



### Description

Bulletin 871Z inductive proximity sensors are self-contained, solid state switching devices designed to sense the presence of metal objects (ferrous and nonferrous) 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 25.4mm (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, PTFE-coated brass housing which meets NEMA 1, 2, 3, 3R, 4, 4X, 6, 6P, 12, 13 and IP67 (IEC 529) enclosure standards. The PTFE-coated housing and mounting nuts, Thermoset Plastic 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 25.4mm (1in) 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 2-8 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
- PTFE-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

DC 3-Wire . . . . . page 2-94  
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### Accessories

Quick-Disconnect Cables . . . page 7-1  
 Mounting Bracket,  
 Spring Return Style . . . . . page 2-186  
 Mounting Bracket,  
 Right Angle Style . . . . . page 2-189  
 Mounting Bracket,  
 Clamp Style . . . . . page 2-190  
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 Lock Washers . . . . . page 2-199

### General Information

Torque Chart . . . . . page 2-201  
 Metric/English  
 Conversion Chart . . . . . page 10-9

# 871Z 3-Wire DC Weld Field Immune

PTFE Face/Threaded PTFE-Coated Brass Barrel



871Z DC Mini  
Quick-Disconnect Style  
18, 30mm  
page 2-95



871Z DC Micro  
Quick-Disconnect Style  
12, 18, 30mm  
page 2-95



## Specifications

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

Inductive Proximity Sensors  
**871Z 3-Wire DC Weld Field Immune**  
 PTFE Face/Threaded PTFE-Coated Brass Barrel

**Product Selection**

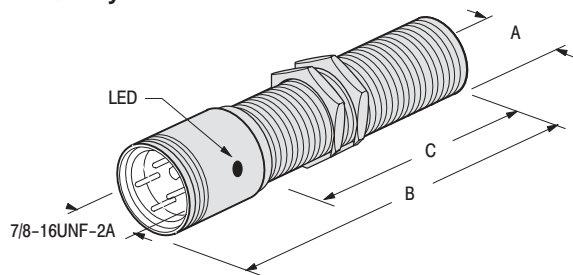
Barrel Diameter	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration		Switching Frequency (Hz)	Catalog Number	
						Mini QD Style	Micro QD Style
12mm	2 (0.08)	Y	N.O.	PNP	15	—	871Z-DW2NP12-D4
18mm	5 (0.20)	Y	N.O.	PNP	15	871Z-DW5NP18-N4	871Z-DW5NP18-D4
30mm	10 (0.39)	Y	N.O.	PNP	15	871Z-DW10NP30-N4	871Z-DW10NP30-D4
Recommended Standard QD Cordset (-6F = 1.8m (6ft), -2 = 2m (6.5ft))						889N-F4AFC-6F	889D-F4WE-2

**QD Cordsets and Accessories**

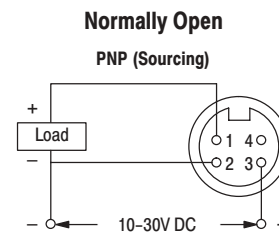
Description	Page Number
Other Cordsets Available	7-8, 7-41
Terminal Chambers	7-20
Mounting Brackets	2-186 - 2-190
PTFE End Caps	2-195
Mounting Nuts	2-197 - 2-198

**Dimensions—mm (inches)**

**Mini QD Style**

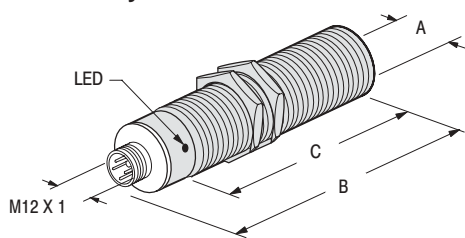


**Wiring Diagram**



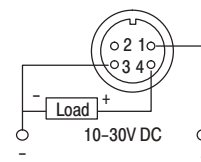
Thread Size	Shielded	mm (inches)		
		A	B	C
M18 X 1	Y	18.0 (0.71)	90 (3.54)	53 (2.09)
M30 X 1.5	Y	30.0 (1.18)	90 (3.54)	56 (2.20)

**Micro QD Style**



**Normally Open**

**PNP (Sourcing)**



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)

AB Drives

# 871Z 2-Wire AC/DC Weld Field Immune

Thermoset Plastic Face/Threaded PTFE-Coated Brass Barrel



871Z AC/DC Cable Style  
12, 18, 30mm  
page 2-97



871Z AC/DC Mini  
Quick-Disconnect Style  
12, 18, 30mm  
page 2-97



871Z AC/DC Micro  
Quick-Disconnect Style  
12, 18, 30mm  
page 2-97



## 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
<b>Load Current</b>	5–250mA	5–400mA
<b>Inrush Current (1 cycle)</b>	≤2A	≤4A
<b>Leakage Current</b>	≤1.7mA at 120V AC	
<b>Operating Voltage</b>	40–250V AC/DC	
<b>Voltage Drop</b>	≤5V at 250mA, 10V at 10mA	≤5V at 400mA, 10V at 10mA
<b>Repeatability</b>	≤10% at constant temperature	
<b>Hysteresis</b>	7% typical	
<b>False Pulse Protection</b>	Incorporated	
<b>Transient Noise Protection</b>	Incorporated	
<b>Short Circuit Protection</b>	Incorporated, trigger at 5A typical	Incorporated, trigger at 8A typical
<b>Overload Protection</b>	Incorporated, trigger at 340mA typical	Incorporated, trigger at 550mA typical
<b>Weld Field Immunity</b>	20,000A at 1 inch	
<b>Reverse Polarity Protection (DC output)</b>	Incorporated	
<b>Approvals</b>	UL listed, CSA certified, and CE marked for all applicable directives	
<b>Enclosure</b>	NEMA 1, 2, 3, 3R, 4, 4X, 6, 6P, 12, 13, IP67 (IEC 529) PTFE coated housing	
<b>Connections</b>	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	
<b>LEDs</b>	Orange: Output Energized Green: Power/Short Circuit (flashing)	
<b>Operating Temperature</b>	–25°C to +70°C (–13°F to +158°F)	
<b>Shock</b>	30g, 11ms	
<b>Vibration</b>	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

Inductive Proximity Sensors  
**871Z 2-Wire AC/DC Weld Field Immune**  
 Thermoset Plastic Face/Threaded PTFE-Coated Brass Barrel

**Product Selection**

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-F3WEA-2

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

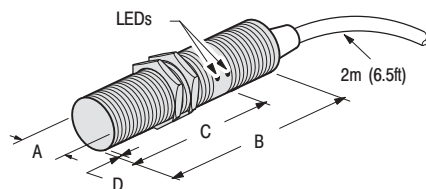
**Note:** This Allen-Bradley Weld Field Immune proximity sensor is also available with additional weld slag resistant material on the sensing face. Consult factory for details.

**QD Cordsets and Accessories**

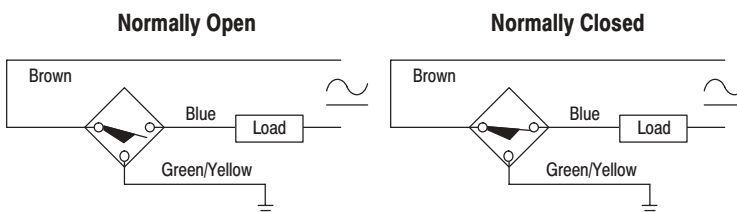
Description	Page Number
Other Cordsets Available	7-8, 7-68
Terminal Chambers	7-20
Mounting Brackets	2-186 - 2-190
PTFE End Caps	2-195
Mounting Nuts	2-197 - 2-198

**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)

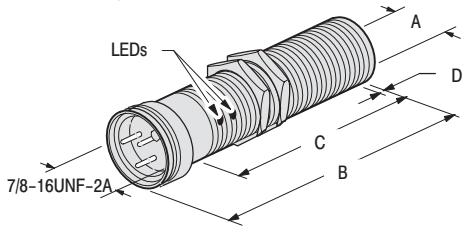
AB Drives

# 871Z 2-Wire AC/DC Weld Field Immune

Thermoset Plastic Face/Threaded PTFE-Coated Brass Barrel

## Dimensions—mm (inches)

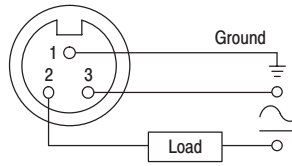
### Mini QD Style



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

## Wiring Diagram

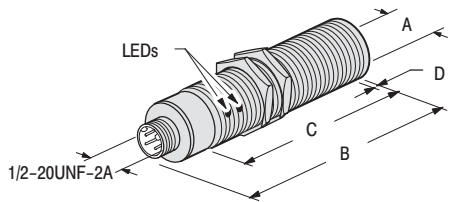
### Normally Open or Normally Closed



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

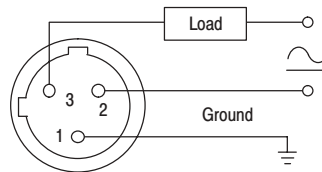
Thread Size	Shielded	mm (inches)			
		A	B	C	D
M12 X 1	Y	12.0 (0.47)	83.3 (3.28)	38.2 (1.50)	0.8 (0.03)
M18 X 1	Y	18.0 (0.71)	72.5 (2.85)	53.1 (2.09)	
M30 X 1.5	Y	30.0 (1.18)	86.5 (3.41)	63.4 (2.50)	

### 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)	