871TM 3-wire DC Short Barrel Tubular Sensors

Stainless Steel Face/Threaded Stainless Steel Barrel

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

871TM DC Mini Quick Disconnect Style
12 mm, 18 mm, and 30 mm

871TM DC Micro Quick Disconnect Style
12 mm, 18 mm, and 30 mm

Specifications

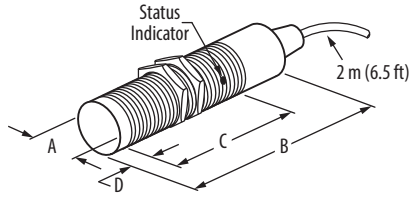
Attribute	12 mm, 18 mm, and 30 mm
Load Current	≤200 mA
Capacitive Load	≤1 µF
Leakage Current	≤10 µA
Operating Voltage	10…30V DC
Voltage Drop	≤1V DC at 200 mA
Repeatability	≤10% at constant temperature
Hysteresis	10% typical
Protection Type	False pulse, transient noise, reverse polarity, short circuit (trigger at 340 mA typical), overload
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) all models; 1200 psi (8270 kPa) washdown; ToughLink™ and micro connector versions are also rated IP69K (IEC 529)
Housing Material	Stainless steel face and barrel
Connection Type	• Cable: 2 m (6.5 ft) length, A2 - 3-conductor PVC, C2 - 3-conductor #22 AWG-ToughLink, H2 - 3-conductor #18 AWG ToughLink • Quick-disconnect: 4-pin mini style, 4-pin micro style
Indicator Status Indicators	• Red: Output Energized • Green: Power/Short Circuit (flashing)—18 mm models only
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	0.9…1.0
Brass	0.3…0.5
Aluminum	0.1…0.4
Aluminum (≤0.02 Thick)	0.9…1.1
Copper	0.1…0.2

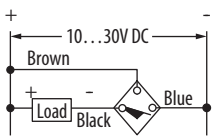
Approximate Dimensions [mm (in.)]

Cable Style



Wiring Diagrams

Normally Open



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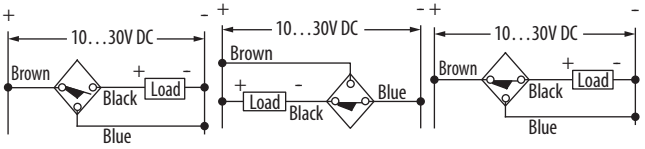
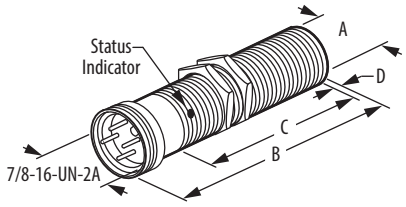


Thread Size	Shielded	mm (in.)			
		A	B	C	D
M12 X 1	Yes	12.0 (0.47)	49.8 (1.96)	26.4 (1.04)	2.5 (0.10)
	No			19.5 (0.77)	9.4 (0.37)
M18 X 1	Yes	18.0 (0.71)	55.4 (2.18)	41.7 (1.64)	2.5 (0.10)
	No				14.5 (0.57)
M30 X 1.5	Yes	30.0 (1.18)	57.9 (2.28)	41.9 (1.65)	2.5 (0.10)
	No			39.4 (1.55)	18.0 (0.71)

Mini QD Style



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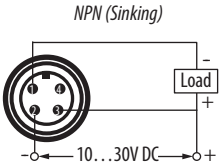

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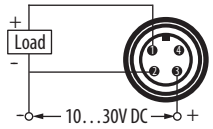
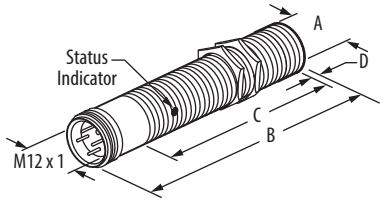
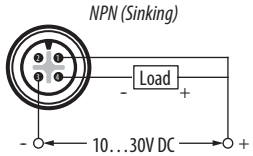


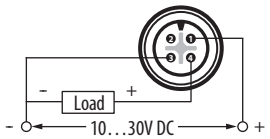
Thread Size	Shielded	mm (in.)			
		A	B	C	D
M12 X 1	Yes	12.0 (0.47)	63.5 (2.50)	25.4 (1.00)	2.5 (0.10)
	No			18.5 (0.73)	9.4 (0.37)
M18 X 1	Yes	18.0 (0.71)	56.1 (2.21)	35.1 (1.38)	2.5 (0.10)
	No			29.2 (1.15)	14.5 (0.57)
M30 X 1.5	Yes	30.0 (1.18)	68.1 (2.68)	41.9 (1.65)	2.5 (0.10)
	No			39.4 (1.55)	18.0 (0.71)

Mini QD Style



Normally Open or Normally Closed





Thread Size	Shielded	mm (in.)			
		A	B	C	D
M12 X 1	Yes	12.0 (0.47)	61.5 (2.40)	26.4 (1.04)	2.5 (0.10)
	No			28.0 (1.10)	9.4 (0.37)
M18 X 1	Yes	18.0 (0.71)	65.1 (2.56)	41.7 (1.64)	2.5 (0.10)
	No				14.5 (0.57)
M30 X 1.5	Yes	30.0 (1.18)	66.3 (2.61)	41.9 (1.65)	2.5 (0.10)
	No			39.4 (1.55)	18.0 (0.71)

871TM 3-wire DC Weld-field Immune Tubular Sensors

Stainless Steel Face/Threaded Stainless Steel Barrel

871TM DC Pico Quick-disconnection Style
8 mm

871TM DC Micro Quick Disconnect Style
12 mm

871TM DC Micro
18 mm

Specifications

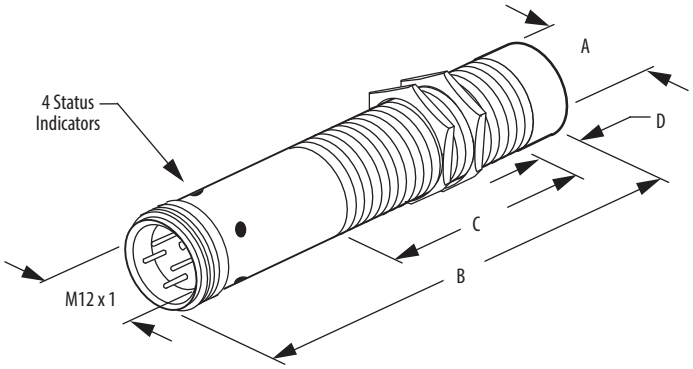
Attribute	8 mm, 12 mm, and 18 mm
Load Current	≤ 200 mA
Leakage Current	≤ 0.1 mA
Operating Voltage	10…30V DC
Voltage Drop	≤ 2V DC at 200 mA
Repeatability	≤ 5% at constant temperature, maximum sensing range
Hysteresis	15% typical
Protection Type	False pulse, transient noise, reverse polarity, short circuit (trigger at 340 mA typical), overload
Certifications	c-UL-us Listed and CE Marked for all applicable directives
Enclosure Type Rating	8/12/18 mm: IP68/IP69K
Housing Material	Stainless steel face and barrel, resistant to weld splatter
Connection Type	Quick-disconnect: 4-pin micro style, 3-pin pico style
Indicator Status Indicators	Yellow: Output energized/360° visibility flashing status indicator indicates target that is located between 80…100% of rated sensing distance
Operating Temperature	-25…+85 °C (-13…+185 °F)
Shock	30 g (1.06 oz), 11 ms
Vibration	55 Hz, 1 mm amplitude, 3 planes
Weld-Field Immunity	≤ 40 mT

Correction Factors

Target Material	Barrel Size and Sensing Range		
	M8	M12	M18
	3 mm	6 mm	10 mm
Steel		1.00	
Copper1	1.00	0.85	1.15
Aluminum	1.00	1.00	1.40
Brass	1.30	1.30	1.50
Stainless Steel1 mm/2 mm	0.4/0.70	0.5/0.90	0.1/0.6

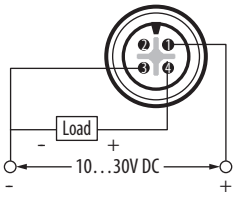
Approximate Dimensions [mm (in.)]

Micro QD Style



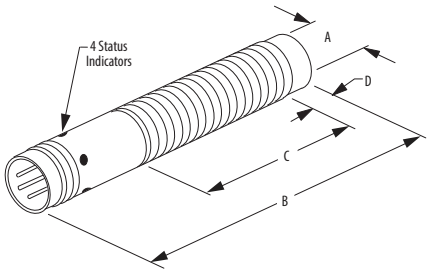
Wiring Diagrams

Normally Open



Thread Size	Shielded	mm (in.)			
		A	B	C	D
M12 X 1	Yes	12.0 (0.47)	60 (2.36)	41 (1.61)	—
M18 X 1	Yes	18.0 (0.71)	63.5 (2.5)	42.5 (1.67)	—

Micro QD Style



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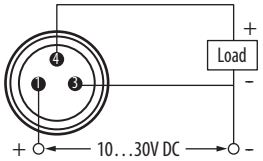


Thread Size	Shielded	mm (in.)			
		A	B	C	D
M8 X 1	Yes	8.0 (0.31)	60 (2.35)	45.5 (1.79)	—

871TM 3-wire DC Long-range Sensing Tubular Sensors

Stainless Steel Face/Threaded Stainless Steel Barrel

871TM Pico Quick-disconnection Style
8 mm

871TM DC Micro Quick-disconnect Style
12 mm

871TM DC Cable Style
18 mm

871TM DC Micro Quick-disconnect Style
30 mm

Specifications

Attribute	8 mm, 12 mm, 18 mm, and 30 mm
Load Current	≤ 200 mA
Capacitive Load	≤ 1 mF
Leakage Current	≤ 0.1 mA
Operating Voltage	10…30V DC
Voltage Drop	≤ 2V DC at 200 mA
Repeatability	≤ 5% at constant temperature
Hysteresis	10% typical
Protection Type	False pulse, transient noise, reverse polarity, short circuit (trigger at 340 mA typical), overload
Certifications	c-UL-us Listed and CE Marked for all applicable directives
Enclosure Type Rating	• 12/18/30 mm: IP68/IP69K • 8 mm quick-disconnect models: IP67 • 8 mm cable models: IP68
Housing Material	Stainless steel face and barrel
Connection Type	• Cable: 2 m (6.5 ft) length • Quick-disconnect: 4-pin micro style, 3-pin pico style
Status Indicators	Yellow: Output energized/360° status indicator visibility, flashing status indicator indicates target that is located between 80…100% of rated sensing distance
Operating Temperature	-25…+70 °C (-13…+158 °F)
Shock	30 g (1.06 oz), 11 ms
Vibration	55 Hz, 1 mm amplitude, 3 planes
IO-Link (enabled on normally open, PNP models only)	
Protocol	IO-Link V1.0
Interface-type	IO-Link
Mode	COM2 (38.4 kBd)
Cycle Time	8 ms minimum
SIO (Standard I/O)	Supported (pin 4 for either IO-Link or SIO)

Switching Frequency

Barrel Diameter [mm]	Switching Frequency [Hz]
8	700
12	400
18	200
30	80

Correction Factors

Instructions for unshielded sensor:

1. To determine the appropriate correction factor, only use Table 1.
2. To determine derated sensing distance (if applicable), multiply the sensor type with the target material by the sensing range.

Instructions for shielded sensor:

1. To determine the appropriate correction factor, use Table 1 and Table 2.
2. In Table 1, determine the appropriate correction factor based on the type and the target material.
3. In Table 2, multiply the result from Table 1 by the material the sensor is mounted in. The result is the final correction factor.

Table 1 - Sensor Type and Target Material Correction Factor

Sensor Type/ Target Material (No Surrounding Metal)	8 mm Diameter		12 mm Diameter		18 mm Diameter		30 mm Diameter	
	Unshielded	Shielded	Unshielded	Shielded	Unshielded	Shielded	Unshielded	Shielded
Steel	1	1	1	1	1	1	1	1
Copper	0.90	085	0.85	0.80	0.80	0.90	0.90	0.90
Aluminum	1	1	1	1	1	1	1	1
Brass	1.35	1.4	1.3	1.4	1.2	1.35	1.3	1.2
Stainless Steel	0.3/0.6	0.3/0.9	0.5/0.9	NA/0.65	0.5/0.9	0.2/0.7	0.35/0.7	NA/0.25

Table 2 - Surrounding Material

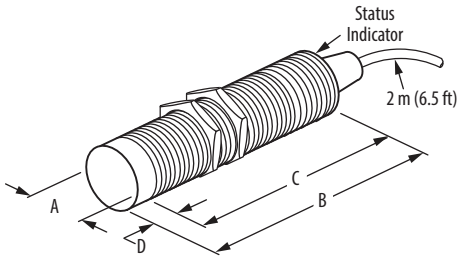
Surrounding Material Type	8 mm Dia.	12 mm Dia.	18 mm Dia.	30 mm Dia.
	Shielded			
Steel	1	0.7	0.75	0.9
Aluminum	0.9	1.15	0.9	0.7
Brass	0.9	1.05	0.75	0.6
Stainless Steel	1	0.8	0.8	1.3

The following table indicates the protrusion distance from the mounting device for the unshielded sensor face.

Surrounding Material Type	8 mm Dia.	12 mm Dia.	18 mm Dia.	30 mm Dia.
	Unshielded			
Steel	15 mm	22 mm	36 mm	18 mm
Aluminum	9 mm	13 mm	22 mm	34 mm
Brass	10 mm	15 mm	22 mm	34 mm
Stainless Steel	14 mm	21 mm	43 mm	18 mm

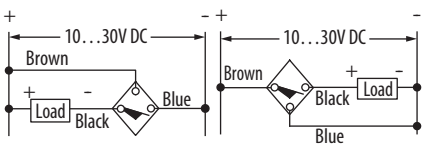
Approximate Dimensions [mm (in.)]

Cable Style



Wiring Diagrams

Normally Open



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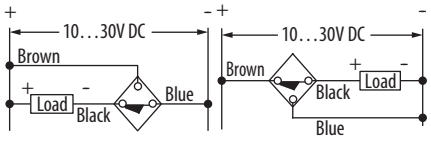
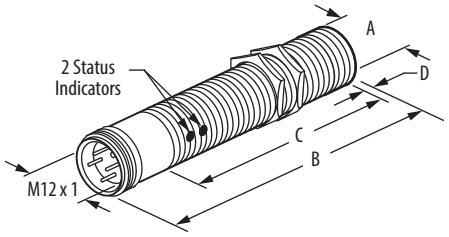
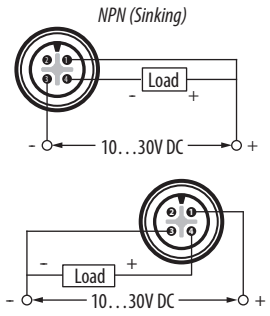


Thread Size	Shielded	mm (in.)			
		A	B	C	D
M8 X 1	Yes	8.0 (0.31)	45 (1.76)	45 (1.76)	—
	No			41 (1.61)	4 (0.16)
M12 X 1	Yes	12.0 (0.47)	61.5 (2.40)	50. (1.96)	—
	No			45 (1.77)	5 (0.19)
M18 X 1	Yes	18.0 (0.71)	65.1 (2.56)	50 (1.96)	—
	No			43 (1.69)	7.0 (0.27)
M30 X 1.5	Yes	30.0 (1.18)	66.3 (2.61)	50.0 (1.96)	—
	No			40.0 (1.57)	10.0 (0.39)

Micro Style



Normally Open



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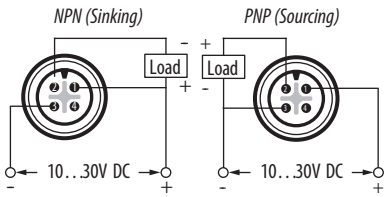
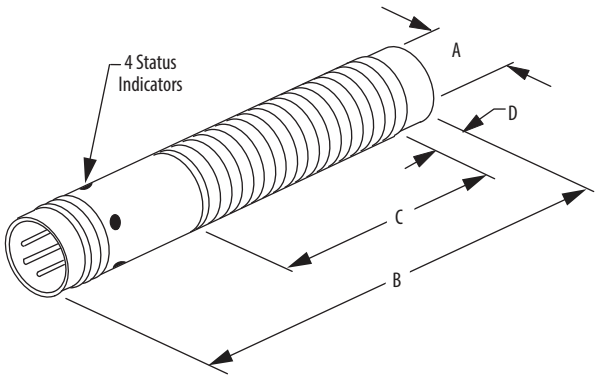


Thread Size	Shielded	mm (in.)			
		A	B	C	D
M8 X 1	Yes	8.0 (0.31)	66 (2.59)	46 (1.81)	—
	No			42 (1.65)	4 (0.16)
M12 X 1	Yes	12.0 (0.47)	60 (2.26)	41. (1.61)	—
	No			36 (1.42)	5 (0.19)
M18 X 1	Yes	18.0 (0.71)	63.5 (2.5)	42.5 (1.67)	—
	No			35.5 (1.40)	7.0 (0.27)
M30 X 1.5	Yes	30.0 (1.18)	66.3 (2.61)	42.5 (1.67)	—
	No			32.5 (1.28)	10.0 (0.39)

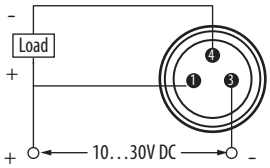
Approximate Dimensions [mm (in.)]

Pico Style



Wiring Diagrams

Normally Open



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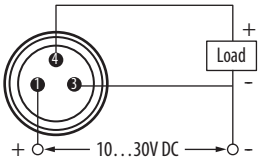


Thread Size	Shielded	mm (in.)			
		A	B (max.)	C (min.)	D (max.)
M8 X 1	Yes	8.0 (0.31)	66 (2.59)	46 (1.81)	—
	No			42 (1.65)	4 (0.16)

871TM 3-wire DC Ferrous or Nonferrous Selective Tubular Sensors

Stainless Steel Face/Threaded Stainless Steel Barrel

871TM DC Micro Quick-disconnection Style
12 mm, 18 mm, and 30 mm

871TM DC ToughLink Cable Style
12 mm, 18 mm, and 30 mm

871TM DC Mini Quick-disconnect Style
12 mm, 18 mm, and 30 mm

871TM DC Micro Cable Style
12 mm, 18 mm, and 30 mm

Specifications

Attribute	12 mm, 18 mm, and 30 mm
Load Current	≤200 mA
Capacitive Load	≤1 µF
Leakage Current	≤10 µA
Operating Voltage	10…30V DC
Voltage Drop	≤1V DC at 200 mA
Repeatability	≤10% at constant temperature
Hysteresis	10% typical
Protection Type	False pulse, transient noise, reverse polarity, short circuit (trigger at 340 mA typical), overload
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) all models; 1200 psi (8270 kPa) washdown; ToughLink and micro connector versions are also rated IP69K (IEC 529)
Housing Material	Stainless steel face and barrel
Connection Type	• Cable: 2 m (6.5 ft) length, A2 - 3-conductor PVC, C2 3-conductor #22 AWG ToughLink, H2 - 3-conductor #18 AWG ToughLink; • Quick-disconnect: 4-pin mini style, 4-pin micro style
Indicator Status Indicators	• Red: Output energized • Green: Power/short circuit (flashing)—18 mm models only
Operating Temperature	-25…+70 °C (-13…+158 °F)
Shock	30 g (1.05 oz), 11 ms
Vibration	55 Hz, 1 mm amplitude, 3 planes

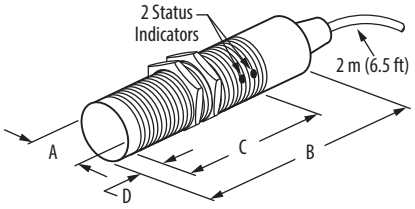
Correction Factors

Target Material	Ferrous Selective	Nonferrous Selective
Steel	1.0	0.0
Stainless Steel	0…1.0 (1)	0…1.0 (1)
Brass	0.0	1.0
Aluminum	0.0	1.0
Aluminum (>0.003 thick)	0.0	1.0
Copper	0.0	1.0

(1) Variations due to differences in alloy composition.

Approximate Dimensions [mm (in.)]

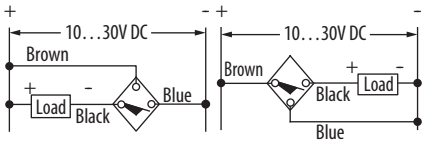
Cable Style



Status Indicators available on 18 mm models only

Wiring Diagrams

Normally Open



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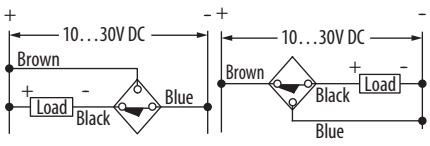
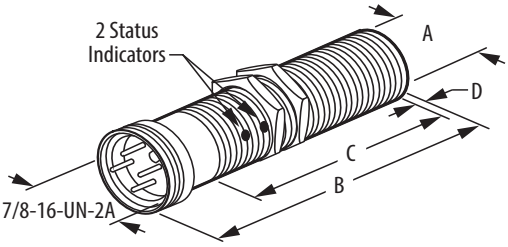


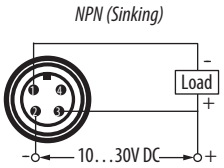
Thread Size	Shielded	Target Type	mm (in.)			
			A	B	C	D
M12 X 1	Yes	Ferrous	12.0 (0.47)	51.0 (2.01)	27.5 (1.08)	—
M18 X 1		Ferrous	18.0 (0.71)	76.8 (3.02)	65.0 (2.56)	—
		Nonferrous		74.7 (2.94)	60.0 (2.36)	2.5 (0.10)
M30 X 1.5		Nonferrous	30.0 (1.18)	77.5 (3.05)	63.0 (2.48)	2.5 (0.10)

Mini QD Style

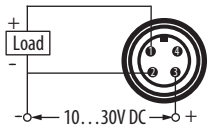


Status Indicators available on 18 mm models only

Normally Open

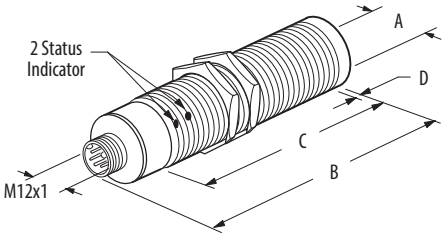


Normally Closed



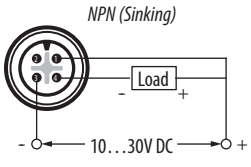
Thread Size	Shielded	Target Type	mm (in.)			
			A	B	C	D
M12 X 1	Yes	Ferrous	12.0 (0.47)	61.3 (2.45)	30.4 (1.20)	—
M18 X 1		Ferrous	18.0 (0.71)	78.5 (3.14)	60.0 (2.36)	—
		Nonferrous		76.6 (3.02)	54.9 (2.16)	2.5 (0.10)
M30 X 1.5		Nonferrous	30.0 (1.18)	86.0 (3.39)	63.5 (2.50)	2.5 (0.10)

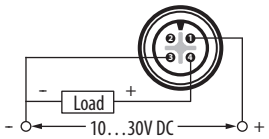
Micro QD Style



Status Indicators available on 18 mm models only.

Normally Open or Normally Closed





Thread Size	Shielded	Target Type	mm (in.)			
			A	B	C	D
M12 X 1	Yes	Ferrous	12.0 (0.47)	62.3 (2.45)	30.4 (1.20)	0.9 (0.04)
M18 X 1		Ferrous	18.0 (0.71)	85.0 (3.35)	65.5 (2.58)	2.0 (0.08)
		Nonferrous		84.3(3.32)	60.0 (2.36)	2.5 (0.10)
M30 X 1.5		Nonferrous	30.0 (1.18)	85.5 (3.37)	63.0 (2.48)	2.5 (0.10)

871TM 2-wire DC Short Barrel Tubular Sensors

Stainless Steel Face/Threaded Stainless Steel Barrel

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

871TM DC Mini Quick-disconnect Style
12 mm, 18 mm, and 30 mm

871TM DC Micro
12 mm, 18 mm, and 30 mm

Specifications

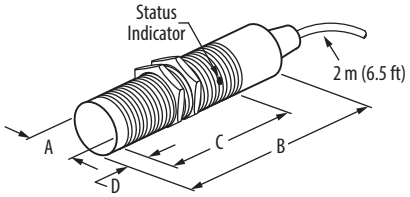
Attribute	12 mm, 18 mm, and 30 mm
Load Current	≤25 mA
Load Current, Minimum	2 mA
Leakage Current	≤0.9 mA
Operating Voltage	10…30V DC
Voltage Drop	≤8V
Repeatability	10% typical
Hysteresis	10% typical
Protection Type	False pulse, transient noise, reverse polarity, short circuit, overload
Certifications	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 (IEC 529) all models; 1200 psi (8270 kPa) washdown; ToughLink and micro connector versions are also rated IP69K (IEC 529)
Housing Material	Stainless steel face and barrel
Connection Type	• Cable: 2 m (6.5 ft) length, A2 - 2-conductor PVC, C2 - 2-conductor #22 AWG ToughLink, H2 - 2-conductor #18 AWG ToughLink • Quick-disconnect: 4-pin mini style, 4-pin micro style
Indicator Status Indicators	Red: Output Energized
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	0.9…1.0
Brass	0.3…0.5
Aluminum	0.1…0.4
Aluminum (≤0.02 Thick)	0.9…1.1
Copper	0.1…0.2

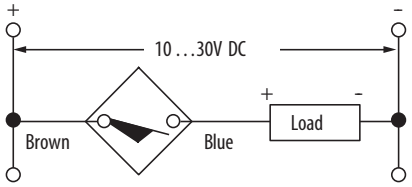
Approximate Dimensions [mm (in.)]

Cable Style

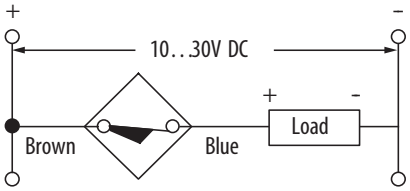


Typical Wiring Diagrams

Normally Open

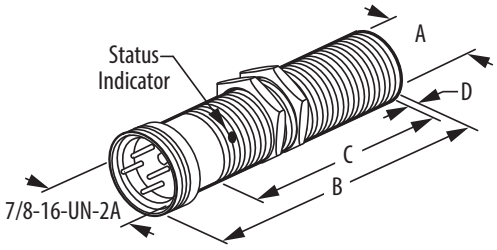


Normally Closed

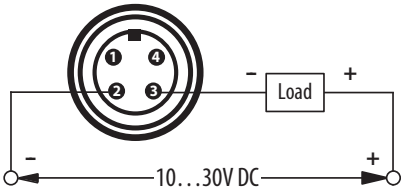


Thread Size	Shielded	mm (in.)			
		A	B	C	D
M12 X 1	Yes	12.0 (0.47)	49.8 (1.96)	26.4 (0.10)	2.5 (0.10)
	No			19.5 (0.77)	9.4 (0.37)
M18 X 1	Yes	18.0 (0.71)	55.4 (2.18)	41.7 (1.64)	2.5 (0.10)
	No				14.5 (0.57)
M30 X 1.5	Yes	30.0 (1.18)	57.9 (2.28)	41.9 (1.65)	2.5 (0.10)
	No			39.4 (1.55)	18.0 (0.71)

Mini QD Style



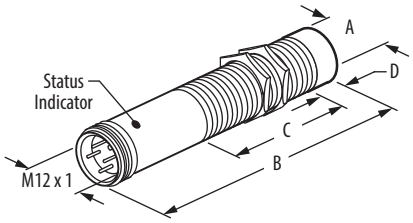
Normally Open or Normally Closed



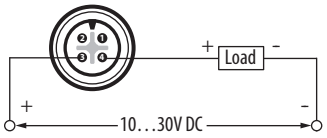
Note: Load can be switched to pin2

Thread Size	Shielded	mm (in.)			
		A	B	C	D
M12 X 1	Yes	12.0 (0.47)	63.5 (2.50)	25.4 (1.00)	2.5 (0.10)
	No			18.5 (0.73)	9.4 (0.37)
M18 X 1	Yes	18.0 (0.71)	56.1 (2.21)	35.1 (1.38)	2.5 (0.10)
	No			29.2 (1.15)	14.5 (0.57)
M30 X 1.5	Yes	30.0 (1.18)	68.1 (2.68)	49.1 (1.65)	2.5 (0.10)
	No			39.4 (1.55)	18.0 (0.71)

Micro QD Style



Normally Open or Normally Closed



Note: Load can be switched to pin3

Thread Size	Shielded	mm (in.)			
		A	B	C	D
M12 X 1	Yes	12.0 (0.47)	61.0 (2.40)	26.4 (1.04)	2.5 (0.10)
	No			19.6 (0.77)	9.4 (0.37)
M18 X 1	Yes	18.0 (0.71)	65.0 (2.56)	41.7 (1.64)	2.5 (0.10)
	No				14.5 (0.57)
M30 X 1.5	Yes	30.0 (1.18)	66.3 (2.61)	41.9 (1.65)	2.5 (0.10)
	No			39.4 (1.55)	18.0 (0.71)

871TM 2-wire AC/DC All Stainless Steel Tubular Sensors

Stainless Steel Face/Threaded Stainless Steel Barrel

871TM AC/DC Cable Style
12 mm, 18 mm, and 30 mm

871TM AC/DC Mini
Quick-disconnect Style
12 mm, 18 mm, and 30 mm

871TM AC/DC Micro Quick-disconnect Style
12 mm, 18 mm, and 30 mm

871TM AC/DC EAC Micro
Quick-disconnect Style
12 mm

871TM AC/DC
ToughLink Cable Style
12 mm, 18 mm, and 20 mm

Specifications

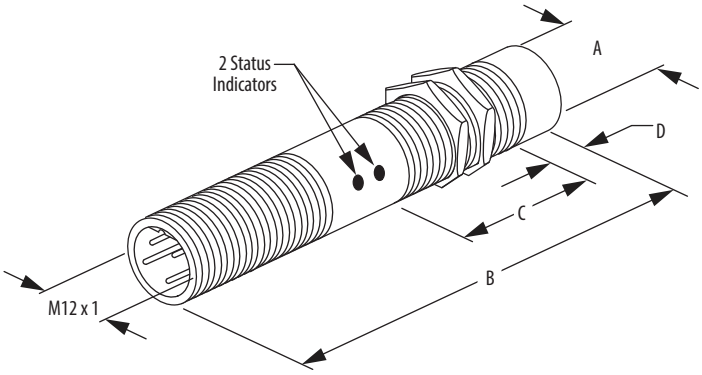
Attribute	12 mm	18 mm and 30 mm
Load Current	5…200 mA	5…250 mA
Inrush Current (one cycle)	≤2 A	≤4 A
Leakage Current	≤1.9 mA @ 120V AC	
Operating Voltage	20…250V AC/DC	
Voltage Drop	≤10V @ 5…200 mA	≤10V @ 5…250 mA
Repeatability	≤10% at constant temperature	
Hysteresis	7% typical	
Protection Type	False pulse, transient noise, short circuit (trigger @ 5 A typical), and overload (trigger @ 260 mA typical)	False pulse, transient noise, short circuit (trigger @ 8 A typical), and overload (trigger @ 320 mA typical)
Certifications	UL Listed, CSA Certified, and CE Marked for all applicable directives, CCC Certified (select models)	
Enclosure Type Rating	NEMA 1, 2, 3, 3R, 4, 4X, 6, 6P, 12, 13; IP67 (IEC 529) all models; 1200 psi (8270 kPa) washdown; ToughLink and micro connector versions are also rated IP69K (IEC 529)	
Housing Material	Stainless steel face and barrel	
Connection Type	• Cable: 2 m (6.5 ft) length; A2—2-conductor #22 AWG PVC, C2—2-conductor #22 AWG ToughLink, H2—3-conductor #18 AWG ToughLink • Quick-disconnect: 3-pin mini style, 3-pin micro style, 4-pin EAC micro style	
Indicator Status Indicators	• Red: Output energized • Green: Power • Short circuit: Red and green flashing	
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	0.9…1.0
Brass	0.3…0.5
Aluminum	0.1…0.4
Aluminum (≤0.02 Thick)	0.9…1.1
Copper	0.1…0.2

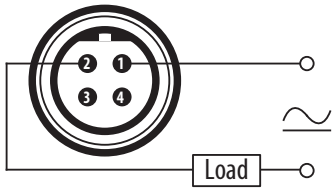
Approximate Dimensions [mm (in.)]

EAC Micro QD Style



Typical Wiring Diagrams

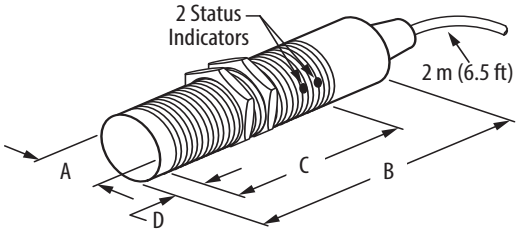
Normally Open



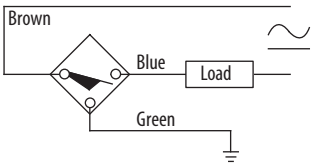
Note: No ground pin. Attach housing to ground.
Note: Load can be switched to pin 2.

Thread Size	Shielded	mm (in.)			
		A	B	C	D
M12 X 1	No	12.0 (0.47)	83.0 (3.27)	31.7 (1.25)	9.4 (0.37)

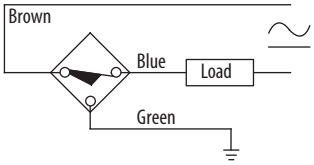
Cable Style



Normally Open



Normally Closed

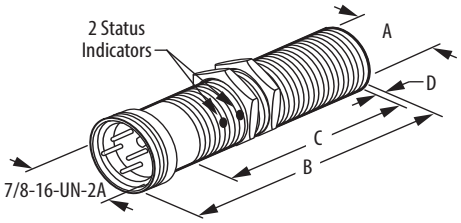


Note: No green wire on 12 mm and on sensors with PVC cable (-A2). Attach housing to ground.
Note: Load can be switched to brown wire.

Thread Size	Shielded	mm (in.)			
		A	B	C	D
M12 X 1	Yes	12.0 (0.47)	72.1 (2.84)	38.4 (1.51)	2.5 (0.10)
	No			31.5 (1.24)	9.4 (0.37)
M18 X 1	Yes	18.0 (0.71)	74.7 (2.94)	60.0 (2.35)	2.5 (0.10)
	No			48.2 (190)	14.4 (0.56)
M30 X 1.5	Yes	30.0 (1.18)	77.2 (3.04)	61.3 (2.41)	2.5 (0.10)
	No			46.1 (1.81)	17.9 (0.70)

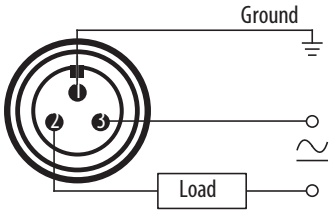
Approximate Dimensions [mm (in.)]

Mini QD Style



Typical Wiring Diagrams

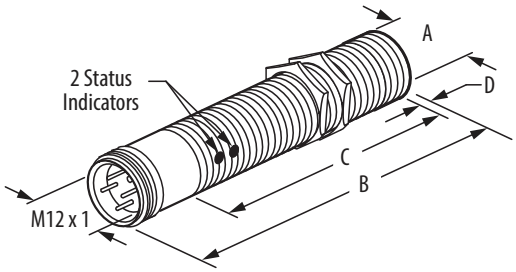
Normally Open or Normally Closed



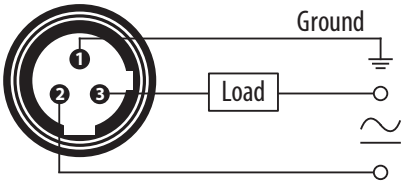
Note: No ground pin on 12 mm. Attach housing to ground.
Note: Load can be switched to pin3

Thread Size	Shielded	mm (in.)			
		A	B	C	D
M12 X 1	Yes	12.0 (0.47)	85.6 (3.37)	37.8 (1.49)	2.5 (0.10)
	No			31.7 (1.25)	9.4 (0.37)
M18 X 1	Yes	18.0 (0.71)	56.1 (2.21)	54.9 (2.16)	2.5 (0.10)
	No			43.1 (1.70)	14.4 (0.56)
M30 X 1.5	Yes	30.0 (1.18)	68.1 (2.68)	61.3 (2.41)	2.5 (0.10)
	No			46.1 (1.81)	17.9 (0.70)

Micro QD Style



Normally Open or Normally Closed



Note: No ground pin on 12 mm. Attach housing to ground.
Note: Load can be switched to pin3

Thread Size	Shielded	mm (in.)			
		A	B	C	D
M12 X 1	Yes	12.0 (0.47)	83.4 (3.28)	38.4 (1.51)	2.5 (0.10)
	No			31.5 (1.24)	9.4 (0.37)
M18 X 1	Yes	18.0 (0.71)	84.3 (3.32)	60.0 (2.36)	2.5 (0.10)
	No			48.2 (1.90)	14.4 (0.56)
M30 X 1.5	Yes	30.0 (1.18)	85.7 (3.37)	61.3 (2.41)	2.5 (0.10)
	No			46.1 (1.81)	17.9 (0.70)

871TM 2-wire AC/DC PLC Interfacer

Stainless Steel Face/Threaded Short Stainless Steel Barrel

871TM AC/DC Cable Style
12 mm, 18 mm, and 30 mm

871TM AC/DC Mini Quick-disconnect Style
12 mm, 18 mm, and 30 mm

871TM AC/DC Micro Quick-disconnect Style
12 mm, 18 mm, and 30 mm

871TM AC/DC EAC Micro Quick-disconnect Style
12 mm

871TM AC/DC ToughLink Cable Style
12 mm, 18 mm, and 20 mm

Specifications

Attribute	12 mm, 18 mm, and 30 mm
Load Current	2…25 mA
Leakage Current	≤0.9 mA at 24V DC ≤1.7 mA at 20…120V AC/DC ≤2.5 mA at 121…250V AC/DC
Operating Voltage	20…250V AC/DC (standard models)20…132V AC/DC (high temperature models)
Voltage Drop	≤8V at 25 mA DC ≤10V at 25 mA AC
Repeatability	10% typical
Hysteresis	10% typical
Protection Type	False pulse, transient noise, radio frequency (10V per meter, frequency range 20…1000 MHz) (1)
Certifications	UL Listed, CSA Certified, and CE Marked for all applicable directives CCC Certified (select models)
Enclosure Type Rating	NEMA 1, 2, 3, 3R, 4, 4X, 6, 6P, 12, 13; IP67 (IEC 529) all models; 1200 psi (8270 kPa) washdown; ToughLink and micro connector versions are also rated IP69K (IEC 529)
Housing Material	Stainless steel face and barrel
Connection Type	• Cable: 2 m (6.5 ft) length, A2 - 2-conductor #22 AWG PVC, C2 - 2-conductor #22 AWG ToughLink, H2 - 2-conductor #18 AWG ToughLink • Quick-disconnect: 3-pin mini style, 3-pin micro style, 4-pin EAC micro style
Indicator Status Indicators	Red: Output Energized
Operating Temperature	-25…+70 °C (-13…+158 °F) (standard models) 0…100 ° (32…212 °) (high temperature models)
Shock	30 g (1.06 oz), 11 ms (standard models) 5 g (0.18 oz), 11 ms (high temperature models)
Vibration	55 Hz, 1 mm amplitude, 3 planes (standard models)30…120 Hz, 1 mm amplitude, 3 planes (high temperature models)

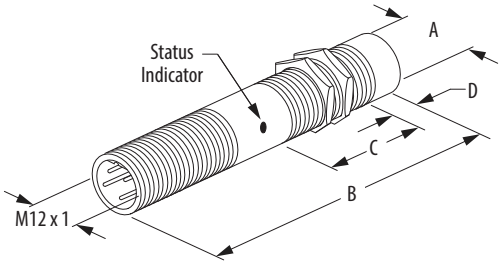
Correction Factors

Target Material	Correction Factors
Steel	1.0
Stainless Steel	0.8…1.0
Brass	0.4…0.7
Aluminum	0.4…0.7
Copper	0.1…0.2

(1) Radio frequency protection is not available on high temperature models.

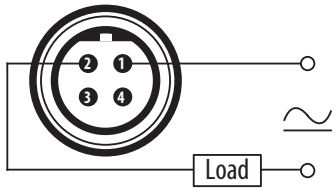
Approximate Dimensions [mm (in.)]

EAC Micro QD Style



Typical Wiring Diagrams

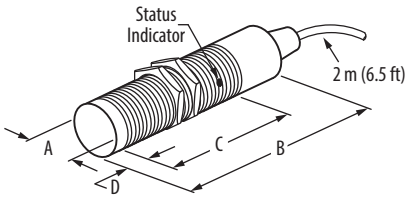
Normally Open



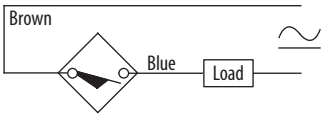
Note: No ground pin. Attach housing to ground.
Note: Load can be switched to pin 2.

Thread Size	Shielded	mm (in.)			
		A	B	C	D
M12 X 1	No	12.0 (0.47)	61.0 (2.40)	26.4 (1.04)	2.5 (0.10)

Cable Style



Normally Open

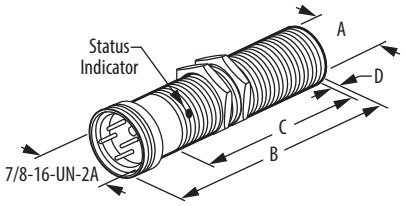


Note: Attach housing to ground.
Note: Load can be switched to brown wire.

Thread Size	Shielded	mm (in.)			
		A	B	C	D
M12 X 1	Yes	12.0 (0.47)	49.8 (1.96)	26.4 (1.04)	2.5 (0.10)
	No			19.5 (0.77)	9.4 (0.37)
M18 X 1	Yes	18.0 (0.71)	55.4 (2.18)	41.7 (1.64)	2.5 (0.10)
	No				14.5 (0.57)
M30 X 1.5	Yes	30.0 (1.18)	57.9 (2.28)	41.9 (1.65)	2.5 (0.10)
	No			39.4 (1.55)	18.0 (0.71)

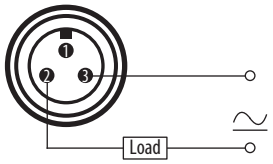
Approximate Dimensions [mm (in.)]

Mini QD Style



Typical Wiring Diagrams

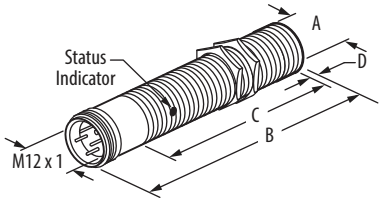
Normally Open



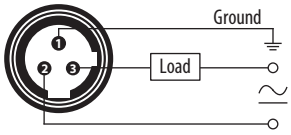
Note: Attach housing to ground.
Note: Load can be switched to pin3.

Thread Size	Shielded	mm (in.)			
		A	B	C	D
M12 X 1	Yes	12.0 (0.47)	63.5 (2.50)	25.4 (1.00)	2.5 (0.10)
	No			18.5 (0.73)	9.4 (0.37)
M18 X 1	Yes	18.0 (0.71)	56.1 (2.21)	35.1 (1.38)	2.5 (0.10)
	No			29.2 (1.15)	14.5 (0.57)
M30 X 1.5	Yes	30.0 (1.18)	68.1 (2.68)	49.1 (1.65)	2.5 (0.10)
	No			39.4 (1.55)	18.0 (0.71)

Micro QD Style



Normally Open or Normally Closed



Note: Attach housing to ground.
Note: Load can be switched to pin2.

Thread Size	Shielded	mm (in.)			
		A	B	C	D
M12 X 1	Yes	12.0 (0.47)	83.4 (3.28)	26.4 (1.04)	2.5 (0.10)
	No			19.6 (0.77)	9.4 (0.37)
M18 X 1	Yes	18.0 (0.71)	84.3 (3.32)	41.7 (1.64)	2.5 (0.10)
	No				14.5 (0.57)
M30 X 1.5	Yes	30.0 (1.18)	85.7 (3.37)	41.9 (1.65)	2.5 (0.10)
	No			39.4 (1.55)	18.0 (0.71)

871TM 2-wire DC Intrinsically Safe

Stainless Steel Face and Barrel

871TM Intrinsically Safe
Cable Style

871TM Intrinsically Safe
Micro Quick-disconnect Style
12 mm, 18 mm, and 30 mm

871TM Intrinsically Safe
ToughLink Cable Style
12 mm

Specifications

Attribute	12 mm, 18 mm, and 30 mm
Outputs	Normally open
Load Current, Max.	25 mA
Load Current, Min.	2 mA
Leakage Current	t≤1.0 mA
Operating Voltage	10…31.5V DC
Voltage Drop	≤8V DC
Repeatability	10% typical
Hysteresis	10% typical
Protection Type	False pulse, transient noise, reverse polarity, short circuit, overload
Certifications	FM Approved and CSA Certified for: • Class I, II, III; Divisions 1, 2; Groups A, B, C, D, E, F, G when used with an approved intrinsic safety barrier • Class I, II, III; Division 2; Groups A, B, C, D, E, F, G without intrinsic safety barrier UL Listed for use in non-hazardous locations (See control drawing 75001-437 for approval details and wiring diagrams)
Enclosure Type Rating	NEMA 1, 2, 3, 3R, 4, 4X, 6, 6P, 12, 13; IP67 (IEC 529) all models; 1200 psi (8270 kPa) washdown; stainless steel face and barrel; ToughLink and micro connector versions are also rated IP69K (IEC 529)
Connection Type	• Cable: 2 m (6.5 ft) length, A2 - 2 conductor #22 AWG PVC, C2 - 2 conductor #22 AWG ToughLink, H2 - 2 conductor #18 AWG ToughLink • Quick Disconnect: 4-pin micro style
Indicator Status Indicators	Red: Output energized
Operating Temperature	-25…+70 °C (-13…+158 °F)
Shock	30 g (1.06 oz), 11 ms
Vibration	55 Hz, 1 mm amplitude, 3 planes

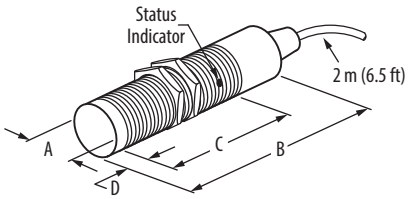
Correction Factors	
Target Material	**Correction Factor**
Steel	1.0
Stainless Steel	0.9…1.0
Brass	0.3…0.5
Aluminum	0.1…0.4
Aluminum (≤0.02 Thick)	0.9…1.1
Copper	0.1…0.2

Entity Parameters			
Sensor			**Barrier**
V_{MAX}	31.5V	≥	V_t
I_{MAX}	130 mA	≥	I_t
P_{MAX}	1.25 W	≥	P_t
C_i	0 µf	≤	C_a
L_i	0 mH	≤	L_{ta}

IMPORTANT Operating parameters must be adhered to.

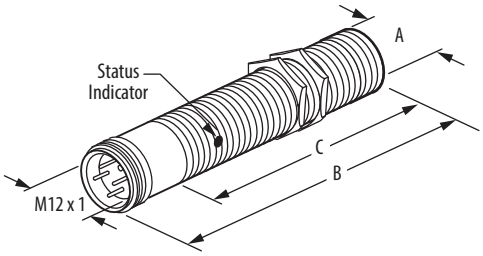
Approximate Dimensions [mm (in.)]

Cable Style



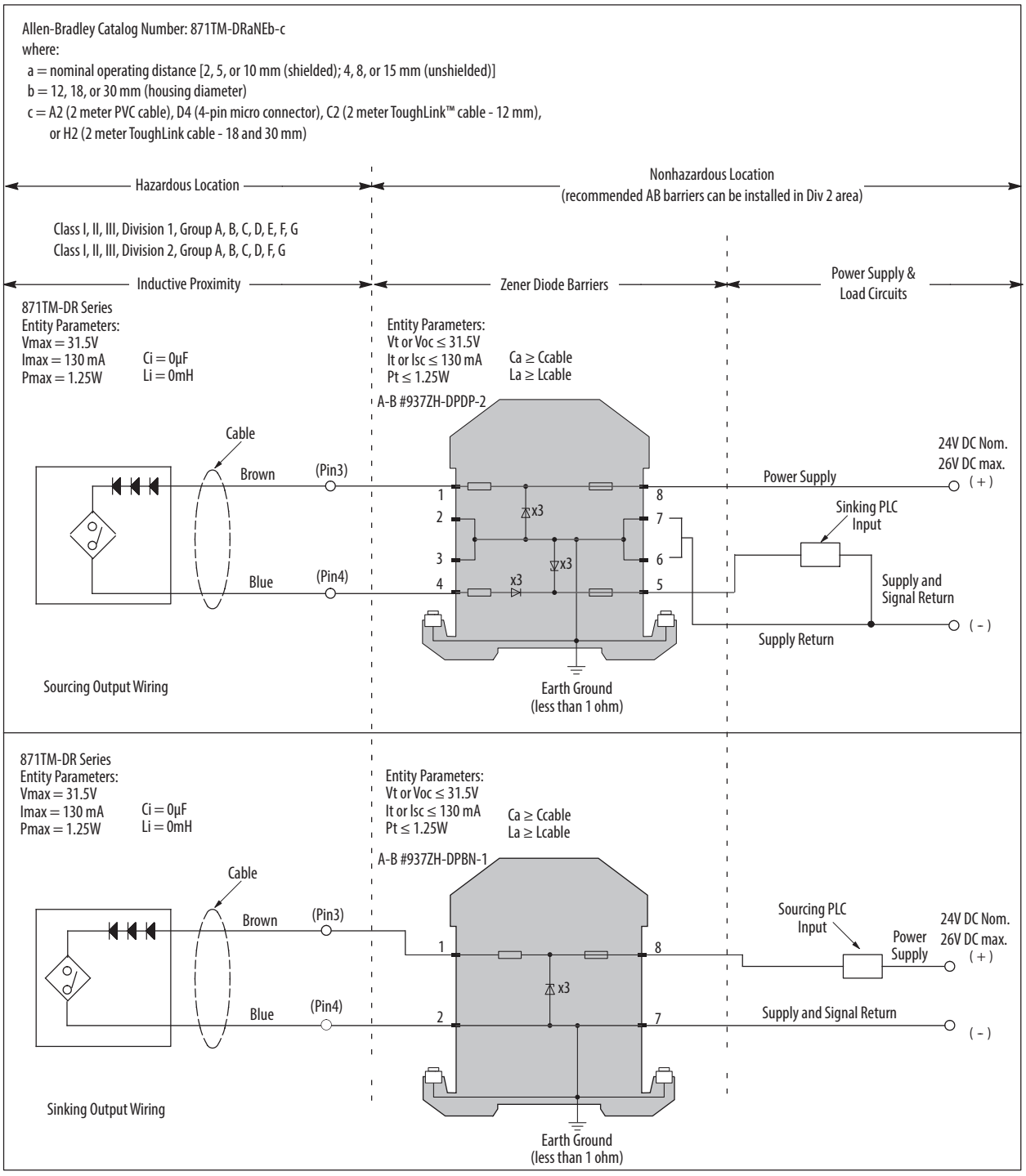
Thread Size	Shielded	mm (in.)			
		A	B	C	D
M12 X 1	Yes	12.0 (0.47)	72.1 (2.84)	36.1 (1.42)	2.5 (0.10)
	No			29.2 (1.15)	9.4 (0.37)
M18 X 1	Yes	18.0 (0.71)	75.7 (2.94)	56.2 (1.22)	2.5 (0.10)
	No			44.5 (1.75)	14.4 (0.56)
M30 X 1.5	Yes	30.0 (1.18)	77.2 (3.04)	58.4 (2.30)	2.5 (0.10)
	No			43.2 (1.70)	17.9 (0.70)

Micro QD Style

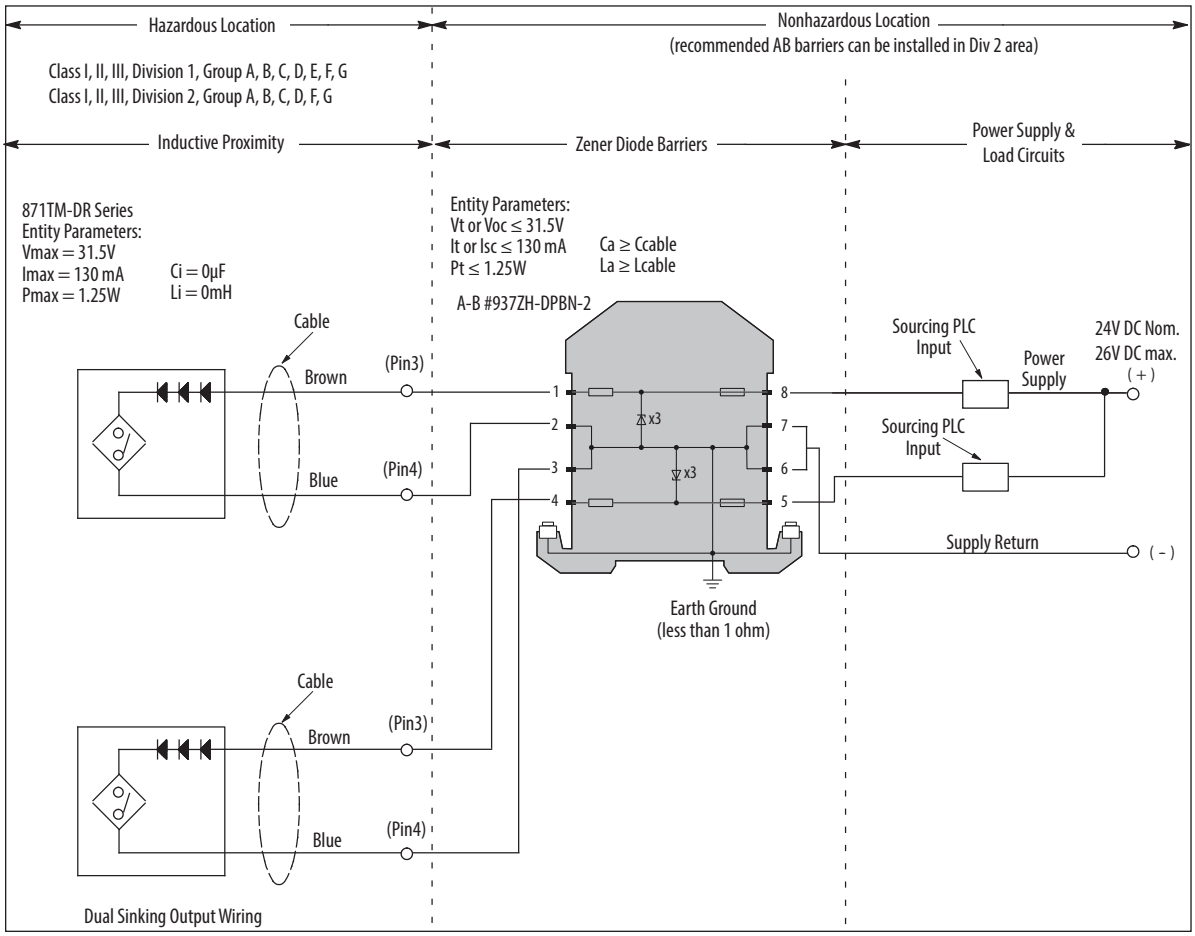


Thread Size	Shielded	mm (in.)			
		A	B	C	D
M12 X 1	Yes	12.0 (0.47)	83.3 (3.28)	36.1 (1.42)	2.5 (0.10)
	No			29.2 (1.15)	9.4 (0.37)
M18 X 1	Yes	18.0 (0.71)	84.3 (3.32)	56.3 (22.2)	2.5 (0.10)
	No			44.5 (1.75)	14.4 (0.56)
M30 X 1.5	Yes	30.0 (1.18)	86.1 (3.39)	58.4 (2.30)	2.5 (0.10)
	No			43.2 (1.70)	17.9 (0.70)

Division 1 Installation Wiring Diagrams



Division 1 Installation Wiring Diagrams (Continued)



Factory Mutual Installation Notes

1 Installation must be in accordance with the National Electrical Code® (NFPA 70, Article 504), ANSI/ISA-RP12.6, and the manufacturer's instructions.
2 If the electrical parameters of the cable used are unknown, the following values may be used: Capacitance — 60 pF/ft.; Inductance — 0.20 µH/ft.
3 The wiring between each Inductive Proximity Sensor and its corresponding channel of the dual-channel barrier is a separate intrinsically safe circuit. Each of the two separate intrinsically safe circuits shall be in separate cables or shall be separated from each other as specified in NEC 504-30. The supply return conductors may be connected at the barrier's grounding terminal.
4 The Barrier bus must be insulated from other grounded metal. Use Power Rail 937A-PR08, 937A-PR20 and Power Feed Module 937A-PSFD.
5 The maximum nonhazardous location voltage must not exceed 250V AC or DC.
6 Barriers are not required for Division 2 (31.5V DC max.). Division 2 applications must be installed in accordance with the NEC.
7 **WARNING**: Substitution of components may impair Intrinsic Safety.
8 No revision to drawing without prior FMRC approval.

Canadian Standards Association Installation Notes

1 Installation must be in accordance with the Canadian Electrical Code (Part I), ANSI/ISA-RP12.6, and the manufacturer's instructions.
2 If the electrical parameters of the cable used are unknown, the following values may be used: Capacitance —60 pF/ft.; Inductance — 0.20 µH/ft.
3 The wiring between each Inductive Proximity Sensor and its corresponding channel of the dual-channel barrier is a separate intrinsically safe circuit. Each of the two separate intrinsically safe circuits shall be in separate cables or shall be separated from each other as specified in CEC. The supply return conductors may be connected at the barrier's grounding terminal.
4 The Barrier bus must be insulated from other grounded metal. Use Power Rail 937A-PR08, 937A-PR20 and Power Feed Module 937A-PSFD.
5 The maximum nonhazardous location voltage must not exceed 250V AC or DC.
6 Barriers are not required for Division 2 (31.5V DC max.). Division 2 applications must be installed in accordance with the CEC.
7 In Division 2 applications without barriers observe the following warnings:
WARNING: EXPLOSION HAZARD. Do not disconnect equipment unless power has been switched off or the area is known to be nonhazardous.
8 **WARNING**: Substitution of components may impair Intrinsic Safety.
9 No revision to drawing without prior CSA approval.

ATTENTION: These parameters must be adhered to.