



Description

Bulletin 871Z inductive proximity sensors are self-contained, solid state switching devices designed to sense the presence of metal objects (ferrous and non-ferrous) without touching them. These special weld-field immune models are ideal for welding environments and other applications where large magnetic fields are present. They are rated for reliable operation at a 1in distance from a current line carrying 20,000 amps.❶

The electronic circuitry is potted for protection against shock, vibration, and contamination and is enclosed in a threaded, teflon-coated brass housing which meets NEMA 1, 2, 3, 3R, 4, 4X, 6, 6P, 12, 13 and IP67 (IEC 529) enclosure standards. The teflon-coated housing and mounting nuts, thermoset plastic face, and fire-retardant cable offer a high degree of weld splatter protection. The heavy #18AWG SOOW-A cable offers additional abrasion, chemical, and environmental protection.

All units are provided with short circuit, overload, transient noise, and false pulse protection and weld field immunity which exceeds 20,000A at 1 inch from the welding tip. All of these protections mean you can reduce your down time due to improper wiring, shorts, radio frequency interference, line spikes, and many other causes.

❶ This distance varies with current line amperage. See page 2-10 of the Introduction section to determine the minimum distance for your application.

These sensors are available in 12, 18 and 30mm diameters. Connection options include a 2-meter cable, mini quick-disconnect and micro quick-disconnect.

Features

- Cable or quick-disconnect styles
- Teflon-coated brass barrel
- Weld field immunity
- Short circuit, false pulse, overload, and transient noise protection
- UL listed and CSA certified (AC/DC models)
- CE marked for all applicable directives

Styles

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DC 3-Wire	page 2-91

Accessories

Quick-Disconnect Cables . . .	page 5-1
Mounting Bracket, Spring Return Style	page 2-188
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871Z 2-Wire AC/DC Weld Field Immune

Teflon-Coated Plastic Face/Threaded Teflon-Coated Brass Barrel



871Z AC/DC Cable Style
12, 18, 30mm
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871Z AC/DC Mini
Quick-Disconnect Style
12, 18, 30mm
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871Z AC/DC Micro
Quick-Disconnect Style
12, 18, 30mm
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Features

- 2-wire operation
- 2-conductor, 3-conductor, or 3-pin connection
- 40–250V AC/DC
- Normally open or normally closed output
- Weld field immunity
- Short circuit, false pulse, overload, and transient noise protection
- UL listed, CSA certified, and CE marked for all applicable directives

Specifications

	12mm	18 & 30mm
Load Current	5–250mA	5–400mA
Inrush Current (1 cycle)	≤2A	≤4A
Leakage Current	≤1.7mA at 120V AC	
Operating Voltage	40–250V AC/DC	
Voltage Drop	≤5V at 250mA, 10V at 10mA	≤5V at 400mA, 10V at 10mA
Repeatability	≤10% at constant temperature	
Hysteresis	7% typical	
False Pulse Protection	Incorporated	
Transient Noise Protection	Incorporated	
Short Circuit Protection	Incorporated, trigger at 5A typical	Incorporated, trigger at 8A typical
Overload Protection	Incorporated, trigger at 340mA typical	Incorporated, trigger at 550mA typical
Weld Field Immunity	20,000A at 1 inch	
Reverse Polarity Protection (DC output)	Incorporated	
Approvals	UL listed, CSA certified, and CE marked for all applicable directives	
Enclosure	NEMA 1, 2, 3, 3R, 4, 4X, 6, 6P, 12, 13, IP67 (IEC 529) Teflon coated housing	
Connections	Cable: 2m (6.5ft) length C2—2 conductor #22AWG ToughLink™ H2—3 conductor #18AWG ToughLink™ Quick-Disconnect: 3-pin micro style 3-pin mini style	
LEDs	Orange: Output Energized Green: Power/Short Circuit (flashing)	
Operating Temperature	–25°C to +70°C (–13°F to +158°F)	
Shock	30g, 11ms	
Vibration	55Hz, 1mm amplitude, 3 planes	

Correction Factors

Target Material	Correction Factor
Steel	1.0
Stainless Steel	0.7–0.8
Brass	0.4–0.5
Aluminum	0.3–0.4
Copper	0.3–0.4

871Z 2-Wire AC/DC Weld Field Immune

Teflon-Coated Plastic Face/Threaded Teflon-Coated Brass Barrel

Selection Guide

Barrel Diameter	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration	Switching Frequency (Hz)	Catalog Number		
					Cable Style	Mini QD Style	Micro QD Style
12mm	2 (0.08)	Y	N.O.	30	871Z-BW2N12-C2	871Z-BW2N12-N3	871Z-BW2N12-R3
			N.C.	20	871Z-BW2C12-C2	871Z-BW2C12-N3	871Z-BW2C12-R3
18mm	5 (0.20)	Y	N.O.	30	871Z-BW5N18-H2	871Z-BW5N18-N3	871Z-BW5N18-R3
			N.C.	20	871Z-BW5C18-H2	871Z-BW5C18-N3	871Z-BW5C18-R3
30mm	10 (0.39)	Y	N.O.	30	871Z-BW10N30-H2	871Z-BW10N30-N3	871Z-BW10N30-R3
			N.C.	20	871Z-BW10C30-H2	871Z-BW10C30-N3	871Z-BW10C30-R3
Recommended Standard QD Cordset (-6F = 1.8m (6ft), -2 = 2m (6.5ft))					889N-F3AFC-6F	889R-F3ACA-2	

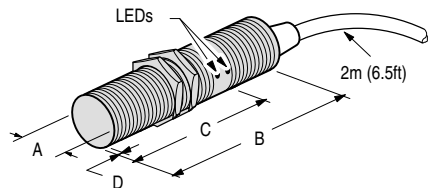
12mm models utilize the same outer and inner jacket materials, but are not SOOW-A rated.

QD Cordsets and Accessories

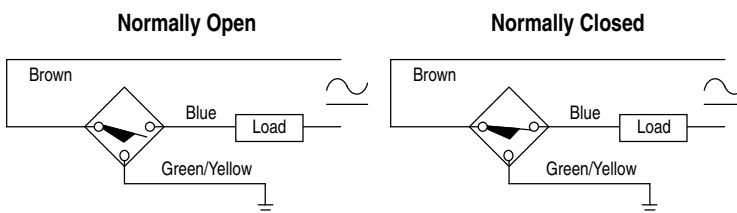
Description	Page Number
Other Cordsets Available	5-8, 5-44
Terminal Chambers	5-19
Mounting Brackets	2-188 - 2-192
Teflon End Caps	2-197
Mounting Nuts	2-199 - 2-200

Dimensions—mm (inches)

Cable Style



Wiring Diagram



Note: Rear portion of barrel left uncoated for ground contact on 12mm models.

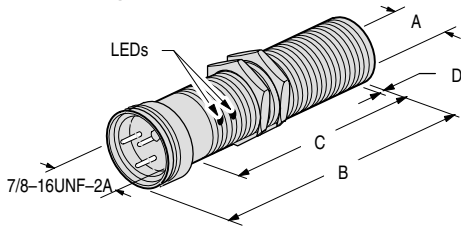
Thread Size	Shielded	mm (inches)			
		A	B	C	D
M12 X 1	Y	12.0 (0.47)	69.9 (2.75)	38.9 (1.53)	0.8 (0.03)
M18 X 1	Y	18.0 (0.71)	70.5 (2.78)	57.5 (2.26)	0.8 (0.03)
M30 X 1.5	Y	30.0 (1.18)	77.4 (3.05)	63.4 (2.50)	0.8 (0.03)

871Z 2-Wire AC/DC Weld Field Immune

Teflon-Coated Plastic Face/Threaded Teflon-Coated Brass Barrel

Dimensions—mm (inches)

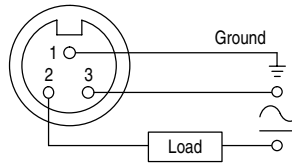
Mini QD Style



Note: Rear portion of barrel left uncoated for ground contact on 12mm models.

Wiring Diagram

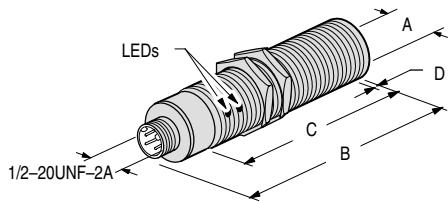
Normally Open or Normally Closed



Note 1: No ground pin on 12mm. Attach housing to ground.
Note 2: Load can be switched to pin 2.

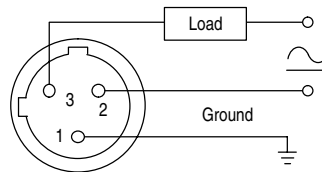
Thread Size	Shielded	mm (inches)			
		A	B	C	D
M12 X 1	Y	12.0 (0.47)	83.3 (3.28)	38.2 (1.50)	0.8 (0.03)
M18 X 1	Y	18.0 (0.71)	72.5 (2.85)	53.1 (2.09)	
M30 X 1.5	Y	30.0 (1.18)	86.5 (3.41)	63.4 (2.50)	

Micro QD Style



Note: Rear portion of barrel left uncoated for ground contact on 12mm models.

Normally Open or Normally Closed



Note 1: No ground pin on 12mm. Attach housing to ground.
Note 2: Load can be switched to pin 2.

Thread Size	Shielded	mm (inches)			
		A	B	C	D
M12 X 1	Y	12.0 (0.47)	85.3 (3.36)	38.9 (1.53)	0.8 (0.03)
M18 X 1	Y	18.0 (0.71)	80.3 (3.16)	57.5 (2.26)	
M30 X 1.5	Y	30.0 (1.18)	85.7 (3.37)	63.4 (2.50)	

871Z 3-Wire DC Weld Field Immune

Teflon Face/Threaded Teflon-Coated Brass Barrel



871Z DC Mini
Quick-Disconnect Style
18, 30mm
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871Z DC Micro
Quick-Disconnect Style
12, 18, 30mm
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Specifications

Load Current	≤200mA
Minimum Load Current	1mA
Leakage Current	≤10μA
Operating Voltage	10–30V DC
Voltage Drop	≤2.4V
Repeatability	≤10%
Hysteresis	≤15% typical
False Pulse Protection	Incorporated
Transient Noise Protection	Incorporated
Reverse Polarity Protection	Incorporated
Short Circuit Protection	Incorporated
Overload Protection	Incorporated
Weld Field Immunity	20,000 A at 1in
Approvals	CE marked for all applicable directives
Enclosure	NEMA 1, 2, 3, 4, 12 and 13, IP67 (IEC 529) Teflon coated brass barrel
Connections	Quick-Disconnect: 4-pin mini style 4-pin micro style
LED	Red: Output Energized
Operating Temperature	–25°C to +70°C (–13°F to +158°F)
Shock	30g, 11ms
Vibration	55Hz, 1mm amplitude, 3 planes

Features

- 3-wire operation
- 3-conductor or 4-pin connection
- 10–30V DC
- Weld field immunity
- Normally open output
- Reverse polarity, short circuit, overload, false pulse and transient noise protection
- CE marked for all applicable directives

Correction Factors

Target Material	Correction Factor
Steel	1.0
Stainless Steel	0.7–0.8
Brass	0.4–0.5
Aluminum	0.3–0.4
Copper	0.3–0.4

871Z 3-Wire DC Weld Field Immune

Teflon Face/Threaded Teflon-Coated Brass Barrel

Selection Guide

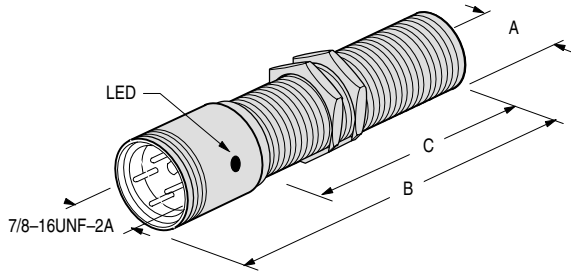
Barrel Diameter	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration		Switching Frequency (Hz)	Catalog Number	
						Mini QD Style	Micro QD Style
12mm	2 (0.08)	Y	N.O.	PNP	15	—	871Z-DW2NP12-D4
18mm	5 (0.20)	Y	N.O.	PNP	15	871Z-DW5NP18-N4	871Z-DW5NP18-D4
30mm	10 (0.39)	Y	N.O.	PNP	15	871Z-DW10NP30-N4	871Z-DW10NP30-D4
Recommended Standard QD Cordset (-6F = 1.8m (6ft), -2 = 2m (6.5ft))						889N-F4AFC-6F	889D-F4AC-2

QD Cordsets and Accessories

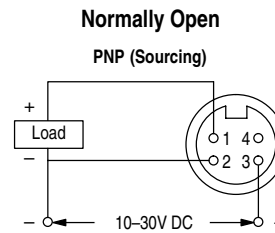
Description	Page Number
Other Cordsets Available	5-8, 5-26
Terminal Chambers	5-19
Mounting Brackets	2-188 - 2-192
Teflon End Caps	2-197
Mounting Nuts	2-199 - 2-200

Dimensions—mm (inches)

Mini QD Style

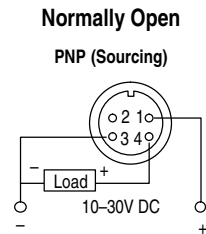
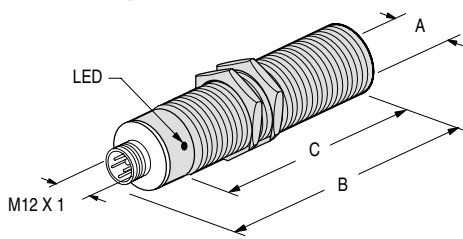


Wiring Diagram



Thread Size	Shielded	mm (inches)		
		A	B	C
M18 X 1	Y	18.0 (0.71)	90 (3.54)	53 (2.09)
M30 X 1.5	Y	30.0 (1.18)	90 (3.54)	56 (2.20)

Micro QD Style



Thread Size	Shielded	mm (inches)		
		A	B	C
M12 X 1	Y	12.0 (0.47)	70.0 (2.76)	50.0 (1.97)
M18 X 1	Y	18.0 (0.71)	80.0 (3.15)	60.0 (2.36)
M30 X 1.5	Y	30.0 (1.18)	80.0 (3.15)	60.0 (2.36)