	XS1M08MA230K
Non-shielded, 2m (6.6') cable								
2.5 mm	N.O. ★	24-240 V	24-210 V	25 Hz	3000 Hz	A	—	XS2M08MA230
Non-shielded, connector - micro style AC								
2.5 mm	N.O. ★	24-240 V	24-210 V	25 Hz	3000 Hz	B	17,18	XS2M08MA230K
Plastic case								
Non-shielded, 2m (6.6') cable								
2.5 mm	N.O. ★	24-240 V	24-210 V	25 Hz	3000 Hz	A	—	XS4P08MA230
Non-shielded, connector - micro style AC								
2.5 mm	N.O. ★	24-240 V	24-210 V	25 Hz	3000 Hz	A	17,18	XS4P08MA230K

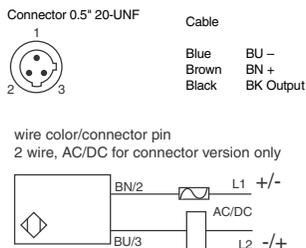
★ To order a normally closed (N.C.) version, change **A** to **B**, example; XS1M08MA230 to XS1M08MB230.

Dual Dimensions $\frac{\text{inches}}{\text{mm}}$

Minimum Mounting Clearances (mm/inches)

Side by side	Face to face	Facing a metal object	Mounting in a metal support
XS1 Shielded XS2/XS4 Non-shielded			
e:3/12 e:10/39	e:18/71 e:30/1.18	e:4.5/18 e:7.5/30	D:8/31, H:0/0 D:24/94, H:5/20

Wiring



Specifications

Mechanical		
Usable sensing range	Shielded	0 to 1.2 mm
	Non-shielded	0 to 2 mm
Standard temperature range		-25° C to +80° C (-13° F to +176° F)
Enclosure rating - cable (for connector, see page 518)	NEMA Type	3, 4X, 6P, 12, 13
	IEC Type	IP67
Enclosure material	Nickel plated brass	Case: Nickel plated Brass Sensing face: PBT
	Plastic	PBT
Tightening torque (max.)	Nickel plated brass	9 N•m (79.6 lb-ft)
	Plastic	1 N•m (.74 lb-ft)
Vibration resistance	(IEC 60068.2.6)	25 G, amplitude +/- 2 mm, f =10-55 Hz
Shock resistance	(IEC60068.2.27)	50 G duration 11 ms
Standard target size (steel)		8 mm x 8 mm
Differential (% of Sr)		15%
Repeatability (% of Sr)		3%
LED indicator type	A	360° ring LED: Shows output status
	B	One LED visible from 4 quadrants: Shows output status
Cable	2 wire	27 AWG (0.11 mm ²), PvR
Electrical		
Voltage range		24 to 240 Vac (50/60 Hz), 24 to 210 Vdc
Voltage limit (including ripple)		20 to 264 Vac/Vdc
Maximum Voltage drop (across switch), closed state		5.5V
Inrush current (inductive @ 20ms)		2A
Minimum load current		5 mA
Maximum load current		100 mA
		20 ≤ Vdc ≤ 58 IEC 60947-5-2 Utilization category DC-13 Vdc > 58 IEC 60947-5-2 Utilization category DC-12
Residual (leakage) current, open state	24 Vac/Vdc	0.8 mA
	120 Vac/Vdc	1.5 mA
On delay (max.)		.2 ms
Off delay (max.)		.2 ms
Power-up delay (max.)		40 ms
Protective circuitry	Short circuit protection	No★
	Radio frequency immunity (RFI)	IEC 61000-4-3 L3
	Electrostatic; transients; impulse	IEC 61000-4-2 L4; IEC 61000-4-4 L4; 60947.5.2 L3
Agency Listings	E164869 CCN NRKH CR 44087 Class 3211 03	

Proximity Sensors

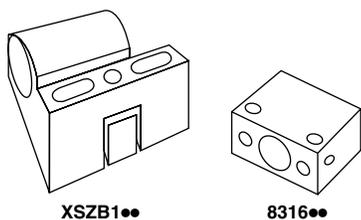
Options

Description		Suffix
Extended temperature range (cable type only)	Down to -40° C (-40° F)	TF
Extended cable length	16.4 ft. (5 meter) cable	L1
	32.8 ft. (10 meter) cable	L2

Accessories

Description	Catalog Number
Plastic mounting nuts	XSZE208
Metal mounting lock nuts	XSZE108
Mounting bracket, plastic	XSZB108
Mounting bracket, diecast zinc	831608

Note: Refer to p. 351, for target material correction coefficient Km.
 ★ See p. 298 for protective fuses.



Connector Cables (U20 or K suffix)

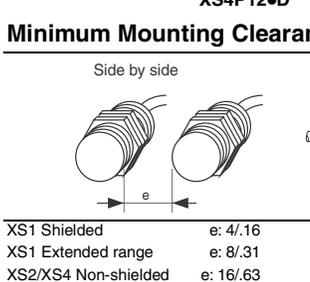
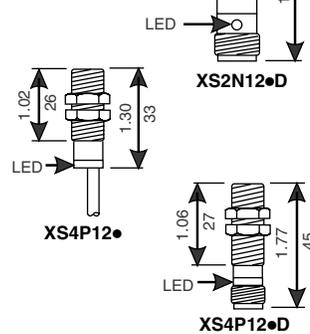
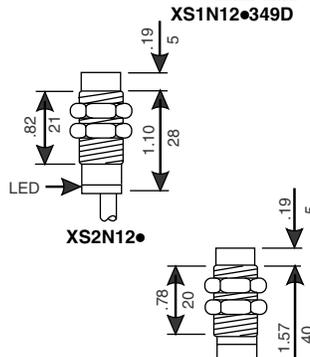
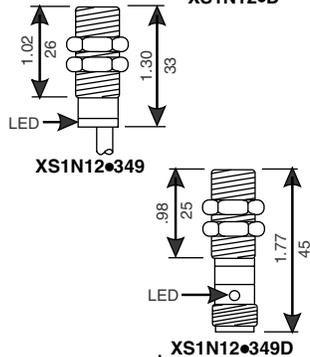
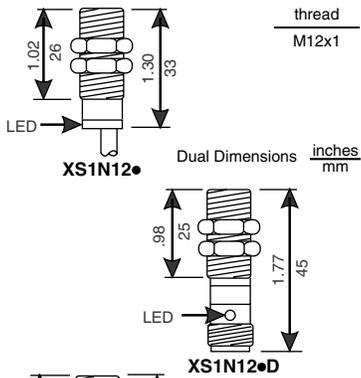
XSZCK101Y	Micro Conn., 3 pin, 2 m, straight
XSZCK111Y	Micro Conn., 3 pin, 2 m, 90°

For additional cable options and lengths see p. 518
 Accessories page 298

Proximity Sensors

XS Tubular, Inductive Sensors

12 mm Diameter, DC; Economy Short Length



Features

- 360° LED indicators
- Extended range models
- Complementary N.O. + N.C. models
- Rugged metal or plastic cases
- Patented plastic mounting bracket
- Connector options
- Extensive protective circuitry
- Works with unregulated DC supply powered by 24 V secondary transformer
- Metal lock nuts or plastic mounting nuts included
- Normally closed (N.C.) output available on versions marked *
- UL Listed, CSA Certified and CE Mark

Nominal Sensing Distance	Circuit Type	Voltage Range	Output Mode	Operating Frequency	Indicator LED (see next page)	Mating Connector Style (see p. 518)	Catalog Number
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Nickel plated brass case

Shielded, 2 m (6.6') cable

2 mm	PNP	12-24 V	N.O. ★	5000 Hz	A	-	XS1N12PA340
2 mm	NPN	12-24 V	N.O. ★	5000 Hz	A	-	XS1N12NA340
2 mm	PNP	12-24 V	N.O. + N.C.	5000 Hz	A	-	XS1N12PC410
2 mm	NPN	12-24 V	N.O. + N.C.	5000 Hz	A	-	XS1N12NC410

Shielded, connector - micro style

2 mm	PNP	12-24 V	N.O.	5000 Hz	B	11,12,13,15,16	XS1N12PA340D
2 mm	NPN	12-24 V	N.O.	5000 Hz	B	11,12,14,15,16	XS1N12NA340D
2 mm	PNP	12-24 V	N.O. + N.C.	5000 Hz	B	11,12,13,15,16	XS1N12PC410D
2 mm	NPN	12-24 V	N.O. + N.C.	5000 Hz	B	11,12,14,15,16	XS1N12NC410D

Shielded, EXTENDED RANGE 2 m (6.6') cable

4 mm	PNP	12-24 V	N.O. ★	2500 Hz	A	-	XS1N12PA349
4 mm	NPN	12-24 V	N.O. ★	2500 Hz	A	-	XS1N12NA349

Shielded, EXTENDED RANGE connector - micro style DC

4 mm	PNP	12-24 V	N.O. ★	2500 Hz	B	11,12,13,15,16	XS1N12PA349D
4 mm	NPN	12-24 V	N.O. ★	2500 Hz	B	11,12,14,15,16	XS1N12NA349D

Non-shielded, 2 m (6.6') cable

4 mm	PNP	12-24 V	N.O.	5000 Hz	A	-	XS2N12PA340
4 mm	NPN	12-24 V	N.O.	5000 Hz	A	-	XS2N12NA340
4 mm	PNP	12-24 V	N.O. + N.C.	5000 Hz	A	-	XS2N12PC410
4 mm	NPN	12-24 V	N.O. + N.C.	5000 Hz	A	-	XS2N12NC410

Non-shielded, connector - micro style DC

4 mm	PNP	12-24 V	N.O. ★	5000 Hz	B	11,12,13,15,16	XS2N12PA340D
4 mm	NPN	12-24 V	N.O. ★	5000 Hz	B	11,12,14,15,16	XS2N12NA340D
4 mm	PNP	12-24 V	N.O. + N.C.	5000 Hz	B	11,12,13,15,16	XS2N12PC410D
4 mm	NPN	12-24 V	N.O. + N.C.	5000 Hz	B	11,12,14,15,16	XS2N12NC410D

Plastic case

Non-shielded, 2 m (6.6') cable

4 mm	PNP	12-24 V	N.O. ★	5000 Hz	A	-	XS4P12PA340
4 mm	NPN	12-24 V	N.O. ★	5000 Hz	A	-	XS4P12NA340
4 mm	PNP	12-24 V	N.O. + N.C.	5000 Hz	A	-	XS4P12PC410
4 mm	NPN	12-24 V	N.O. + N.C.	5000 Hz	A	-	XS4P12NC410

Non-shielded, connector - micro style DC

4 mm	PNP	12-24 V	N.O. ★	5000 Hz	A	11,12,13,15,16	XS4P12PA340D
4 mm	NPN	12-24 V	N.O. ★	5000 Hz	A	11,12,14,15,16	XS4P12NA340D
4 mm	PNP	12-24 V	N.O. + N.C.	5000 Hz	A	11,12,13,15,16	XS4P12PC410D
4 mm	NPN	12-24 V	N.O. + N.C.	5000 Hz	A	11,12,14,15,16	XS4P12NC410D

◆ See X dimension below.

★ To order a normally closed (N.C.) version, change **A** to **B**, example: XS1M08MA230 to XS1M08MB230.

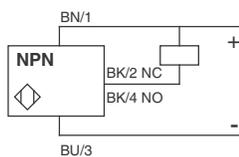
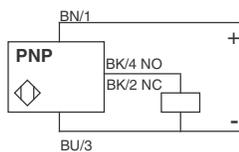
Minimum Mounting Clearances (mm/inches)

	Side by side	Face to face	Facing a metal object	Mounting in a metal support	Mounted in a metal support
XS1 Shielded	e: 4/16	e: 24/94	e: 6/24	D: 12/47	x: 0/0
XS1 Extended range	e: 8/31	e: 48/1.89	e: 12/47	D: 12/47	D: 12/47, x: 2.4/09
XS2/XS4 Non-shielded	e: 16/63	e: 48/1.89	e: 12/47	D: 36/1.42, H: 8/31	D: 12/47, x: 2.4/09

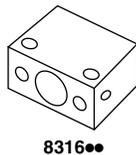
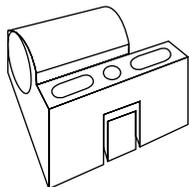
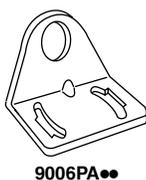
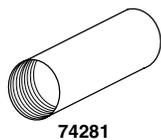
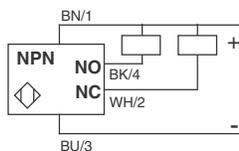
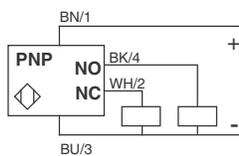
Wiring



3 wire NO or NC
 wire color/connector pin



4 wire NO + NC



Connector Cables (M12 or D suffix)

XSZCD101Y	Micro Conn., 4 pin, 2 m, straight
XSZCD111Y	Micro Conn., 4 pin, 2 m, 90°

For additional cable options and lengths see p. 518
 Accessories page 298, 316

Specifications

Mechanical			
Usable sensing range	Shielded	Standard Range	0 to 1.6 mm
		Extended Range	0 to 3.2 mm
	Non-shielded		0 to 3.2 mm
Standard temperature range	Ni plated brass		-25° C to +70° C (-13° F to +158° F)
	Plastic		-25° C to +80° C (-13° F to +176° F)
Extended range			-25° C to +50° C (-13° F to +122° F)
Enclosure rating - cable (for connector see page 518)	Nickel plated brass	NEMA Type	3, 4X, 6P, 12, 13
		IEC Type	IP67
Enclosure material	Plastic case	NEMA Type	3, 4X, 6P, 12, 13
		IEC Type	IP68
Enclosure material	Nickel plated brass	Case	Nickel plated brass
	Plastic case	Sensing face	PBT
Tightening torque (max.)	Nickel plated brass		6 N•m (4.4 lb-ft)
	Plastic		2 N•m (1.5 lb-ft)
Vibration resistance	(IEC 60068.2.6)		25 G, amplitude +/- 2 mm, f=10-55 Hz
Shock resistance	(IEC 60068.2.27)		50 G duration 11 ms
Standard target size (steel)			12 mm x 12 mm
Differential (% of Sr)			15%
Repeatability (% of Sr)			3%
LED indicator type	A		360° ring LED: Shows output status
	B		One LED visible from 4 quadrants: Shows output status
Cable	3 wire		22 AWG (0.34 mm ²), PvR
	4 wire (N.O. + N.C.)		21 AWG (0.22 mm ²), PvR
Electrical			
Voltage range - nominal			12 to 24 Vdc
Voltage limit (including ripple)			10 to 38 Vdc
Voltage drop (across switch), closed state			2V
Maximum load current			200 mA
Current consumption (no load)			10 mA
On delay (max.)		Standard Range	0.1 ms
		Extended Range	0.2 ms
Off delay (max.)		Standard Range	0.1 ms
		Extended Range	0.2 ms
Power-up delay (max.)		Standard/Extended Range	5 ms
Protective circuitry	Short circuit protection		Yes
	Overload		Yes
	Radio frequency immunity (RFI)		IEC 61000-4-3 L3
	Electrostatic; transients; impulse		IEC 61000-4-2 L2; IEC 61000-4-4 L3; 60947.5.2 L3
	Reverse polarity protection		Yes
Agency Listings	E164869 CCN NRKH	CR 44087 Class 3211 03	

Options

Description		Suffix
Extended temperature range (cable type only)	Down to -40° C (-40° F)	TF
Extended cable length	16.4 ft. (5 meter) cable	L1
	32.8 ft. (10 meter) cable	L2

Accessories

Description	Catalog Number
Plastic mounting nuts	XSZE212
Metal mounting nuts	XSZE112
Mounting bracket 90° steel	9006PA12
Mounting bracket, plastic	XSZB112
Mounting bracket, diecast zinc	831612
0.5" NPT conduit adapter length: 2" (50.8mm)	Aluminum 74281

Note: Refer to p. 351 for target material correction coefficient Km.

Proximity Sensors

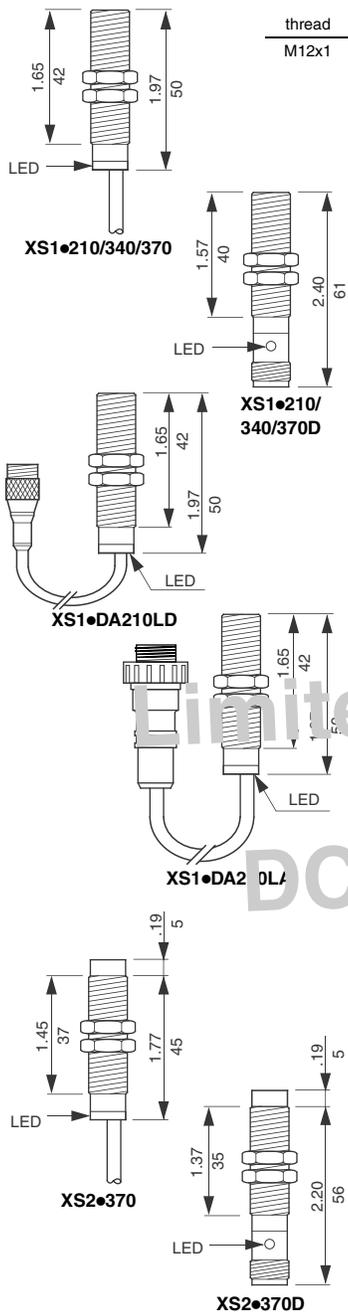
Proximity Sensors

XS Tubular, Inductive Sensors

12 mm Diameter, DC; Universal Standard Length



Proximity Sensors



Features

- Faster troubleshooting aided by high visibility 360° indicators
- 2 wire versions simplify wiring
- Rugged case designed for aggressive environments
- Worry free replacement: standard length, extended temperature and supply voltage range, improved enclosure ratings (IP68), 3 wire complementary PNP + NPN with selectable N.O./N.C. output circuit.
- Significant replacement time savings using patented plastic mounting bracket (no gauging) or connectors
- Pigtail connectors, version (0.8m/2.6' cable) provide cutting oil (IP68) rating and connection for aggressive environments
- Trouble free operation ensured by extensive protective circuitry
- Works with unfiltered rectified power supply
- Metal mounting lock nuts included
- Normally closed (N.C.) output available on versions (marked ★)
- UL Listed, CSA Certified and CE Mark

Nominal Sensing Distance	Circuit Type	Voltage Range	Output Mode	Max. Load	Operating Frequency	Indicator LED ①	Mating Connector Style (see p. 518)	Catalog Number
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Nickel plated brass case

Shielded, connector - (6.6') cable

2 mm	2-wire	12-48 V	N.O. ★	1.5-100 mA	500 Hz	A	—	XS1M12DA210
2 mm	PNP	12-48 V	N.O. ★	200 mA	5000 Hz	A	—	XS1M12PA370
2 mm	NPN	12-48 V	N.O. ★	200 mA	5000 Hz	A	—	XS1M12NA370
2 mm	PNP/NPN	12-24 V	N.O./N.C.	200 mA	5000 Hz	A	—	XS1M12KP340

Shielded, connector - micro style DC

2 mm	2-wire	12-48 V	N.O. ★	5-100 mA	4000 Hz	A	11,12,15,16	XS1M12DA210D
2 mm	PNP	12-48 V	N.O. ★	100 mA	5000 Hz	A	11,12,13,15,16	XS1M12PA370D
2 mm	NPN	12-48 V	N.O. ★	200 mA	5000 Hz	B	11,12,14,15,16	XS1M12NA370D
2 mm	PNP/NPN	12-24 V	N.O./N.C.	200 mA	5000 Hz	B	11,12,15,16	XS1M12KP340D

Shielded, connector - micro style DC - 0.8 m (2.6 ft) pigtail

2 mm	2-wire	12-48 V	N.O. ★	1.5-100 mA	4000 Hz	A	9,10,11,12,15,16	XS1M12DA210LD
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Shielded, connector - mini style - 0.8 m (2.6 ft) pigtail

2 mm	2-wire	12-48 V	N.O. ★	1.5-100 mA	4000 Hz	A	21,22	XS1M12DA210LA
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Non-shielded, 2 m (6.6') cable

4 mm	PNP	12-48 V	N.O. ★	200 mA	5000 Hz	A	—	XS2M12PA370
4 mm	NPN	12-48 V	N.O. ★	200 mA	5000 Hz	A	—	XS2M12NA370
4 mm	PNP + NPN	12-24 V	N.O./N.C.	200 mA	5000 Hz	A	—	XS2M12KP340

Non-shielded, connector - micro style D

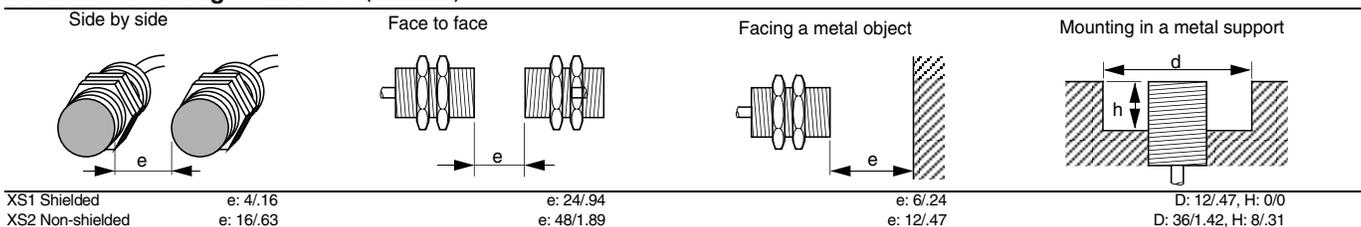
4 mm	PNP	12-48 V	N.O. ★	200 mA	5000 Hz	B	11,12,13,15,16	XS2M12PA370D
4 mm	NPN	12-48 V	N.O. ★	200 mA	5000 Hz	B	11,12,14,15,16	XS2M12NA370D
4 mm	PNP + NPN	12-24 V	N.O./N.C.	200 mA	5000 Hz	B	11,12,15,16	XS2M12KP340D

★ To order a normally closed (N.C.) version change the A to B, example: XS1M12PA370 to XS1M12PB370.

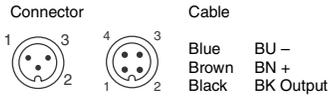
① See next page under specifications for LED function.

Dual Dimensions $\frac{\text{inches}}{\text{mm}}$

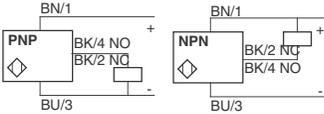
Minimum Mounting Clearances (mm/inches)



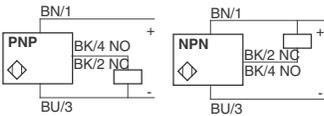
Wiring



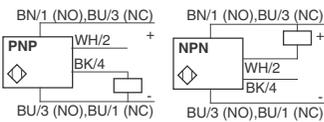
Wire color/connector pin 3 wire NO or NC



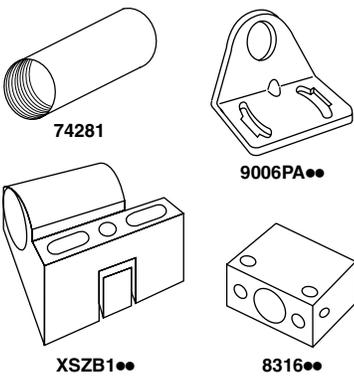
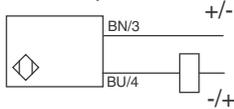
3 wire, selectable PNP/NPN, NO/NC



4 wire, programmable, NO or NC output



2 wire non-polarized



Connector Cables (M12 or D suffix; U78 or A suffix)

XSZCD101Y	Micro Conn., 4 pin, 2 m, straight
XSZCD111Y	Micro Conn., 4 pin, 2 m, 90°
XSZCA101Y	Micro Conn., 3 pin, 2 m, straight
XSZCA111Y	Micro Conn., 3 pin, 2 m, 90°

For additional cable options and lengths see p. 518
 Accessories page 298, 316

Specifications

Mechanical		
Usable sensing range ★	Shielded	0 to 1.6 mm
	Non-shielded	0 to 3.2 mm
Standard temperature range	-25° C to +80° C (-13° F to +176° F)	
Enclosure rating - cable (for connector, see p. 518)	NEMA Type	3, 4X, 6P, 12, 13
	IEC Type	IP68 – cutting oil proof
Enclosure material	Nickel plated brass	Case Sensing face
		Nickel plated Brass PBT
Tightening torque (max.)	Nickel plated brass	15 N·m (11 lb-ft)
Vibration resistance	(IEC 60068.2.6)	25 G, amplitude +/- 2 mm, f = 10-55 Hz
Shock resistance	(IEC 60068.2.27)	50 G duration 11 ms
Standard target size (steel)	12 mm x 12 mm	
Differential (% of Sr)	15%	
Repeatability (% of Sr)	3%	
LED indicator type	A	360° ring LED: Shows output status
	B	One LED visible from 4 quadrants: Shows output status
Cable	2 or 3 wire	22 AWG (0.34 mm ²), PvR
Electrical		
Voltage range – nominal		Std 12 to 48 Vdc KP Models 12 to 24 Vdc
Voltage limit (including ripple)		10 to 58 Vdc 10 to 38 Vdc
Voltage drop (across switch), closed state	3 wire	2 V
	2 wire	4 V
Minimum load current	2 wire	1.5 mA
Maximum load current	2 wire	100 mA
	3 wire	200 mA
Current consumption (no load)	2 wire	–
Residual (leakage) current, open state	2 wire	0.5 mA
	3 wire	10 mA
On delay (max.)	2 wire	0.2 ms
	3 wire	0.1 ms
Off delay (max.)	2 wire	0.2 ms
	3 wire	0.1 ms
Power-up delay (max.)	2 wire	5 ms
	3 wire	5 ms
Protective circuitry	Short circuit protection	Yes
	Overload	Yes
	Radio frequency immunity (RFI)	IEC 61000-4-3 Level 3
	Electrostatic; transients; impulse (L - indicates level number)	2 wire: IEC 61000-4-2 L3; IEC 61000-4-4 L3; 60947.5.2 L3 3 wire: IEC 61000-4-2 L2; IEC 61000-4-4 L3; 60947.5.2 L3
	Reverse polarity protection	Yes
Agency Listings	E164869 CCN NRKH CR 44087 Class 3211 03 	

Options

Description		Suffix
Extended temperature range (cable type only)	Down to -40° C (-40° F)	TF
Extended cable length	16.4 ft. (5 meter) cable	L1
	32.8 ft. (10 meter) cable	L2

Accessories

Description	Catalog Number
Plastic mounting nuts	XSZE212
Metal mounting lock nuts	XSZE112
Mounting bracket, 90° steel	9006PA12
Mounting bracket, plastic	XSZB112
Mounting bracket, diecast zinc	831612
0.5" NPT conduit adapter length 2" (50.8mm)	Aluminum 74281

★ Refer to page 351 for target material correction coefficient Km.

Proximity Sensors