871C 2-wire AC Full Featured Tubular Sensors

Plastic Face/Threaded Nickel-plated Brass Barrel

871C AC Cable Style
18 mm and 30 mm

871C AC Mini Quick-disconnect Style
12 mm, 18 mm, and 30 mm

871C AC Micro Quick-disconnect Style
12 mm, 18 mm, and 30 mm

Specifications

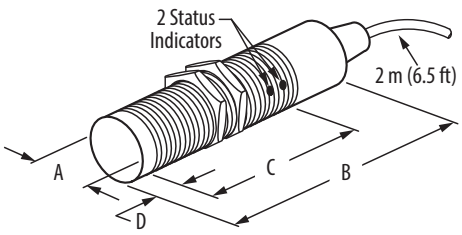
Attribute	12 mm	18 mm and 30 mm
Load Current	5…200 mA	5…250 mA
Inrush Current (one cycle)	≤2 A	≤4 A
Leakage Current	≤1.9 mA @ 120V AC	
Operating Voltage	20…250V AC	
Voltage Drop	≤10V @ 5…200 mA	≤10V @ 5…250 mA
Repeatability	≤10% at constant temperature	
Hysteresis	10% typical	
Protection Type	False pulse, transient noise, short circuit, overload (trigger at 250 mA typical)	False pulse, transient noise, short circuit, overload (trigger at 320 mA typical)
Certifications	UL Listed, CSA Certified, and CE Marked for all applicable directives	
Enclosure Type Rating	NEMA 1, 2, 3, 3R, 4, 4X, 6, 6P, 12, 13; IP67 (IEC529)	
Housing Material	Nickel plated brass barrel	
Connection Type	• Cable: 2 m (6.5 ft) length, 2-conductor PVC • Quick-disconnect: 3-pin micro, 3-pin mini	
Status Indicator	• Red: Output energized/short circuit (flashing) • Green: Power	
Operating Temperature	-25…+70 °C (-13…+158 °F)	
Shock	30 g (1.06 oz), 11 ms	
Vibration	55 Hz, 1 mm (0.04 in.) amplitude, 3 planes	

Correction Factors

Target Material	Correction Factors
Steel	1.0
Stainless Steel	0.9
Brass	0.5
Aluminum	0.45
Copper	0.4

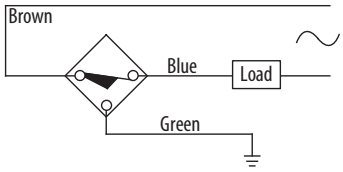
Approximate Dimensions [mm (in.)]

Cable Style

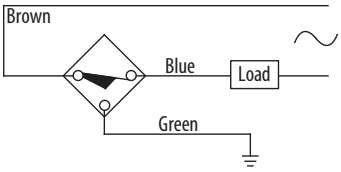


Wiring Diagrams

Normally Open



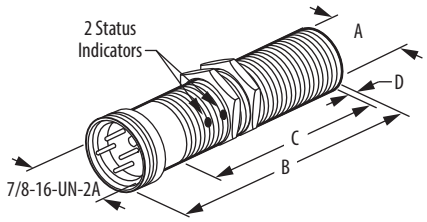
Normally Closed



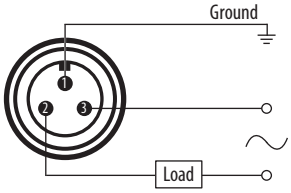
Note: Load can be switched to brown wire.

Thread Size	Shielded	mm (in.)			
		A	B	C	D
M12 x 1	Yes	12.0 (0.47)	78.99 (3.11)	47.24 (1.86)	0.8 (0.03)
M18 x 1	Yes	18.0 (0.71)	74.68 (2.94)	61.6 (2.43)	
M30 X 1.5	Yes	30.0 (1.18)	77.52 (3.05)	64.31 (2.53)	

Mini QD Style



Normally Open or Normally Closed

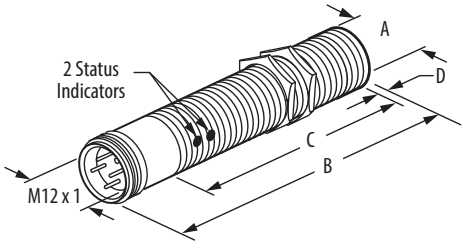


Note: No ground wire on 12 mm. Attach housing to ground.

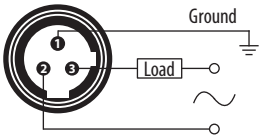
Note: Load can be switched to pin 3.

Thread Size	mm (in.)		
	A	B	C
M12 x 1	12.0 (0.47)	93.45 (3.68)	46.08 (1.81)
M18 x 1	18.0 (0.71)	75.82 (2.99)	53.9 (2.12)
M30 X 1.5	30.0 (1.18)	86.66 (3.41)	64.31 (2.53)

Micro QD Style



Normally Open or Normally Closed



Note: No ground wire on 12 mm. Attach housing to ground.

Note: Load can be switched to pin 2.

Thread Size	mm (in.)		
	A	B	C
M12 x 1	12.0 (0.47)	90.42 (3.56)	46.99 (1.85)
M18 x 1	18.0 (0.71)	83.54 (3.29)	61.6 (2.43)
M30 X 1.5	30.0 (1.18)	86.00 (3.39)	64.31 (2.53)

871C 2-wire AC Plastic Barrel Tubular Sensors

Plastic Face/Threaded

871C AC Cable Style
18 mm and 30 mm

Specifications

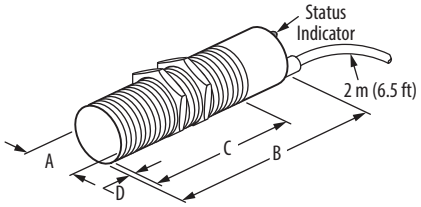
Attribute	18 mm	30 mm
Load Current	≤180 mA	≤300 mA
Inrush Current (one cycle)	≤1 A	≤3 A
Leakage Current	≤1.7 mA	
Operating Voltage	24…250V AC	
Voltage Drop	≤11V	
Hysteresis	≤20% typical	
Protection Type	Transient noise	
Certifications	CE Marked for all applicable directives	
Enclosure Type Rating	NEMA 1, 2, 3, 4, 4X, 12, 13; IP67 (IEC529)	
Housing Material	Plastic barrel	
Connection Type	Cable: 2 m (6.5 ft) length, 2-conductor PVC	
Status Indicator	Red: Output energized	
Operating Temperature	-25…+55 °C (-13…+131 °F)	
Shock	30 g (1.06 oz), 11 ms	
Vibration	55 Hz, 1 mm (0.039 in.) amplitude, 3 planes	

Correction Factors

Target Material	Correction Factors
Steel	1.0
Stainless Steel	0.7…0.8
Brass	0.4…0.5
Aluminum	0.3…0.4
Copper	0.3…0.4

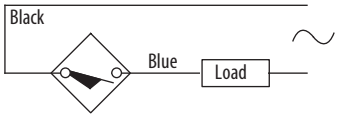
Approximate Dimensions [mm (in.)]

Cable Style



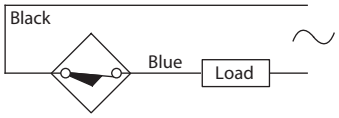
Wiring Diagrams

Normally Open



Note: Load can be switched to black wire.

Normally Closed



Thread Size	Shielded	mm (in.)			
		A	B	C	D
M18x 1	Yes	18.0 (0.71)	81.0 (3.19)	61.0 (2.40)	2.0 (0.08)
	No (1)				
M30 X 1.5	Yes	30.0 (1.18)			
	No (1)				

(1) Unshielded proximity sensors require a metal-free zone around the sensing face. Any metal immediately opposite the sensing face must be no closer than three times the rated nominal sensing distance of the sensor.

871C Analog Output, 3-wire DC Tubular Sensors

Plastic Face/Nickel-plated Brass Barrel

871C Cable Style
12 mm, 18 mm, and 30 mm

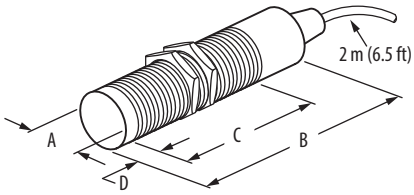
Specifications

Attribute	12 mm	18 mm	30 mm
Analog Output	0…10V Sourcing		
Load Current	5 mA		
Operating Voltage	18…30V DC		
Repeatability	≤1%		
Ripple	10%		
Slew Speed	1.0 V/ms	0.7 V/ms	0.1 V/ms
Δ Output/Δ Distance	0.25 mm/V	0.375 mm/V	0.875 mm/V
Linearity Tolerance	6.25%		
Temperature Drift	±0.3V		
Protection Type	Transient noise, reverse polarity, short circuit, and overload		
Certifications	CE Marked for all applicable directives		
Enclosure Type Rating	NEMA 1, 2, 3, 4, 12, 13; IP67 (IEC529)		
Housing Material	Nickel-plated brass barrel, plastic face (PBT)		
Connection Type	Cable: 2 m (6.5 ft) length, 3-conductor PVC		
Status Indicator	None		
Operating Temperature	-25…+70 °C (-13…+158 °F)		
Shock	30 g (1.06 oz), 11 ms		
Vibration	55 Hz, 1 mm amplitude, 3 planes		

Correction Factors

Target Material	Correction Factors
Steel	1.0
Stainless Steel	0.7…0.8
Brass	0.4…0.5
Aluminum	0.3…0.4
Copper	0.2…0.3

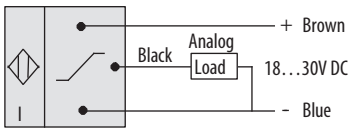
Approximate Dimensions [mm (in.)]



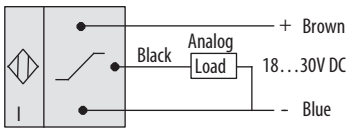
Thread Size	mm (in.)			
	A	B	C	D
12 mm	12.0 (0.47)	81.0 (3.15)	58.0 (2.28)	12 (0.47)
18 mm	18 (0.71)			
30 mm	30.0 (1.18)		70 (2.75)	

Wiring Diagrams

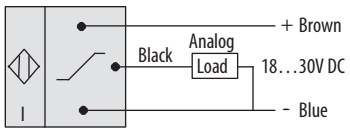
12 mm



18 mm

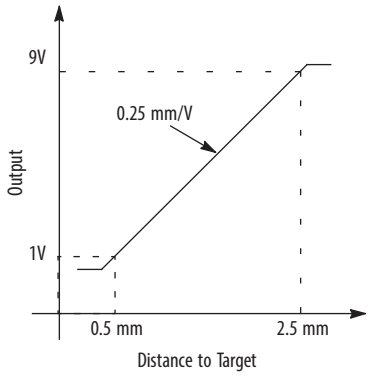


30 mm

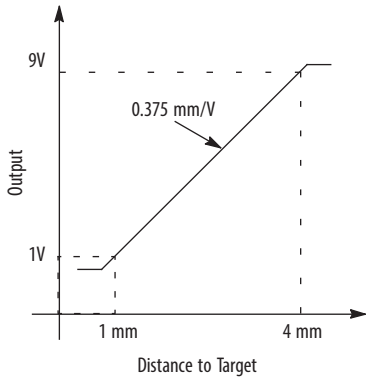


Nominal Output

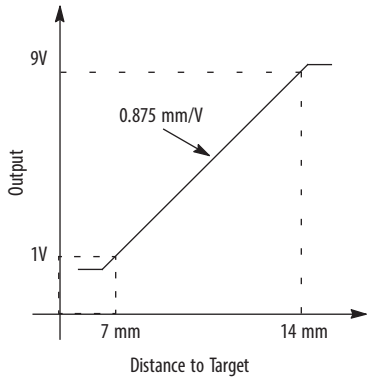
12 mm



18 mm



30 mm



871C 2-wire NAMUR Intrinsically Safe, Cable Style Tubular Sensors

Nickel-plated Brass Barrel, Plastic Face

871C NAMUR Cable Style
8 mm, 12 mm, 18 mm, and 30 mm

871C NAMUR Micro Quick-disconnect Style
8 mm, 12 mm, 18 mm, and 30 mm

Specifications

Attribute	8 mm, 12 mm, 18 mm, and 30 mm
Output Type	NAMUR (conforms to DIN 19 234)
Load Current, Nom.	<1 mA (target present), >3 mA (target absent)
Operating Voltage	5…15V DC (8.2V DC nom., Ri = 1 kohm, DIN 19 234)
Ripple	5%
Repeatability	<10%
Hysteresis	10% typical
Protection Type	Reverse polarity, false pulse, transient noise, short circuit, and overload
Certifications	FM Approved: • Class I, II, III; Divisions 1, 2; Groups A, B, C, D, E, F, G • Class I; Zone 0, 1, 2; Groups IIC, IIB, IIA; T6; CSA Certified • Class I, II, III; Divisions 1, 2; Groups A, B, C, D, E, F, G • Class I; Zone 0, 1, 2; Groups IIC, IIB, IIA; CE Marked for all applicable directives
Enclosure Type Rating	NEMA 4, IP67 (IEC529)
Housing Material	Nickel-plated brass barrel, plastic face
Connection Type	• Cable: 2 m (6.5 ft) length, 2-conductor #22 AWG PVC • Quick-disconnect: 4-pin micro style
Status Indicator	None
Operating Temperature	-25…+60 °C (-13…+140 °F)
Shock	30 g (1.06 oz), 11 ms
Vibration	55 Hz, 1 mm amplitude, 3 plane

Correction Factors

Target Material	Correction Factors
Steel	1.0
Stainless Steel	0.7…0.8
Brass	0.4…0.5
Aluminum	0.3…0.4
Copper	0.2…0.3

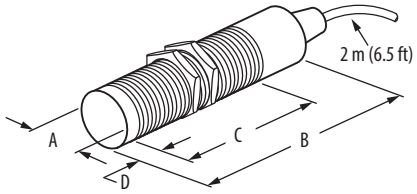
Entity Parameters

Sensor			Barrier
V_{max}	16V	≥	V_t
I_{max}	60 mA	≥	I_t
C_I	150 $_n$F	≤	C_a
L_I	200 µH	≤	L_a

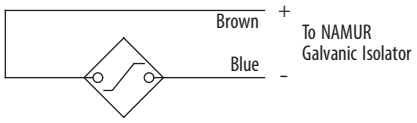
IMPORTANT Operating parameters must be adhered to.

Approximate Dimensions [mm (in.)]

Cable Style

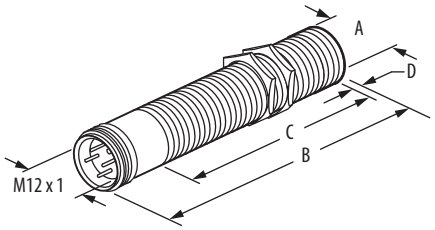


Wiring Diagrams



Thread Size	Shielded	mm (in.)		
		A	B	C
M8 X1	Yes	8.0 (0.31)	30.0 (1.18)	—
	No			5.0 (0.20)
M12 X 1	Yes	12.0 (0.47)		—
	No			6.0 (0.24)
M18 X 1	Yes	18.0 (0.71)		—
	No			8.0 (0.31)
M30 X 1.5	Yes	30.0 (1.18)	40.0 (1.57)	—
	No			12.0 (0.47

Micro QD Style



Normally Open

PNP (Sourcing)

Thread Size	Shielded	mm (in.)			
		A	B	C	D
M8 X1	Yes	8.0 (0.31)	50.0 (1.97)	28.0 (1.10)	—
	No			23.0 (0.91)	5.0 (0.20)
M12 X 1	Yes	12 (0.47)		30.0 (1.18)	—
	No			24.0 (0.94)	6.0 (0.24)
M18 X 1	Yes	18.0 (0.71)		30.0 (1.18)	—
	No			22.0 (0.87)	8.0 (0.31)
M30 X 1.5	Yes	30.0 (1.36)	60.0 (2.36)	40.0 (1.57)	—
	No			28.0 (1.10)	12.0 (0.47)

871C 3-wire DC Mini Tubular Sensors

Plastic Face/Small Threaded or Smooth Stainless Steel Barrel 3 mm, 4 mm, and 5 mm

871C NAMUR Cable Style
8 mm, 12 mm, 18 mm, and 30 mm

871C NAMUR Micro Quick-disconnect Style
8 mm, 12 mm, 18 mm, and 30 mm

871C NAMUR Micro Quick-disconnect Style
8 mm, 12 mm, 18 mm, and 30 mm

871C NAMUR Micro Quick-disconnect Style
8 mm, 12 mm, 18 mm, and 30 mm

871C NAMUR Micro Quick-disconnect Style
8 mm, 12 mm, 18 mm, and 30 mm

IO-Link

Specifications

Attribute	3 mm Smooth Barrel and 4 mm Threaded Barrel	4 mm Smooth Barrel and 5 mm Threaded Barrel
Environmental		
Operating Environment	NEMA 1, 2, 3, 4, 12, 13 IP67 (IEC 529)	
Operating Temperature	-25…+70 °C (-13…+158 °F)	
Vibration	55 Hz, 1 mm amplitude, 3 planes	
Shock	30 g (1.06 oz), 11 ms	
Electrical		
Load Current	≤ 100 mA	<200 mA
Leakage Current	≤ 0.1 mA	
Operating Voltage	10…30V DC	
Voltage Drop	≤ 2V	
Repeatability	≤ 5%	
Hysteresis	10% typical	
Protection Type	False pulse, transient noise, reverse polarity, and short circuit	
IO-Link (Enabled on Normally Open, PNP Models Only)		
Protocol	IO-Link V1.0	
Interface Type	IO-Link	
Mode	COM 2 (38.4 kBd)	
Cycle Time 1	10.4 ms, minimum	
SIO (standard I/O)	Supported (pin 4 for either IO-Link or SIO)	
Mechanical		
Housing Material	Stainless steel barrel, polyester face	
Status Indicator	Yellow: Output energized	
Status Indicator (IO-Link Mode)	Solid yellow: Sensor in IO-Link mode	
Connection Type	Pico™ QD (M8), 2 m (6.6 ft) cable, pico with lead	

Correction Factors

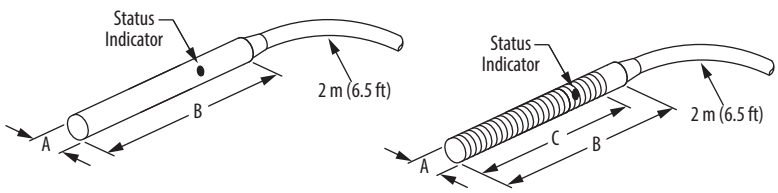
Sensor Type/ Target Material	3 mm Diameter Smooth		4 mm Diameter Smooth or Threaded		5 mm Diameter Smooth or Threaded	
	0.6 mm Sr	1.0 mm Sr	0.8 mm Sr	1.5 mm Sr	1 mm Sr	1.5 mm Sr
Steel	1	1	1	1	1	1
Copper	0.5	0.45	0.45	0.4	0.45	0.4
Aluminum	0.55	0.5	0.5	0.4	0.5	0.4
Brass	0.65	0.6	0.55	0.5	0.55	0.5
Stainless Steel 304	0.8	0.8	0.8	0.75	0.8	0.75

Switching Frequency

Barrel Diameter [mm (in.)]	Nominal Sensing Distance [mm (in.)]	Switching Frequency [Hz]
3	0.6 (0.02)	5000
	1 (0.04)	3000
4	0.8 (0.03)	5000
	1 (0.04)	3000
	1.5 (0.06)	3000
5	1 (0.04)	5000
	1.5 (0.06)	3000

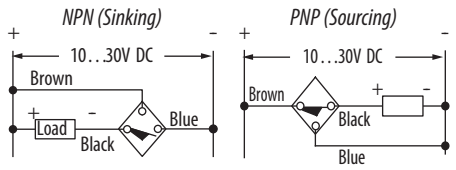
Approximate Dimensions [mm (in.)]

Cable Style



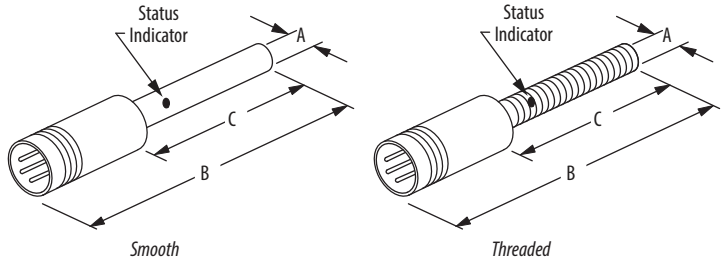
Wiring Diagrams

Normally Open

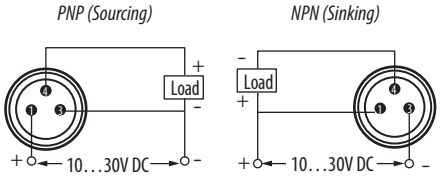


Smooth Diameter	Thread Size	Shielded	[mm (in.)]		
			A	B	C
3.0	—	Yes	3.0 (0.12)	22.0 (0.87)	—
4.0	—		4.0 (0.16)	25.0 (0.98)	—
4.0	M4 X 0.5	Yes	4.0 (0.16)	22.0 (0.87)	19.0 (0.75)
5.0	M5 X 0.5		5.0 (0.20)	25.0 (0.98)	20.0 (0.79)

Pico QD Style

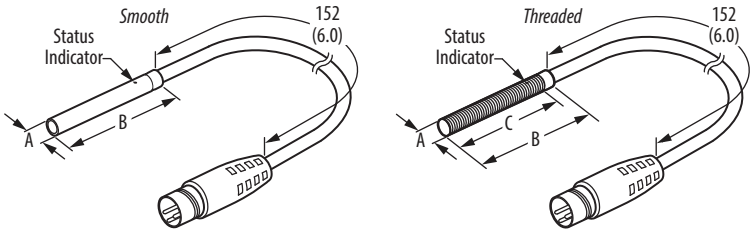


Normally Open

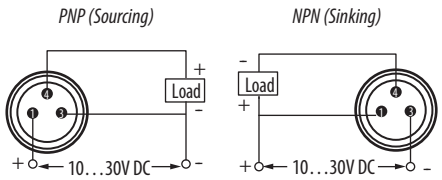


Smooth Diameter	Thread Size	Shielded	mm (in.)		
			A	B	C
4.0	—	Yes	4.0 (0.16)	38.0 (1.50)	19.0 (0.74)
5.0	M5 X 0.5		5.0 (0.20)	38.0 (1.50)	23.0 (0.90)

Pico with Lead Style



Normally Open



Smooth Diameter	Shielded	mm (in.)		
		A	B	C
3.0	Yes	3.0 (0.1)	22.0 (0.87)	—
4.0		4.0 (0.16)	22.0 (0.87)	19.0 (0.74)

871C 3-wire DC Extended Temperature Tubular Sensors

Plastic Face/Threaded Nickel-plated Brass Barrel

871C DC Cable Style
12 mm, 18 mm, and 30 mm

871C DC Micro Quick-disconnect Style
12 mm, 18 mm, and 30 mm

Specifications

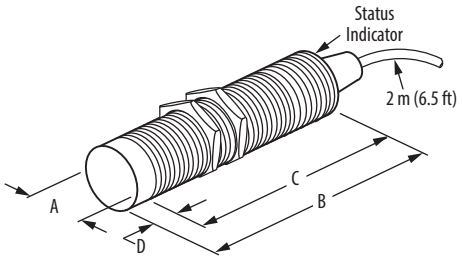
Attribute	12 mm, 18 mm, and 30 mm
Load Current	1…200 mA
Leakage Current	≤10 µA
Operating Voltage	10…30V DC
Voltage Drop	≤2.4V
Repeatability	≤10%
Hysteresis	≤15% typical
Protection Type	False pulse, transient noise, reverse polarity, short circuit, and overload
Certifications	CE Marked for all applicable directives
Enclosure Type Rating	NEMA 1, 2, 3, 4, 12, 13; IP67 (IEC529)
Housing Material	Nickel-plated brass barrel
Connection Type	• Cable: 2 m (6.5 ft) length, 3-conductor PUR • Quick-disconnect: 4-pin micro style
Status Indicator	Orange: Output Energized
Operating Temperature	-40…+100 °C (-40…+212 °F)
Shock	30 g (1.06 oz), 11 ms
Vibration	55 Hz, 1 mm amplitude, 3 planes

Correction Factors

Target Material	Correction Factors
Steel	1.0
Stainless Steel	0.9
Brass	0.5
Aluminum	0.45
Copper	0.4

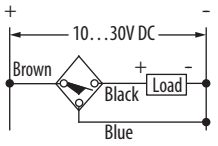
Approximate Dimensions [mm (in.)]

Cable Style



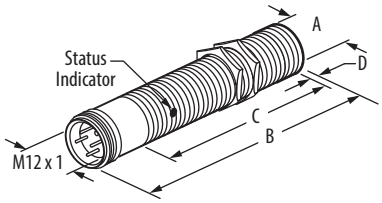
Wiring Diagrams

Normally Open

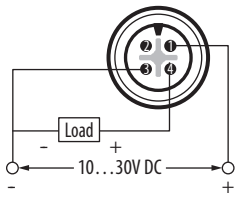


Thread Size	Shielded	mm (in.)			
		A	B	C	D
M12 X 1	Yes	12.0 (0.47)	40.0 (1.57)	40.0 (1.57)	—
	No			34.0 (1.34)	6.0 (0.24)
M18 X 1	Yes	18.0 (0.71)		40.0 (1.57)	—
	No			32.0 (1.26)	8.0 (0.31)
M30 X 1.5	Yes	30.0 (1.18)		40.0 (1.57)	—
	No			28.0 (1.12)	12 (0.47)

Micro QD Style



Normally Open



Thread Size	Shielded	mm (in.)			
		A	B	C	D
M12 X 1	Yes	12.0 (0.47)	60.0 (2.36)	40.0 (1.57)	—
	No			34.0 (1.34)	6.0 (0.24)
M18 X 1	Yes	18.0 (0.71)		40.0 (1.57)	—
	No			32.0 (1.26)	8.0 (0.31)
M30 X 1.5	Yes	30.0 (1.18)		40.0 (1.57)	—
	No			28.0 (1.12)	12 (0.47)