



### Description

Bulletin 871P VersaCube™ inductive proximity sensors are self-contained, solid state devices designed to sense the presence of ferrous and nonferrous metal objects without touching them.

The special weld field immune models are ideal for welding environments and other applications where magnetic fields are present. General Purpose 871P VersaCube models are available for more standard applications where long sensing distance and compact size are required.

The unique VersaCube package is ideal for applications in which space is limited. Their overall size is approximately half that of limit switch style models. The two mounting holes on the VersaCube base align with standard limit switch style mounting holes allowing easy and convenient retrofit capability.

VersaCube models feature two LEDs, one for output and one for power and short-circuit indication. Connection options include mini and micro quick-disconnect.

### Features

- 5-position sensing head
- Rugged burn and weld-slag resistant housing on weld-field immune models
- Mini and micro quick-disconnect styles
- Weld field immunity (some models)
- Short circuit protection
- False pulse protection
- Overload protection
- Transient noise protection
- Reverse polarity protection (DC models)
- UL listed, c-UL certified, and CE marked for all applicable directives

### Styles

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Mounting Kit . . . . .	page 2-192
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### General Information

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# 871P VersaCube™ 4-Wire DC

Weld Field Immune/Weld Slag Resistant Cube Style



871P DC WFI Micro  
Quick-Disconnect Style



## Specifications

<b>Load Current</b>	≤200mA
<b>Inrush Current (1 cycle)</b>	≤2A
<b>Leakage Current</b>	≤80μA
<b>Operating Voltage</b>	10–30V DC
<b>Voltage Drop</b>	<2.5V
<b>Repeatability</b>	≤5%
<b>Hysteresis</b>	12% typical
<b>Short Circuit Protection</b>	Incorporated
<b>Reverse Polarity Protection</b>	Incorporated
<b>Approvals</b>	cULus and CE marked for all applicable directives
<b>Enclosure</b>	IP67
<b>Connections</b>	4-pin micro quick-disconnect style
<b>LED</b>	Green: Output energized; Orange: Target present
<b>Operating Temperature</b>	Shielded: -25°C to +70°C (-13°F to +158°F) Unshielded: -10°C to +70°C (14°F to +158°F)
<b>Shock and Vibration</b>	5g, 30–55Hz per IEC 60947-5-2

## Features

- New rugged housing
- Weld-slag resistant body and face
- Convenient mounting base
- Weld field immune
- Equal sensing capabilities
- Shielded or unshielded models
- 10–30V DC
- Complementary normally open and normally closed outputs

## Correction Factors

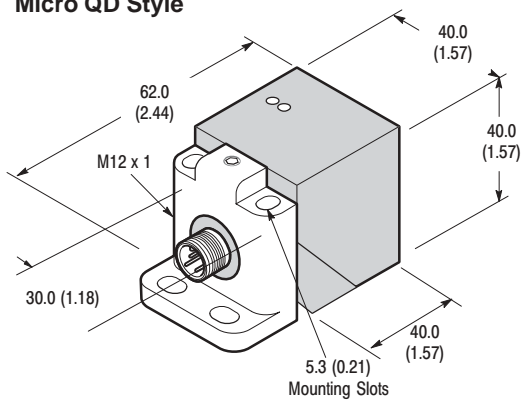
Target Material	Correction Factor
Steel	1.0
Stainless Steel	1.0
Brass	1.0
Aluminum	1.0
Copper	1.0

## Product Selection

Head Size	Weld Field Immune	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration	Switching Frequency (Hz)	Catalog Number
40mm	Y	15 (0.59)	Y	N.O. and N.C.	400	871P-MW15BP40LD4
		35 (1.37)	N		200	871P-NW35BP40LD4
Recommended Standard QD Cordset (-2 = 2m (6.5ft))						889D-F4WE-2

## Dimensions—mm (inches)

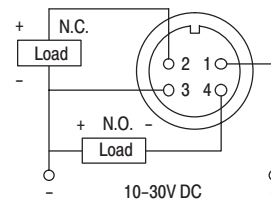
### Micro QD Style



## Wiring Diagram

### Complementary Normally Open and Normally Closed

PNP (Sourcing)





871P DC General Purpose  
 Micro Quick-Disconnect Style  
 page 2-108



871P DC Mini  
 Quick-Disconnect Style  
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871P DC WFI Micro  
 Quick-Disconnect Style  
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### Features

- New rugged housing
- Weld field immune models
- Burn and weld-slag resistant body on weld field immune models
- Convenient mounting base
- 3-wire operation
- 4-pin connection
- 10–60V DC
- Normally open or normally closed output
- Short circuit, overload, false pulse, transient noise, and reverse polarity protection
- UL listed, c-UL certified, and CE marked for all applicable directives

### Specifications

	General Purpose	Weld Field Immune
<b>Load Current</b>	≤200mA	≤200mA
<b>Leakage Current</b>	≤10μA	≤10μA
<b>Operating Voltage</b>	10–60V DC	10–60V DC
<b>Voltage Drop</b>	<2.5V @ 200mA	<2.5V @ 200mA
<b>Repeatability</b>	≤5%	≤10% of effective operating distance
<b>Hysteresis</b>	5% typical	12% typical
<b>False Pulse Protection</b>	Incorporated	Incorporated
<b>Transient Noise Protection</b>	Incorporated	Incorporated
<b>Short Circuit Protection</b>	Incorporated	Incorporated
<b>Overload Protection</b>	Incorporated	Incorporated
<b>Reverse Polarity Protection</b>	Incorporated	Incorporated
<b>Weld Field Immunity</b>	N/A	1000 Gauss ❶
<b>Connections</b>	Quick-Disconnect: 4-pin mini style 4-pin micro style	Quick-Disconnect: 4-pin mini style 4-pin micro style
<b>Approvals</b>	UL listed, c-UL certified and CE marked for all applicable directives	
<b>Enclosure</b>	NEMA 1, 2, 3, 4, 6, 6P, 12, 13; IP67 (IEC 529), 1200 psi (8270kPa) washdown; Plastic body, zinc base	
<b>LED</b>	Orange: Output Energized Green: Power	
<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	

❶ Measured with field perpendicular to face.

### 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	0.2–0.3

**Product Selection**

Head Size	Weld Field Immune	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration		Switching Frequency (Hz)	Catalog Number		
							Mini QD Style	Micro QD Style	
40mm	N	20 (0.79)	Y	N.O.	PNP	100	871P-D20NP40-N4	871P-D20NP40-D4	
					NPN		871P-D20NN40-N4	871P-D20NN40-D4	
				N.C.	PNP		871P-D20CP40-N4	871P-D20CP40-D4	
		NPN	871P-D20CN40-N4		871P-D20CN40-D4				
		40 (1.57)	N	N.O.	PNP		871P-D40NP40-N4 ①	871P-D40NP40-D4 ①	
					NPN		871P-D40NN40-N4 ①	871P-D40NN40-D4 ①	
	N.C.			PNP	871P-D40CP40-N4 ①	871P-D40CP40-D4 ①			
		NPN	871P-D40CN40-N4 ①	871P-D40CN40-D4 ①					
	Y	15 (0.59)	Y	N.O.	PNP	50	871P-DW15NP40-N4	871P-DW15NP40-D4	
					NPN		871P-DW15NN40-N4	871P-DW15NN40-D4	
				N.C.	PNP		871P-DW15CP40-N4	871P-DW15CP40-D4	
		NPN	871P-DW15CN40-N4		871P-DW15CN40-D4				
		25 (0.98)	N	N.O.	PNP		871P-DW25NP40-N4	871P-DW25NP40-D4	
					NPN		871P-DW25NN40-N4	871P-DW25NN40-D4	
	N.C.			PNP	871P-DW25CP40-N4	871P-DW25CP40-D4			
		NPN	871P-DW25CN40-N4	871P-DW25CN40-D4					
	Recommended Standard QD Cordset (-6F = 1.8m (6ft), -2 = 2m (6.5ft))							889N-F4AFC-6F	889D-F4AC-2

① Assured operating distance for general purpose unshielded models is 0 to 33mm.

**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.

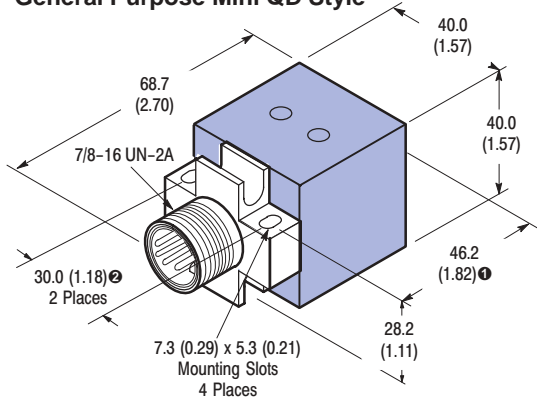
**QD Cordsets and Accessories**

Description	Page Number
Other Cordsets Available	7-8, 7-41
Terminal Chambers	7-20
Mounting Kit ②	2-192
Limit Switch Style Mounting Brackets	2-193
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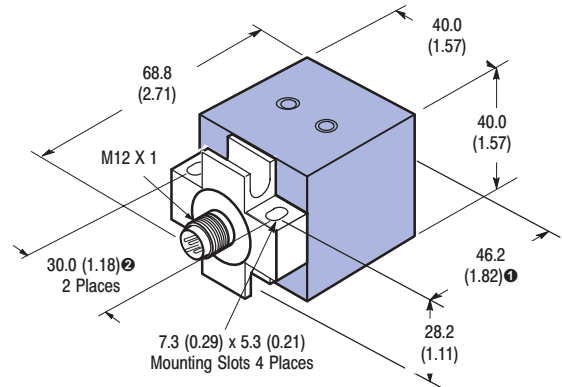
② Each Weld Field Immune unit is supplied with mounting hardware, a ground lug, a ground screw, and an optional adaptor for competitive retrofits. Additional sets of hardware are available under catalog number 871A-PKIT.

**Dimensions—mm (inches)**

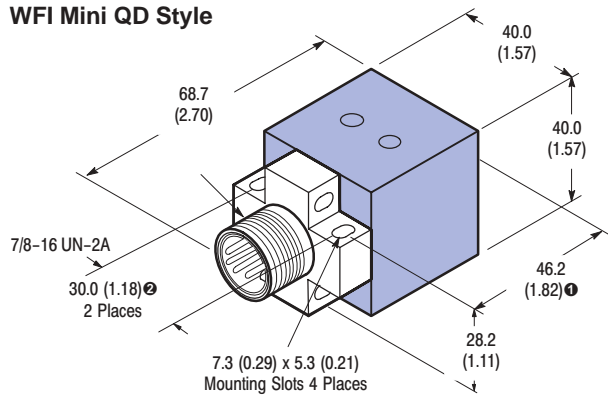
**General Purpose Mini QD Style**



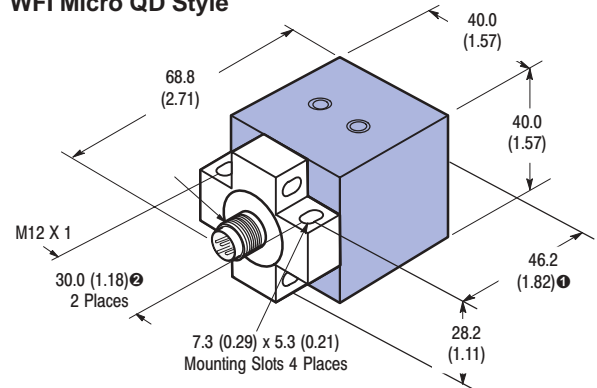
**General Purpose Micro QD Style**



**WFI Mini QD Style**



**WFI Micro QD Style**



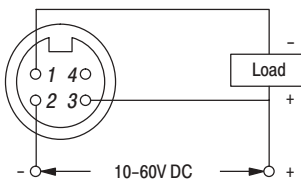
- ① With retrofit adaptor, distance from face to mounting holes becomes 60.0 (2.36).
- ② With retrofit adaptor, spacing between mounting holes becomes 20.0 (0.79).

**Wiring Diagrams**

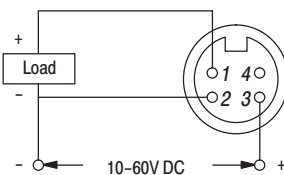
**Mini QD Style**

**Normally Open or Normally Closed**

**NPN (Sinking)**



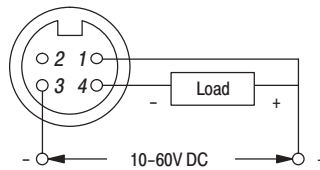
**PNP (Sourcing)**



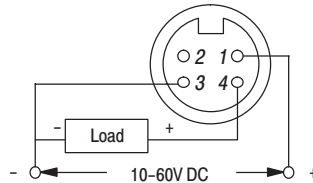
**Micro QD Style**

**Normally Open or Normally Closed**

**NPN (Sinking)**



**PNP (Sourcing)**



**Note:** Unit must be mounted to a grounded metal frame or grounded via field wiring lug per NEC requirements. Recommended grounding lug is available in Allen-Bradley mounting kit **871A-PKIT**. This kit is included with all weld field immune models.

**Spare Allen-Bradley Parts**

# 871P Equal Sensing VersaCube™ 3-Wire DC



871P DC Mini  
Quick-Disconnect Style  
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871P DC Micro  
Quick-Disconnect Style  
page 2-111



## Specifications

	General Purpose
<b>Load Current</b>	≤200mA
<b>Leakage Current</b>	≤10μA
<b>Operating Voltage</b>	10–30V DC
<b>Voltage Drop</b>	<2.5V @ 200mA
<b>Repeatability</b>	≤2%
<b>Hysteresis</b>	5% typical
<b>False Pulse Protection</b>	Incorporated
<b>Transient Noise Protection</b>	Incorporated
<b>Short Circuit Protection</b>	Incorporated
<b>Overload Protection</b>	Incorporated
<b>Reverse Polarity Protection</b>	Incorporated
<b>Weld Field Immunity</b>	1000 Gauss
<b>Connections</b>	Quick-Disconnect: 4-pin mini style 4-pin micro style
<b>Approvals</b>	UL listed, c-UL certified, and CE marked for all applicable directives
<b>Enclosure</b>	NEMA 1, 2, 3, 4, 6, 6P, 12, 13; IP67 (IEC 529), 1200 psi (8270kPa) washdown; Plastic body, zinc base
<b>LED</b>	Orange: Output Energized Green: Power
<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

- Equal sensing distance from all metals
- Rugged housing
- Convenient mounting base
- Short circuit, overload, false pulse, transient noise, and reverse polarity protection
- Weld field immune
- UL listed, c-UL certified, and CE marked for all applicable directives

## Correction Factors

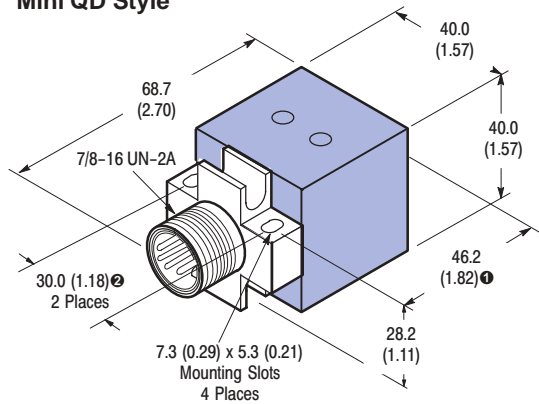
Target Material	Correction Factor
Steel	1.0
Stainless Steel	1.0
Brass	1.0
Aluminum	1.0
Copper	1.0

**Product Selection**

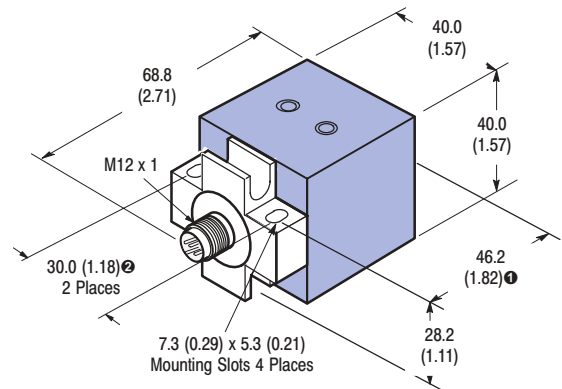
Head Size	Weld Field Immune	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration		Switching Frequency (Hz)	Catalog Number	
							Mini QD Style	Micro QD Style
40mm	Y	25 (0.98)	N	N.O.	PNP	100	871P-DB25NP40-N4	871P-DB25NP40-D4
					NPN		871P-DB25NN40-N4	871P-DB25NN40-D4
				N.C.	PNP		871P-DB25CP40-N4	871P-DB25CP40-D4
					NPN		871P-DB25CN40-N4	871P-DB25CN40-D4
Recommended Standard QD Cordset (-6F = 1.8m (6ft), -2 = 2m (6.5ft))							889N-F4AFC-6F	889D-F4AC-2

**Dimensions—mm (inches)**

**Mini QD Style**



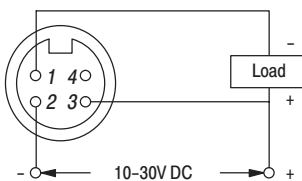
**Micro QD Style**



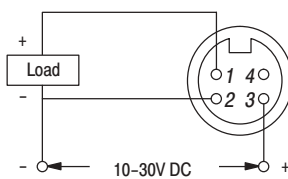
**Wiring Diagrams**

**Mini QD Style**

**Normally Open or Normally Closed  
NPN (Sinking)**

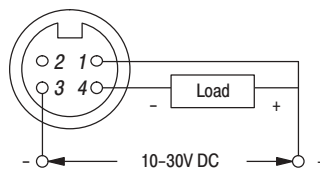


**PNP (Sourcing)**

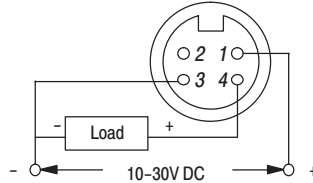


**Micro QD Style**

**Normally Open or Normally Closed  
NPN (Sinking)**



**PNP (Sourcing)**



**Note:** Unit must be mounted to a grounded metal frame or grounded via field wiring lug per NEC requirements. Recommended grounding lug is available in Allen-Bradley mounting kit **871A-PKIT**.



871P AC/DC General Purpose  
Micro Quick-Disconnect Style  
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871P AC/DC WFI Mini  
Quick-Disconnect Style  
page 2-113



871P AC/DC WFI Micro  
Quick-Disconnect Style  
page 2-113



**Features**

- New rugged housing
- Burn and weld-slag resistant body on weld field immune models
- Convenient mounting base
- 2-wire operation
- 3-pin connection
- 20–250V AC/DC
- Normally open or normally closed output
- Weld-field immune models
- Short circuit, overload, false pulse, and transient noise protection
- UL listed, c-UL certified, and CE marked for all applicable directives

**Specifications**

	General Purpose	Weld Field Immune
<b>Load Current</b>	2–100mA	2–300mA
<b>Inrush Current (1 cycle)</b>	≤ 2A	≤ 2A
<b>Leakage Current</b>	≤1.5mA@20V ≤1.7mA@120V ≤2.0mA@250V	≤1.5mA@20V ≤1.7mA@120V ≤2.0mA@250V
<b>Operating Voltage</b>	20–250V AC/DC	20–250V AC/DC
<b>Voltage Drop</b>	<10V	<10V
<b>Repeatability</b>	≤10% of effective operating distance	≤10% of effective operating distance
<b>Hysteresis</b>	12% typical	12% typical
<b>False Pulse Protection</b>	Incorporated	Incorporated
<b>Transient Noise Protection</b>	Incorporated	Incorporated
<b>Short Circuit Protection</b>	Incorporated	Incorporated
<b>Overload Protection</b>	Incorporated	Incorporated
<b>Weld-Field Immunity</b>	N/A	1000 Gauss ①
<b>Approvals</b>	UL listed, c-UL certified, and CE marked for all applicable directives	
<b>Enclosure</b>	NEMA 1, 2, 3, 4, 6, 6P, 12, 13; IP67 (IEC 529), 1200 psi (8270kPa) washdown; Plastic body, zinc base	
<b>Connections</b>	Quick-Disconnect: 3-pin mini style 3-pin micro style	
<b>LED</b>	Red: Output Energized Green: Power (short circuit if 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	

① Measured with field perpendicular to sensing face.

**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	0.2–0.3



### Product Selection

Head Size	Weld Field Immune	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration	Switching Frequency (Hz)	Catalog Number		
						Mini QD Style	Micro QD Style	
40mm	N	20 (0.79)	Y	N.O.	30	871P-B20N40-N3	871P-B20N40-R3	
				N.C.		871P-B20C40-N3	871P-B20C40-R3	
		40 (1.57)	N	N.O.	20	871P-B40N40-N3 ①	871P-B40N40-R3 ①	
				N.C.		871P-B40C40-N3 ①	871P-B40C40-R3 ①	
	Y	15 (0.59)	Y	N.O.	30	871P-BW15N40-N3	871P-BW15N40-R3	
				N.C.		871P-BW15C40-N3	871P-BW15C40-R3	
		25 (0.98)	N	N.O.	20	871P-BW25N40-N3	871P-BW25N40-R3	
				N.C.		871P-BW25C40-N3	871P-BW25C40-R3	
	Recommended Standard QD Cordset (-6F = 1.8m (6ft), -2 = 2m (6.5ft))						889N-F3AFC-6F	889R-F3ACA-2

① Assured operating distance for general purpose unshielded models is 0 to 33mm.

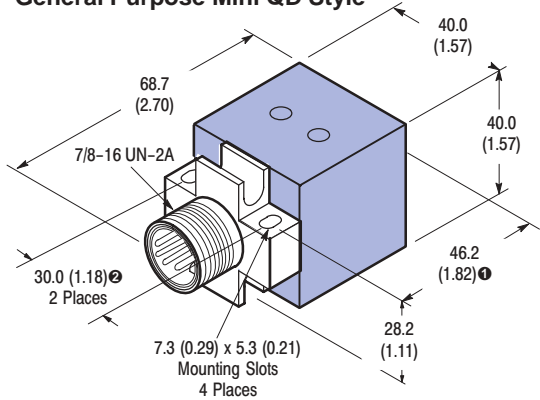
### QD Cordsets and Accessories

Description	Page Number
Other Cordsets Available	7-8, 7-68
Terminal Chambers	7-20
Mounting Kit ②	2-192
Limit Switch Style Mounting Brackets	2-193
PTFE Covers	2-194

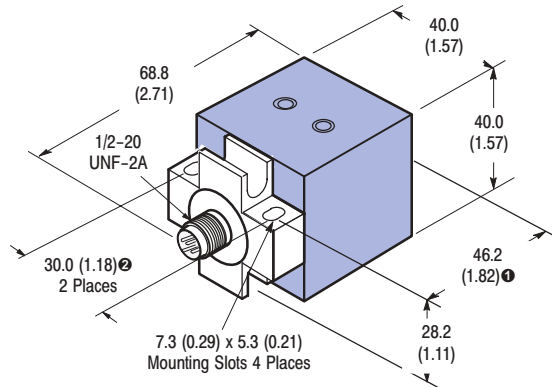
② Each Weld Field Immune unit is supplied with mounting hardware, a ground lug, a ground screw, and an optional adaptor for competitive retrofits. Additional sets of hardware are available under catalog number 871A-PKIT.

**Dimensions—mm (inches)**

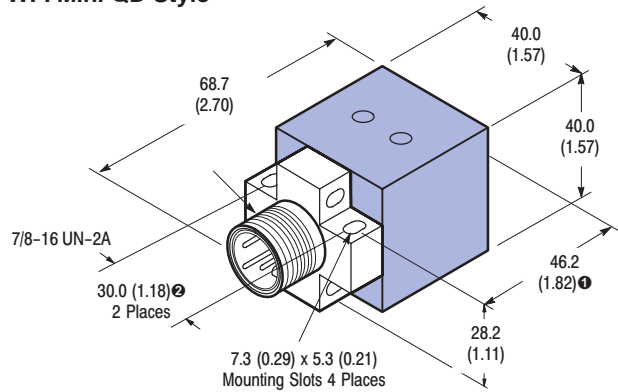
**General Purpose Mini QD Style**



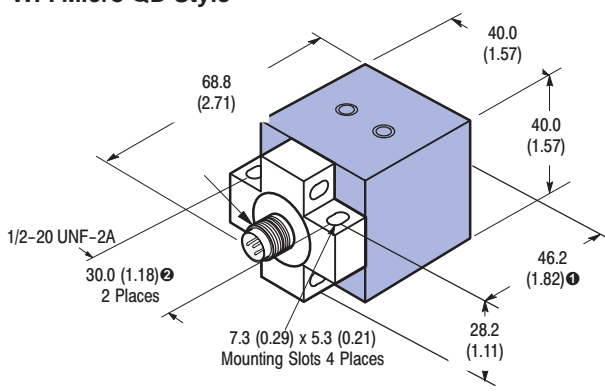
**General Purpose Micro QD Style**



**WFI Mini QD Style**



**WFI Micro QD Style**

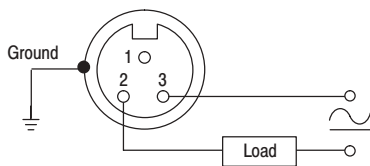


- ❶ With retrofit adaptor, distance from face to mounting holes becomes 60.0 (2.36).
- ❷ With retrofit adaptor, spacing between mounting holes becomes 20.0 (0.79).

**Wiring Diagrams**

**Mini QD Style**

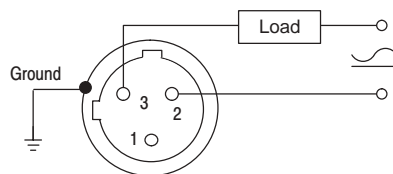
**Normally Open or Normally Closed**



Note: Load can be switched to pin 3.

**Micro QD Style**

**Normally Open or Normally Closed**



Note: Load can be switched to pin 2.

**Note:** Unit must be mounted to a grounded metal frame or grounded via field wiring lug per NEC requirements. Recommended grounding lug is available in Allen-Bradley mounting kit **871A-PKIT**. This kit is included with all weld field immune models.