



Description

Bulletin 871F inductive flat pack and block style proximity sensors are self-contained, solid state devices. These devices are designed for most applications where it is required to sense the presence of ferrous and nonferrous metal objects without touching them.

The body material is either plastic (flat pack) or aluminum (block) and meets NEMA 4, 13 and IP67 (IEC 529) enclosure standards. The electronic circuitry is potted for protection against shock, vibration, and contamination.

Connection options include a micro and mini quick-disconnect, ToughLink™ and PVC cable models, and both 1/2–14 NPT and PG13.5 conduit opening with screw terminals.

Features

- Cable, conduit, or quick-disconnect styles
- Short circuit protection
- Overload protection
- Transient noise protection
- False pulse protection
- Reverse polarity protection (DC models)
- CE marked for all applicable directives

Styles

Complementary Output	
DC 4-Wire Flat Pack	page 2–126
DC Weld Field Immune	page 2–129
2-Wire AC/DC Flat Pack	page 2–131
AC/DC 2-Wire Flat Pack	
Weld Field Immune	page 2–134
AC/DC 2-Wire	
Weld Field Immune	page 2–136
DC 3-Wire Block	page 2–138

Accessories

Quick-Disconnect Cables	page 8–1
-------------------------	----------

General Information

Metric/English	
Conversion Chart	page 11–10

AB PLCs

871F 4-Wire DC Complementary Output

Flat Pack Style



871F DC Cable Style
page 2-127



871F DC Mini
Quick-Disconnect Style
page 2-127



871F DC Micro
Quick-Disconnect Style
page 2-128



Specifications

Load Current	≤200mA
Minimum Load Current	1mA
Leakage Current	≤10μA
Operating Voltage	10-30V DC
Voltage Drop	≤2.5V
Repeatability	≤2%
Hysteresis	≤5% typical
False Pulse Protection	Incorporated
Transient Noise Protection	Incorporated
Reverse Polarity Protection	Incorporated
Short Circuit Protection	Incorporated
Overload Protection	Incorporated
Approvals	UL listed, c-UL certified, and CE marked for all applicable all directives
Enclosure	NEMA 1, 2, 3, 4, 6, 6P, 12 and 13, IP67 (IEC 529), 1200psi (8270kPa) washdown; Housing material: Valox®
Connections	Cable: 2m (6.5ft) length 4-conductor #22AWG ToughLink™ Quick Disconnect: 4-pin mini style 4-pin micro style Conduit Opening: 1/2-14 NPT thread, PG13.5 thread
LEDs	Green: Power Orange: Output Energized
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	0.2-0.3

Features

- 4-wire operation
- 4-pin, 4-conductor or 4-terminal connection
- 10-30V DC
- Complementary normally open and normally closed outputs
- False pulse, transient noise, reverse polarity, short circuit and overload protection
- UL listed, c-UL certified, and CE marked for all applicable directives
- DIN rail mounting option on quick-disconnect and cable models
- Adjustable sensing models available

Inductive Proximity Sensors
871F 4-Wire DC Complementary Output
 Flat Pack Style

Product Selection

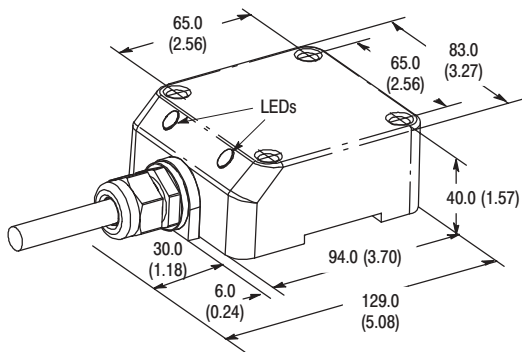
Head Size	Nominal Sensing Distance mm (in)	Shielded	Output Configuration		Switching Frequency (Hz)	Catalog Number				
						ToughLink™ Cable	Mini QD Style	Micro QD Style	Conduit 1/2 NPT	Conduit PG13.5
83 (3.27)	50 (1.97) ①	Y	N.O. and N.C.	PNP	100	871F-P50BP80-H2	871F-P50BP80-N4	871F-P50BP80-D4	871F-P50BP80-T4	871F-P50BP80-Q4
				NPN		871F-P50BN80-H2	871F-P50BN80-N4	871F-P50BN80-D4	871F-P50BN80-T4	871F-P50BN80-Q4
	PNP	871F-N65BP80-H2		871F-N65BP80-N4		871F-N65BP80-D4	871F-N65BP80-T4	871F-N65BP80-Q4		
	NPN	871F-N65BN80-H2		871F-N65BN80-N4		871F-N65BN80-D4	871F-N65BN80-T4	871F-N65BN80-Q4		
Recommended Standard QD Cordset (-6F = 1.8m (6ft), -2 = 2m (6.5ft))						889N-F4AFC-6F	889D-F4AC-2			

① 50mm when fully embedded in mild steel as shown

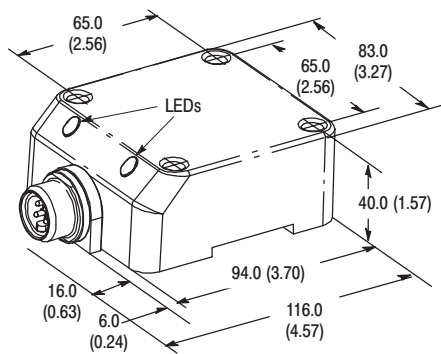


Dimensions—mm (inches)

Cable Style



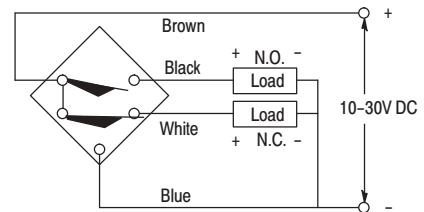
Mini QD Style



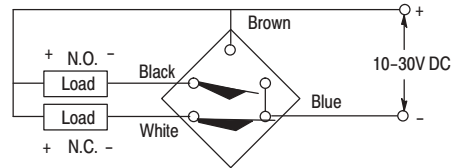
Wiring Diagram

Complementary Normally Open and Normally Closed

PNP (Sourcing)

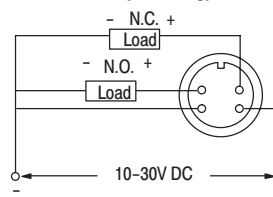


NPN (Sinking)

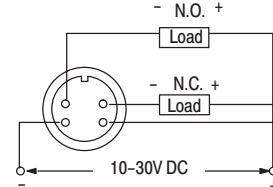


Complementary Normally Open and Normally Closed Outputs

PNP (Sourcing)



NPN (Sinking)



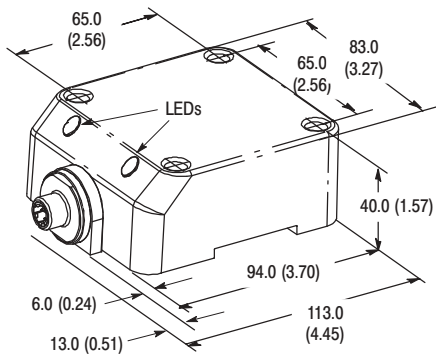
AB PLCs

871F 4-Wire DC Complementary Output

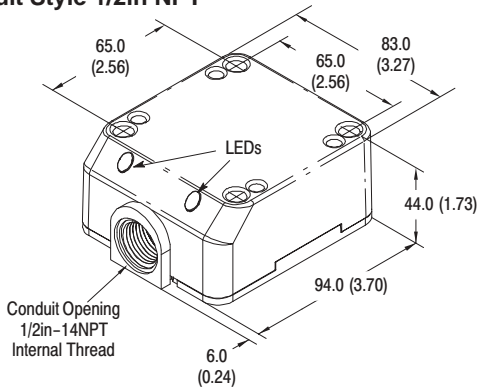
Flat Pack Style

Dimensions—mm (inches)

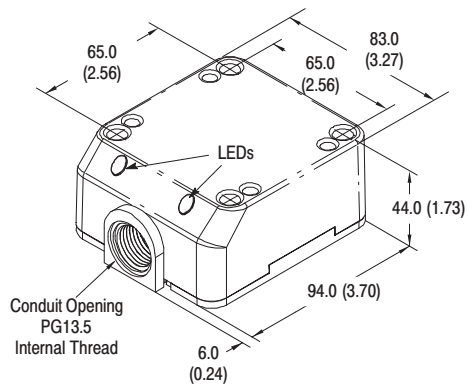
Micro QD Style



Conduit Style 1/2in NPT



Conduit Style PG13.5

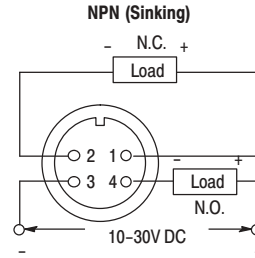
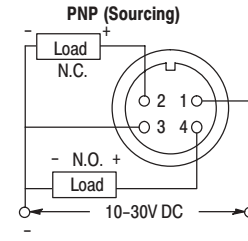


QD Cordsets and Accessories

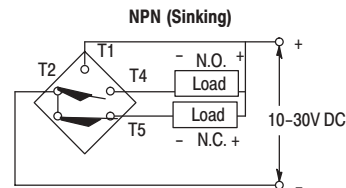
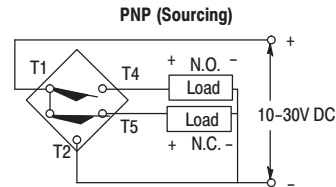
Description	Page Number
Other Cordsets Available	8-1, 8-68

Wiring Diagram

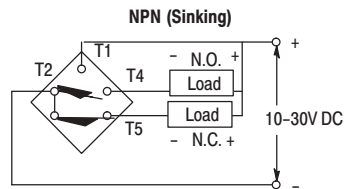
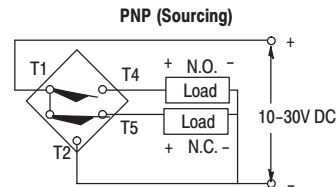
Complementary Normally Open and Normally Closed



Complementary Normally Open and Normally Closed Outputs



Complementary Normally Open and Normally Closed Outputs





871F DC Mini
Quick-Disconnect Style



871F DC Micro
Quick-Disconnect Style



Specifications

Load Current	≤200mA
Minimum Load Current	1mA
Leakage Current	≤10μA
Operating Voltage	10-30V DC
Voltage Drop	≤2.5V
Repeatability	≤5%
Hysteresis	≤5% typical
False Pulse Protection	Incorporated
Transient Noise Protection	Incorporated
Reverse Polarity Protection	Incorporated
Short Circuit Protection	Incorporated
Overload Protection	Incorporated
Weld Field Immunity	1600 Gauss
Approvals	UL listed, c-UL certified, and CE marked for all applicable all directives
Enclosure	NEMA 1, 2, 3, 4, 6, 6P, 12 and 13, IP67 (IEC 529), 1200psi (8270kPa) washdown; Housing material: Valox®
Connections	Quick Disconnect: 4-pin mini style 4-pin micro style
LEDs	Green: Power Orange: Output Energized
Operating Temperature	-25°C to +70°C (-13°F to +158°F)
Shock	5g
Vibration	55Hz, 1mm amplitude, 3 planes

Features

- 4-wire operation
- 4-pin, 4-conductor or 4-terminal connection
- 10-30V DC
- Complementary normally open and normally closed outputs
- False pulse, transient noise, reverse polarity, short circuit and overload protection
- UL listed, c-UL certified, and CE marked for all applicable directives
- DIN rail mounting option on quick-disconnect
- Weld field immune

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

AB PLCs

871F DC Weld Field Immune

Flat Pack Style

Product Selection

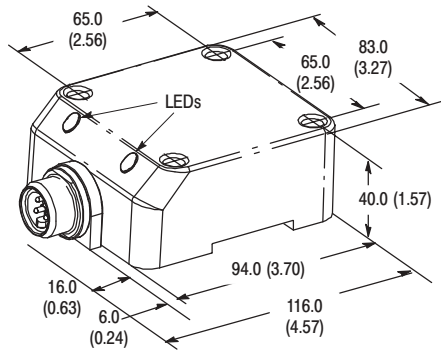
Head Size	Nominal Sensing Distance mm (in)	Shielded	Output Configuration		Switching Frequency (Hz)	Catalog Number	
						Mini QD Style	Micro QD Style
83 (3.27)	40 (1.57) ①	Y	N.O. and N.C.	PNP	15	871F-PW40BP80-N4	871F-PW40BP80-D4
				NPN		871F-PW40BN80-N4	871F-PW40BN80-D4
	N	PNP		871F-NW50BP80-N4		871F-NW50BP80-D4	
		NPN		871F-NW50BN80-N4		871F-NW50BN80-D4	
Recommended Standard QD Cordset (-6F = 1.8m (6ft), -2 = 2m (6.5ft))						889N-F4AFC-6F	889D-F4WE-2

① 40mm when fully embedded in mild steel as shown

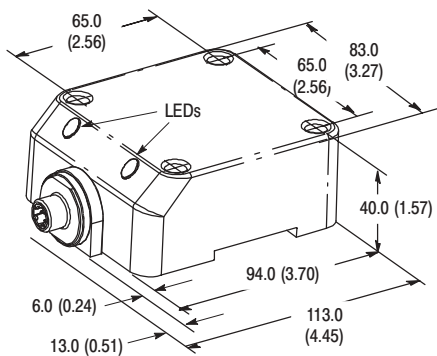


Dimensions—mm (inches)

Mini QD Style

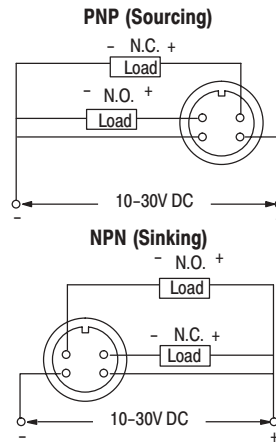


Micro QD Style

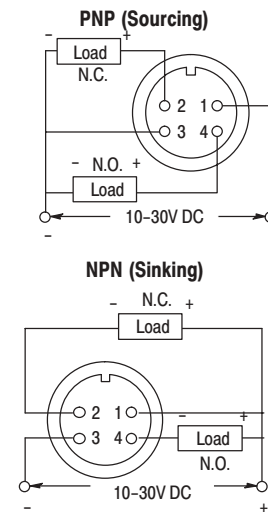


Wiring Diagram

Complementary Normally Open and Normally Closed Outputs



Complementary Normally Open and Normally Closed





871F AC/DC Cable Style

871F AC/DC Mini
Quick-Disconnect Style871F AC/DC Micro
Quick-Disconnect Style

Specifications

Load Current	≤100mA
Minimum Load Current	5mA
Leakage Current	≤1.7mA @ 120V; ≤2.0mA @ 250V
Operating Voltage	20-250V AC/DC
Voltage Drop	≤10V
Repeatability	≤5%
Hysteresis	≤10% typical
False Pulse Protection	Incorporated
Transient Noise Protection	Incorporated
Short Circuit Protection	Incorporated
Overload Protection	Incorporated
Approvals	UL listed, c-UL certified, and CE marked for all applicable all directives
Enclosure	NEMA 1, 2, 3, 4, 6, 6P, 12 and 13, IP67 (IEC 529), 1200psi (8270kPa) washdown; Housing material: Valox®
Connections	Quick Disconnect: 3-pin mini style 3-pin micro style Cable: 2m (6.5ft) 2 conductor #22AWG ToughLink™ Conduit Opening: 1/2-14NPT thread, PG 13.5 thread
LEDs	Green: Power Orange: Output Energized
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	0.2-0.3

Features

- 2-wire operation
- 2 conductor, 2 terminal, or 3-pin connection
- 20-250V AC/DC
- False pulse, transient noise, short circuit and overload protection
- UL listed, c-UL certified, and CE marked for all applicable directives
- DIN rail mounting option on quick-disconnect and cable models

AB PLCs

871F 2-Wire AC/DC

Flat Pack Style

Selection Guide

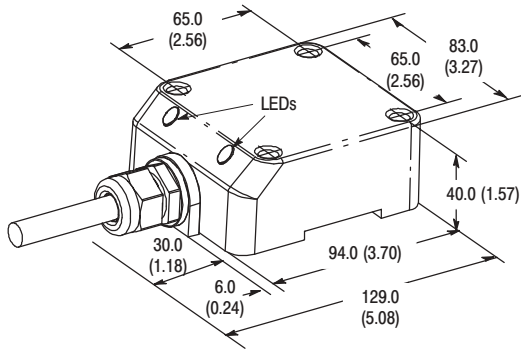
Head Size	Nominal Sensing Distance mm (in)	Shielded	Output Configuration	Switching Frequency (Hz)	Catalog Number				
					ToughLink™ Cable	Mini QD Style	Micro QD Style	Conduit 1/2 NPT	Conduit PG13.5
83 (3.27)	50 (1.97) ①	Y	N.O.	10	871F-R50N80-C2	871F-R50N80-N3	871F-R50N80-R3	871F-R50N80-T2	871F-R50N80-Q2
	65 (2.56)	N			871F-K65N80-C2	871F-K65N80-N3	871F-K65N80-R3	871F-K65N80-T2	871F-K65N80-Q2
Recommended Standard QD Cordset (-6F = 1.8m (6ft), -2 = 2m (6.5ft))					889N-F3AFC-6F	889R-F3ACA-2			

① 50mm when fully embedded in mild steel as shown

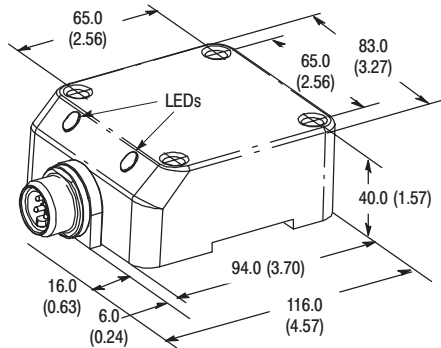


Dimensions—mm (inches)

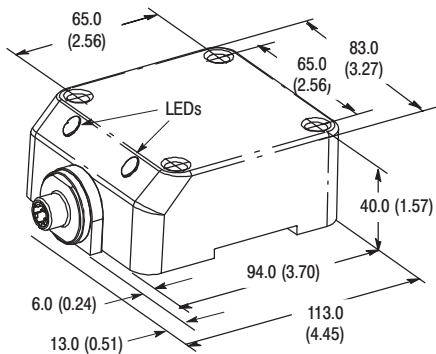
Cable Style



Mini QD Style

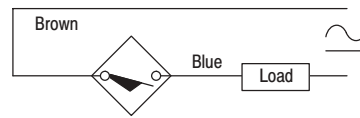


Micro QD Style



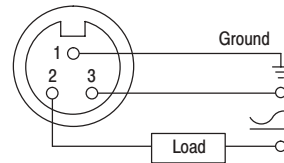
Wiring Diagram

Normally Open



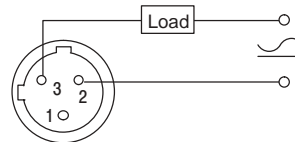
Note: Load can be switched to brown wire.

Normally Open



Note: Load can be switched to pin 3.

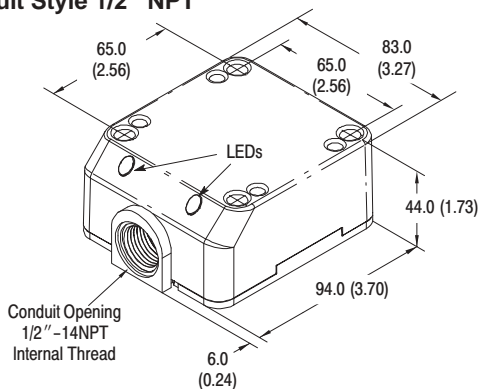
Normally Open



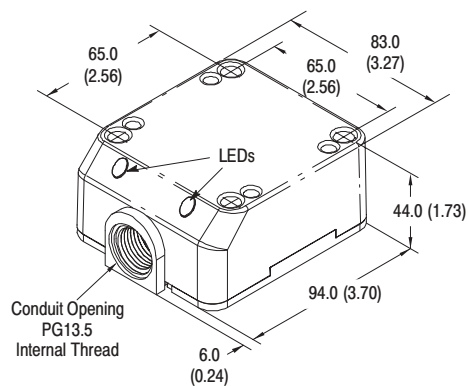
Note: Load can be switched to pin 2.

Dimensions—mm (inches)

Conduit Style 1/2" NPT

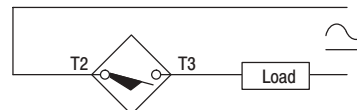


Conduit Style PG13.5



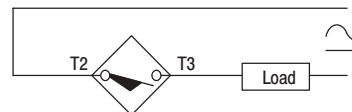
Wiring Diagram

Normally Open



Note: Load can be switched to terminal 2.

Normally Open



Note: Load can be switched to terminal 2.

QD Cordsets and Accessories

Description	Page Number
Other Cordsets Available	8-1

AB PLCs

871F 2-Wire AC/DC Weld Field Immune

Flat Pack Style



871F AC/DC WFI Micro
Quick-Disconnect Style



Features

- Weld Field Immune
- 2-wire operation
- 20-250V AC/DC
- False pulse, transient noise, short circuit and overload protection
- UL listed, c-UL certified, and CE marked for all applicable directives
- DIN rail mountable option on quick-disconnect and cable models

Specifications

Load Current	≤100mA
Minimum Load Current	5mA
Leakage Current	≤1.7mA @ 120V; ≤2.0mA @ 250V
Operating Voltage	20-250V AC/DC
Voltage Drop	≤10V
Repeatability	≤5%
Hysteresis	10% typical
False Pulse Protection	Incorporated
Transient Noise Protection	Incorporated
Short Circuit Protection	Incorporated
Overload Protection	Incorporated
Approvals	UL listed, c-UL certified, and CE marked for all applicable all directives
Enclosure	NEMA 1, 2, 3, 4, 6, 6P, 12 and 13, IP67 (IEC 529), 1200psi (8270kPa) washdown; Housing material: Valox®
Connections	Quick Disconnect: 3-pin micro style
LEDs	Green: Power Red: Output Energized
Operating Temperature	-25°C to +70°C (-13°F to +158°F)
Shock	30g, 11ms
Vibration	55Hz, 1mm amplitude, 3 planes
Weld Field Immunity	1600 Gauss

Correction Factors

Target Material	Correction Factor	
	Shielded	Unshielded
Steel	1.0	1.0
Stainless Steel	0.7-0.8	0.7-0.8
Brass	0.5-0.6	0.4-0.5
Aluminum	0.4-0.5	0.4-0.5
Copper	0.4-0.5	0.4-0.5

QD Cordsets

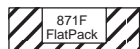
Description	Page Number
Other Cordsets Available	8-1

Inductive Proximity Sensors
871F 2-Wire AC/DC Weld Field Immune
 Flat Pack Style

Product Selection

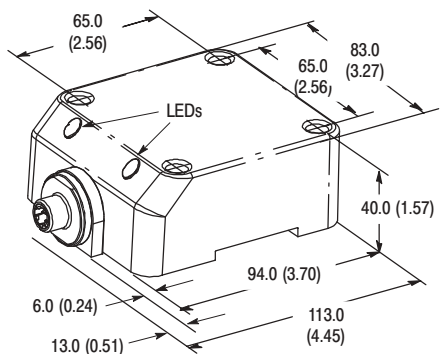
Head Size	Nominal Sensing Distance mm (in)	Shielded	Output Configuration	Switching Frequency (Hz)	Catalog Number Micro QD Style
83 (3.27)	40 (1.57) ①	Y	N.O.	10	871F-JW40N80-R3
	50 (1.97)	N	N.O.	10	871F-KW50N80-R3
Recommended Standard QD Cordset (-2 = 2m (6.5ft))					889R-F3WEA-2

① 40mm when fully embedded in mild steel as shown

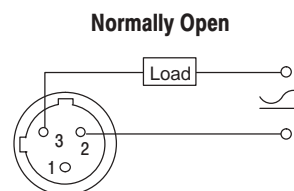


Dimensions—mm (inches)

Micro QD Style



Wiring Diagram



Note: Load can be switched to pin 2.

AB PLCs

871F 2-Wire AC/DC Weld Field Immune



871F AC/DC Mini and Micro
Quick-Disconnect Style
page 2-137



Specifications

Load Current	≤400mA
Minimum Load Current	3mA
Inrush Current (1 cycle)	≤8A
Leakage Current	≤1.5mA
Operating Voltage	20-250V AC/DC
Voltage Drop	≤5V
Repeatability	≤10%
Hysteresis	≤15% typical
Short Circuit Protection	Incorporated
False Pulse Protection	Incorporated
Transient Noise Protection	Incorporated
Weld Field Immunity	20,000A at 1in
Approvals	CE marked for all applicable directives
Enclosure	NEMA 4 and 13, IP67 (IEC 529) Aluminum body, PTFE sensing area
Connections	Quick-Disconnect: 3-pin mini style 3-pin micro style
LEDs	Green: Power Orange: Output Energized
Operating Temperature	-25°C to +70°C (-13°F to +158°F)
Shock	30g, 11ms
Vibration	55Hz, 1mm amplitude, 3 planes

Description

Bulletin 871F inductive proximity sensors are self-contained, solid-state devices designed to sense the presence of ferrous and nonferrous metal objects 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 in line carrying 20,000A. ❶

Each sensor is housed by an aluminum body which meets NEMA 4, 13, and IP67 (IEC 529) enclosure standards. It is equipped with a green LED to indicate power and an orange LED which lights when the output is energized.

Features

- 2-wire operation
- 3-pin connection
- 20-250V AC/DC
- Normally open output
- Weld field immune
- Short circuit, 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	0.2-0.3

❶ Note: This distance varies with current line amperage. See page 2-7 of the Introduction section to determine the minimum distance for your application.

Product Selection

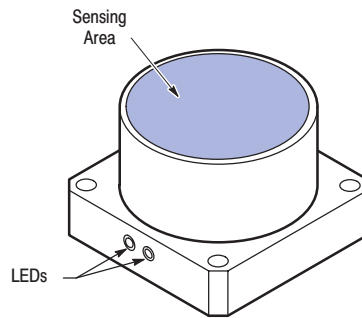
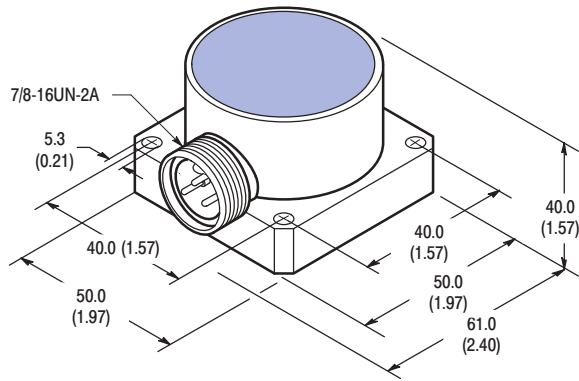
Head Size	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration	Switching Frequency (Hz)	Catalog Number	
					Mini QD Style	Micro QD Style
50	20 (0.79)	Y	N.O.	15	871F-BW20N50-N3	871F-BW20N50-R3
Recommended Standard QD Cordset (-2 = 2m (6.5ft), -6F = 1.8m (6ft))					889N-F3AFC-6F	889R-F3WEA-2

QD Cordsets and Accessories

Description	Page Number
Other Cordsets Available	8-1

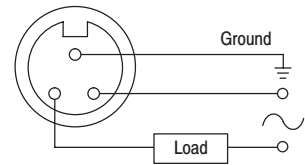
Dimensions—mm (inches)

Mini QD Style



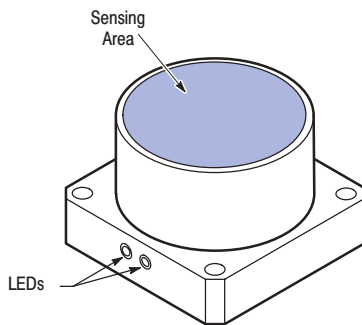
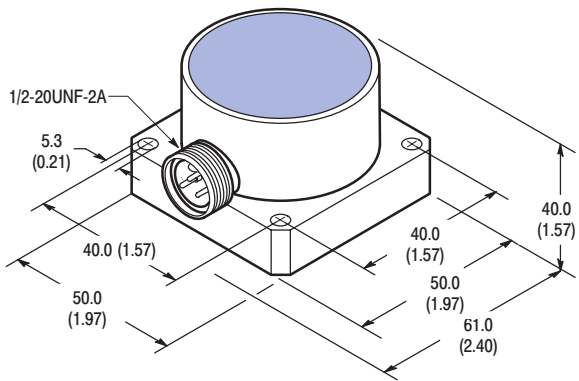
Wiring Diagram

Normally Open

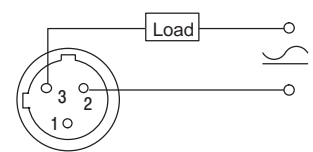


Note: Load can be switched to pin 3.

Micro QD Style



Normally Open



Note: Load can be switched to pin 2.

AB PLCs

871F 3-Wire DC

Block Style



871F DC Cable Style
page 2-139



871F DC Micro
Quick-Disconnect Style
page 2-139



Specifications

Load Current	≤400mA
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
Approvals	CE marked for all applicable directives
Enclosure	NEMA 1, 2, 3, 4, 12, 13, IP67 (IEC 529) Aluminum Body
Connections	Cable: 2m (6.5ft) length 3-conductor PVC Quick-Disconnect: 4-pin micro style
LED	Orange: 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
- Normally open output
- False pulse, transient noise, reverse polarity, short circuit and overload 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	0.2-0.3

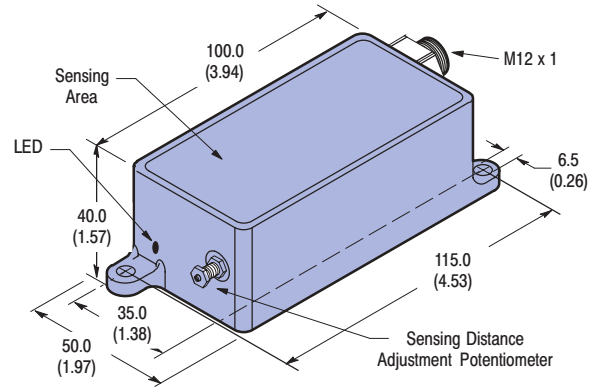
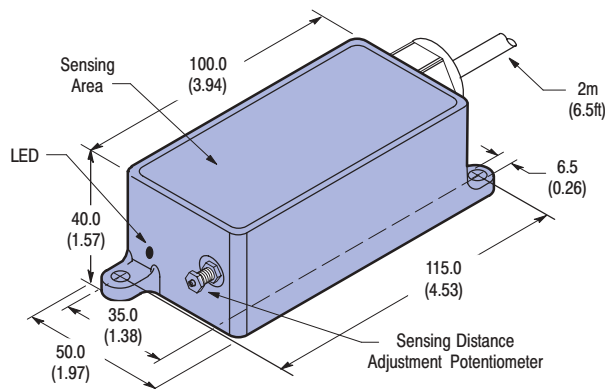
Product Selection

Head Size	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration		Switching Frequency (Hz)	Catalog Number	
						Cable Style	Micro QD Style
50	70 (2.76)	N	N.O.	NPN	300	871F-D70NN50-E2	871F-D70NN50-D4
				PNP		871F-D70NP50-E2	871F-D70NP50-D4
Recommended Standard QD Cordset (-2 = 2m (6.5ft))							889D-F4AC-2

QD Cordsets and Accessories

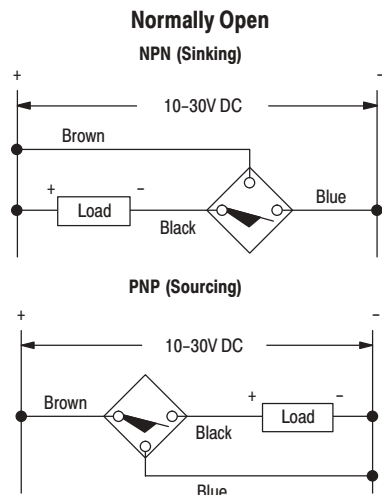
Description	Page Number
Other Cordsets Available	8-1
Terminal Chambers	8-20

Dimensions—mm (inches)

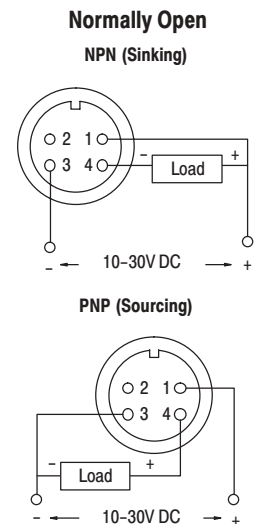


Wiring Diagrams

Cable Style



Micro QD Style



AB PLCs

Notes
