

# Section 20

## Electronic Sensors and Machine Cabling



Photoelectric Sensors

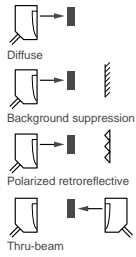


Proximity Sensors



Ultrasonic Sensors

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A single product that adapts to most environments.

For multi-mode models (XUB0, XUM0, XUK0, and XUX0) that are programmable to function as Diffuse, Diffuse/Background Suppression, Polarized Retroreflective, or Thru-Beam Receivers, consult the factory.

XUB Tubular Sensors



Table 20.1: XUB Tubular Sensors

XUB Tubular Sensors		XUB-A 18 mm plastic	XUB-B 18 mm metal
Usable sensing distance	Proximity diffuse (adjustable)	0.6 m (2.0 ft)	0.6 m (2.0 ft)
	Polarized retroreflective	2 m (6.6 ft)	2 m (6.6 ft)
	Retroreflective	4 m (13.1 ft)	4 m (13.1 ft)
	Thru-beam	15 m (49 ft)	15 m (49 ft)
Mounting (mm)		M 18 x 1	M 18 x 1
Enclosure: M (metal), P (plastic) / Dimensions (mm) Ø x L or W x H x D		P / M 18 x 46	P / M 18 x 46
Setup LEDs		—	—
Temperature range		-25 to +55 °C (-13 to +131 °F)	
Degree of protection (conforming to IEC 60529):		IP65; IP67 double insulation; IP69K double insulation (M12 only)	

Table 20.2: Sensors for DC Applications (Solid State Output: Transistor)

Connection		Precabled, PvR, 2 m [1]	M12 connector	Precabled, PvR, 2 m [1]	M12 connector	
		Catalog No.	Catalog No.	Catalog No.	Catalog No.	
Receiver or Transmitter/Receiver, 3-wire PNP [2]	Proximity diffuse, adjustable	N.O.	XUB5APANL2	XUB5APANM12	XUB5BPANL2	XUB5BPANM12
		N.C.	XUB5APBNL2	XUB5APBNM12	XUB5BPNL2	XUB5BPNM12
	Polarized retroreflective	N.O.	XUB9APANL2	XUB9APANM12	XUB9BPANL2	XUB9BPANM12
		N.C.	XUB9APBNL2	XUB9APBNM12	XUB9BPNL2	XUB9BPNM12
	Retroreflective	N.O.	XUB1APANL2	XUB1APANM12	XUB1BPANL2	XUB1BPANM12
		N.C.	XUB1APBNL2	XUB1APBNM12	XUB1BPNL2	XUB1BPNM12
	Thru-beam	N.O.	XUB2APANL2R	XUB2APANM12R	XUB2BPANL2R	XUB2BPANM12R
		N.C.	XUB2APBNL2R	XUB2APBNM12R	XUB2BPNL2R	XUB2BPNM12R
Transmitter			XUB2AKSNM12T	XUB2AKSNL2T	XUB2AKSNM12T	
Supply voltage limits, min/max (V) including ripple		10–36		10–36		
Switching frequency (Hz)		500		500		
Common characteristics for DC versions		Switching capacity, max (mA): 100 / Overload and short-circuit protection / LED output state				

Table 20.3: Metal Body Sensors for Two-Wire AC [3] or DC Applications (Solid-State Output: Transistor)

Connection		Precabled, PvR, 2 m [1]	1/2"-20UNF Connector	
		Catalog No.	Catalog No.	
System	Diffuse with adjustable background suppression	NO	XU8M18MA230	XU8M18MA230K
		NC	XU8M18MB230	XU8M18MB230K
	Diffuse	NO	XU5M18MA230	XU5M18MA230K
		NC	XU5M18MB230	XU5M18MB230K
	Polarized retroreflective [4]	NO	XU9M18MA230	XU9M18MA230K
		NC	XU9M18MB230	XU9M18MB230K
Thru-beam[5]	NO	XU2M18MA230	XU2M18MA230K	
	NC	XU2M18MB230	XU2M18MB230K	
Rated supply voltage (Vac/Vdc)		24–240	24–240	
Switching frequency (Hz)		25	25	
Switching capacity (mA) [3]		10–200	10–200	

Table 20.4: Accessories

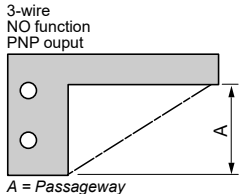
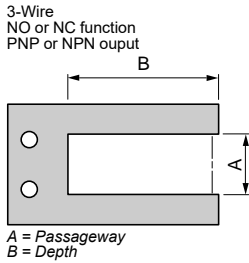
	mm	Catalog No.	
Reflectors	24 x 21	XUZC24	
	Ø 80	XUZC80	
	50 x 50	XUZC50	
	100 x 100	XUZC100	
Mounting brackets for XUB	Material	Catalog No.	
	Die Cast Zinc	XUZA118	
	Plastic	XUZA218	
Cables, 2 m, without LED [6]	90°	Straight	
	Catalog No.	Catalog No.	
	M8 (4-Pin)	XZCP1041L2	XZCP0941L2
	M12 (4-pin)	XZCP1241L2	XZCP1141L2
Suitable plug-in female connectors, including pre-wired versions	1/2"-20UNF	XZCP1965L2	XZCP1865L2

[1] For a 5 m cable, change L2 to L5. For example, XUMB5APANL2 becomes XUMB5APANL5.  
 [2] For version with NPN output, change "P" to "N". For example: XUB1APANL2 would become XUB1ANANL2.  
 [3] These sensors do not incorporate overload or short-circuit protection. A 0.4 A fast-acting fuse should be connected in series with the load.  
 [4] A 50 x 50 mm reflector XUZC50 is included with a polarized retroreflective system.  
 [5] Includes a thru-beam transmitter and receiver.  
 [6] For 5 or 10 meter lengths, replace 2 in the cable catalog number with 5 or 10.

XUVR / XUVA

Table 20.5: XUVR / XUVA Optical fork without adjustment

		Connector	Precabled	Angular Fork
<b>Sensing Characteristics</b>		<b>Thru-beam</b>		
Sensing range, mm (in.)		2–180 (0.08 –7.09)		
Sensing frequency		4000 Hz		
Minimum size of object detected, mm (in.)	Passageway 2–120 mm	0.8 (0.03)	1.2 (0.05)	
	Passageway u 150 mm	1 (0.04)	1.5 (0.06)	
Fork type		XUVR*	XUVA*	
<b>Power Requirements</b>				
Supply voltage		12–24 Vdc		
Max. load		100 mA with overload and short-circuit protection		
<b>Environmental</b>				
Operating temperature range		–10 to +60 °C (+14 to +140 °F)		
Environmental protection ratings		IP65 and IP67		
<b>Construction</b>				
Materials—Case		Painted aluminum and polyamide		
<b>Catalog numbers of forks type XUVR*</b>				
<b>Precabled, 2 m, Depth (B): 40 mm (1.18 in.)</b>				
<b>Passageway (A)</b>	<b>Function</b>	<b>Output</b>	<b>Catalog Number</b>	
30 mm (1.18 in.)	NO	PNP	XUVR0303PANL2	
<b>M8, 3-Pin, Depth (B): 60 mm (2.36 in.)</b>				
<b>Passageway (A)</b>	<b>Function</b>	<b>Output</b>	<b>Catalog Number</b>	
50 mm (1.97 in.)	NO	PNP	XUVR0605PANM8	
		NPN	XUVR0605NANM8	
	NC	PNP	XUVR0605PBNM8	
		NPN	XUVR0605NBNM8	
80 mm (3.15 in.)	NO	PNP	XUVR0608PANM8	
		NPN	XUVR0608NANM8	
	NC	PNP	XUVR0608PBNM8	
		NPN	XUVR0608NBNM8	
<b>Connection—M8, 3-Pin, Depth (B): 120 mm (4.72 in.)</b>				
<b>Passageway (A)</b>	<b>Function</b>	<b>Output</b>	<b>Catalog Number</b>	
120 mm (4.72 in.)	NO	PNP	XUVR1212PANM8	
		NPN	XUVR1212NANM8	
	NC	PNP	XUVR1212PBNM8	
		NPN	XUVR1212NBNM8	
180 mm (7.09 in.)	NO	PNP	XUVR1218PANM8	
		NPN	XUVR1218NANM8	
	NC	PNP	XUVR1218PBNM8	
		NPN	XUVR1218NBNM8	
<b>Catalog numbers of forks, type XUVA*</b>				
<b>M8 connector, 3-Pin</b>				
<b>Passageway (A)</b>	<b>Function</b>	<b>Output</b>	<b>Catalog Number</b>	
50 mm (1.97 in.)	NO	PNP	XUVA0505PANM8	
80 mm (3.15 in.)	NO	PNP	XUVA0808PANM8	
120 mm (4.72 in.)	NO	PNP	XUVA1212PANM8	
150 mm (5.91 in.)	NO	PNP	XUVA1515PANM8	

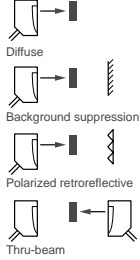



XUK and XUX Compact Sensors

Table 20.6: XUK and XUX Compact

**A single product that adapts to most environments.**

For multi-mode models (XUB0, XUM0, XUK0, and XUX0) that are programmable to function as Diffuse, Diffuse/Background Suppression, Polarized Retroreflective, or Thru-Beam Receivers, consult the factory.

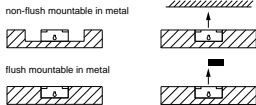
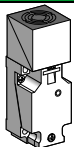
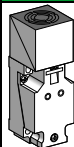
Sensors		XUK Compact Design 50 x 50	XUX Compact Design			
Usable sensing distance	Proximity diffuse (adjustable sensitivity)	1 m (3.2 ft) [7]	2.1 m (6.8 ft)			
	Polarized retroreflective	5 m (16.4 ft) [7]	11 m (36 ft)			
	Retroreflective	7 m (23.0 ft) [7]	14 m (46 ft)			
	Thru-beam	30 m (98 ft) [7]	40 m (131.2 ft)			
Mounting (mm)		direct: mounting centers 40 x 40, M4 screws	direct: mounting centers 30/36 to 40/50/74, M5 screws			
Enclosure: M (metal) P (plastic) / Dimensions (mm) Ø x L or W x H x D		P / 18 x 50 x 50	P / 30 x 92 x 71			
Setup LEDs		⊗	⊗			
Sensors for DC Applications (Solid State Output: Transistor)						
Connection			Precabled, PVC, 2 m	M12 connector	Screw terminals, ISO 16 cable gland	M12 connector
Transmitter	Proximity diffuse, adjustable	N.O.	XUK2AKSNL2T	XUK2AKSNM12T	XUX0AKSAT16T	XUX0AKSAM12T
		N.C.	XUK5APANL2	XUK5APANM12	XUX5APANT16	XUX5APANM12
Receiver or Transmitter/ Receiver, 3-wire PNP [8]	Polarized retroreflective	N.O.	XUK9APANL2	XUK9APANM12	XUX9APANT16	XUX9APANM12
		N.C.	XUK9APBNL2	XUK9APBNM12	XUX9APBNT16	XUX9APBNM12
	Retroreflective	N.O.	XUK1APANL2	XUK1APANM12	XUX1APANT16	XUX1APANM12
		N.C.	XUK1APBNL2	XUK1APBNM12	XUX1APBNT16	XUX1APBNM12
Thru-beam	N.O.	XUK2APANL2R	XUK2APANM12R	XUX2APANT16R	XUX2APANM12R	
	N.C.	XUK2APBNL2R	XUK2APBNM12R	XUX2APBNT16R	XUX2APBNM12R	
Supply voltage limits, min/max (V) including ripple			10–36	10–36	10–36	10–36
Switching frequency (Hz)			250	250	250	250
Common characteristics for DC versions			Yellow output state LED (except T-beam transmitter): ⊗; Green power LED (T-beam Transmitter only): ⊗			
Multi-current/multi-voltage sensors for AC/DC applications, 20–264 Vac/Vdc, including ripple (relay output, 1 C/O, 3 A)						
Connection			Precabled, 2 m	—	Screw terminals, ISO 16 cable gland	—
Transmitter	Diffuse	N.O. + N.C.	XUK2ARC�L2T	—	XUX0ARCTT16T	—
		N.O. + N.C.	XUK5ARC�L2	—	XUX5ARCNT16	—
Receiver or Transmitter/ Receiver	Polarized retroreflective	N.O. + N.C.	XUK9ARC�L2	—	XUX9ARCNT16	—
		N.O. + N.C.	XUK1ARC�L2	—	XUX1ARCNT16	—
	Thru-beam	N.O. + N.C.	XUK2ARC�L2R	—	XUX2ARCNT16R	—
Switching frequency (Hz)			20	—	20	—
Yellow output state LED (except T-beam Transmitter) ⊗ /			⊗ / ⊗	—	⊗ / ⊗	—
Green power LED (T-beam Transmitter only) ⊗			—	—	—	—

NOTE: See Table 20.4 Accessories, page 20-2 for suitable plug-in cables with female connectors.

[7] Excess gain of 2.  
[8] For version with NPN output, change "P" to "N". For example, XUM5APCNL2 would become XUM5ANC�L2.

XS Plastic Rectangular Sensors

Table 20.7: General Purpose, Plastic Case, Limit Switch Style, 5-Position Turret Head

Sensor		Flush mountable in metal	Non-flush mountable in metal	
<p>A single product that automatically adapts to most environments. Accurate position detection via teach mode.</p> 				
<b>General Specifications</b>				
Product certifications		UL, CSA, CE		
Degree of protection conforming to IEC 60529		IP65, IP67, and IP69K		
Operating temperature		-25 to +70 °C (-13 to +158 °F) [1]		
<b>DC Supply</b>				
<b>Catalog Numbers</b>				
Nominal sensing distance $S_n$ , mm (in.)		Increased range 20 (0.79)	15 (0.59)	Increased range 40 (1.57)
4-wire DC (complementary outputs)	PNP, NO + NC	XS8C4A1PCN12	—	XS8C4A4PCN12
	NPN, NO + NC	XS8C4A1NCN12	—	XS8C4A4NCN12
2-wire DC (non-polarized)	NO or NC programmable	XS8C4A1DPN12	XS7C4A1DPN12	XS8C4A4DPN12
Weight, kg (lb)		0.244 (0.54)	0.244 (0.54)	0.244 (0.54)
<b>Supplemental Specifications</b>				
Connection [2]		Screw terminals, clamping capacity: 2 or 4 x 1.5 mm <sup>2</sup> (16 AWG)		
Operating zone, mm (in.)		0–16 (0–0.63)	0–12 (0–0.47)	0–32 (0–1.26)
Repeat accuracy		≤3% of effective sensing distance (Sr)		
Differential travel		3–15% of effective sensing distance (Sr)		
Status indication	Output	Yellow LED		
	Supply on	Green LED (4-wire)		
Rated supply voltage		12–48 Vdc with protection against reverse polarity		
Voltage limits (including ripple)		10–58 Vdc		
Current consumption, 4-wire no-load		<15 mA		
Switching capacity with overload + short-circuit protection		4-wire, 200 mA; 2-wire, 100 mA		
Residual current, 2-wire open state		<0.6 mA		
Voltage drop, closed state		4-wire, <2 V; 2-wire, <4.2 V		
Maximum switching frequency		300 Hz flush mount	300 Hz flush mount	150 Hz non-flush mount
Delays	First-up	4-wire, 7 ms; 2-wire, 20 ms		
	Response	Flush mount: ≤1.2 ms; non-flush mount: ≤1.4 ms		
	Recovery	Flush mount: ≤1.8 ms; non-flush mount: ≤3.5 ms		
<b>Plug-in, AC or DC supply</b>				
<b>Catalog Numbers</b>				
Nominal sensing distance $S_n$ , mm (in.)		AC, Flush Mountable 20 (0.78)	AC/DC, Flush Mountable 15 (0.59)	AC/DC, Non-Flush Mountable 40 (1.57)
2-wire AC	NO or NC programmable	XS8C4A1DPN12	XS7C4A1DPN12	XS8C4A4DPN12
2-wire AC or DC universal model	NO or NC programmable	XS8C4A1MPN12	XS7C4A1MPN12	XS8C4A4MPN12
<b>Supplemental Specifications</b>				
Weight, kg (lb)		0.244 (0.54)	0.244 (0.54)	0.244 (0.54)
Connection [2]		Screw terminals, clamping capacity 2 x 1.5 mm <sup>2</sup> (16 AWG)		
Operating zone, mm (in.)		0–16 (0–0.63)	0–12 (0–0.47)	0–32 (0–1.26)
Repeat accuracy		≤3% of effective sensing distance (Sr)		
Differential travel		3–15% of effective sensing distance (Sr)		
Output state indication		Yellow LED		
Rated supply voltage (with reverse polarity protection)		24–240 Vac, 50/60 Hz	24–240 Vac, 50/60 Hz / 24–210 Vdc	24–240 Vac, 50/60 Hz / 24–210 Vdc
Voltage limits (including ripple)		20–264 Vac or Vdc	20–264 Vac or Vdc	20–264 Vac or Vdc
Current consumption, no-load		—		
Switching capacity [3]		5–300 mA or 5–200 mA DC [3]	5–300 mA AC or 5–200 mA DC [3]	5–300 mA AC or 5–200 mA DC [3]
Residual current, open state		1.5 mA	1.5 mA	1.5 mA
Voltage drop, closed state		≤5.5 V		
Maximum switching frequency		AC: 25 Hz; DC: 300 Hz	AC: 25 Hz; DC: 300 Hz	AC: 25 Hz; DC: 150 Hz
Delays	First-up	20 ms		
	Response	Flush mount: ≤1.2 ms; non-flush mount: ≤1.4 ms		
	Recovery	Flush mount: ≤1.8 ms; non-flush mount: ≤3.5 ms		

[1] Also available: very low temperature models (suffix TF: -40 to +70 °C) or very high temperature models (suffix TT: -25 to +85 °C). Consult the Sensor Competency Center at 800-425-2121, option 2.

[2] 1/2" NPT conduit Entry. For PC13, change N12 to G13. For M20, change N12 to P20.

[3] These sensors do not incorporate overload or short-circuit protection. A 0.4 mA fast-acting fuse (XUZE04) should be connected in series with the load.

3-Wire, 12–48 Vdc, Long Case Sensors and Accessories

Table 20.8: General Purpose, Long Case, Increased Range, Flush Mountable, 3-Wire DC, Solid-State Output

Sensors, 3-wire 12–48 Vdc, long case model						
Sensing Distance Sn, mm (in.)	Function	Output	Connection	Weight		Catalog No.
				kg	lb	
<b>Ø 8, threaded M8 x 1</b>						
2.5 (0.10)	NO	PNP	Precabled (2 m) [4]	0.035	0.08	XS608B1PAL2
			M12 connector	0.015	0.03	XS608B1PAM12
		NPN	Precabled (2 m) [4]	0.035	0.08	XS608B1NAL2
	M12 connector		0.015	0.03	XS608B1NAM12	
	NC	PNP	Precabled (2 m) [4]	0.035	0.08	XS608B1PBL2
			M12 connector	0.015	0.03	XS608B1PBM12
NPN		Precabled (2 m) [4]	0.035	0.08	XS608B1NBL2	
	M12 connector	0.015	0.03	XS608B1NBM12		
<b>Ø 12, threaded M12 x 1</b>						
4 (0.16)	NO	PNP	Precabled (2 m) [4]	0.075	0.17	XS612B1PAL2
			M12 connector	0.020	0.04	XS612B1PAM12
		NPN	Precabled (2 m) [4]	0.075	0.17	XS612B1NAL2
	M12 connector		0.020	0.04	XS612B1NAM12	
	NC	PNP	Precabled (2 m) [4]	0.075	0.17	XS612B1PBL2
			M12 connector	0.020	0.04	XS612B1PBM12
NPN		Precabled (2 m) [4]	0.075	0.17	XS612B1NBL2	
	M12 connector	0.020	0.04	XS612B1NBM12		
<b>Ø 18, threaded M18 x 1</b>						
8 (0.31)	NO	PNP	Precabled (2 m) [4]	0.100	0.22	XS618B1PAL2
			M12 connector	0.040	0.09	XS618B1PAM12
			Remote screw term. connector	0.100	0.22	XS618B1PAL01B[5]
		NPN	Remote DIN 43650 connector	0.100	0.22	XS618B1PAL01C
			Remote M18 connector	0.100	0.22	XS618B1PAL01G
			Remote U78 connector	0.100	0.22	XS618B1PAL01U78
	NC	PNP	Precabled (2 m) [4]	0.100	0.22	XS618B1NAL2
			M12 connector	0.040	0.09	XS618B1NAM12
			Remote screw term. connector	0.100	0.22	XS618B1NAL01B[5]
		NPN	Remote DIN 43650 connector	0.100	0.22	XS618B1NAL01C
			Remote M18 connector	0.100	0.22	XS618B1NAL01G
			Remote U78 connector	0.100	0.22	XS618B1NAL01U78[5]
<b>Ø 30, threaded M30 x 1.5</b>						
15 (0.59)	NO	PNP	Precabled (2 m) [4]	0.205	0.45	XS630B1PAL2
			M12 connector	0.145	0.32	XS630B1PAM12
			Remote screw term. connector	0.205	0.45	XS630B1PAL01B[5]
		NPN	Remote DIN 43650 connector	0.205	0.45	XS630B1PAL01C
			Remote M18 connector	0.205	0.45	XS630B1PAL01G
			Remote U78 connector	0.100	0.22	XS630B1PAL01U78
	NC	PNP	Precabled (2 m) [4]	0.205	0.45	XS630B1NAL2
			M12 connector	0.145	0.32	XS630B1NAM12
			Remote screw term. connector	0.205	0.45	XS630B1NAL01B[5]
		NPN	Remote DIN 43650 connector	0.205	0.45	XS630B1NAL01C
			Remote M18 connector	0.205	0.45	XS630B1NAL01G
			Remote U78 connector	0.100	0.22	XS630B1NAL01U78

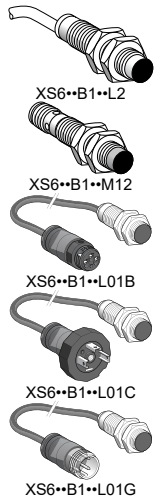


Table 20.9: Accessories

Description	For use with sensors	Weight		Catalog No.	
		kg	lb		
90° metal mounting brackets	Ø 8	0.006	0.01	9006PA08	
	Ø 12	0.006	0.01	9006PA12	
	Ø 18	0.010	0.02	9006PA18	
	Ø 30	0.020	0.02	9006PA30	
Cables		Mounting Bracket			
Description	90°	Straight	with Indexing Pin for Tubular Sensors		
	M12	XZCP1241L2	XZCP1141L2	M18	XSZB118
Plug-in PUR female connectors, including pre-wired versions (2 m, without LED) [6]					
		Catalog No.	Catalog No.		Catalog No.
M8	XZCP0666L2	XZCP0566L2	M12	XSZB112	
U20	XZCP1965L2	XZCP1865L2	M30	XSZB130	

[4] For a 5 m cable replace L2 with L5; for a 10 m cable replace L2 with L10. For example, XS608B1PAL2 becomes XS608B1PAL5 with a 5 m cable.

[5] Protective cable gland included with remote screw terminal connector.

[6] For PVC models, add V after the P in the model number. For example, XZCP1241L2 becomes XZCPV1241L2.

3-wire 12–24 Vdc, Short Case Sensors

Table 20.10: Sensors, 3-wire 12–24 Vdc, Short Case Model

Sensing Distance Sn, mm (in.)	Function	Output	Connection	Weight		Catalog Number
				kg	lb	
<b>Ø 6.5, plain</b>						
1.5 (0.06)	NO	PNP	Precabled (2 m) [7]	0.035	0.08	XS506B1PAL2
			M8 connector	0.025	0.06	XS506B1PAM8
			M12 connector	0.025	0.06	XS506B1PAM12
	NC	NPN	Precabled (2 m) [7]	0.035	0.08	XS506B1NAL2
			M8 connector	0.025	0.06	XS506B1NAM8
			M12 connector	0.025	0.06	XS506B1NAM12
1.5 (0.06)	NO	PNP	Precabled (2 m) [7]	0.035	0.08	XS506B1PBL2
			M8 connector	0.025	0.06	XS506B1PBM8
			M12 connector	0.025	0.06	XS506B1PBL2
	NC	NPN	Precabled (2 m) [7]	0.035	0.08	XS506B1NBL2
			M8 connector	0.025	0.06	XS506B1NBM8
			M12 connector	0.025	0.06	XS506B1NBL2
<b>Ø 8, threaded M8 x 1</b>						
1.5 (0.06)	NO	PNP	Precabled (2 m) [7]	0.035	0.08	XS508B1PAL2
			M8 connector	0.025	0.06	XS508B1PAM8
			M12 connector	0.025	0.06	XS508B1PAM12
	NC	NPN	Precabled (2 m) [7]	0.035	0.08	XS508B1NAL2
			M8 connector	0.025	0.06	XS508B1NAM8
			M12 connector	0.025	0.06	XS508B1NAM12
1.5 (0.06)	NO	PNP	Precabled (2 m) [7]	0.035	0.08	XS508B1PBL2
			M8 connector	0.025	0.06	XS508B1PBM8
			M12 connector	0.025	0.06	XS508B1PBL2
	NC	NPN	Precabled (2 m) [7]	0.035	0.08	XS508B1NBL2
			M8 connector	0.025	0.06	XS508B1NBM8
			M12 connector	0.025	0.06	XS508B1NBL2
<b>Ø 12, threaded M12 x 1</b>						
2 (0.08)	NO	PNP	Precabled (2 m) [7]	0.075	0.17	XS512B1PAL2
			M12 connector	0.035	0.08	XS512B1PAM12
			M12 connector	0.035	0.08	XS512B1NAM12
	NC	NPN	Precabled (2 m) [7]	0.075	0.17	XS512B1PBL2
			M12 connector	0.035	0.08	XS512B1PBM12
			M12 connector	0.035	0.08	XS512B1NBL2
2 (0.08)	NO	PNP	Precabled (2 m) [7]	0.075	0.17	XS512B1PAL2
			M12 connector	0.035	0.08	XS512B1PAM12
			M12 connector	0.035	0.08	XS512B1NAM12
	NC	NPN	Precabled (2 m) [7]	0.075	0.17	XS512B1PBL2
			M12 connector	0.035	0.08	XS512B1PBM12
			M12 connector	0.035	0.08	XS512B1NBL2
<b>Ø 18, threaded M18 x 1</b>						
5 (0.20)	NO	PNP	Precabled (2 m) [7]	0.120	0.26	XS518B1PAL2
			M12 connector	0.060	0.13	XS518B1PAM12
			M12 connector	0.060	0.13	XS518B1NAM12
	NC	NPN	Precabled (2 m) [7]	0.120	0.26	XS518B1PBL2
			M12 connector	0.060	0.13	XS518B1PBM12
			M12 connector	0.060	0.13	XS518B1NBL2
5 (0.20)	NO	PNP	Precabled (2 m) [7]	0.120	0.26	XS518B1PAL2
			M12 connector	0.060	0.13	XS518B1PAM12
			M12 connector	0.060	0.13	XS518B1NAM12
	NC	NPN	Precabled (2 m) [7]	0.120	0.26	XS518B1PBL2
			M12 connector	0.060	0.13	XS518B1PBM12
			M12 connector	0.060	0.13	XS518B1NBL2
<b>Ø 30, threaded M30 x 1.5</b>						
10 (0.39)	NO	PNP	Precabled (2 m) [7]	0.205	0.45	XS530B1PAL2
			M12 connector	0.145	0.32	XS530B1PAM12
			M12 connector	0.145	0.32	XS530B1NAM12
	NC	NPN	Precabled (2 m) [7]	0.205	0.45	XS530B1PBL2
			M12 connector	0.145	0.32	XS530B1PBM12
			M12 connector	0.145	0.32	XS530B1NBL2

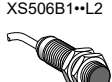
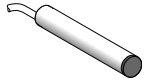


Table 20.11: Accessories






Description	For use with sensors	Weight		Catalog Number
		kg	lb	
Mounting brackets	Ø 6.5 (plain)	0.005	0.01	XSZB165
	Ø 8	0.006	0.01	XSZB108
	Ø 12	0.006	0.01	XSZB112
	Ø 18	0.010	0.02	XSZB118
	Ø 30	0.020	0.02	XSZB130

[7] For a 5 m cable replace L2 with L5; for a 10 m cable replace L2 with L10. Example: XS508B1PAL2 becomes XS508B1PAL5 with a 5 m cable.



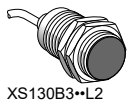
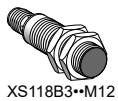
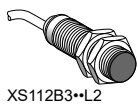
**XS...B3 Basic Plus Sensors**

**Table 20.12: Basic Plus, XS...B3**

Sensing Characteristics	Ø 6.5 Plain Flush Mountable	Ø M8 Flush Mountable	Ø M12 Flush Mountable	Ø M18 Flush Mountable	Ø M30 Flush Mountable
<b>Basic, Tubular, Flush-Mountable, Increased Range, 3-Wire DC, Solid-State Output</b>					
Sensing range	2 mm (0–0.08 in.)	2 mm (0–0.08 in.)	4.0 mm (0–0.15 in.)	8.0 mm (0.31 in.)	15.0 mm (0.59 in.)
Switching frequency	2500 Hz	2500 Hz	2500 Hz	1000 Hz	500 Hz
Shock resistance	50 gn, duration 11 ms	50 gn, duration 11 ms	50 gn, duration 11 ms	50 gn, duration 11 ms	50 gn, duration 11 ms
Vibration resistance (10–55 Hz)	25 gn, amplitude ± 2 mm	25 gn, amplitude ± 2 mm	25 gn, amplitude ± 2 mm	25 gn, amplitude ± 2 mm	25 gn, amplitude ± 2 mm
<b>Power Requirements</b>					
Supply voltage	12–24 (10–36 max) Vdc with protection against reverse polarity, overload, and short circuit				
<b>Specifications</b>					
Operating zone	XS1...B3...M8, XS1...B3...M12, XS1...B3...L2				
	Ø 6.5 and Ø 8	0–2.0 mm (0–0.07 in.)			
	Ø 12	0–4.0 mm (0–0.15 in.)			
	Ø 18	0–8.0 mm (0–0.31 in.)			
Degree of protection	Conforming to IEC 60529				
Operating temperature	IP65 and IP67				
Materials	Case	–25 to +70 °C (–13 to +158 °F)			
	Cable (XS1...B3...L only)	Nickel-plated brass			
Vibration resistance	Conforming to IEC 60068-2-6				
Shock resistance	Conforming to IEC 60068-2-27				
Rated supply voltage	12–24 Vdc with protection against reverse polarity				
Switching capacity	200 mA with overload and short-circuit protection				
Maximum switching frequency	Ø 6.5, Ø 8, and Ø 12	2500 Hz			
	Ø 18	1000 Hz			
	Ø 30	500 Hz			

Sensing Distance Sn, mm (in.)	Function	Output	Connection	Sold in lots of	Weight		Catalog Number
					kg	lb	
<b>Ø 8, threaded M8 x 1</b>							
<b>Three-wire 12–24 Vdc, flush mountable</b>							
2 (0.07)	NO	PNP	Precabled (2 m) [8]	1	0.070	0.15	XS108B3PAL2
			M8 connector	1	0.030	0.06	XS108B3PAM8
			M12 connector	1	0.060	0.13	XS108B3PAM12
		NPN	Precabled (2 m) [8]	1	0.070	0.15	XS108B3NAL2
			M8 connector	1	0.030	0.06	XS108B3NAM8
			M12 connector	1	0.060	0.13	XS108B3NAM12
	NC	PNP	Precabled (2 m) [8]	1	0.070	0.15	XS108B3PBL2
			M8 connector	1	0.030	0.06	XS108B3PBM8
			M12 connector	1	0.060	0.13	XS108B3PBM12
		NPN	Precabled (2 m) [8]	1	0.070	0.15	XS108B3NBL2
			M8 connector	1	0.030	0.06	XS108B3NBM8
			M12 connector	1	0.060	0.13	XS108B3NBM12
<b>Ø 12, threaded M12 x 1</b>							
<b>Three-wire 12–24 Vdc, flush mountable</b>							
4 (0.15)	NO	PNP	Precabled (2 m) [8]	1	0.090	0.19	XS112B3PAL2
			M12 connector	1	0.030	0.06	XS112B3PAM12
			Precabled (2 m) [8]	1	0.090	0.19	XS112B3NAL2
		NPN	M12 connector	1	0.030	0.06	XS112B3NAM12
			Precabled (2 m) [8]	1	0.090	0.19	XS112B3PBL2
			M12 connector	1	0.030	0.06	XS112B3PBM12
	NC	PNP	Precabled (2 m) [8]	1	0.090	0.19	XS112B3NBL2
			M12 connector	1	0.030	0.06	XS112B3NBM12
			Precabled (2 m) [8]	1	0.090	0.19	XS112B3PBL2
		NPN	M12 connector	1	0.030	0.06	XS112B3PBM12
			Precabled (2 m) [8]	1	0.090	0.19	XS112B3NBL2
			M12 connector	1	0.030	0.06	XS112B3NBM12
<b>Ø 18, threaded M18 x 1</b>							
<b>Three-wire 12–24 Vdc, flush mountable</b>							
8 (0.31)	NO	PNP	Precabled (2 m) [8]	1	0.110	0.24	XS118B3PAL2
			M12 connector	1	0.060	0.13	XS118B3PAM12
			Precabled (2 m) [8]	1	0.110	0.24	XS118B3NAL2
		NPN	M12 connector	1	0.060	0.13	XS118B3NAM12
			Precabled (2 m) [8]	1	0.110	0.24	XS118B3PBL2
			M12 connector	1	0.060	0.13	XS118B3PBM12
	NC	PNP	Precabled (2 m) [8]	1	0.110	0.24	XS118B3NBL2
			M12 connector	1	0.060	0.13	XS118B3NBM12
			Precabled (2 m) [8]	1	0.110	0.24	XS118B3PBL2
		NPN	M12 connector	1	0.060	0.13	XS118B3PBM12
			Precabled (2 m) [8]	1	0.110	0.24	XS118B3NBL2
			M12 connector	1	0.060	0.13	XS118B3NBM12
<b>Ø 30, threaded M30 x 1.5</b>							
<b>Three-wire 12–24 Vdc, flush mountable</b>							
15 (0.59)	NO	PNP	Precabled (2 m) [8]	1	0.180	0.39	XS130B3PAL2
			M12 connector	1	0.130	0.28	XS130B3PAM12
			Precabled (2 m) [8]	1	0.180	0.39	XS130B3NAL2
		NPN	M12 connector	1	0.130	0.28	XS130B3NAM12
			Precabled (2 m) [8]	1	0.180	0.39	XS130B3PBL2
			M12 connector	1	0.130	0.28	XS130B3PBM12
	NC	PNP	Precabled (2 m) [8]	1	0.180	0.39	XS130B3NBL2
			M12 connector	1	0.130	0.28	XS130B3NBM12
			Precabled (2 m) [8]	1	0.180	0.39	XS130B3PBL2
		NPN	M12 connector	1	0.130	0.28	XS130B3PBM12
			Precabled (2 m) [8]	1	0.180	0.39	XS130B3NBL2
			M12 connector	1	0.130	0.28	XS130B3NBM12

[8] For a 5 m cable replace L2 with L5; for a 10 m cable replace L2 with L10. Example: XS106B3PAL2 becomes XS106B3PAL5 with a 5 m cable.





2-Wire AC or DC, Long Case Sensors

Table 20.13: Accessories, Basic Plus, XS\*\*\*B3

Mounting Bracket	Sensor Body	Catalog No.	Mounting Bracket with Indexing Pin for Cylindrical Sensors	Diameter	Catalog No.
	M8	9006PA08		M6	XSZB165
	M12	9006PA12		M8	XSZB108
	M18	9006PA18		M12	XSZB112
	M30	9006PA30		M18	XSZB118
				M30	XSZB130

Cables See M8 and M12 connector cables on page 3—Wire, 12 — 48 Vdc, Long Case Sensors and Accessories, page 20-6.

Table 20.14: General Purpose, Long Case, Tubular, Increased Range, Flush Mountable, 2-Wire AC or DC

Sensors, 2-wire 24–240 V AC or DC, long case model							
Sensing Distance Sn, mm (in.)	Function	Connection	Catalog Number	Weight kg lb			
<b>Ø 12, threaded M12 x 1</b>							
4 (0.16)	NO	Precabled (2 m) [1]	XS612B1MAL2	0.075	0.17		
		1/2"-20UNF connector	XS612B1MAU20	0.025	0.06		
	NC	Precabled (2 m) [1]	XS612B1MBL2	0.075	0.17		
		1/2"-20UNF connector	XS612B1MBU20	0.025	0.06		
<b>Ø 18, threaded M18 x 1</b>							
8 (0.31)	NO	Precabled (2 m) [1]	XS618B1MAL2	0.100	0.22		
		1/2"-20UNF connector	XS618B1MAU20	0.060	0.13		
		Remote screw terminal connector	XS618B1MAL01B [2]	0.100	0.22		
		Remote DIN 43650A connector	XS618B1MAL01C	0.100	0.22		
		Remote M18 connector	XS618B1MAL01G	0.100	0.22		
	NC	Precabled (2 m) [1]	XS618B1MBL2	0.100	0.22		
		Remote screw terminal connector	XS618B1MBL01B [2]	0.100	0.22		
		Remote DIN 43650A connector	XS618B1MBL01C	0.100	0.22		
		<b>Ø 30, threaded M30 x 1.5</b>					
		15 (0.59)	NO	Precabled (2 m) [3]	XS630B1MAL2	0.205	0.45
1/2"-20UNF connector	XS630B1MAU20			0.145	0.32		
Remote screw terminal connector	XS630B1MAL01B [2]			0.205	0.45		
Remote DIN 43650A connector	XS630B1MAL01C			0.205	0.45		
Remote M18 connector	XS630B1MAL01G			0.205	0.45		
NC	Precabled (2 m) [3]		XS630B1MBL2	0.205	0.45		
	1/2"-20UNF connector		XS630B1MBU20	0.145	0.32		
	Remote screw terminal connector		XS6 30B1MBL01B [2]	0.205	0.45		
	Remote DIN 43650A connector		XS6 30B1MBL01C	0.205	0.45		
	Remote M18 connector		XS6 30B1MBL01G	0.205	0.45		
<b>Description</b>		<b>For use with sensors</b>	<b>Catalog Number</b>	<b>Weight kg lb</b>			
Mounting brackets		Ø 12	XSZB112	0.006	0.01		
		Ø 18	XSZB118	0.010	0.02		
		Ø 30	XSZB130	0.020	0.04		

Table 20.15: Osisense Capacitive Proximity Sensors, Cylindrical Stainless Steel, DC

Sensing Characteristics			
	Ø M12 threaded M12 x 1	Ø M18 threaded M18 x 1	Ø M30 threaded M30 x 1.5
Sensing Range	2 mm (0.078 in.)	5 mm (0.197 in.)	10 mm (0.394 in.)
Switching Frequency	300	200	150
Shock Resistance	Conforming to IEC 60068-2-27: 30 gn, 11 ms		
Vibration Resistance	Conforming to IEC 60068-2-6 10 gn, +/- 1 mm (10–55 Hz)		
<b>Power Requirements</b>			
Supply Voltage	30 mm: 24 Vdc (12–30 Vdc limits)		32 mm: 24–240 Vac (20–264 Vac limits)
Max. Load	200 mA		
<b>Environment</b>			
Operating Temperature Range	–25 +70 °C (–13 +158 °F)		
Product Certification	CE, ETL		
Environmental Protection Ratings	IP67, NEMA 4X (Indoor Use Only), IP65 (Ø M12 PCM and Ø18 PCM)		
Connection	Precabled, PVC (2 m)		
<b>Catalog Numbers</b>			
<b>Housing Material</b>	Stainless Steel		Nickel Plated Brass
<b>Cable (flush mountable)</b>	Catalog No.		Catalog No.
3-wire / PNP / N.O. function	XT112S1PAL2	XT118B1PAL2	XT130B1PAL2
3-wire / NPN / N.O. function	XT112S1NAL2	XT118B1NAL2	XT130B1NAL2
4-wire / PNP / N.O./N.C. function	XT112S1PCL2	XT118B1PCL2	XT130B1PCL2
<b>Connector (flush mountable)</b>	M12		
4-wire / PNP / N.O./N.C. function	XT112S1PCM12	XT118B1PCM12	XT130B1PCM12

[1] For a 5 m cable, replace L2 with L5; for a 10 m cable, replace L2 with L10. Example: XS612B1MAL2 becomes XS612B1MAL5 with a 5 m cable.

[2] Protective cable gland included with remote screw terminal connector.

[3] Available in Ø8 plastic with double insulation. See page 2/30 of 9006CT1007.

XX•18, XUV, and XXV Sensors

Table 20.16: XX•18 Sensors, 1 m Nominal Sensing Distance, 18 mm Diameter, M12 Connector



XXS18P1-M12



XXS18B1-M12, XXS18S1-M12

Body	Output	Catalog Number
Plastic	Discrete	XXS18P1PM12
	4–20 mA	XXS18P1AM12
	0–10 V	XXS18P1VM12
Plastic (with 90° head)	Discrete	XXA18P1PM12
	4–20 mA	XXA18P1AM12
	0–10 V	XXA18P1VM12
Brass	Discrete	XXS18B1PM12
	4–20 mA	XXS18B1AM12
	0–10 V	XXS18B1VM12
Brass (with 90° head)	Discrete	XXA18B1PM12
	4–20 mA	XXA18B1AM12
	0–10 V	XXA18B1VM12
Stainless Steel	Discrete	XXS18S1PM12
	4–20 mA	XXS18S1AM12
	0–10 V	XXS18S1VM12
Stainless Steel (with 90° head)	Discrete	XXA18S1PM12
	4–20 mA	XXA18S1AM12
	0–10 V	XXA18S1VM12

Table 20.17: XUV Label Sensor

Sensing Characteristics	
Nominal Sensing Distance	3 mm (0.12 in.)
Switching Frequency	500 Hz
Power Requirements	
Supply Voltage	12–24 Vdc (10–30 Vdc limits)
Max. Load	100 mA
Environmental	
Operating Temperature Range	+5 to +55 °C (+41 to +131 °F)
Environmental Protection Ratings	IP65, NEMA 4X (indoor use only), 5, 12, 12k, 13
Construction	
Flat Profile Dimensions (W x H x D)	92.5 x 47.3 x 16.0 mm (3.64 x 1.86 x 0.63 in.)
Housing Material	Aluminium
Transducer	Glass Epoxy
Connection	
Precabled (2 m)	XUVU06M3KCNL2
Connector (M8)	XUVU06M3KSNM8



XUV



XXV

Table 20.19: Mounting Brackets

Body Type	Catalog No.
M12	9006PA12
M18	9006PA18
M30	9006PA30



Table 20.18: XXV 18 mm Ultrasonic Sensors

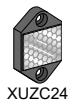
Sensing Characteristics		
Nominal Sensing Distance	2 mm to 50.8 mm (0.08 in. to 2.0 in.)	
Switching Frequency	80 Hz	
Power Requirements		
Supply Voltage	12–24 Vdc	
Max. Load	200 mA	
Environmental		
Operating Temperature Range	0 to 60 °C (32 to 140 °F)	
Environmental Protection Ratings	NEMA Type 4 and 13, and IP67	
Construction		
Barrel Dimensions (Ø x L)	18 x 1 x 43.2 mm (0.71 x 0.04 x 1.70 in.)	
Housing Material	Nickel Plated Brass	
Transducer	Glass Epoxy	
Connection		
Cable		
Precabled, PVC (2 m)		
PNP	N.O.	XXV18B1PAL2
	N.C.	XXV18B1PBL2
NPN	N.O.	XXV18B1NAL2
	N.C.	XXV18B1NBL2
Connection		
M12		
PNP	N.O.	XXV18B1PAM12
	N.C.	XXV18B1PBM12
NPN	N.O.	XXV18B1NAM12
	N.C.	XXV18B1NBM12

Table 20.20: Sensor Accessories

	Teach Push Button Accessory for Virtu and XX•18 Series Catalog No. XXZPB100
	Python AC/DC Power Converter Catalog No. XXZPM100M12

Table 20.21: Accessories

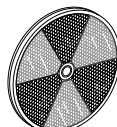
Description	mm	Catalog No.	
Reflectors	24 x 21	XUJC24	
	Ø 80	XUJC80	
	50 x 50	XUJC50	
Material		Catalog No.	
Mounting Brackets for XUB	Die Cast Zinc	XUZA118	
	Plastic	XUZA218	
90°		Straight	
Catalog No.		Catalog No.	
Cables (PUR), 2 m, without LED <sup>[1]</sup> Suitable plug-in female connectors, including pre-wired versions	M8 (4-Pin)	XZCP1041L2	XZCP0941L2
	M12 (4-pin)	XZCP1241L2	XZCP1141L2
	1/2-20UNF	XZCP1965L2	XZCP1865L2
Cables (PVC), 2 m, without LED <sup>[1]</sup> Suitable plug-in female connectors, including pre-wired versions	M8 (4-Pin)	XZCPV1041L2	XZCPV0941L2
	M12 (4-pin)	XZCPV1241L2	XZCPV1141L2
	1/2-20UNF	XZCPV1965L2	XZCPV1865L2



XUJC24



XUJC50



XUJC80



XZCP1241L2



XZCP1141L2



XUZA118



XUZA218

[1] For 5 or 10 meter lengths, replace 2 in the cable catalog number with 5 or 10.

VM Sensors

Table 20.22: Specifications and Catalog Numbers



Virtu™ VM1 and VM18

Specifications						
Sensing Characteristics						
Sensing Range	51–508 mm (2–20 in.)					
Max. Switching Frequency	300 Hz					
Power Requirements						
Supply Voltage	12–24 Vdc					
Supply Current	40 mA (excluding load)					
Environmental Ratings						
Operating Temperature	–30 to 70 °C (–22 to 158 °F)					
Environment	NEMA 4X (indoor use only), IP67					
Construction						
VM18 Barrel, ØxL	18 x 77.62 mm (0.709 x 3.06 in.) with 1 mm-6g thread					
VM1 Dual Mount	Ø 18 mm and Flat Format 43.7 x 18 x 59.7 mm (1.72 x 0.70 x 2.35 in.)					
Housing Material	PBT Resin					
Transducer	Glass Epoxy					
Output Type		Catalog Number				
Output		Cable			Quick Disconnect	
		Dual Mount	Barrel	Dual Mount	Barrel	
Proximity	PNP Sourcing	N.O.	VM1PNO	VM18PNO	VM1PNOQ	VM18PNOQ
		N.C.	VM1PNC	VM18PNC	VM1PNCQ	VM18PNCQ
	NPN Sinking	N.O.	VM1NNO	VM18NNO	VM1NNOQ	VM18NNOQ
		N.C.	VM1NNC	VM18NNC	VM1NNCQ	VM18NNCQ
	PNP Sourcing	N.O.	VM1PTO	VM18PTO	VM1PTOQ	VM18PTOQ
		N.C.				
NPN Sinking	N.O.	VM1NTO	VM18NTO	VM1NTOQ	VM18NTOQ	
	N.C.					
Dual-Level Pump In Normally Open	Off at loss of echo and at powerup	PNP	VM1PPI0000	VM18PPI0000	VM1PPI0000Q	VM18PPI0000Q
		NPN	VM1NPI0000	VM18NPI0000	VM1NPI0000Q	VM18NPI0000Q
	On at loss of echo and at powerup	PNP	VM1PPI1000	VM18PPI1000	VM1PPI1000Q	VM18PPI1000Q
		NPN	VM1NPI1000	VM18NPI1000	VM1NPI1000Q	VM18NPI1000Q
	Hold on loss of echo, Off at powerup	PNP	VM1PPI2000	VM18PPI2000	VM1PPI2000Q	VM18PPI2000Q
		NPN	VM1NPI2000	VM18NPI2000	VM1NPI2000Q	VM18NPI2000Q
Dual-Level Pump Out Normally Open	Off at loss of echo and at powerup	PNP	VM1PPO0000	VM18PPO0000	VM1PPO0000Q	VM18PPO0000Q
		NPN	VM1NPO0000	VM18NPO0000	VM1NPO0000Q	VM18NPO0000Q
	On at loss of echo and at powerup	PNP	VM1PPO1000	VM18PPO1000	VM1PPO1000Q	VM18PPO1000Q
		NPN	VM1NPO1000	VM18NPO1000	VM1NPO1000Q	VM18NPO1000Q
	Hold on loss of echo, Off at powerup	PNP	VM1PPO2000	VM18PPO2000	VM1PPO2000Q	VM18PPO2000Q
		NPN	VM1NPO2000	VM18NPO2000	VM1NPO2000Q	VM18NPO2000Q
Analog	Voltage 0–10 Vdc with Temperature Compensation For Direct/Inverse models, change VD or VI to VA.					
	Direct, 0 V at loss of echo and at powerup		VM1VD0000	VM18VD0000	VM1VD0000Q	VM18VD0000Q
	Inverse, 0 V at loss of echo and at powerup		VM1VI0000	VM18VI0000	VM1VI0000Q	VM18VI0000Q
	Direct, 10 V at loss of echo and at powerup		VM1VD1000	VM18VD1000	VM1VD1000Q	VM18VD1000Q
	Inverse, 10 V at loss of echo and at powerup		VM1VI1000	VM18VI1000	VM1VI1000Q	VM18VI1000Q
	Direct, hold on loss of echo, 0 V at powerup		VM1VD2000	VM18VD2000	VM1VD2000Q	VM18VD2000Q
	Inverse, hold on loss of echo, 0 V at powerup		VM1VI2000	VM18VI2000	VM1VI2000Q	VM18VI2000Q
	Direct, hold on loss of echo, 10 V at powerup		VM1VD3000	VM18VD3000	VM1VD3000Q	VM18VD3000Q
	Inverse, hold on loss of echo, 10 V at powerup		VM1VI3000	VM18VI3000	VM1VI3000Q	VM18VI3000Q
	Current 4–20 mA with Temperature Compensation For Direct/Inverse models, change CD or CI to CA					
	Direct, 4 mA at loss of echo and at powerup		VM1CD0000	VM18CD0000	VM1CD0000Q	VM18CD0000Q
	Inverse, 4 mA at loss of echo and at powerup		VM1CI0000	VM18CI0000	VM1CI0000Q	VM18CI0000Q
	Direct, 20 mA at loss of echo and at powerup		VM1CD1000	VM18CD1000	VM1CD1000Q	VM18CD1000Q
	Inverse, 20 mA at loss of echo and at powerup		VM1CI1000	VM18CI1000	VM1CI1000Q	VM18CI1000Q
	Direct, hold on loss of echo, 4 mA at powerup		VM1CD2000	VM18CD2000	VM1CD2000Q	VM18CD2000Q
	Inverse, hold on loss of echo, 4 mA at powerup		VM1CI2000	VM18CI2000	VM1CI2000Q	VM18CI2000Q
	Direct, hold on loss of echo, 20 mA at powerup		VM1CD3000	VM18CD3000	VM1CD3000Q	VM18CD3000Q
	Inverse, hold on loss of echo, 20 mA at powerup		VM1CI3000	VM18CI3000	VM1CI3000Q	VM18CI3000Q

30 mm Ultrasonic Sensors

Table 20.23: Specifications and Catalog Numbers



Virtu™ 30 mm



M30  
30 mm (1 or 2 m)



M30  
30 mm (8 m)

Specifications							
Sensing Characteristics							
Sensing Range	102–1000 mm (4–39 in.)		51 mm to 1 m (2–39 in.); 119 mm to 2 m (4.7–79 in.)		304.8 mm to 8 m (12–315 in.)		
Sensing Frequency	180 kHz		200 kHz		75 kHz		
Power Requirements							
Supply Voltage	12–24 Vdc discrete, 15–24 Vdc analog		12–24 Vdc discrete; 15–24 Vdc analog		12–24 Vdc discrete; 15–24 Vdc analog		
Supply Current	40 mA discrete, 90 mA analog (excluding load)		80 mA (excluding load)		80 mA (excluding load)		
Environmental Ratings							
Operating Temperature	0 to 70 °C (32 to 158 °F)		0 to 50 °C (32 to 122 °F) discrete –20 to 60 °C (–4 to 140 °F) analog		–40 to 60 °C (–40 to 140 °F)		
Environment	NEMA 4X (indoor use only), IP67		NEMA 4X (indoor use only), IP67		NEMA 4X (indoor use only), IP67		
Construction							
Barrel, ØxL	30 x 1 x 95.26 mm (1.18 x 3.75 in.)		30 x 1 x 95 mm (1.18 x 3.74 in.)		30 x 1 x 116 mm (9.18 x 4.58 in.)		
Housing Material	PBT Resin		PEI Resin, or Stainless Steel (1 m only)		PEI Resin		
Transducer	Glass Epoxy		Silicon Rubber or Fluorosilicone		Glass Epoxy or PVDF		
Output Type							
			1 m / 2 m		8 m		
Proximity Output	Description	Catalog No.	Description	Catalog No.	Description	Catalog No.	
	PNP Sourcing N.O.	XX6V3A1PAM12	1 m [2]	Connector	SM950A100000	Cable	SM900A800000
PNP Sourcing N.C.	XX6V3A1PBM12	Cable		SM900A100000			
	PNP Sourcing N.O./N.C.	XX6V3A1PSM12	2 m	Connector	SM950A400000	Connector	SM950A800000
	NPN Sinking N.O.	XX6V3A1NAM12					
	NPN Sinking N.C.	XX6V3A1NBM12					
	NPN Sinking N.O./N.C.	XX6V3A1NSM12					
Dual-Level Pump In	Connector		Cable 1 m [3]	PNP, NO	Cable 8 m	PNP, NO	
		Normally Open	Pump-out latch	SM902A100000	Pump-out latch	SM902A800000	
		Hold on loss of echo; Off on power up	Pump-out latch with alarm	SM902A1560000	Pump-out latch with alarm	SM902A8560000	
		PNP	XX2V3A1PGM12	Pump-out latch, with setpoint	SM902A1760000	Pump-out latch, with setpoint	SM902A8760000
		NPN	XX2V3A1NGM12	Pump-in latch	SM902A110000	Pump-in latch	SM902A810000
		Off on loss of echo; Off on power up	Pump-in latch with alarm	SM902A1460000	Pump-in latch with alarm	SM902A8460000	
		PNP	XX2V3A1PFM12	Pump-in latch, with setpoint	SM902A1660000	Pump-in latch, with setpoint	SM902A8660000
Dual-Level Pump Out		NPN	XX2V3A1NFM12	Dual setpoint	SM902A1260000	Dual setpoint	SM902A8260000
		Hold on loss of echo; Off on power up	Dual alarm	SM902A1360000	Dual alarm	SM902A8360000	
		PNP	XX2V3A1PJM12	Connector [3]	PNP, NO	Connector	PNP, NO
		NPN	XX2V3A1NJM12	Pump-out latch	SM952A100000	Pump-out latch	SM952A800000
		Off on loss of echo; Off on power up	Pump-out latch with alarm	SM952A1560000	Pump-out latch with alarm	SM952A8560000	
		PNP	XX2V3A1PHM12	Pump-out latch, with setpoint	SM952A1760000	Pump-out latch, with setpoint	SM952A8760000
		NPN	XX2V3A1NHM12	Pump-in latch	SM952A110000	Pump-in latch	SM952A810000
Analog			Pump-in latch with alarm	SM952A1460000	Pump-in latch with alarm	SM952A8460000	
			Pump-in latch, with setpoint	SM952A1660000	Pump-in latch, with setpoint	SM952A8660000	
			Dual setpoint	SM952A1260000	Dual setpoint	SM952A8260000	
			Dual alarm	SM952A1360000	Dual alarm	SM952A8360000	
		Quick Disconnect	Cable 1 m [3]		Cable 8 m		
		0–20 mA	Catalog No.	Voltage (0–10 Vdc)	Catalog No.	Voltage (0–10 Vdc)	Catalog No.
		Direct/Inverse slope	XX9V3A1C4M12	Auto slope	SM906A180000	Auto slope	SM906A880000
		Direct output	XX9V3A1D4M12	Direct slope	SM906A110000	Direct slope	SM906A810000
		Inverse output	XX9V3A1E4M12	Inverse slope	SM906A100000	Inverse slope	SM906A800000
		4–20 mA		Current (4–20 mA)		Current (4–20 mA)	
	Direct/Inverse slope	XX9V3A1C2M12	Auto slope	SM906A190000	Auto slope	SM906A890000	
	Direct output	XX9V3A1D2M12	Direct slope	SM906A130000	Direct slope	SM906A830000	
	Inverse output	XX9V3A1E2M12	Inverse slope	SM906A120000	Inverse slope	SM906A820000	
	0–5 Vdc		Connector		Connector		
	Direct/Inverse slope	XX9V3A1F3M12	Voltage (0–10 Vdc)		Voltage (0–10 Vdc)		
	Direct output	XX9V3A1G3M12	Auto slope	SM956A180000	Auto slope	SM956A880000	
	Inverse output	XX9V3A1H3M12	Direct slope	SM956A110000	Direct slope	SM956A810000	
	0–10 Vdc		Inverse slope	SM956A100000	Inverse slope	SM956A800000	
	Direct/Inverse slope	XX9V3A1F1M12	Current (4–20 mA)		Current (4–20 mA)		
	Direct output	XX9V3A1G1M12	Auto slope	SM956A190000	Auto slope	SM956A890000	
	Inverse output	XX9V3A1H1M12	Direct slope	SM956A130000	Direct slope	SM956A830000	
			Inverse slope	SM956A120000	Inverse slope	SM956A820000	

[2] For stainless steel, add suffix S.  
[3] For the 2 m version, change model from SMxxxA1xxxx to SMxxxA4xxxx.