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Inductive Proximity Sensors

Quick Selection Guide

					
Specifications	871TM All Stainless Steel Tubular	872C WorldProx General Purpose	871T Stainless Barrel Tubular	871C Special Purpose	871Z Weld Field Immune
Description	Tubular Style <ul style="list-style-type: none"> Stainless Steel Face/Threaded Stainless Steel Barrel 	Tubular Style <ul style="list-style-type: none"> Plastic Face/Threaded Nickel-Plated Brass Barrel Plastic Face/Threaded Plastic Barrel 	Tubular Style <ul style="list-style-type: none"> All metal sensing: Plastic Face/Threaded Stainless Steel Barrel Ferrous Selective: Stainless Steel Face/Threaded Stainless Steel Barrel 	Tubular Style <ul style="list-style-type: none"> Plastic Face/Threaded Nickel-Plated Brass Barrel Plastic Face/Smooth Nickel-Plated Brass Barrel Plastic Face/Threaded Plastic Barrel 	Tubular Style <ul style="list-style-type: none"> PTFE Face/Threaded PTFE-Coated Brass Barrel Thermoset Plastic Face/Threaded PTFE-Coated Brass Barrel
Features	<ul style="list-style-type: none"> Stainless steel face and barrel Full mechanical seals (all-metal sensing models) ToughLink™ or PVC cable styles Mini, micro or EAC micro QD styles Short circuit protection Overload protection Transient noise protection False pulse protection Reverse polarity protection (DC models) Radio frequency interference protection 	<ul style="list-style-type: none"> Threaded, nickel-plated brass barrel or plastic barrel 360° visible LED Cable or quick-disconnect styles Short circuit protection Overload protection Transient noise protection False pulse protection Reverse polarity protection 	<ul style="list-style-type: none"> Threaded stainless steel barrel Cable or QD styles Short circuit protection (DC models) Overload protection (DC models) Transient noise protection False pulse protection Reverse polarity protection (DC models) 	<ul style="list-style-type: none"> Cable or QD styles Short circuit protection Overload protection Transient noise protection False pulse protection Reverse polarity protection 	<ul style="list-style-type: none"> Cable or QD styles PTFE-coated brass barrel Weld field immunity Short circuit, false pulse, overload, and transient noise protection
Diameter	• 12, 18, 30mm	• 6.5, 8, 12, 18, 30mm	• 12, 18mm	• 3, 4, 5, 12, 18, 30mm	• 12, 18, 30mm
Available Models	<ul style="list-style-type: none"> DC 3-Wire 2-20 Ferrous Selective DC 3-Wire 2-23 Nonferrous Selective DC 3-Wire 2-23 Submersible DC 3-Wire 2-26 DC 2-Wire 2-28 Intrinsically Safe DC 2-Wire 2-31 AC/DC 2-Wire 2-36 AC/DC 2-Wire PLC Interfacer 2-39 	<ul style="list-style-type: none"> DC 3-Wire 2-44 DC 3-Wire Short Barrel 2-48 DC 3-Wire Extended Sensing 2-52 DC 3-Wire Plastic Barrel 2-55 DC 2-Wire 2-58 DC 2-Wire QuadroPlex 2-60 DC 4-Wire Complementary Output 2-62 AC 2-Wire 2-64 AC/DC 2-Wire Relay Output 2-67 	<ul style="list-style-type: none"> DC 3-Wire 2-70 AC 2-Wire 2-72 Ferrous Selective AC 2-Wire or 4-Wire 2-74 	<ul style="list-style-type: none"> DC 3-Wire Small Diameter 2-78 Extended Temperature Range DC 3-Wire 2-81 AC 2-Wire Full-Featured 2-83 AC 2-Wire Plastic Barrel 2-86 NAMUR Intrinsically Safe 2-88 Analog Output 2-91 	<ul style="list-style-type: none"> Weld Field Immune DC 3-Wire 2-94 Weld Field Immune AC 2-Wire 2-96
Connections	<ul style="list-style-type: none"> PVC Cable ToughLink™ cable Mini QD Micro QD 	<ul style="list-style-type: none"> Cable (PVC) Mini Quick-Disconnect Micro Quick-Disconnect Pico Quick-Disconnect 	<ul style="list-style-type: none"> Cable (PVC) Mini QD 	<ul style="list-style-type: none"> Cable (PVC or PUR) Mini Quick-Disconnect Micro Quick-Disconnect Pico Quick-Disconnect 	<ul style="list-style-type: none"> Cable (ToughLink™) Mini QD Micro QD
Enclosure	<ul style="list-style-type: none"> Stainless steel face and barrel NEMA 1, 2, 3, 3R, 4, 4X, 6, 6P, 12, 13; IP67 (IEC 529) 1200psi (8270kPa) washdown 	<ul style="list-style-type: none"> NEMA 1, 2, 3, 4, 6P, 12, 13 IP67 (IEC529) Nickel-plated brass barrel or plastic barrel, plastic face (PBT) 	<ul style="list-style-type: none"> NEMA 1, 2, 3, 4, 12 and 13 IP67 (IEC 529) 303 Stainless steel barrel 	<ul style="list-style-type: none"> NEMA 1, 2, 3, 4, 12, 13 IP67 (cable only) IP65 (qd only) (IEC 529); Nickel-plated brass barrel 	<ul style="list-style-type: none"> NEMA 1, 2, 3, 3R, 4, 4X, 6, 6P, 12, 13, IP67 (IEC 529) PTFE coated housing
Additional Info	• See page 2-19	• See page 2-43	• See page 2-69	• See page 2-77	• See page 2-93






Inductive Proximity Sensors

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871ZC Weld Field Immune	871P VersaCube	871P Rectangular	871F Flat Pack & Block	871L & 872L Limit Switch Style	802PR Limit Switch Style
Tubular Style <ul style="list-style-type: none"> Thermoset Plastic Face/Threaded Copper Barrel 	Rectangular Style <ul style="list-style-type: none"> Plastic Housing 	Rectangular Style <ul style="list-style-type: none"> Plastic Housing 	Flat Pack Style <ul style="list-style-type: none"> Plastic Body Block Style Aluminum Body 	Limit Switch Style <ul style="list-style-type: none"> Plastic Body/17-position Head 	Limit Switch Style <ul style="list-style-type: none"> Glass-Reinforced Polyester Housing
<ul style="list-style-type: none"> Micro and mini QD styles Copper barrel Weld field immunity Short circuit, false pulse, overload, and transient noise protection 	<ul style="list-style-type: none"> 5-position sensing head Rugged burn and weld-slag resistant housing on weld-field immune models Mini and micro QD styles Weld field immunity (some models) Short circuit protection False pulse protection Overload protection Transient noise protection Reverse polarity protection (DC models) 	<ul style="list-style-type: none"> Cable or QD styles Short-circuit protection Transient noise protection False pulse protection 	<ul style="list-style-type: none"> Cable, conduit, or QD styles Short circuit protection Overload protection Transient noise protection False pulse protection Reverse polarity protection (DC models) 	<ul style="list-style-type: none"> 17 sensing head positions (1 top, 16 side) Conduit or QD styles Short circuit protection Overload protection Transient noise protection False pulse protection Reverse polarity protection Selectable normally open or normally closed output 	<ul style="list-style-type: none"> Multiple sensing directions Cable, conduit, or QD styles Short circuit protection (AC/DC models) Overload protection (AC/DC models) Transient noise protection False pulse protection Hazardous location models are available
<ul style="list-style-type: none"> 12, 18, 30mm 	<ul style="list-style-type: none"> 40mm x 40mm x 69mm 	<ul style="list-style-type: none"> 35mm x 35mm x 78mm 	Flat Pack Style <ul style="list-style-type: none"> 80mm x 80mm x 40mm Block Style <ul style="list-style-type: none"> 50mm x 50mm x 40mm 40mm x 50mm x 100mm 	<ul style="list-style-type: none"> 40mm x 40mm x 120mm 	<ul style="list-style-type: none"> 42mm x 41mm x 109mm
<ul style="list-style-type: none"> Weld Field Immune DC 3-Wire 2-100 Weld Field Immune AC/DC 2-Wire . . 2-102 	<ul style="list-style-type: none"> General Purpose DC 3-Wire 2-107 Weld Field Immune DC 3-Wire 2-107 General Purpose DC 3-Wire Equal Sensing 2-110 General Purpose AC/DC 2-Wire 2-112 Weld Field Immune AC/DC 2-Wire . . . 2-112 	<ul style="list-style-type: none"> General Purpose AC 2-Wire 2-116 Weld Field Immune AC 2-Wire 2-116 	<ul style="list-style-type: none"> Complementary Output DC 4-Wire Flat Pack 2-120 DC Weld Field Immune Flat Pack 2-123 2-Wire AC/DC Flat Pack 2-125 Weld Field Immune 2-Wire AC/DC Flat Pack . 2-127 DC 3-Wire Block . 2-129 	<ul style="list-style-type: none"> DC 3-Wire 2-132 AC 2-Wire 2-134 AC/DC 2-Wire . . . 2-134 	<ul style="list-style-type: none"> AC/DC 2-Wire . . . 2-138 Hazardous Location AC/DC 2-Wire . . . 2-143 AC 2-Wire (High Output) . . . 2-145 Hazardous Location AC 2-Wire (High Output) 2-149
<ul style="list-style-type: none"> Mini QD Micro QD 	<ul style="list-style-type: none"> Mini QD Micro QD 	<ul style="list-style-type: none"> Cable (PVC) Mini QD Micro QD 	Flat Pack Style <ul style="list-style-type: none"> Cable Mini QD Micro QD Block Style <ul style="list-style-type: none"> Micro QD Cable 	<ul style="list-style-type: none"> Mini QD Micro QD Conduit/Terminal 	<ul style="list-style-type: none"> Cable (STO or ToughLink™) Mini QD Micro QD Conduit/Terminal
<ul style="list-style-type: none"> NEMA 1, 2, 3, 4, 12 and 13, IP67 (IEC 529) Copper barrel, thermoset plastic face 	<ul style="list-style-type: none"> NEMA 1, 2, 3, 4, 6, 6P, 12 and 13, IP67 (IEC 529), 1200psi (8270kPa) washdown 	<ul style="list-style-type: none"> NEMA 1, 2, 3, 4X, 12, 13, IP65 (IEC 529) Self-extinguishing glass reinforced polyester 	<ul style="list-style-type: none"> NEMA 1, 2, 3, 4, 6, 6P, 12 and 13, IP67 (IEC 529), 1200psi (8270kPa) washdown 	<ul style="list-style-type: none"> NEMA 3, 4, 6, 12, 13, IP67 (IEC 529) Polyloy 	<ul style="list-style-type: none"> NEMA 1, 2, 3, 4, 4X, 12, 13, IP65 (IEC 529) Self extinguishing glass-reinforced polyester body
<ul style="list-style-type: none"> See page 2-99 	<ul style="list-style-type: none"> See page 2-105 	<ul style="list-style-type: none"> See page 2-115 	<ul style="list-style-type: none"> See page 2-119 	<ul style="list-style-type: none"> See page 2-131 	<ul style="list-style-type: none"> See page 2-137

Inductive Proximity Sensors

Quick Selection Guide

					
Specifications	871FM Miniature Flat Pack	871P Can Sensors	871D WorldClamp	871D Cylinder Position	871R & 871S Ring & Slot Sensors
Description	Miniature Flat Pack Style <ul style="list-style-type: none"> Plastic Body 	Can Sensor Style <ul style="list-style-type: none"> Stainless Steel Housing/Plastic Face 	On-Clamp Cylinder Position Style <ul style="list-style-type: none"> Power Clamp and Gripper Style 	In-port Cylinder Position Style <ul style="list-style-type: none"> Ceramic Face/Stainless Steel Probe Assembly 	Ring and Slot Style <ul style="list-style-type: none"> Plastic and Metal Housing
Features	<ul style="list-style-type: none"> Cable or QD styles Short circuit protection (DC models) Overload protection (DC models) Transient noise protection False pulse protection Reverse polarity protection (DC models) 	<ul style="list-style-type: none"> Short circuit protection Overload protection Transient noise protection False pulse protection Reverse polarity protection (DC models) Stainless steel housing 	<ul style="list-style-type: none"> Superior LED visibility Weld-field immune Shielded construction Short circuit protection Overload protection Transient noise protection False pulse protection Reverse polarity protection (DC models) 	<ul style="list-style-type: none"> Stainless steel probe with ceramic face Low profile housing can be rotated 304° after installation without breaking pressure seal Shielded construction Weld-field immune Short circuit protection Overload protection Transient noise protection False pulse protection Reverse polarity protection (DC models) 	<ul style="list-style-type: none"> Cable or micro QD style Short circuit protection Reverse polarity protection
Diameter	<ul style="list-style-type: none"> 28mm x 16mm x 11mm 40mm x 26mm x 12mm 25mm x 50mm x 10mm 31mm x 18mm x 10mm 	<ul style="list-style-type: none"> 76mm x 38mm x 59mm 140mm x 44.5mm x 59mm 	<ul style="list-style-type: none"> 47mm x 18mm x 18mm 55mm x 35mm x 19mm 	<ul style="list-style-type: none"> 64mm x 48mm x 37mm installed 	<ul style="list-style-type: none"> 12, 20, 50, and 100mm 30mm
Available Models	<ul style="list-style-type: none"> DC 3-Wire 2-152 AC 2-Wire 2-155 	<ul style="list-style-type: none"> Short-Range AC 2-Wire Inductive Can . . . 2-158 Long-Range AC 2-Wire Inductive Can . . . 2-158 Short-Range DC 4-Wire Inductive Can . . . 2-160 Long-Range DC 4-Wire Inductive Can . . . 2-160 Motion DC 4-Wire Inductive Can . . . 2-162 	<ul style="list-style-type: none"> DC 4-wire 2-166 AC/DC 5-wire . . . 2-168 	<ul style="list-style-type: none"> DC 3-wire 2-172 AC/DC 2-wire . . . 2-174 	<ul style="list-style-type: none"> 871R DC 3-Wire Ring Style 2-178 871S DC 3-Wire Slot Style 2-181
Connections	<ul style="list-style-type: none"> Cable (PVC) Pico QD 	<ul style="list-style-type: none"> Cable (PVC) Mini QD 	<ul style="list-style-type: none"> Micro QD 	<ul style="list-style-type: none"> Mini QD Micro QD 	<ul style="list-style-type: none"> Cable (PVC) Micro QD
Enclosure	<ul style="list-style-type: none"> NEMA 4, IP67 (IEC 529) Plastic 	<ul style="list-style-type: none"> NEMA 1, 3, 4, 4X, 6, 6P, 12, 13, IP67 (IEC 529), 1200psi (8270kPa) washdown 	<ul style="list-style-type: none"> IP67 	<ul style="list-style-type: none"> NEMA 1, 2, 3, 3R, 4, 6, 12, 13, IP67 (IEC 529) 	<ul style="list-style-type: none"> NEMA 4 IP67 (IEC529)
Additional Info	<ul style="list-style-type: none"> See page 2-151 	<ul style="list-style-type: none"> See page 2-157 	<ul style="list-style-type: none"> See page 2-168 	<ul style="list-style-type: none"> See page 2-171 	<ul style="list-style-type: none"> See page 2-177

Weld Field Immune Proximity Sensors

871Z Weld Field Immune Tubular	page 2-93
871ZC Weld Field Immune Tubular	page 2-99
871D Cylinder Position Sensor	page 2-171
871D WorldClamp™	page 2-168
871P Weld Field Immune VersaCube	page 2-105
871P Weld Field Immune Rectangular	page 2-115
871F Weld Field Immune Puck Style	page 2-127

Hazardous Location Proximity Sensors

871TM 2-Wire DC Intrinsically Safe	page 2-31
871C NAMUR Intrinsically Safe	page 2-88
802PR Hazardous Location	page 2-137

Ferrous/Nonferrous Selective Proximity Sensors

871TM Ferrous Selective	page 2-23
871T Ferrous Selective	page 2-74
871TM Nonferrous Selective	page 2-23

Extended Temperature Range Proximity Sensors

871C Extended Temperature	page 2-81
Other extended temperature range models available as special order items. Contact factory for details.	

Active Face: Portion of the sensor from which the electromagnetic field or ultrasonic pulse emanates.

Axial Approach: The approach of the target with its center maintained on the reference axis.

Complementary Outputs: (N.O. & N.C.) A proximity sensor that features both normally open and normally closed outputs, which can be used simultaneously.

Correction Factors: Suggested multiplication factors taking into account variations in the target material composition. When figuring actual sensing distance this factor should be multiplied with the nominal sensing distance.

Current Consumption: The current consumed by the proximity switch when the output device is in the off condition.

Damping Material: Material which causes a decrease in the strength of the electromagnetic or electrical field produced by the sensing coil.

Differential Travel (Hysteresis): The distance between the operating point and the release point. See Hysteresis.

Dual Output: Sensor which has two outputs which may be complementary or may be of a single type (i.e. two normally open or two normally closed).

Effective Operating Distance: (Sr) The operating distance of an individual proximity switch measured at stated temperature, voltage, and mounting condition.

False Pulse: An undesired change in the state of the output of the proximity switch that lasts for more than two milliseconds.

Flush Mounting: A shielded proximity sensor which can be flush mounted in metal up to the plane of the active sensing face.

Free Zone: The area around the proximity switch which must be kept free from any damping material.

Hysteresis: The difference, in percentage (%), of the nominal sensing distance between the operate (switch on) and release point (switch off) when the target is moving away from the sensors active face. Without sufficient hysteresis a proximity sensor will "chatter" (continuously switch on and off) when there is significant vibration applied to the target or sensor.

Isolated Output: An output that is optically separated from the input and other output and independent of the other output to a specified level.

Isolation Voltage: Maximum rated voltage between isolated outputs or input and output.

Lateral Approach: The approach of the target perpendicular to the reference axis.

Leakage Current: Current which flows through the output when the output is in an "off" condition or de-energized. This current is necessary to supply power to the electronics of the sensor.

LED (Light Emitting Diode): Semi-conductor that generates monochromatic light when current flows in the conductive direction. An LED is the standard Light Source for most photoelectric sensors.

Maximum Inrush Current: The maximum current level at which the proximity sensor can be operated for a short period of time.

Maximum Load Current: The maximum current level at which the proximity sensor can be continuously operated.

Minimum Load Current: The minimum amount of current required by the sensor to maintain reliable operation.

Nonferrous Metal: Any metal which does not contain iron.

Normally Closed: Output opens when an object is detected in the active switching area.

Normally Open: Output closes when an object is detected in the active switching area.

NPN: The sensor switches the load to the negative terminal. The load should be connected between the sensor output and positive terminal.

Operating Distance, Assured: Between 0 and 81% of the rated operating distance for inductive proximity switches.

Operating Distance, Rated: The operating distance specified by the manufacturer and used as a reference value. Also known as nominal sensing distance.

PNP: The sensor switches the load to the positive terminal. The load should be connected between the sensor output and negative terminal.

Programmable Output: (N.O. or N.C.) Output which can be changed from N.O. to N.C. or N.C. to N.O. by way of a switch or jumper wire. Also known as selectable output.

Repeatability: The variation of the effective operating distance measured at room temperature and constant supply voltage. It is expressed as a percentage of the sensing distance.

Residual Voltage: The voltage across the sensor output while energized and carrying maximum load current.

Response Time: The sum of the time needed for a string of electronic circuits to translate a change in light into a change of output status.

Reverse Polarity Protection: A circuit that uses a diode to avoid damage to the control in case the polarity of the power supply is accidentally reversed.

Ripple: The variance between peak-to-peak values in DC voltage. It is expressed in percentage of rated voltage.

Sensing Distance: The distance at which an approaching target activates (changes state of) the proximity output.

Sensing Range: The sensing range is the distance within which the sensor will detect a target under fluctuations of temperature and voltage.

Shielded: Sensor which can be flush mounted in metal up to the plane of the active sensing face.

Short Circuit Protection: (SCP) Sensor protected from damage when a shorted condition exists for an indefinite or defined period of time.

Sinking: See NPN.

Sourcing: See PNP.

Switching Frequency: The maximum number of times per second the sensor can change state (ON and OFF) usually expressed in Hertz (Hz). As measured in DIN EN 50010.

Target: Object which activates the sensor.

Three-Wire Proximity Switch: An AC or DC proximity sensor with three leads, two of which supply power and a third that switches the load.

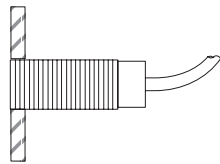
Two-Wire Proximity Switch: A proximity sensor which switches a load connected in series to the power supply. Power for the proximity switch is obtained through the load at all times.

Unshielded: Sensors which have longer sensing distances and a wider magnetic field but are sensitive to surrounding metal.

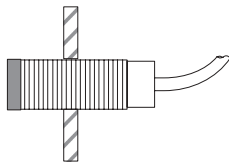
Voltage Drop: The maximum voltage drop across a conducting sensor.

Weld Field Immunity: (WFI) The ability of a sensor not to false trigger in the presence of strong electromagnetic fields.

Shielded



Unshielded



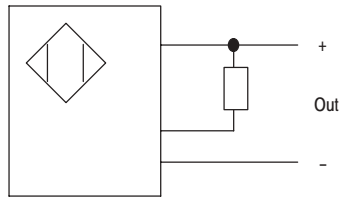
Normally Open



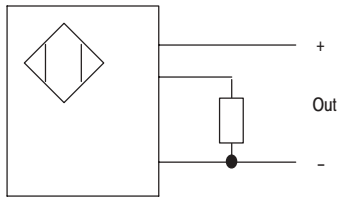
Normally Closed



NPN



PNP



DC



AC/DC

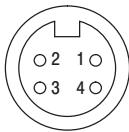


AC

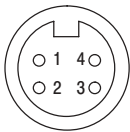


Connectors

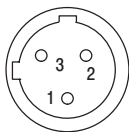
4-Pin Micro



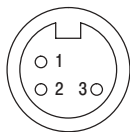
4-Pin Mini



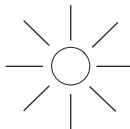
3-Pin Micro



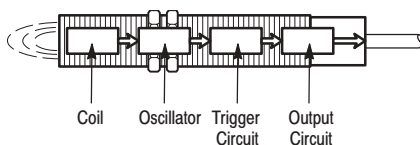
3-Pin Mini



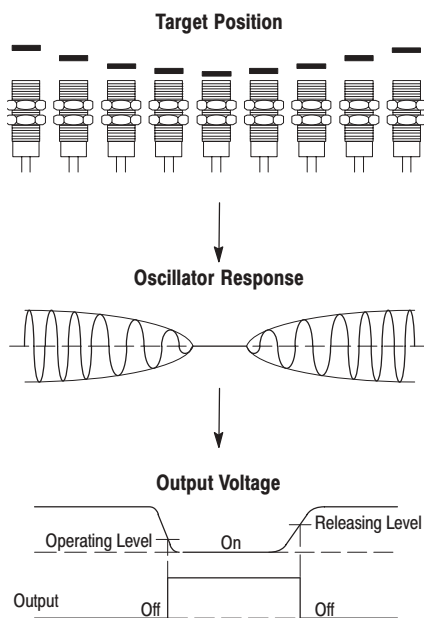
LED



Principles of Operation for Inductive Proximity Sensors

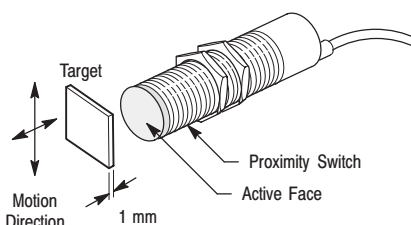


Inductive proximity sensors are designed to operate by generating an electromagnetic field and detecting the eddy current losses generated when ferrous and nonferrous metal target objects enter the field. The sensor consists of a coil on a ferrite core, an oscillator, a trigger-signal level detector and an output circuit. As a metal object advances into the field, eddy currents are induced in the target. The result is a loss of energy and a smaller amplitude of oscillation. The detector circuit then recognizes a specific change in amplitude and generates a signal which will turn the solid-state output "ON" or "OFF."



A metal target approaching an inductive proximity sensor (above) absorbs energy generated by the oscillator. When the target is in close range, the energy drain stops the oscillator and changes the output state.

Standard Target for Inductive Proximity Sensors



The active face of an inductive proximity switch is the surface where a high-frequency electro-magnetic field emerges.

A standard target is a mild steel square, 1mm thick, with side lengths equal to the diameter of the active face or 3X the nominal switching distance, whichever is greater.

Target Correction Factors for Inductive Proximity Sensors

To determine the sensing distance for materials other than the standard mild steel, a correction factor is used. The composition of the target has a large effect on sensing distance of inductive proximity sensors. If a target constructed from one of the materials listed is used, multiply the nominal sensing distance by the correction factor listed in order to determine the nominal sensing distance for that target. Note that ferrous-selective sensors will not detect brass, aluminum or copper, while nonferrous selective sensors will not detect steel or ferrous-type stainless steels.

The correction factors listed below can be used as a general guideline. Common materials and their specific correction factors are listed on each product specification page.

(Nominal Sensing Range) x (Correction Factor) = Sensing Range.

Correction Factors	
Target Material	Approximate Correction Factor
Mild Steel	1.0
Stainless Steel	0.85
Brass	0.50
Aluminum	0.45
Copper	0.40

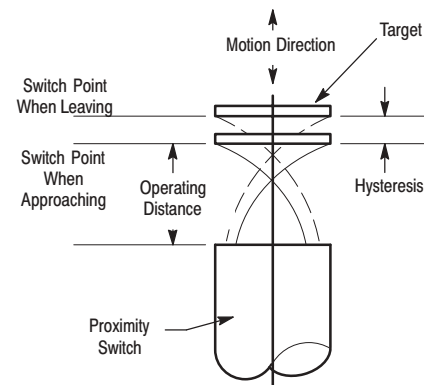
The size and shape of the target may also affect the sensing distance. The following should be used as a general guideline when correcting for the size and shape of a target:

- Flat targets are preferable
- Rounded targets may reduce the sensing distance
- Nonferrous materials usually reduce the sensing distance for all-metal sensing models
- Targets smaller than the sensing face typically reduce the sensing distance
- Targets larger than the sensing face may increase the sensing distance
- Foils may increase the sensing distance

Hysteresis (Differential Travel)

The difference between the operate and the release points is called hysteresis or differential travel. The amount of target travel required for release after operation must be accounted for when selecting target and sensor locations. Hysteresis is needed to help prevent chattering (turning on and off rapidly) when the sensor is subjected to shock and vibration or when the target is stationary at the nominal sensing distance.

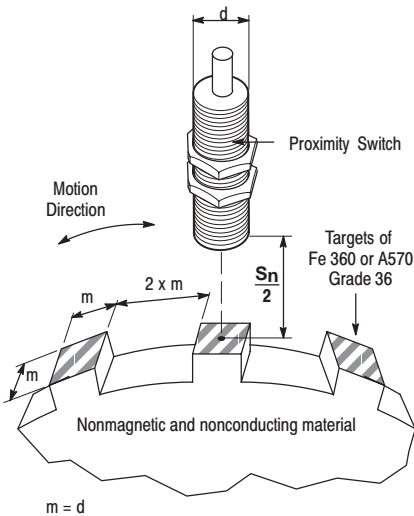
Vibration amplitudes must be smaller than the hysteresis band to avoid chatter.



Introduction

Switching Frequency

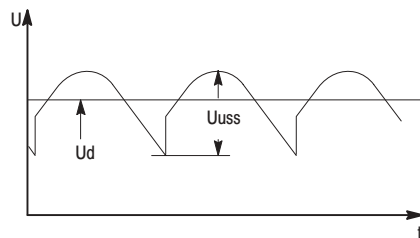
The switching frequency is the maximum speed at which a sensor will deliver discrete individual pulses as the target enters and leaves the sensing field. This value is always dependent on target size, distance from sensing face, speed of target and switch type. This indicates the maximum possible number of switching operations per second. The measuring method for determining switching frequency with standard targets is specified by IEC 60947-5-2.



Ripple

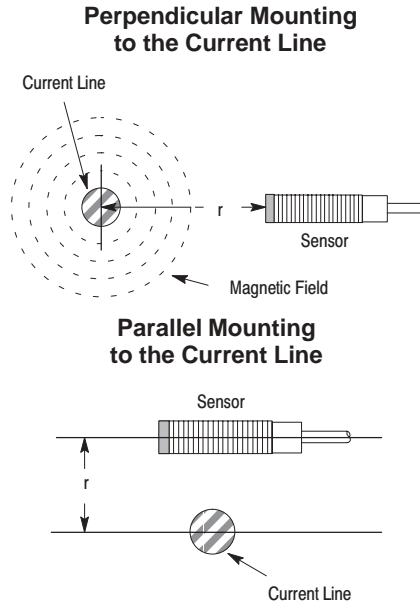
Ripple is the alternating voltage superimposed on the DC voltage (peak to peak) in %.

For the operation of DC voltage switches, a filtered DC voltage with a ripple of 10% maximum is required (according to DIN 41755).



Mounting Considerations for Weld Field Immune Proximities

Reliable operation is dependent on the strength of the magnetic field and the distance between the current line and the sensor.



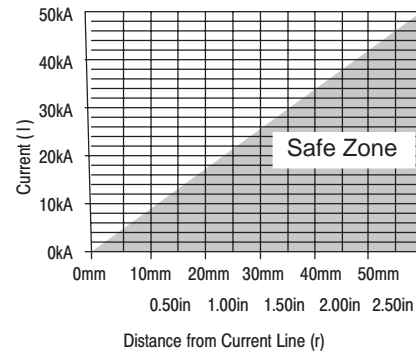
Use the following chart or formulas to determine the spacing requirements between the current line and proximity sensor. Select a distance that falls within the safe zone.

- $H = \frac{I}{2\pi r}$
- $B = \frac{H}{0.796}$
- Gauss = $10^4 \cdot B$

where:

I = welding current (in kA),
 H = field strength (in kA/m),
 B = flux (in mT), and
 r = distance between sensor and current carrying lines (in meters).

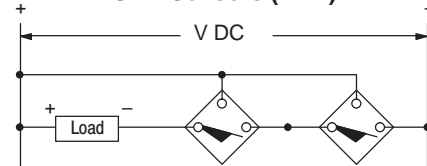
Weld Field Immunity



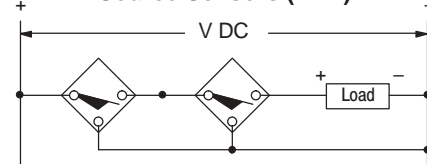
Series Connected Sensors

Sensors can be connected in series with a load. For proper operation, the load voltage must be less than or equal to the minimum supply voltage minus the voltage drops across the series-connected proximity sensors.

Wiring Diagram for Series Connected Current Sink Sensors (NPN)



Wiring Diagram for Series Connected Current Source Sensors (PNP)

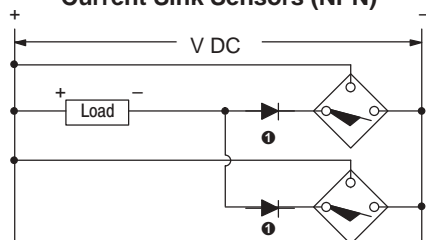


Parallel Connected Sensors

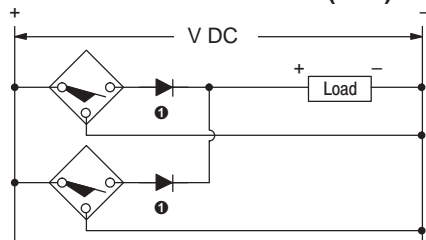
Sensors can be connected in parallel to energize a load. To determine the maximum allowable number of sensors for an application, the sum of the maximum leakage current of the sensors connected in parallel must be less than the maximum OFF-state current of the load device.

Note: Care should be taken when designing parallel proximity circuits. If too much leakage current flows into the load it may cause the solid state input to change state or a small relay not to drop out. Sensors connected in parallel do not provide a higher load current capability.

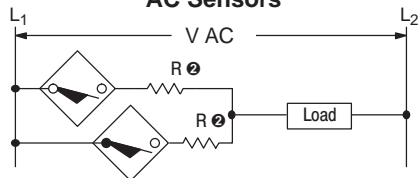
Wiring Diagram for Parallel Connected Current Sink Sensors (NPN)



Wiring Diagram for Parallel Connected Current Source Sensors (PNP)

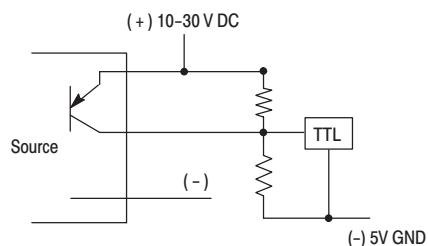
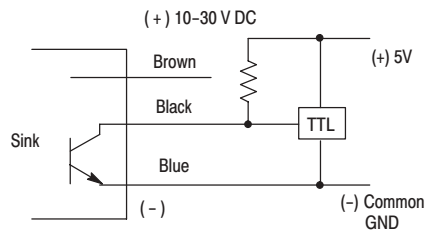


Wiring Diagram for Parallel Connected AC Sensors



- ① Add diode as shown to each output to maintain individual output indicator function.
- ② Add R in series with sensor to maintain minimum voltage when sensor is switching.

TTL Wiring



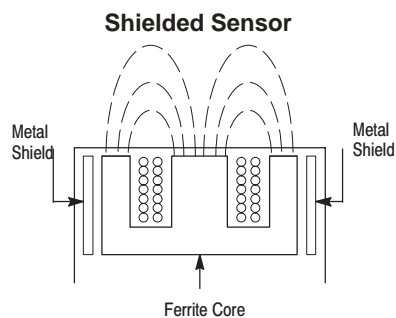
Note: When using sourcing outputs, ground must be floating and cannot be common, or short circuit will result.

PLC Wiring

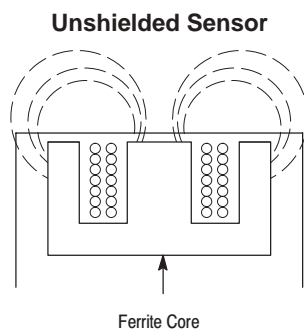
For PLC wiring information for Inductive and Capacitive sensors, refer to publication 871-4.5, June 1996.

Introduction

Shielded vs. Unshielded Inductive Sensors



Shielded construction includes a metal band which surrounds the ferrite core and coil arrangement.



Unshielded sensors do not have this metal band.

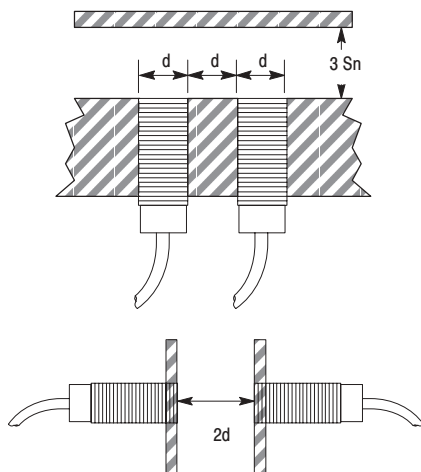
Spacing Between Shielded Sensors (Flush-Mountable) and Nearby Metal Surfaces

Shielded proximity sensors allow the electro-magnetic field to be concentrated to the front of the sensor

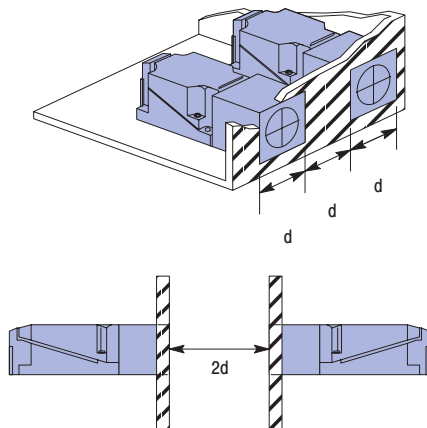
face. Shielded construction allows the proximity to be mounted flush in

surrounding metal without causing a false trigger.

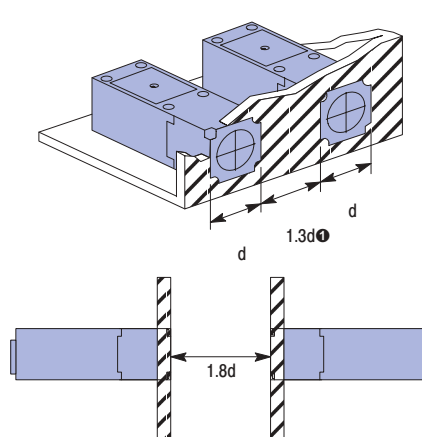
Tubular Style



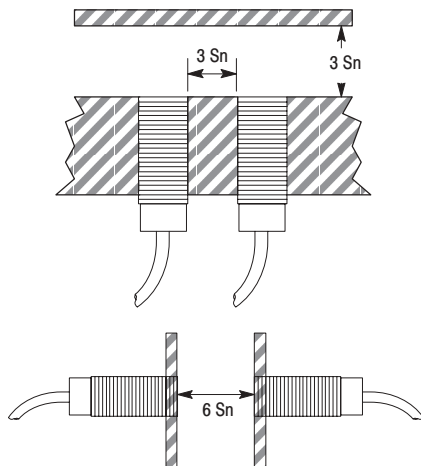
Limit Switch Style (871L and 872L)



Limit Switch Style (802PR)



Tubular Style Extended Sensing (872C)

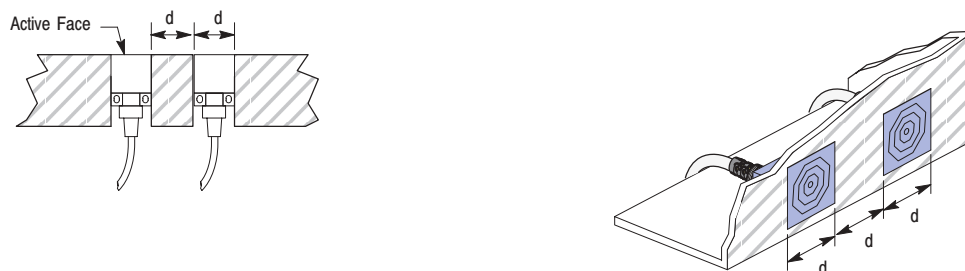


d = diameter or width of active sensing face
 Sn = nominal sensing distance

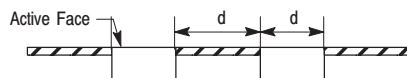
❶ 802PR-LB or 802PR-XB can be mounted side by side.

Spacing Between Shielded Sensors (Flush-Mountable) and Nearby Metal Surfaces (continued)

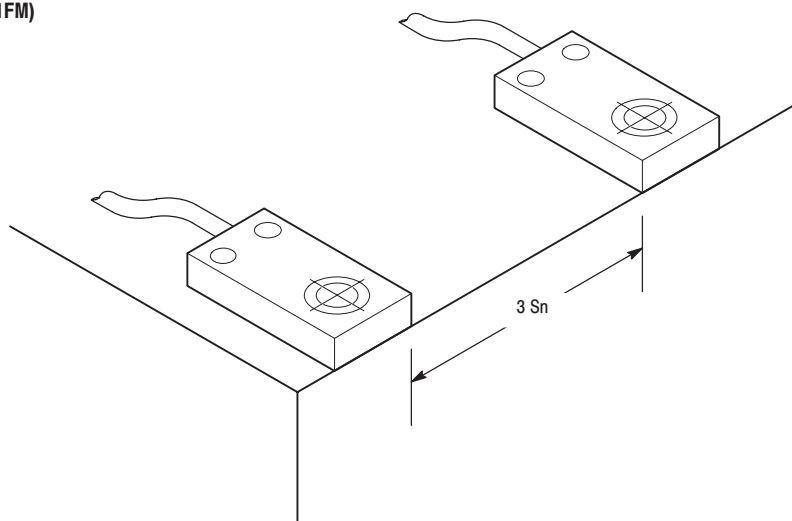
Cube Style (871P VersaCube)



Flat Pack Style (871F)



Miniature Flat Pack Style (871FM)



d = diameter or width of active sensing face
 S_n = nominal sensing distance

Introduction

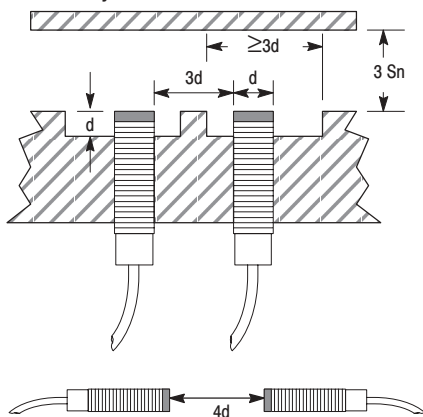
Spacing Between Unshielded Sensors (Nonflush-Mountable) and Nearby Metal Surfaces

Longer sensing distances can be obtained by using an unshielded sensor. Unshielded proximity sensors

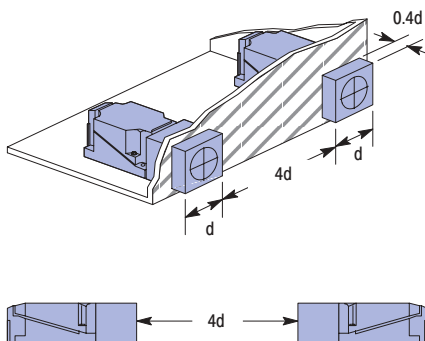
require a metal-free zone around the sensing face. Metal immediately opposite the sensing face should be no

closer than 3 times the rated nominal sensing distance of the sensor.

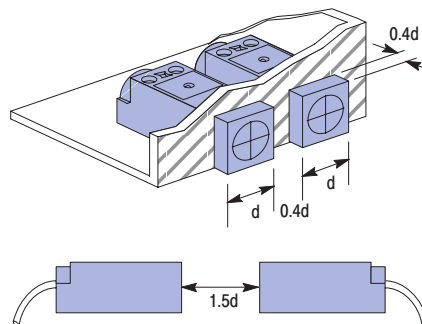
Tubular Style



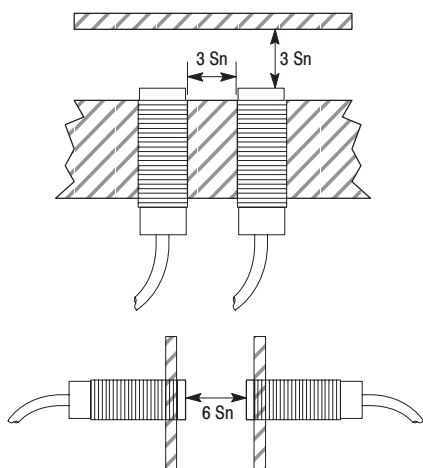
Limit Switch Style (871L and 872L)



Limit Switch Style (802PR)

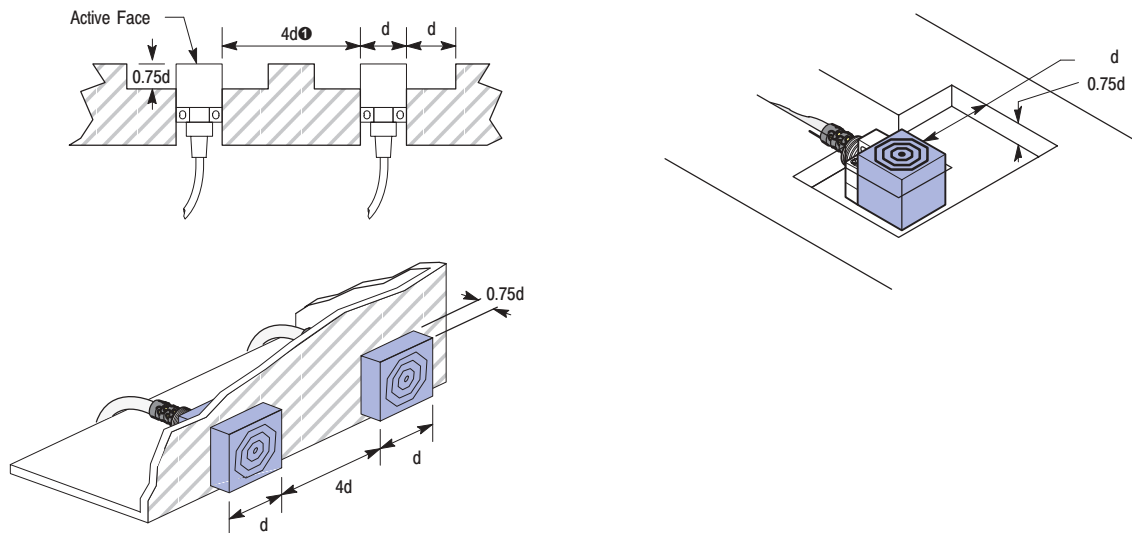


Tubular Style Extended Sensing (872C)

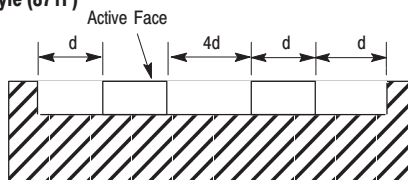


Spacing Between Unshielded Sensors (Nonflush-Mountable) and Nearby Metal Surfaces (continued)

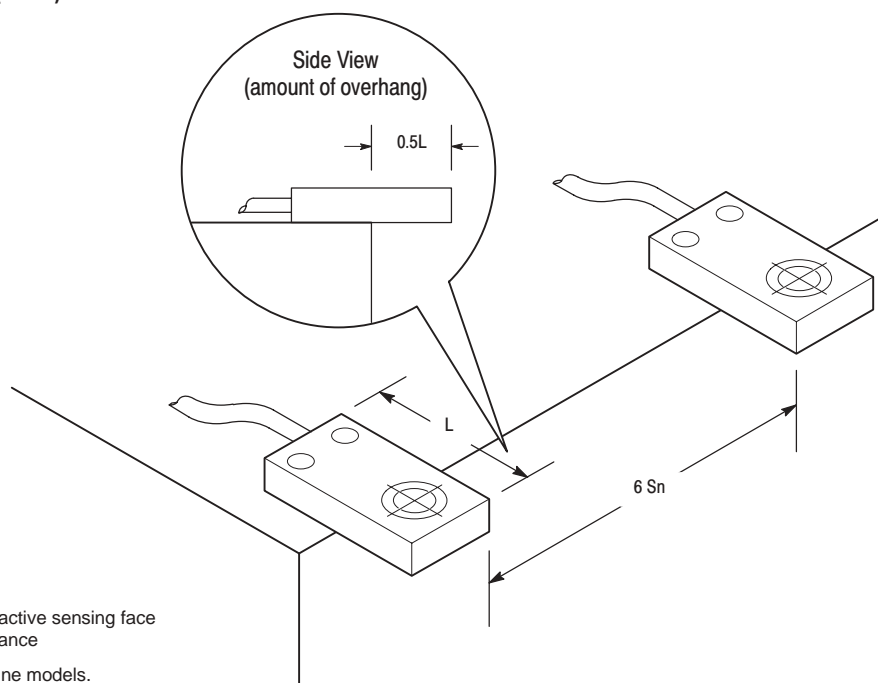
Cube Style (871P VersaCube)



Flat Pack Style (871F)



Miniature Flat Pack Style (871FM)

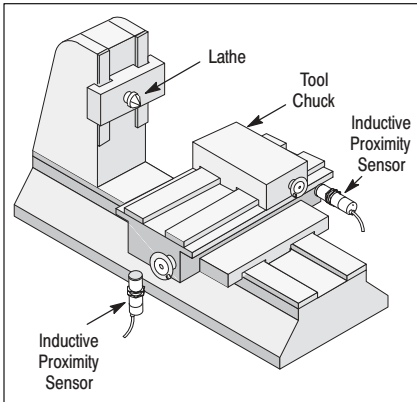


d = diameter or width of active sensing face
 S_n = nominal sensing distance

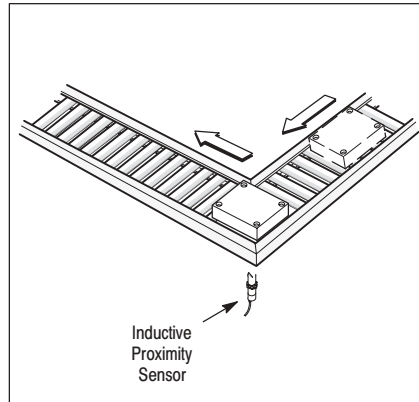
① $3d$ for Weld Field Immune models.

Applications

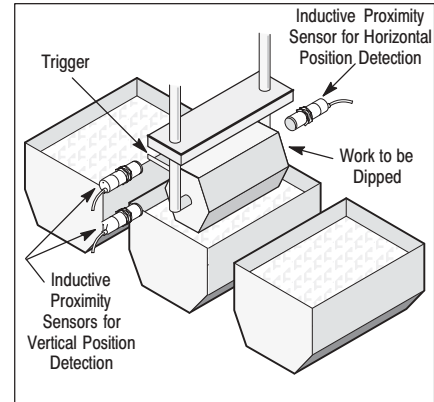
Machine Tools



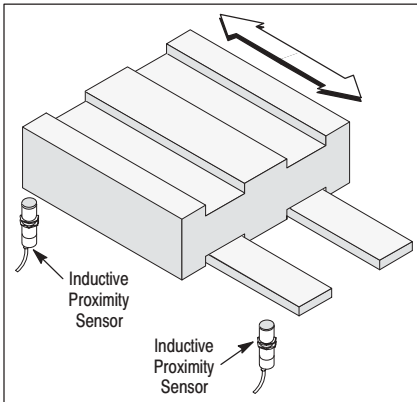
Plating Line



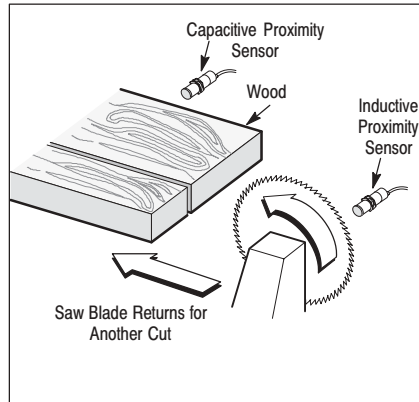
Plating Line



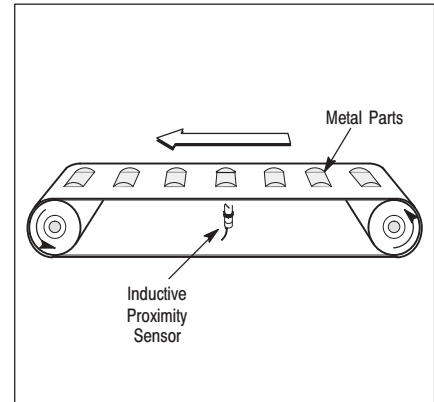
Grinding Machines



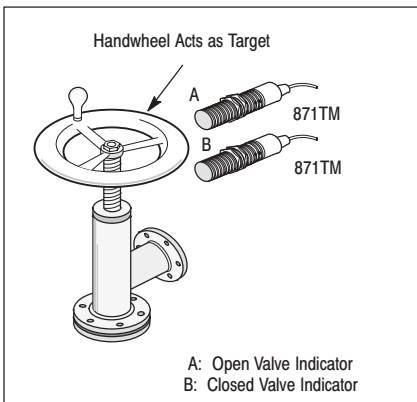
Wood Industry

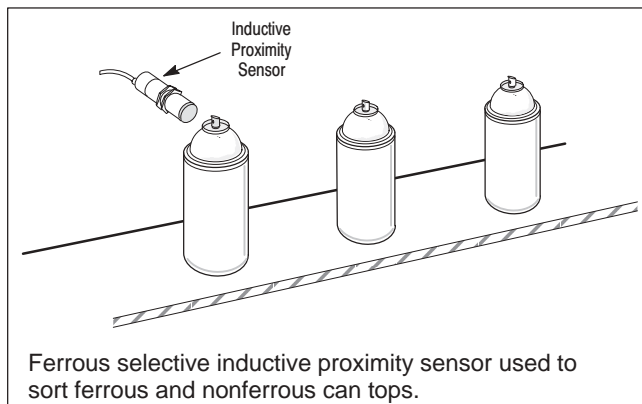
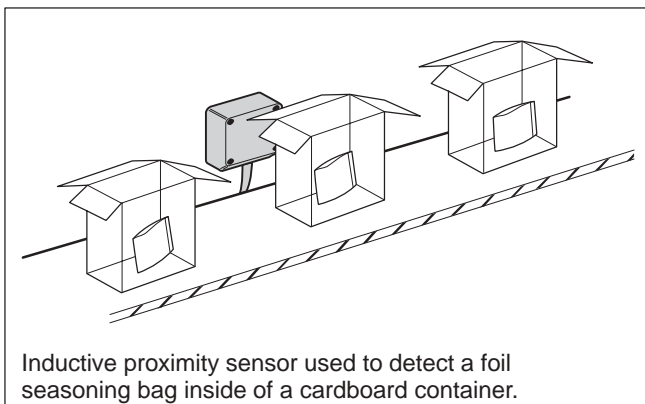


Conveyor Belts

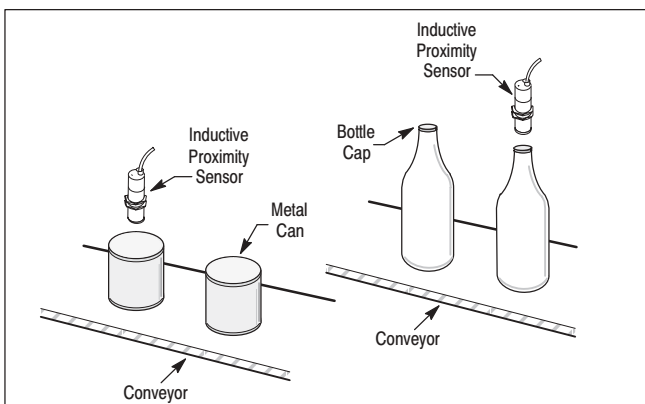


Petroleum Industry— Valve Position

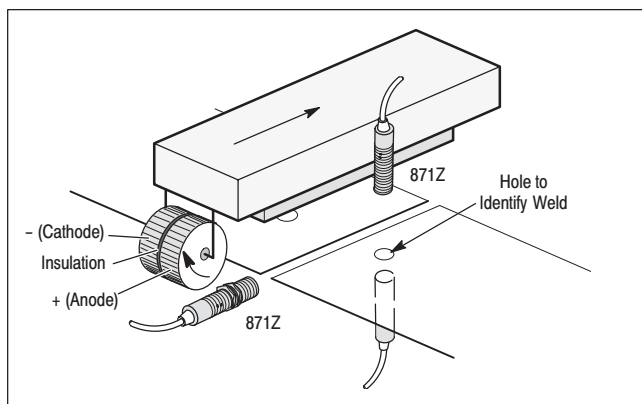




Food Industry

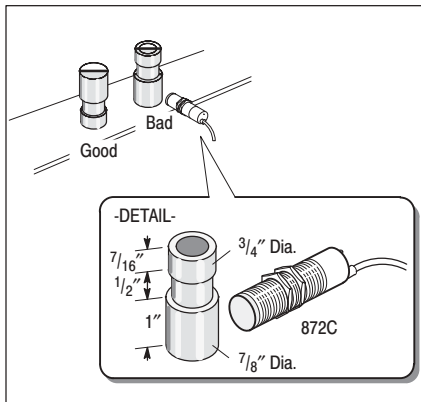


Stainless Steel Sheet Welder

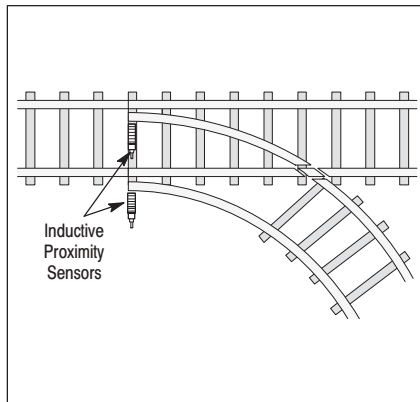


Applications

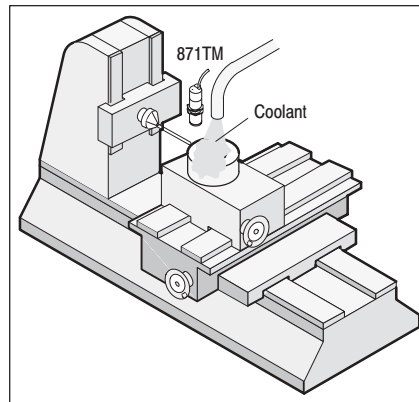
On Line Parts Sorting



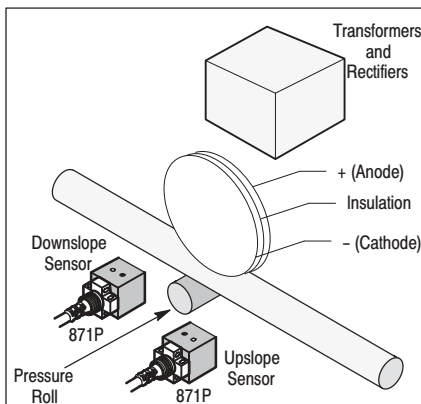
Railroad Yard Position Sensing



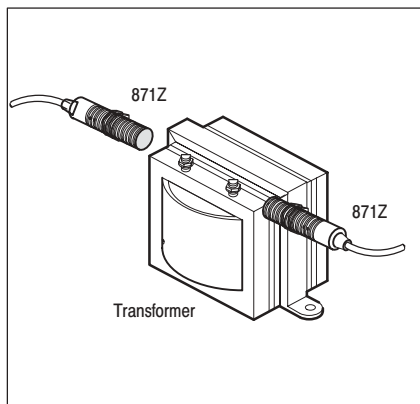
Coolant Resistant Sensing



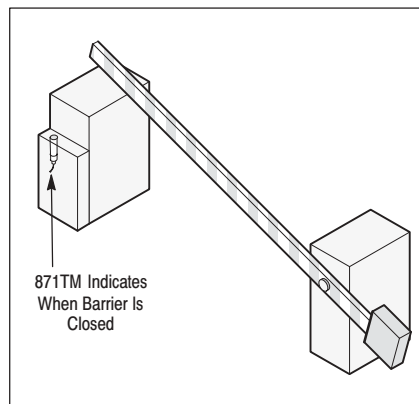
Up and Downslope Control of Continuous Tube Welder



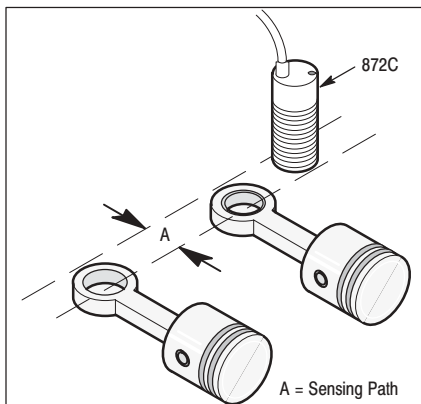
Nut Placement on Transformer



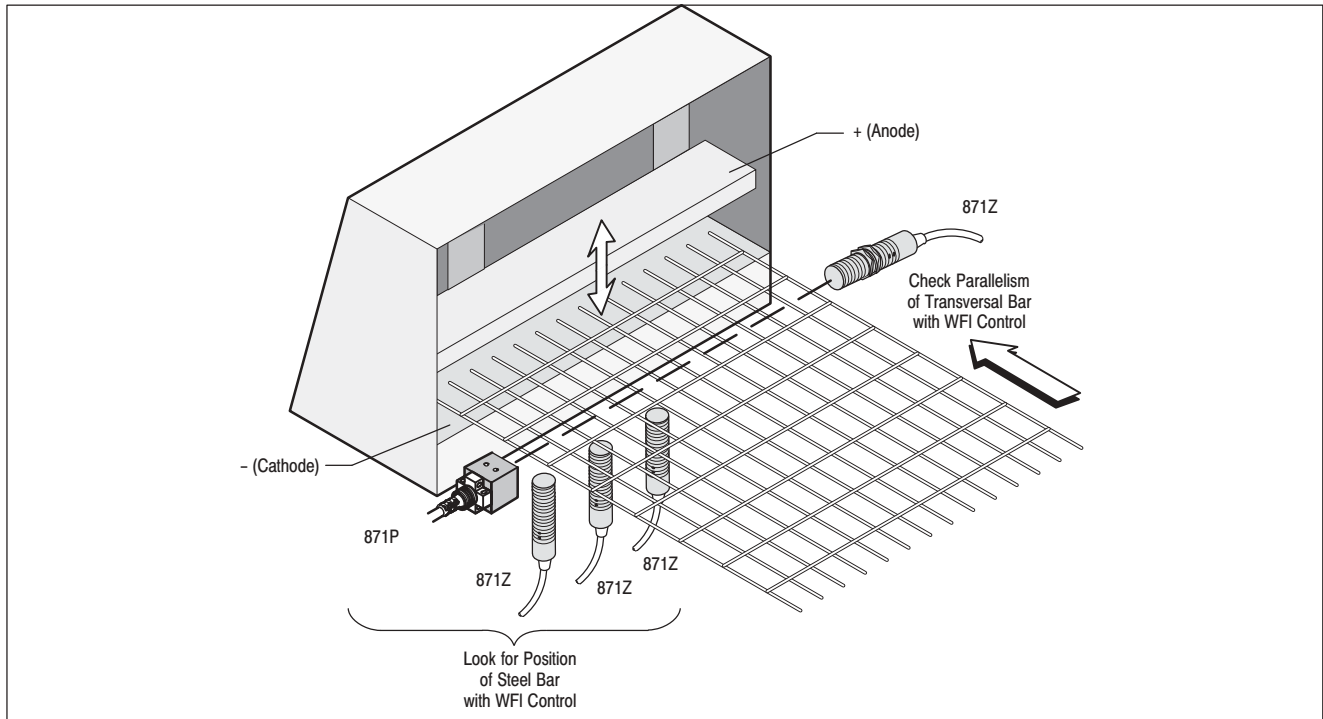
Closed Barrier Indicator



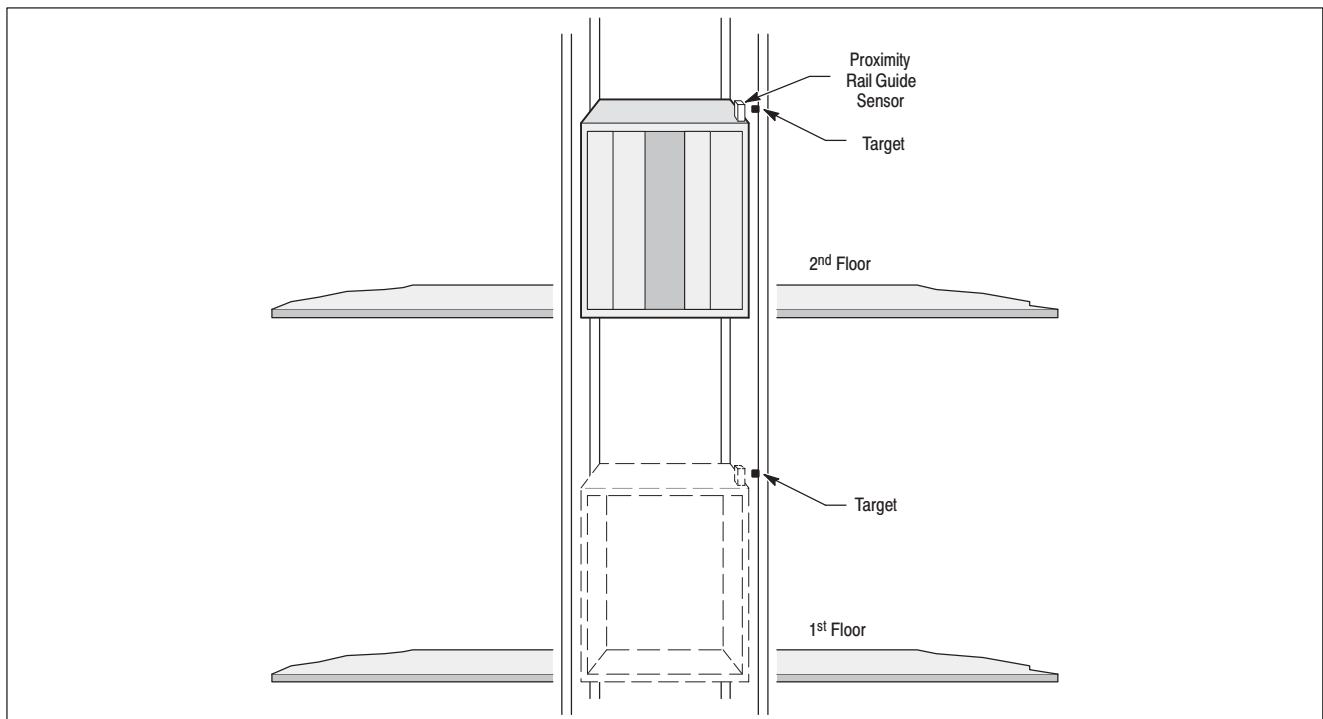
Detect Presence of Bushing in Piston



Control Presence of Mild Steel Bars in Grate Welding



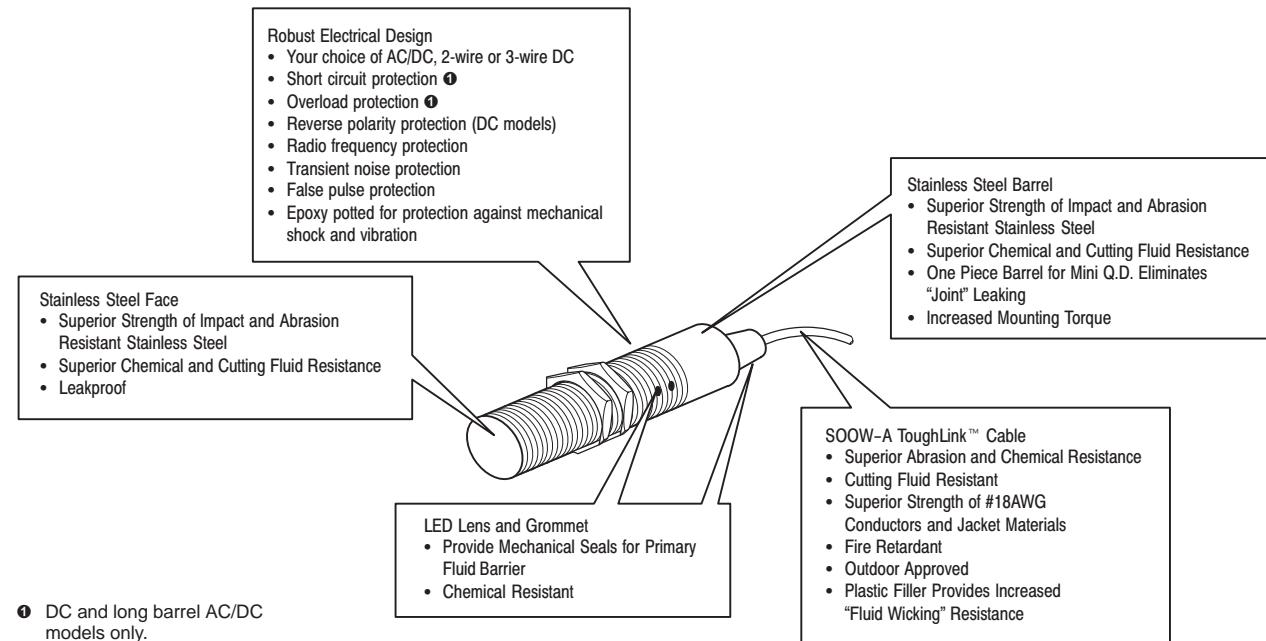
Elevator Positioning



Allen-Bradley produces rail guide inductive proximity sensors for the positioning of elevator cars. These sensors offer increased accuracy and longer life when compared to typical mechanical switches. They are a cost effective solution for lowering your repair costs and down-time. Contact your local Allen-Bradley salesperson for a proximity tailored to your requirements!

Applications

Top 23 Reasons to Use the 871TM





Description

Designed to reduce your downtime, the Bulletin 871TM is an excellent choice for harsh-environment applications because it stands up to conditions that standard plastic face sensors cannot tolerate. Each sensor is housed by a stainless steel face and barrel which make the front of the sensor leakproof and significantly improve resistance to chemicals, cutting fluid, oils and abrasion. Mechanical seals are provided at all barrel openings. Full epoxy encapsulation provides protection against shock, vibration, and contamination. The electronic circuitry is equipped with transient noise, false pulse, reverse polarity, short circuit and overload protection.

In addition to standard all-metal sensing models, the 871TM is available in ferrous and nonferrous selective versions which differentiate between iron-based and other metals as well as extended range models for increased sensing distance. For some metals, nonferrous selective sensors can have up to four times the sensing distance of their all-metal sensing equivalents.

Although they all carry a NEMA 6P enclosure rating, one style of 871TM is designed particularly for use under temporary submersion and in other extremely wet environments. Its cable grommet is fused directly to the cable jacketing for superior sealing. LEDs have been eliminated to reduce points of possible fluid ingress.

871TM sensors are also available in high and low temperature models. Consult the factory for details.

DeviceNet™ 871TM sensors are also available. These sensors are designed to be connected directly to DeviceNet networks. These models have built-in advanced features and diagnostics such as autobaud, timing options, analog output capability, target too close, target too far, motion detection and teach and learn capabilities.

The Bulletin 871TM is available with Rockwell Automation/Allen-Bradley's exclusive ToughLink™ cable, which exceeds SOOW-A ratings and reduces cable failure due to cracking, wearing, melting, or breaking. Other connection options include a PVC cable, mini quick-disconnect, micro quick-disconnect, and EAC micro quick-disconnect.

Features

- Stainless steel face and barrel
- Full mechanical seals (all-metal sensing models)
- ToughLink™ or PVC cable styles
- Mini, micro or EAC micro quick-disconnect styles
- Short circuit protection ❶
- Overload protection ❶
- Transient noise protection
- False pulse protection
- Reverse polarity protection (DC models)
- Radio frequency interference protection
- UL listed, CSA certified, and CE marked for all applicable directives (most models)

Styles

DC 3-Wire	page 2–20
Ferrous Selective DC 3-Wire	page 2–23
Nonferrous Selective DC 3-Wire	page 2–23
Submersible DC 3-Wire ...	page 2–26
DC 2-Wire	page 2–28
Intrinsically Safe DC 2-Wire	page 2–31
AC/DC 2-Wire	page 2–36
AC/DC 2-Wire PLC Interfacer	page 2–39
DeviceNet™	page 8–12

Accessories

Quick-Disconnect Cables ...	page 7–1
Conduit Adaptors	page 2–185
Mounting Brackets, Spring Return Style	page 2–186
Mounting Brackets, Swivel/Tilt Style	page 2–188
Mounting Brackets, Right Angle Style	page 2–189
Mounting Brackets, Clamp Style	page 2–190
End Caps	page 2–195
Mounting Nuts	page 2–197
Lock Washers	page 2–199

General Information

Torque Chart	page 2–201
Metric/English Conversion Chart	page 10–9

❶ Not available on PLC Interfacer models.

871TM 3-Wire DC**Stainless Steel Face/Threaded Short Stainless Steel Barrel**

871TM DC Cable Style
12, 18, 30mm
page 2-21



871TM DC Mini
Quick-Disconnect Style
12, 18, 30mm
page 2-21



871TM DC Micro
Quick-Disconnect Style
12, 18, 30mm
page 2-21

**Features**

- 3-wire operation
- 3-conductor or 4-pin connection
- 10–30V DC
- Short circuit, overload, false pulse, reverse polarity, and transient noise protection
- Normally open or normally closed output
- UL listed, CSA certified, and CE marked for all applicable directives

Specifications

Load Current	≤200mA
Capacitive Load	≤1μF
Leakage Current	≤10μA
Operating Voltage	10–30V DC
Voltage Drop	≤1V DC at 200mA
Repeatability	≤10% at constant temperature
Hysteresis	10% typical
False Pulse Protection	Incorporated
Transient Noise Protection	Incorporated
Reverse Polarity Protection	Incorporated
Short Circuit Protection	Incorporated (trigger at 340mA typical)
Overload Protection	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), 1200psi (8270kPa) washdown Stainless steel face and barrel
Connections	Cable: 2m (6.5ft) length A2-3-conductor PVC C2-3-conductor #22AWG ToughLink™ H2-3-conductor #18AWG ToughLink™ 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

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 ≤0.020 Thick	0.9–1.1
Copper	0.4–0.6

871TM 3-Wire DC

Stainless Steel Face/Threaded Short Stainless Steel Barrel

Product Selection

Barrel Dia.	Nominal Sensing Distance mm (in)	Shielded	Output Configuration		Switching Frequency (Hz)	Catalog Number			
						PVC Cable	ToughLink™ Cable	Mini QD Style	Micro QD Style
12mm	2 (0.08)	Y	N.O.	NPN	75	871TM-DH2NN12-A2	871TM-DH2NN12-C2	871TM-DH2NN12-N4	871TM-DH2NN12-D4
				PNP		871TM-DH2NP12-A2	871TM-DH2NP12-C2	871TM-DH2NP12-N4	871TM-DH2NP12-D4
	4 (0.16)	N		NPN	70	871TM-DH4NN12-A2	871TM-DH4NN12-C2	871TM-DH4NN12-N4	871TM-DH4NN12-D4
				PNP		871TM-DH4NP12-A2	871TM-DH4NP12-C2	871TM-DH4NP12-N4	871TM-DH4NP12-D4
	2 (0.08)	Y	N.C.	NPN	75	871TM-DH2CN12-A2	871TM-DH2CN12-C2	871TM-DH2CN12-N4	871TM-DH2CN12-D4
				PNP		871TM-DH2CP12-A2	871TM-DH2CP12-C2	871TM-DH2CP12-N4	871TM-DH2CP12-D4
	4 (0.16)	N		NPN	70	871TM-DH4CN12-A2	871TM-DH4CN12-C2	871TM-DH4CN12-N4	871TM-DH4CN12-D4
				PNP		871TM-DH4CP12-A2	871TM-DH4CP12-C2	871TM-DH4CP12-N4	871TM-DH4CP12-D4
18mm	5 (0.20)	Y	N.O.	NPN	60	871TM-DH5NN18-A2	871TM-DH5NN18-H2	871TM-DH5NN18-N4	871TM-DH5NN18-D4
				PNP		871TM-DH5NP18-A2	871TM-DH5NP18-H2	871TM-DH5NP18-N4	871TM-DH5NP18-D4
	8 (0.31)	N		NPN	40	871TM-DH8NN18-A2	871TM-DH8NN18-H2	871TM-DH8NN18-N4	871TM-DH8NN18-D4
				PNP		871TM-DH8NP18-A2	871TM-DH8NP18-H2	871TM-DH8NP18-N4	871TM-DH8NP18-D4
	5 (0.20)	Y	N.C.	NPN	60	871TM-DH5CN18-A2	871TM-DH5CN18-H2	871TM-DH5CN18-N4	871TM-DH5CN18-D4
				PNP		871TM-DH5CP18-A2	871TM-DH5CP18-H2	871TM-DH5CP18-N4	871TM-DH5CP18-D4
	8 (0.31)	N		NPN	40	871TM-DH8CN18-A2	871TM-DH8CN18-H2	871TM-DH8CN18-N4	871TM-DH8CN18-D4
				PNP		871TM-DH8CP18-A2	871TM-DH8CP18-H2	871TM-DH8CP18-N4	871TM-DH8CP18-D4
30mm	10 (0.39)	Y	N.O.	NPN	40	871TM-DH10NN30-A2	871TM-DH10NN30-H2	871TM-DH10NN30-N4	871TM-DH10NN30-D4
				PNP		871TM-DH10NP30-A2	871TM-DH10NP30-H2	871TM-DH10NP30-N4	871TM-DH10NP30-D4
	15 (0.59)	N		NPN	30	871TM-DH15NN30-A2	871TM-DH15NN30-H2	871TM-DH15NN30-N4	871TM-DH15NN30-D4
				PNP		871TM-DH15NP30-A2	871TM-DH15NP30-H2	871TM-DH15NP30-N4	871TM-DH15NP30-D4
	10 (0.39)	Y	N.C.	NPN	40	871TM-DH10CN30-A2	871TM-DH10CN30-H2	871TM-DH10CN30-N4	871TM-DH10CN30-D4
				PNP		871TM-DH10CP30-A2	871TM-DH10CP30-H2	871TM-DH10CP30-N4	871TM-DH10CP30-D4
	15 (0.59)	N		NPN	30	871TM-DH15CN30-A2	871TM-DH15CN30-H2	871TM-DH15CN30-N4	871TM-DH15CN30-D4
				PNP		871TM-DH15CP30-A2	871TM-DH15CP30-H2	871TM-DH15CP30-N4	871TM-DH15CP30-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	7-8, 7-68
Terminal Chambers	7-20
Mounting Brackets	2-186 - 2-190
End Caps	2-195, 2-196
Mounting Nuts	2-197 - 2-198

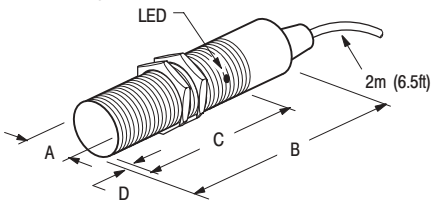
Inductive Proximity Sensors

871TM 3-Wire DC

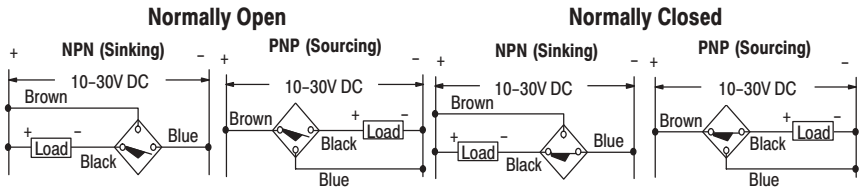
Stainless Steel Face/Threaded Short Stainless Steel Barrel

Dimensions—mm (inches)

Cable Style

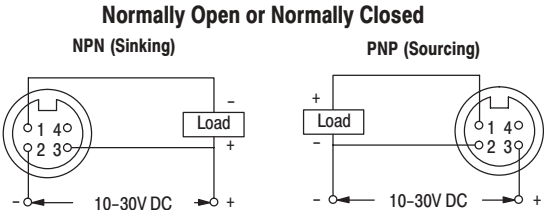
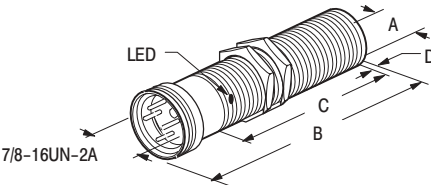


Wiring Diagrams



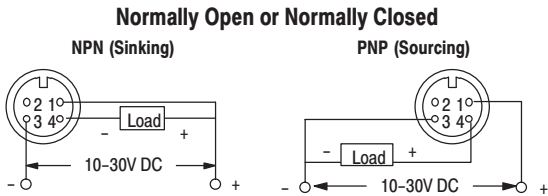
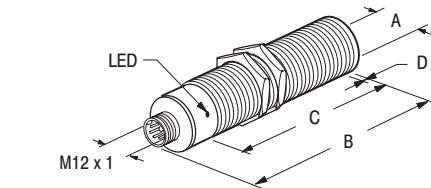
Thread Size	Shielded	mm (inches)			
		A	B	C	D
M12 X 1	Y	12.0 (0.47)	49.8 (1.96)	26.4 (1.04)	2.5 (0.10)
	N			19.5 (0.77)	9.4 (0.37)
M18 X 1	Y	18.0 (0.71)	55.4 (2.18)	41.7 (1.64)	2.5 (0.10)
	N				14.5 (0.57)
M30 X 1.5	Y	30.0 (1.18)	57.9 (2.28)	41.9 (1.65)	2.5 (0.10)
	N			39.4 (1.55)	18.0 (0.71)

Mini QD Style



Thread Size	Shielded	mm (inches)			
		A	B	C	D
M12 X 1	Y	12.0 (0.47)	63.5 (2.50)	25.4 (1.00)	2.5 (0.10)
	N			18.5 (0.73)	9.4 (0.37)
M18 X 1	Y	18.0 (0.71)	56.1 (2.21)	35.1 (1.38)	2.5 (0.10)
	N			29.2 (1.15)	14.5 (0.57)
M30 X 1.5	Y	30.0 (1.18)	68.1 (2.68)	41.9 (1.65)	2.5 (0.10)
	N			39.4 (1.55)	18.0 (0.71)

Micro QD Style



Thread Size	Shielded	mm (inches)			
		A	B	C	D
M12 X 1	Y	12.0 (0.47)	61.0 (2.40)	26.4 (1.04)	2.5 (0.10)
	N			19.6 (0.77)	9.4 (0.37)
M18 X 1	Y	18.0 (0.71)	65.0 (2.56)	41.7 (1.64)	2.5 (0.10)
	N				14.5 (0.57)
M30 X 1.5	Y	30.0 (1.18)	66.3 (2.61)	41.9 (1.65)	2.5 (0.10)
	N			39.4 (1.55)	18.0 (0.71)

871TM 3-Wire DC Ferrous or Nonferrous Selective

Stainless Steel Face/Threaded Stainless Steel Barrel



871TM DC Cable Style
12, 18, 30mm
page 2-24



871TM DC Mini
Quick-Disconnect Style
12, 18, 30mm
page 2-24



871TM DC Micro
Quick-Disconnect Style
12, 18, 30mm
page 2-24

**Features**

- 3-wire operation
- 3-conductor or 4-pin connection
- 10–30V DC
- Ferrous or nonferrous selective sensing
- Short circuit, overload, false pulse, reverse polarity, and transient noise protection
- Normally open or normally closed output
- UL listed, CSA certified, and CE marked for all applicable directives (may not be available for some special order models)

Note: AC/DC models also available as special order items. Consult the factory for details.

Specifications

Load Current	≤200mA
Capacitive Load	≤1μF
Leakage Current	≤10μA
Operating Voltage	10–30 V DC
Voltage Drop	≤1V DC at 200mA
Repeatability	≤10% at constant temperature
Hysteresis	10% typical
False Pulse Protection	Incorporated
Transient Noise Protection	Incorporated
Reverse Polarity Protection	Incorporated
Short Circuit Protection	Incorporated (trigger at 340mA typical)
Overload Protection	Incorporated
Approvals	UL listed, CSA certified, and CE marked for all applicable directives (May not be available for some special order models.)
Enclosure	NEMA 1, 2, 3, 3R, 4, 4X, 6, 6P, 12, 13 IP67 (IEC 529), 1200psi (8270kPa) washdown Stainless steel face and barrel
Connections	Cable: 2m (6.5ft) 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
LEDs	Red: Output Energized Green: Power/Short Circuit (flashing)—18mm models only
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	
	Ferrous Selective	Nonferrous Selective
Steel	1.0	0.0
Stainless Steel	0–1.0①	0–1.0①
Brass	0.0	1.0
Aluminum	0.0	1.0
Aluminum >0.003 Thick	0.0	1.0
Copper	0.0	1.0

① Variation due to differences in alloy composition.

871TM 3-Wire DC Ferrous or Nonferrous Selective

Stainless Steel Face/Threaded Stainless Steel Barrel

Product Selection

Barrel Dia.	Nominal Sensing Distance mm (in)	Shielded	Output Configuration		Switching Frequency (Hz)	Target Type	Catalog Number				
							PVC Cable	ToughLink Cable	Mini QD Style	Micro QD Style	
12mm	1 (0.04)	Y	N.O.	PNP	25	Ferrous	871TM-DF1NP12-A2	871TM-DF1NP12-C2	871TM-DF1NP12-N4	871TM-DF1NP12-D4	
				NPN			871TM-DF1NN12-A2	871TM-DF1NN12-C2	871TM-DF1NN12-N4	871TM-DF1NN12-D4	
			N.C.	PNP			871TM-DF1CP12-A2	871TM-DF1CP12-C2	871TM-DF1CP12-N4	871TM-DF1CP12-D4	
				NPN			871TM-DF1CN12-A2	871TM-DF1CN12-C2	871TM-DF1CN12-N4	871TM-DF1CN12-D4	
	2 (0.08)		N.O.	PNP		Nonferrous	—	871TM-DN2NP12-C2*	871TM-DN2NP12-N4*	871TM-DN2NP12-D4*	
				NPN			—	871TM-DN2NN12-C2*	871TM-DN2NN12-N4*	871TM-DN2NN12-D4*	
			N.C.	PNP			—	871TM-DN2CP12-C2*	871TM-DN2CP12-N4*	871TM-DN2CP12-D4*	
				NPN			—	871TM-DN2CN12-C2*	871TM-DN2CN12-N4*	871TM-DN2CN12-D4*	
18mm	3 (0.12)		N.O.	PNP	10		Ferrous	—	871TM-DF3NP18-H2	871TM-DF3NP18-N4	871TM-DF3NP18-D4
				NPN				—	871TM-DF3NN18-H2*	871TM-DF3NN18-N4	871TM-DF3NN18-D4*
			N.C.	PNP				—	871TM-DF3CP18-H2*	871TM-DF3CP18-N4*	871TM-DF3CP18-D4*
				NPN				—	871TM-DF3CN18-H2*	871TM-DF3CN18-N4*	871TM-DF3CN18-D4*
	5 (0.20)		N.O.	PNP	20	Nonferrous	871TM-DN5NP18-A2	871TM-DN5NP18-H2	871TM-DN5NP18-N4	871TM-DN5NP18-D4	
				NPN			—	871TM-DN5NN18-H2*	871TM-DN5NN18-N4*	871TM-DN5NN18-D4*	
			N.C.	PNP			—	871TM-DN5CP18-H2*	871TM-DN5CP18-N4*	871TM-DN5CP18-D4*	
				NPN			—	871TM-DN5CN18-H2*	871TM-DN5CN18-N4*	871TM-DN5CN18-D4*	
30mm	7.5 (0.30)		N.O.	PNP	15	Ferrous	—	871TM-DF8NP30-H2*	871TM-DF8NP30-N4*	871TM-DF8NP30-D4*	
				NPN			—	871TM-DF8NN30-H2*	871TM-DF8NN30-N4*	871TM-DF8NN30-D4*	
			N.C.	PNP			—	871TM-DF8CP30-H2*	871TM-DF8CP30-N4*	871TM-DF8CP30-D4*	
				NPN			—	871TM-DF8CN30-H2*	871TM-DF8CN30-N4*	871TM-DF8CN30-D4*	
	10 (0.39)		N.O.	PNP		Nonferrous	871TM-DN10NP30-A2	871TM-DN10NP30-H2	871TM-DN10NP30-N4	871TM-DN10NP30-D4	
				NPN			—	871TM-DN10NN30-H2*	871TM-DN10NN30-N4*	871TM-DN10NN30-D4*	
			N.C.	PNP			—	871TM-DN10CP30-H2*	871TM-DN10CP30-N4*	871TM-DN10CP30-D4*	
				NPN			—	871TM-DN10CN30-H2*	871TM-DN10CN30-N4*	871TM-DN10CN30-D4*	
Recommended Standard QD Cordset (–6F = 1.8m (6ft), –2 = 2m (6.5ft))									889N-F4AFC-6F	889D-F4AC-2	

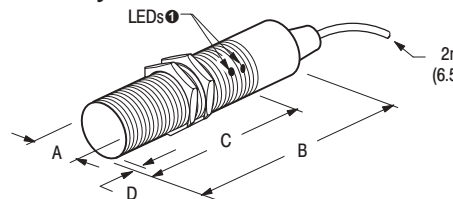
* Available as a special order item. AC/DC models also available. Specifications and dimensions subject to change. Fifteen piece minimum order required. Consult the factory for prices and lead times.

QD Cordsets and Accessories

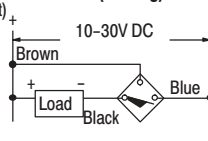
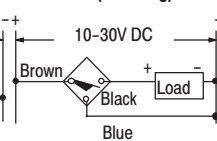
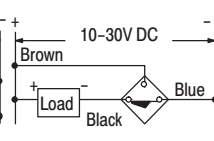
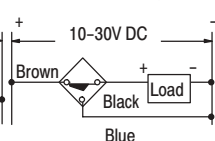
Description	Page Number
Other Cordsets Available	7–8, 7–68
Terminal Chambers	7–20
Mounting Brackets	2–186 – 2–190
End Caps	2–195, 2–196
Mounting Nuts	2–197 – 2–198

871TM 3-Wire DC Ferrous or Nonferrous Selective

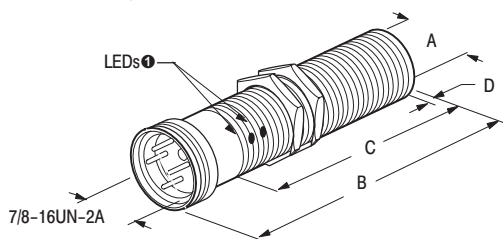
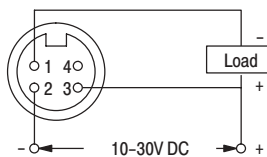
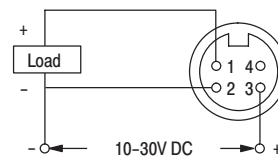
Stainless Steel Face/Threaded Stainless Steel Barrel

Dimensions—mm (inches)**Cable Style**

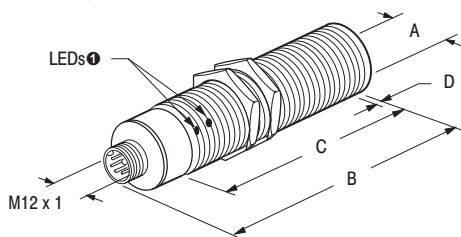
① Available for 18mm models only

Wiring Diagrams**Normally Open****NPN (Sinking)****PNP (Sourcing)****Normally Closed****NPN (Sinking)****PNP (Sourcing)**

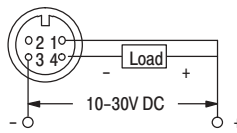
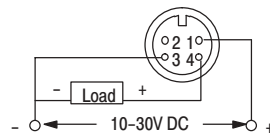
Thread Size	Shielded	Target Type	mm (inches)			
			A	B	C	D
M12 X 1	Y	Ferrous and Nonferrous	12.0 (0.47)	51.0 (2.01)	27.5 (1.08)	—
M18 X 1		Ferrous	18.0 (0.71)	76.8 (3.02)	65.0 (2.56)	—
		Nonferrous	18.0 (0.71)	74.7 (2.94)	60.0 (2.36)	2.5 (0.10)
M30 X 1.5		Ferrous and Nonferrous	30.0 (1.18)	77.5 (3.05)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

Mini QD Style**Normally Open or Normally Closed****NPN (Sinking)****PNP (Sourcing)**

Thread Size	Shielded	Target Type	mm (inches)			
			A	B	C	D
M12 X 1	Y	Ferrous and Nonferrous	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 (2.40)	—
		Nonferrous	18.0 (0.71)	76.6 (3.02)	54.9 (2.16)	2.5 (0.10)
M30 X 1.5		Ferrous and Nonferrous	30.0 (1.18)	86.0 (3.39)	63.5 (2.50)	2.5 (0.10)

Micro QD Style

① Available for 18mm models only

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

Thread Size	Shielded	Target Type	mm (inches)			
			A	B	C	D
M12 X 1	Y	Ferrous and Nonferrous	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	18.0 (0.71)	84.3 (3.32)	60.0 (2.36)	2.5 (0.10)
M30 X 1.5	Y	Ferrous and Nonferrous	30.0 (1.18)	85.5 (3.37)	63.0 (2.48)	2.5 (0.10)

871TM 3-Wire DC Submersible

Stainless Steel Face/Threaded Short Stainless Steel Barrel



871TM DC Cable Style
18mm
page 2-27

Features

- 3-wire operation
- 3-conductor or 4-pin connection
- 10–30V DC
- Short circuit, overload, false pulse, reverse polarity and transient noise protection
- Normally open or normally closed output

Specifications

Load Current	≤200mA
Capacitive Load	≤1μF
Leakage Current	≤10μA
Operating Voltage	10–30V DC
Voltage Drop	≤1V DC at 200mA
Repeatability	≤1% at constant temperature
Hysteresis	10% typical
False Pulse Protection	Incorporated
Transient Noise Protection	Incorporated
Reverse Polarity Protection	Incorporated
Short Circuit Protection	Incorporated (trigger at 340mA typical)
Overload Protection	Incorporated
Enclosure	NEMA 1, 2, 3, 3R, 4, 4X, 6, 6P, 12, 13; IP68 (IEC 529), 1200psi (8270kPa) washdown Stainless steel face and barrel
Connections	Cable: 5m (16.4ft) length 3-conductor #18AWG ToughLink™
LED	None
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	0.9–1.0
Brass	0.3–0.5
Aluminum	0.1–0.4
Aluminum ≤0.020 Thick	0.9–1.1
Copper	0.4–0.6

871TM 3-Wire DC Submersible

Stainless Steel Face/Threaded Short Stainless Steel Barrel

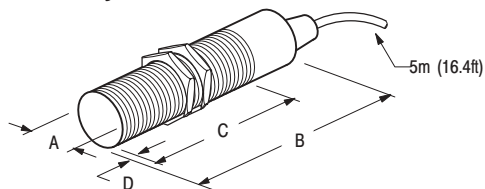
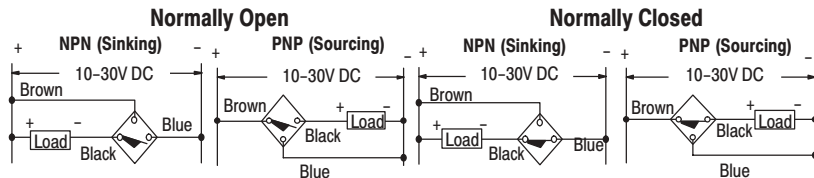
Product Selection

Barrel Diameter	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration		Switching Frequency (Hz)	Catalog Number Cable Style
18mm	5 (0.20)	Y	N.O.	NPN	60	871TM-DX14
				PNP		871TM-DX15
	8 (0.31)	N		NPN	40	871TM-DX16
				PNP		871TM-DX09
	5 (0.20)	Y	N.C.	NPN	60	871TM-DX17
				PNP		871TM-DX18
	8 (0.31)	N		NPN	40	871TM-DX19
				PNP		871TM-DX20

Note: These models are available as special order items. AC/DC and other DC models also available. Consult the 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
End Caps	2-195, 2-196
Mounting Nuts	2-197 - 2-198

Dimensions—mm (inches)**Cable Style****Wiring Diagrams**

Thread Size	Shielded	mm (inches)			
		A	B	C	D
M18 X 1	Y	18.0 (0.71)	55.4 (2.18)	41.7 (1.64)	2.5 (0.10)
	N				14.5 (0.57)

871TM 2-Wire DC**Stainless Steel Face/Threaded Short Stainless Steel Barrel**

871TM DC Cable Style
12, 18, 30mm
page 2-29



871TM DC Mini
Quick-Disconnect Style
12, 18, 30mm
page 2-29



871TM DC Micro
Quick-Disconnect Style
12, 18, 30mm
page 2-29

**Features**

- 2-wire operation
- 2-conductor or 4-pin connection
- 10–30V DC
- Normally open or normally closed output
- Short circuit, overload, false pulse, reverse polarity, and transient noise protection
- UL listed, CSA certified, and CE marked for all applicable directives

Specifications

Load Current	≤25mA
Minimum Load Current	2mA
Leakage Current	≤0.9mA
Operating Voltage	10–30V DC
Voltage Drop	≤8V
Repeatability	10% typical
Hysteresis	10% typical
False Pulse Protection	Incorporated
Transient Noise Protection	Incorporated
Reverse Polarity Protection	Incorporated
Short Circuit Protection	Incorporated
Overload Protection	Incorporated
Approvals	UL listed, CSA certified, and CE marked for all applicable directives
Enclosure	NEMA 1, 2, 3, 3R, 4, 4X, 6P, 12, 13; IP67 (IEC 529), 1200psi (8270kPa) washdown Stainless steel face and barrel
Connections	Cable: 2m (6.5ft) length A2—2-conductor #22 AWG PVC C2—2-conductor #22 AWG ToughLink™ H2—2-conductor #18 AWG ToughLink™ 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

Correction Factors

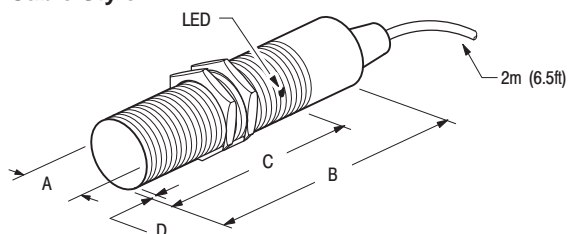
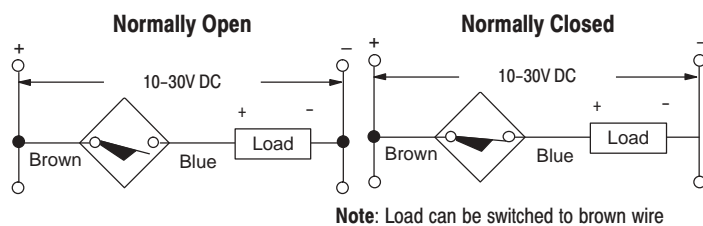
Target Material	Correction Factor
Steel	1.0
Stainless Steel	0.9–1.0
Brass	0.3–0.5
Aluminum	0.1–0.4
Aluminum ≤0.020 Thick	0.9–1.1
Copper	0.4–0.6

871TM 2-Wire DC**Stainless Steel Face/Threaded Short Stainless Steel Barrel****Product Selection**

Barrel Dia.	Nominal Sensing Distance mm (in)	Shielded	Output Configuration	Switching Frequency (Hz)	Catalog Number			
					PVC Cable	ToughLink™ Cable	Mini QD Style	Micro QD Style
12mm	2 (0.08)	Y	N.O.	75	871TM-DH2NE12-A2	871TM-DH2NE12-C2	871TM-DH2NE12-N4	871TM-DH2NE12-D4
	4 (0.16)	N			871TM-DH4NE12-A2	871TM-DH4NE12-C2	871TM-DH4NE12-N4	871TM-DH4NE12-D4
	2 (0.08)	Y	N.C.	70	871TM-DH2CE12-A2	871TM-DH2CE12-C2	871TM-DH2CE12-N4	871TM-DH2CE12-D4
	4 (0.16)	N			871TM-DH4CE12-A2	871TM-DH4CE12-C2	871TM-DH4CE12-N4	871TM-DH4CE12-D4
18mm	5 (0.20)	Y	N.O.	60	871TM-DH5NE18-A2	871TM-DH5NE18-H2	871TM-DH5NE18-N4	871TM-DH5NE18-D4
	8 (0.31)	N			871TM-DH8NE18-A2	871TM-DH8NE18-H2	871TM-DH8NE18-N4	871TM-DH8NE18-D4
	5 (0.20)	Y	N.C.	40	871TM-DH5CE18-A2	871TM-DH5CE18-H2	871TM-DH5CE18-N4	871TM-DH5CE18-D4
	8 (0.31)	N			871TM-DH8CE18-A2	871TM-DH8CE18-H2	871TM-DH8CE18-N4	871TM-DH8CE18-D4
30mm	10 (0.39)	Y	N.O.	40	871TM-DH10NE30-A2	871TM-DH10NE30-H2	871TM-DH10NE30-N4	871TM-DH10NE30-D4
	15 (0.59)	N			871TM-DH15NE30-A2	871TM-DH15NE30-H2	871TM-DH15NE30-N4	871TM-DH15NE30-D4
	10 (0.39)	Y	N.C.	30	871TM-DH10CE30-A2	871TM-DH10CE30-H2	871TM-DH10CE30-N4	871TM-DH10CE30-D4
	15 (0.59)	N			871TM-DH15CE30-A2	871TM-DH15CE30-H2	871TM-DH15CE30-N4	871TM-DH15CE30-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	7-8, 7-68
Terminal Chambers	7-20
Mounting Brackets	2-186 - 2-190
End Caps	2-195, 2-196
Mounting Nuts	2-197 - 2-198

Dimensions—mm (inches)**Cable Style****Wiring Diagrams**

Thread Size	Shielded	mm (inches)			
		A	B	C	D
M12 X 1	Y	12.0 (0.47)	49.8 (1.96)	26.4 (1.04)	2.5 (0.10)
	N			19.5 (0.77)	9.4 (0.37)
M18 X 1	Y	18.0 (0.71)	55.4 (2.18)	41.7 (1.64)	2.5 (0.10)
	N				14.5 (0.57)
M30 X 1.5	Y	30.0 (1.18)	57.9 (2.28)	41.9 (1.65)	2.5 (0.10)
	N			39.4 (1.55)	18.0 (0.71)

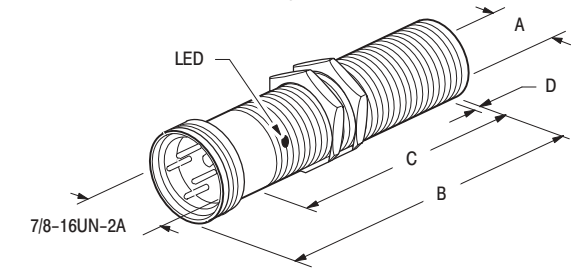
Inductive Proximity Sensors

871TM 2-Wire DC

Stainless Steel Face/Threaded Short Stainless Steel Barrel

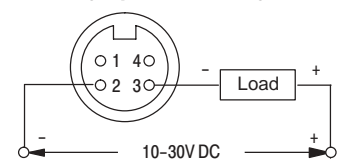
Dimensions—mm (inches) (continued)

Mini Quick-Disconnect Style



Wiring Diagrams

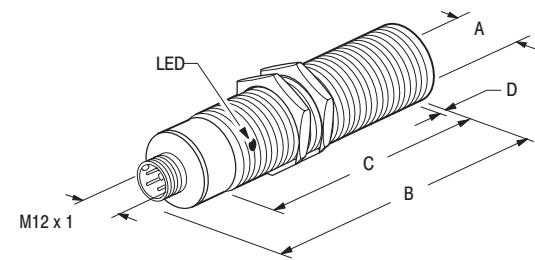
Normally Open or Normally Closed



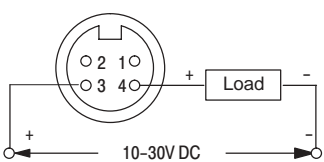
Note: Load can be switched to pin 2.

Thread Size	Shielded	mm (inches)			
		A	B	C	D
M12 X 1	Y	12.0 (0.47)	63.5 (2.50)	25.4 (1.00)	2.5 (0.10)
	N			18.5 (0.73)	9.4 (0.37)
M18 X 1	Y	18.0 (0.71)	56.1 (2.21)	35.1 (1.38)	2.5 (0.10)
	N			29.2 (1.15)	14.5 (0.57)
M30 X 1.5	Y	30.0 (1.18)	68.1 (2.68)	41.9 (1.65)	2.5 (0.10)
	N			39.4 (1.55)	18.0 (0.71)

Micro Quick-Disconnect Style



Normally Open or Normally Closed



Note: Load can be switched to pin 3.

Thread Size	Shielded	mm (inches)			
		A	B	C	D
M12 X 1	Y	12.0 (0.47)	61.0 (2.40)	26.4 (1.04)	2.5 (0.10)
	N			19.6 (0.77)	9.4 (0.37)
M18 X 1	Y	18.0 (0.71)	65.0 (2.56)	41.7 (1.64)	2.5 (0.10)
	N				14.5 (0.57)
M30 X 1.5	Y	30.0 (1.18)	66.3 (2.61)	41.9 (1.65)	2.5 (0.10)
	N			39.4 (1.55)	18.0 (0.71)



871TM Intrinsically Safe
Cable Style
page 2-32



871TM Intrinsically Safe
Micro Quick-Disconnect Style
page 2-32



Description

These special 871TM models are approved as Intrinsically Safe for use in hazardous areas. These special models are designed for use in Division 1, 2; Class I, II, III; Groups A, B, C, D, E, F, G areas when used in conjunction with an appropriate I.S. approved zener diode barrier. Recommended barriers are available from Rockwell Automation/Allen-Bradley. These approved units can also be used in Division 2 locations without a barrier.

Features

- 2-wire operation
- 2 conductor or 4 pin connection
- 10–31.5V DC
- Normally open output
- Short circuit, overload, false pulse, transient noise, and reverse polarity protection
- FM and CSA entity approved

Specifications

Outputs	Normally Open
Max. Load Current	25mA
Min. Load Current	2mA
Leakage Current	<1.0mA
Operating Voltage	10–31.5V DC
Voltage Drop	<8V DC
Repeatability	10% typical
Hysteresis	10% typical
Reverse Polarity Protection	Incorporated
False Pulse Protection	Incorporated
Transient Noise Protection	Incorporated
Short Circuit Protection	Incorporated
Overload Protection	Incorporated
Enclosure	NEMA 1, 2, 3, 3R, 4, 4X, 6, 6P, 12, 13, IP67 (IEC 529), 1200psi (8270kPa) washdown, Stainless steel face and barrel
Approvals	FM and CSA approved for <ul style="list-style-type: none"> – Class I, II, III; Divisions 1, 2; Groups A, B, C, D, E, F, G when used in conjunction with an approved intrinsic safety barrier – Class I, II, III; Division 2; Groups A, B, C, D, E, F, G without intrinsic safety barrier (See control drawing 75001–437 for approval details and wiring diagrams)
Connections	Cable: 2m (6.5ft) length A2 – 2 conductor #22AWG PVC C2 – 2 conductor #22AWG ToughLink H2 – 2 conductor #18AWG ToughLink Quick Disconnect: 4-pin micro style
LED	Red: Output Energized
Operating Temperature	–25°C to 40°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	0.9–1.0
Brass	0.3–0.5
Aluminum	0.1–0.4
Aluminum ≤0.020 Thick	0.9–1.1
Copper	0.4–0.6

Entity Parameters

Sensor			Barrier	
V_{max}	31.5V	≥	V_t	
I_{max}	130mA	≥	I_t	
P_{max}	1.25W	≥	P_t	
C_i	0μF	≤	C_a	
L_i	0mH	≤	L_a	



WARNING: These parameters must be adhered to. If not, injury may be caused to person or property.

Inductive Proximity Sensors

871TM Intrinsically Safe, 2-Wire DC

Stainless Steel Face and Barrel

Product Selection

Barrel Dia.	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration	Switching Frequency (Hz)	Catalog Numbers		
					PVC Cable	ToughLink™ Cable	Micro QD Style
12mm	2 (0.08)	Y	N.O.	75	871TM-DR2NE12-A2	871TM-DR2NE12-C2	871TM-DR2NE12-D4
	4 (0.16)	N			871TM-DR4NE12-A2	871TM-DR4NE12-C2	871TM-DR4NE12-D4
18mm	5 (0.20)	Y		60	871TM-DR5NE18-A2	871TM-DR5NE18-H2	871TM-DR5NE18-D4
	8 (0.31)	N			871TM-DR8NE18-A2	871TM-DR8NE18-H2	871TM-DR8NE18-D4
30mm	10 (0.39)	Y		40	871TM-DR10NE30-A2	871TM-DR10NE30-H2	871TM-DR10NE30-D4
	15 (0.59)	N			871TM-DR15NE30-A2	871TM-DR15NE30-H2	871TM-DR15NE30-D4
Recommended Standard QD Cordset (~2 = 2m (6.5ft))							889D-F4AC-2 ⓘ

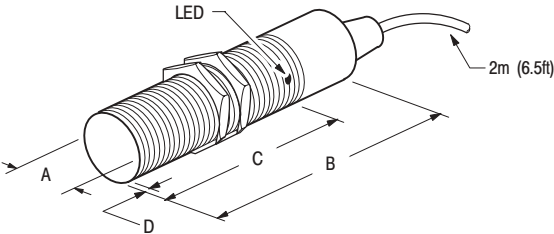
ⓘ Intrinsically Safe wiring labels 897H-L1 or 897H-L2 must be applied every 7.6m (25ft).

QD Cordsets and Accessories

Description	Page Number
Other Cordsets Available	7-8, 7-68
Terminal Chambers	7-20
Zener Diode Barriers	7-114
Intrinsically Safe Wiring Labels	7-116

Dimensions—mm (inches)

Cable Style



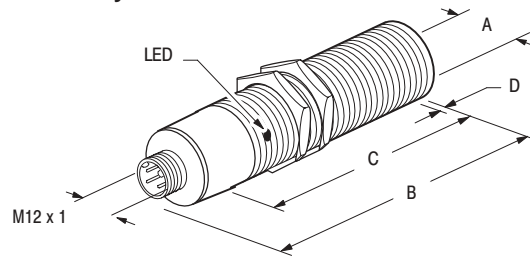
Wiring Diagrams

See pages 2-34 and 2-35.

Thread Size	Shielded	mm (inches)			
		A	B	C	D
M12 x 1	Y	12.0 (0.47)	72.1 (2.84)	38.4 (1.51)	2.5 (0.10)
	N			31.5 (1.24)	9.4 (0.37)
M18 x 1	Y	18.0 (0.71)	74.7 (2.94)	60.0 (2.36)	2.5 (0.10)
	N			48.2 (1.90)	14.4 (0.56)
M30 x 1.5	Y	30.0 (1.18)	77.2 (3.04)	61.3 (2.41)	2.5 (0.10)
	N			41.6 (1.64)	17.9 (0.70)

Dimensions—mm (inches)

Micro QD Style



Wiring Diagrams

See pages 2–34 and 2–35.

Thread Size	Shielded	mm (inches)			
		A	B	C	D
M12 x 1	Y	12.0 (0.47)	72.1 (2.84)	38.4 (1.51)	2.5 (0.10)
	N			31.5 (1.24)	9.4 (0.37)
M18 x 1	Y	18.0 (0.71)	74.7 (2.94)	60.0 (2.36)	2.5 (0.10)
	N			48.2 (1.90)	14.4 (0.56)
M30 x 1.5	Y	30.0 (1.18)	77.2 (3.04)	61.3 (2.41)	2.5 (0.10)
	N			41.6 (1.64)	17.9 (0.70)

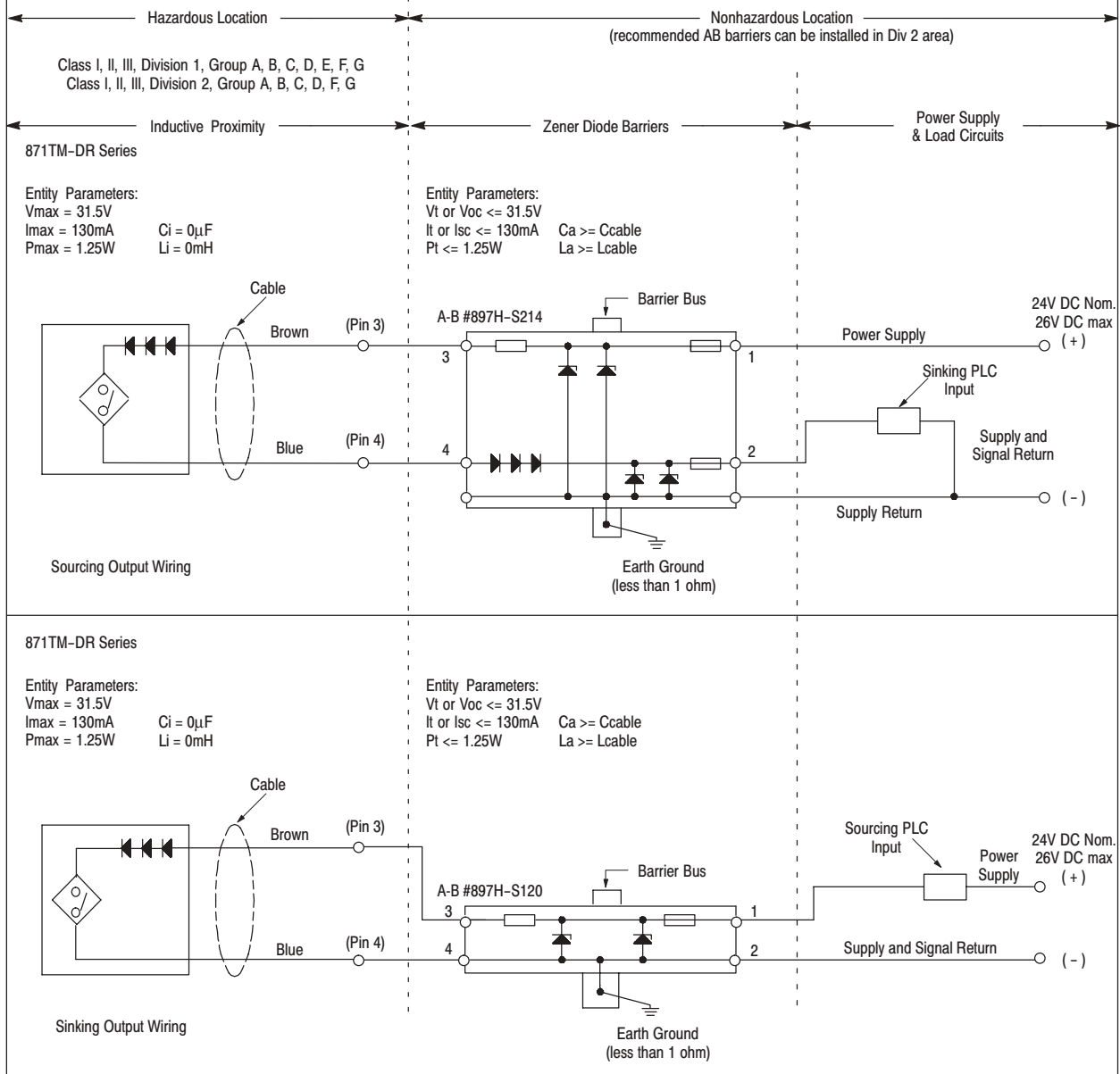
Inductive Proximity Sensors

Division 1 Installation Wiring Diagrams

Allen-Bradley Catalog Number: 871TM-DRaNEb-c

where:

- a = nominal operating distance [2, 5, or 10 (mm, shielded); 4, 8, or 15 (mm, unshielded)]
 b = 12, 18, or 30 (mm, housing diameter)
 c = A2 (2 meter PVC cable), D4 (4-pin micro connector), C2 (2 meter ToughLink™ cable -12mm),
 or H2 (2 meter ToughLink cable -18 and 30mm)

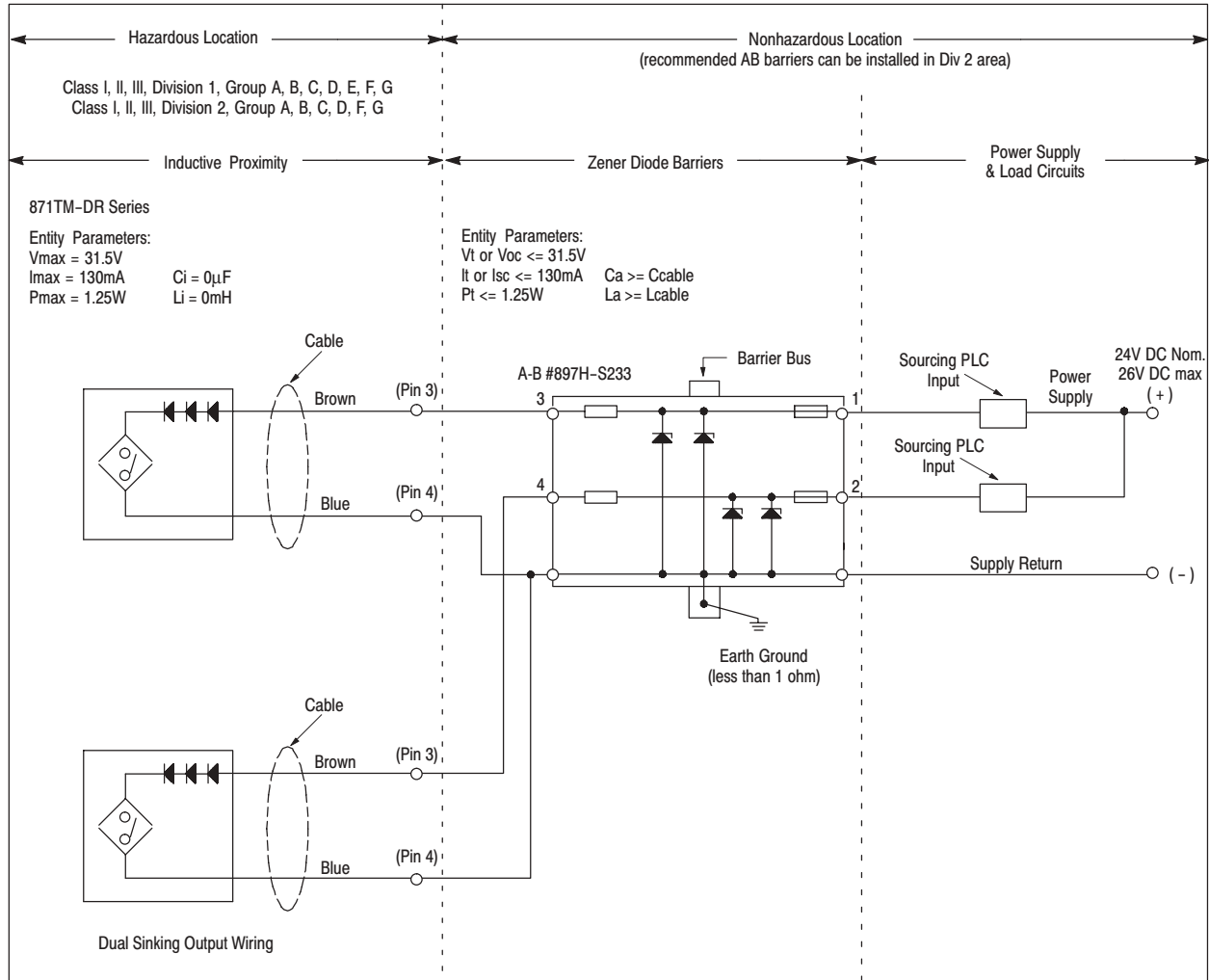


WARNING: These parameters must be adhered to. If not, injury may be caused to person or property.

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 March 1998
 Page 1 of 2

Inductive Proximity Sensors

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 - 60pF/ft.; Inductance - 0.20μH/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 DIN Rail Mounting Kit, Allen-Bradley #64-136.
- 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 - 60pF/ft.; Inductance - 0.20μH/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 DIN Rail Mounting Kit, Allen-Bradley #64-136.
- 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.
WARNING: Substitution of components may impair Intrinsic Safety.
- ⑧ No revision to drawing without prior CSA approval.



WARNING: These parameters must be adhered to. If not, injury may be caused to person or property.

75001-437-01(C)
 March 1998
 Page 2 of 2

871TM 2-Wire AC/DC**Stainless Steel Face/Threaded Stainless Steel Barrel**

871TM AC/DC Cable Style
12, 18, 30mm
page 2-37



871TM AC/DC Mini
Quick-Disconnect Style
12, 18, 30mm
page 2-37



871TM AC/DC Micro
Quick-Disconnect Style
12, 18, 30mm
page 2-37



871TM AC/DC EAC Micro
Quick-Disconnect Style
12mm
page 2-37

**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	Trigger at 5A typical	Trigger at 8A typical
Overload Protection	Trigger at 340mA typical	Trigger at 550mA typical
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), 1200psi (8270kPa) washdown Stainless steel face and barrel	
Connections	Cable: 2m (6.5ft) 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	
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	0.9–1.0
Brass	0.3–0.5
Aluminum	0.1–0.4
Aluminum ≤0.020 Thick	0.9–1.1
Copper	0.4–0.6

Features

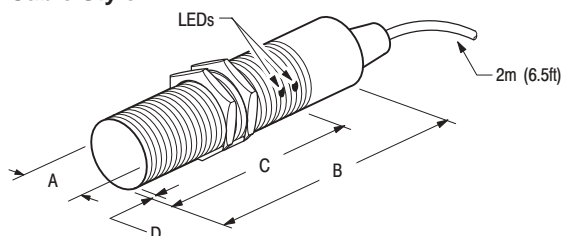
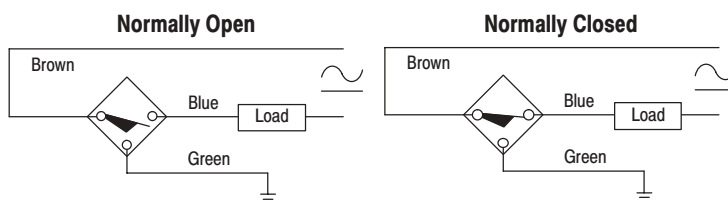
- 2-wire operation
- 2-conductor, 3-conductor, 3-pin or 4-pin connection
- 40–250V AC/DC
- Normally open or normally closed output
- Short circuit, false pulse, overload, and transient noise protection
- UL listed, CSA certified, and CE marked for all applicable directives

Product Selection

Barrel Dia.	Nominal Sensing Distance mm (in)	Shielded	Output Config-uration	Switching Frequency (Hz)	Catalog Number				
					PVC Cable	ToughLink™ Cable	Mini QD Style	Micro QD Style	EAC Micro QD Style
12mm	2 (0.08)	Y	N.O.	35	871TM-B2N12-A2	871TM-B2N12-C2	871TM-B2N12-N3	871TM-B2N12-R3	—
			N.C.	30	871TM-B2C12-A2	871TM-B2C12-C2	871TM-B2C12-N3	871TM-B2C12-R3	—
	4 (0.16)	N	N.O.	20	871TM-B4N12-A2	871TM-B4N12-C2	871TM-B4N12-N3	871TM-B4N12-R3	871TM-B4N12-B4
			N.C.	15	871TM-B4C12-A2	871TM-B4C12-C2	871TM-B4C12-N3	871TM-B4C12-R3	—
18mm	5 (0.20)	Y	N.O.	20	871TM-B5N18-A2	871TM-B5N18-H2	871TM-B5N18-N3	871TM-B5N18-R3	—
			N.C.	15	871TM-B5C18-A2	871TM-B5C18-H2	871TM-B5C18-N3	871TM-B5C18-R3	—
	8 (0.31)	N	N.O.	15	871TM-B8N18-A2	871TM-B8N18-H2	871TM-B8N18-N3	871TM-B8N18-R3	—
			N.C.	12	871TM-B8C18-A2	871TM-B8C18-H2	871TM-B8C18-N3	871TM-B8C18-R3	—
30mm	10 (0.39)	Y	N.O.	15	871TM-B10N30-A2	871TM-B10N30-H2	871TM-B10N30-N3	871TM-B10N30-R3	—
			N.C.	12	871TM-B10C30-A2	871TM-B10C30-H2	871TM-B10C30-N3	871TM-B10C30-R3	—
	15 (0.59)	N	N.O.	12	871TM-B15N30-A2	871TM-B15N30-H2	871TM-B15N30-N3	871TM-B15N30-R3	—
			N.C.	10	871TM-B15C30-A2	871TM-B15C30-H2	871TM-B15C30-N3	871TM-B15C30-R3	—
Recommended Standard QD Cordset (-6F = 1.8m (6ft), -2 = 2m (6.5ft))							889N-F3AFC-6F	889R-F3ACA-2	889B-F3AC-2

QD Cordsets and Accessories

Description	Page Number
Other Cordsets Available	7-8, 7-68, 7-84
Terminal Chambers	7-20, 7-63, 7-81
Mounting Brackets	2-186 - 2-190
End Caps	2-195, 2-196
Mounting Nuts	2-197 - 2-198

Dimensions—mm (inches)**Cable Style****Wiring Diagrams**

Note 1: No green wire on 12mm and on sensors with PVC cable (-A2).
Attach housing to ground.

Note 2: Load can be switched to brown wire.

Thread Size	Shielded	mm (inches)			
		A	B	C	D
M12 x 1	Y	12.0 (0.47)	72.1 (2.84)	38.4 (1.51)	2.5 (0.10)
	N			31.5 (1.24)	9.4 (0.37)
M18 x 1	Y	18.0 (0.71)	74.7 (2.94)	60.0 (2.36)	2.5 (0.10)
	N			48.2 (1.90)	14.4 (0.56)
M30 x 1.5	Y	30.0 (1.18)	77.2 (3.04)	61.3 (2.41)	2.5 (0.10)
	N			41.6 (1.64)	17.9 (0.70)

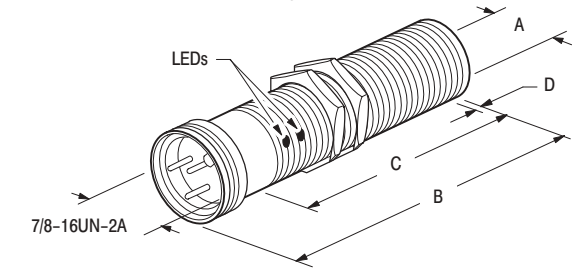
Inductive Proximity Sensors

871TM 2-Wire AC/DC

Stainless Steel Face/Threaded Stainless Steel Barrel

Dimensions—mm (inches) (continued)

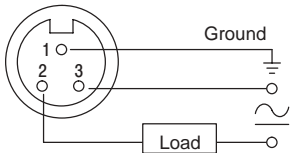
Mini Quick-Disconnect Style



Thread Size	Shielded	mm (inches)			
		A	B	C	D
M12 X 1	Y	12.0 (0.47)	85.6 (3.37)	37.8 (1.49)	2.5 (0.10)
	N			31.7 (1.25)	9.4 (0.37)
M18 X 1	Y	18.0 (0.71)	76.6 (3.02)	54.9 (2.16)	2.5 (0.10)
	N			43.1 (1.70)	14.4 (0.56)
M30 X 1.5	Y	30.0 (1.18)	86.4 (3.40)	61.3 (2.41)	2.5 (0.10)
	N			41.6 (1.64)	17.9 (0.70)

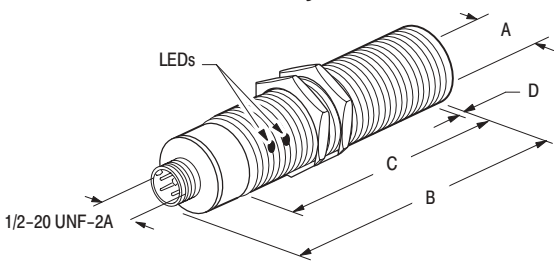
Wiring Diagrams

Normally Open or Normally Closed



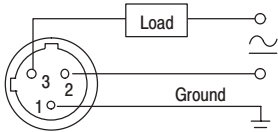
- Note 1: No ground pin on 12mm. Attach housing to ground.
- Note 2: Load can be switched to pin 3.

Micro Quick-Disconnect Style



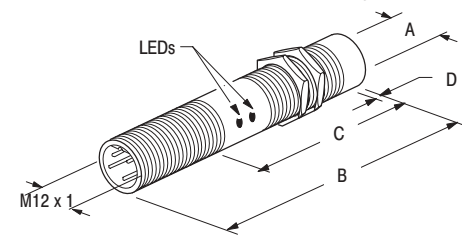
Thread Size	Shielded	mm (inches)			
		A	B	C	D
M12 X 1	Y	12.0 (0.47)	87.3 (3.44)	38.4 (1.51)	2.5 (0.10)
	N	12.0 (0.47)	87.3 (3.44)	31.5 (1.24)	9.4 (0.37)
M18 X 1	Y	18.0 (0.71)	84.3 (3.32)	60.0 (2.36)	2.5 (0.10)
	N	18.0 (0.71)	84.3 (3.32)	48.2 (1.90)	14.4 (0.56)
M30 X 1.5	Y	30.0 (1.18)	85.7 (3.37)	61.3 (2.41)	2.5 (0.10)
	N	30.0 (1.18)	85.7 (3.37)	46.1 (1.81)	17.9 (0.70)

Normally Open or Normally Closed



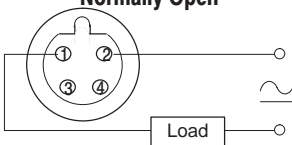
- Note 1: No ground pin on 12mm. Attach housing to ground.
- Note 2: Load can be switched to pin 2.

EAC Micro Quick-Disconnect Style



Thread Size	Shielded	mm (inches)			
		A	B	C	D
M12 X 1	N	12.0 (0.47)	83.0 (3.27)	31.7 (1.25)	9.4 (0.37)

Normally Open



- Note 1: No ground pin. Attach housing to ground.
- Note 2: Load can be switched to pin 2.

871TM 2-Wire AC/DC PLC Interfacer

Stainless Steel Face/Threaded Short Stainless Steel Barrel



871TM AC/DC Cable Style
12, 18, 30mm
page 2-40



871TM AC/DC Mini
Quick-Disconnect Style
12, 18, 30mm
page 2-40



871TM AC/DC Micro
Quick-Disconnect Style
12, 18, 30mm
page 2-40



871TM AC/DC EAC Micro
Quick-Disconnect Style
12mm
page 2-40

**Specifications**

Load Current	2-25mA
Leakage Current	≤0.9mA at 24V DC ≤1.7mA at 20-120V AC/DC; ≤2.5mA at 121-250V AC/DC
Operating Voltage	20-250V AC/DC
Voltage Drop	≤8V at 25mA DC ≤10V at 25mA AC
Repeatability	10% typical
Hysteresis	10% typical
False Pulse Protection	Incorporated
Transient Noise Protection	Incorporated
Radio Frequency Protection	10V per meter Frequency range 20-1000MHz
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), 1200psi (8270kPa) washdown Stainless steel face and barrel
Connections	Cable: 2m (6.5ft) 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
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

Correction Factors

Target Material	Correction Factor
Steel	1.0
Stainless Steel	0.8-1.0
Brass	0.4-0.7
Aluminum	0.4-0.7
Copper	0.2-0.5

Features

- Designed for low load current PLC, I/O, and PC applications
- 2-wire operation
- 2-conductor, 3-pin or 4-pin connection
- 20-250V AC/DC
- Normally open or normally closed output
- False pulse, transient noise, and radio frequency protection
- UL listed, CSA certified, and CE marked for all applicable directives

871TM 2-Wire AC/DC PLC Interfacer

Stainless Steel Face/Threaded Short Stainless Steel Barrel

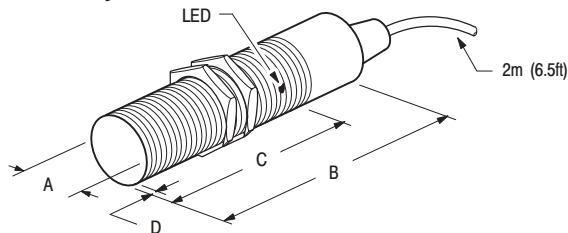
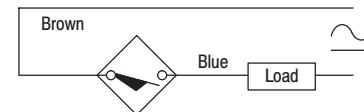
Product Selection

Barrel Dia.	Nominal Sensing Distance mm (in)	Shielded	Output Configuration	Switching Frequency (Hz)	Catalog Number				
					PVC Cable	ToughLink™ Cable	Mini QD Style	Micro QD Style	EAC Micro QD Style
12mm	2 (0.08)	Y	N.O.	75	871TM-BH2N12-A2	871TM-BH2N12-C2	871TM-BH2N12-N3	871TM-BH2N12-R3	871TM-BH2N12-B4
	4 (0.16)	N		35	871TM-BH4N12-A2	871TM-BH4N12-C2	871TM-BH4N12-N3	871TM-BH4N12-R3	—
18mm	5 (0.20)	Y	N.O.	65	871TM-BH5N18-A2	871TM-BH5N18-H2	871TM-BH5N18-N3	871TM-BH5N18-R3	—
	8 (0.31)	N		30	871TM-BH8N18-A2	871TM-BH8N18-H2	871TM-BH8N18-N3	871TM-BH8N18-R3	—
30mm	10 (0.39)	Y	N.O.	45	871TM-BH10N30-A2	871TM-BH10N30-H2	871TM-BH10N30-N3	871TM-BH10N30-R3	—
	15 (0.59)	N		20	871TM-BH15N30-A2	871TM-BH15N30-H2	871TM-BH15N30-N3	871TM-BH15N30-R3	—
Recommended Standard QD Cordset (-6F = 1.8m (6ft), -2 = 2m (6.5ft))							889N-F3AFC-6F	889R-F3ACA-2	889B-F3AC-2

Note: Normally closed models available as special order items. Fifteen piece minimum order required. Consult the factory for prices and lead times.

QD Cordsets and Accessories

Description	Page Number
Other Cordsets Available	7-8, 7-68, 7-84
Terminal Chambers	7-20
Mounting Brackets	2-186 - 2-190
End Caps	2-195, 2-196
Mounting Nuts	2-197 - 2-198

Dimensions—mm (inches)**Cable Style****Wiring Diagrams****Normally Open**

Note 1: Attach housing to ground.

Note 2: Load can be switched to brown wire.

Thread Size	Shielded	mm (inches)			
		A	B	C	D
M12 X 1	Y	12.0 (0.47)	49.8 (1.96)	26.4 (1.04)	2.5 (0.10)
	N			19.5 (0.77)	9.4 (0.37)
M18 X 1	Y	18.0 (0.71)	55.4 (2.18)	41.7 (1.64)	2.5 (0.10)
	N				14.5 (0.57)
M30 X 1.5	Y	30.0 (1.18)	57.9 (2.28)	41.9 (1.65)	2.5 (0.10)
	N			39.4 (1.55)	18.0 (0.71)

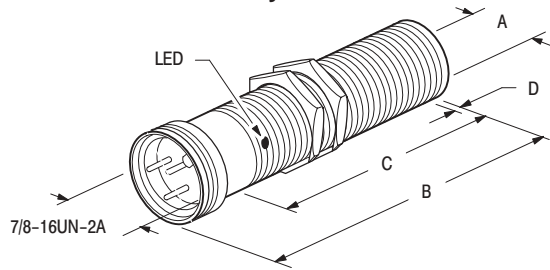
Inductive Proximity Sensors

871TM 2-Wire AC/DC PLC Interfacer

Stainless Steel Face/Threaded Short Stainless Steel Barrel

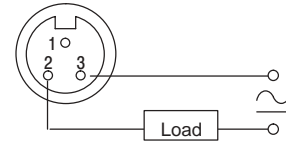
Dimensions—mm (inches) (continued)

Mini Quick-Disconnect Style



Wiring Diagrams

Normally Open

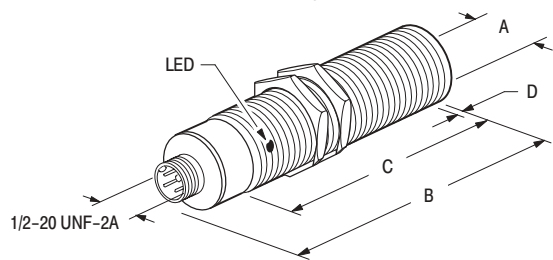


Note 1: Attach housing to ground.

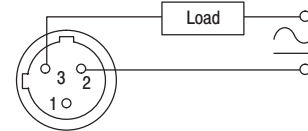
Note 2: Load can be switched to pin 3.

Thread Size	Shielded	mm (inches)			
		A	B	C	D
M12 X 1	Y	12.0 (0.47)	63.5 (2.50)	25.4 (1.00)	2.5 (0.10)
	N			18.5 (0.73)	9.4 (0.37)
M18 X 1	Y	18.0 (0.71)	56.1 (2.21)	35.1 (1.38)	2.5 (0.10)
	N			29.2 (1.15)	14.5 (0.57)
M30 X 1.5	Y	30.0 (1.18)	68.1 (2.68)	41.9 (1.65)	2.5 (0.10)
	N			39.4 (1.55)	18.0 (0.71)

Micro Quick-Disconnect Style



Normally Open

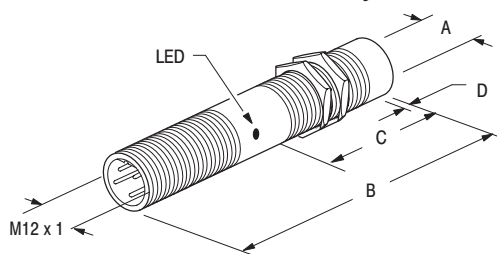


Note 1: Attach housing to ground.

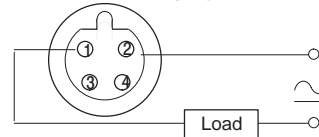
Note 2: Load can be switched to pin 2.

Thread Size	Shielded	mm (inches)			
		A	B	C	D
M12 X 1	Y	12.0 (0.47)	61.0 (2.40)	26.4 (1.04)	2.5 (0.10)
	N			19.6 (0.77)	9.4 (0.37)
M18 X 1	Y	18.0 (0.71)	65.0 (2.56)	41.7 (1.64)	2.5 (0.10)
	N				14.5 (0.57)
M30 X 1.5	Y	30.0 (1.18)	66.3 (2.61)	41.9 (1.65)	2.5 (0.10)
	N			39.4 (1.55)	18.0 (0.71)

EAC Micro Quick-Disconnect Style



Normally Open



Note 1: No ground pin. 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)	61.0 (2.40)	26.4 (1.04)	2.5 (0.10)



Description

Bulletin 872C WorldProx inductive proximity sensors are self-contained, general purpose, solid-state devices designed to sense the presence of ferrous and nonferrous metal objects without touching them.

The switch body consists of a plastic face and a nickel-plated brass barrel. It meets NEMA 1, 2, 3, 4, 6P, 12, 13 and IP67 (IEC529) enclosure standards. The electronic circuitry is fully potted for protection against shock, vibration, and contamination.

All models have a 360° visible LED. Cable models have a translucent end cap which glows when the LED indicator is on, and is visible from almost every angle. Quick-disconnect models have a four porthole LED design for better visibility from most angles. In addition to making installation easier, 360° visibility may facilitate troubleshooting.

These sensors are available in 8, 12, 18 and 30mm diameters. Connection options include a 2m PVC cable, mini, micro, and pico quick-disconnect.

Features

- Threaded, nickel-plated brass barrel
- 360° visible LED
- Cable or quick-disconnect styles
- Short circuit protection
- Overload protection
- Transient noise protection
- False pulse protection
- Reverse polarity protection
- UL listed, c-UL listed, and CE marked for all applicable directives

Styles

DC 3-Wire	page 2-44
DC 3-Wire Short Barrel	page 2-48
DC 3-Wire Extended Sensing	page 2-52
DC 3-Wire Plastic Barrel Sensing	page 2-55
DC 2-Wire	page 2-58
DC 2-Wire QuadroPlex	page 2-60
DC 4-Wire Complementary Output	page 2-62
AC 2-Wire	page 2-64
AC/DC 2-Wire Relay Output	page 2-67

QD Cordsets and Accessories

Quick-Disconnect Cables ...	page 7-1
Mounting Bracket, Spring Return Style	page 2-186
Mounting Bracket, Swivel/Tilt Style	page 2-188
Mounting Bracket, Right Angle Style	page 2-189
Mounting Bracket, Clamp Style	page 2-190
End Caps	page 2-196
Mounting Nuts	page 2-197
Lock Washers	page 2-199

General Information

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

872C WorldProx™ 3-Wire DC

Plastic Face/Threaded Nickel-Plated Brass Barrel



872C DC Cable Style
8, 12, 18, 30mm
page 2-45



872C DC
Quick-Disconnect Micro Style
8, 12, 18, 30mm
page 2-45



872C DC
Quick-Disconnect Mini Style
18, 30mm
page 2-45



872C DC Pico
Quick-Disconnect Style
8mm
page 2-45



872C DC Pico
Quick-Disconnect Style
6.5mm

**Specifications**

Load Current	≤200mA
Leakage Current	≤10μA
Operating Voltage	10–30V DC
Voltage Drop	≤1.6V; ≤2.4V (8mm only)
Repeatability	≤2% (≤5% 6.5mm)
Hysteresis	10% typical
Reverse Polarity Protection	Incorporated
Transient Noise Protection	Incorporated
Short Circuit Protection	Incorporated
Overload Protection	Incorporated
False Pulse Protection	Incorporated
Approvals	UL listed, c-UL certified for Canada, and CE marked for all applicable directives (6.5mm is only CE marked)
Enclosure	NEMA 1, 2, 3, 4, 6P, 12, 13 IP67 (IEC529) Nickel-plated brass barrel, plastic face (PBT)
Connections	Cable: 2m (6.5ft) length, 4.4mm (0.175in) diameter 3-conductor #26AWG PVC Quick-Disconnect: 4-pin mini style 4-pin micro style 3-pin pico style
LED	Red: Output energized, 360° visibility
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 Factors
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

- 3-wire operation
- 3-conductor, 3- or 4-pin connection
- 10–30V DC
- Normally open or normally closed
- Reverse polarity, short circuit, overload, false pulse, and transient noise protection
- UL listed, c-UL listed, and CE marked for all applicable directives

Inductive Proximity Sensors
872C WorldProx™ 3-Wire DC
 Plastic Face/Threaded Nickel-Plated Brass Barrel

Product Selection

Barrel Dia.	Nominal Sensing Distance mm (in)	Shielded	Output Configuration		Switching Frequency (Hz)	Catalog Number			
						Cable Style	Mini QD Style	Micro QD Style	Pico QD Style
6.5mm	2.0 (0.08)	Y	N.O.	NPN	2000	872C-MM1NN7-E2			872C-MM1NN7-P3
				PNP		872C-MM1NP7-E2			872C-MM1NP7-P3
			N.C.	NPN		872C-MM1CN7-E2			872C-MM1CN7-P3
				PNP		872C-MM1CP7-E2			872C-MM1CP7-P3
8mm	2 (0.08)	Y	N.O.	NPN	2500	872C-D2NN8-E2	—	872C-D2NN8-D4	872C-D2NN8-P3
				PNP		872C-D2NP8-E2	—	872C-D2NP8-D4	872C-D2NP8-P3
			N.C.	NPN		872C-D2CN8-E2	—	872C-D2CN8-D4	872C-D2CN8-P3
				PNP		872C-D2CP8-E2	—	872C-D2CP8-D4	872C-D2CP8-P3
	3 (0.12)	N	N.O.	NPN		872C-D3NN8-E2	—	872C-D3NN8-D4	872C-D3NN8-P3
				PNP		872C-D3NP8-E2	—	872C-D3NP8-D4	872C-D3NP8-P3
			N.C.	NPN		872C-D3CN8-E2	—	872C-D3CN8-D4	872C-D3CN8-P3
				PNP		872C-D3CP8-E2	—	872C-D3CP8-D4	872C-D3CP8-P3
12mm	3 (0.12)	Y	N.O.	NPN	2000	872C-D3NN12-E2	—	872C-D3NN12-D4	—
				PNP		872C-D3NP12-E2	—	872C-D3NP12-D4	—
			N.C.	NPN		872C-D3CN12-E2	—	872C-D3CN12-D4	—
				PNP		872C-D3CP12-E2	—	872C-D3CP12-D4	—
	4 (0.16)	N	N.O.	NPN		872C-D4NN12-E2	—	872C-D4NN12-D4	—
				PNP		872C-D4NP12-E2	—	872C-D4NP12-D4	—
			N.C.	NPN		872C-D4CN12-E2	—	872C-D4CN12-D4	—
				PNP		872C-D4CP12-E2	—	872C-D4CP12-D4	—
18mm	5 (0.20)	Y	N.O.	NPN	1000	872C-D5NN18-E2	872C-D5NN18-N4	872C-D5NN18-D4	—
				PNP		872C-D5NP18-E2	872C-D5NP18-N4	872C-D5NP18-D4	—
			N.C.	NPN		872C-D5CN18-E2	872C-D5CN18-N4	872C-D5CN18-D4	—
				PNP		872C-D5CP18-E2	872C-D5CP18-N4	872C-D5CP18-D4	—
	8 (0.31)	N	N.O.	NPN		872C-D8NN18-E2	872C-D8NN18-N4	872C-D8NN18-D4	—
				PNP		872C-D8NP18-E2	872C-D8NP18-N4	872C-D8NP18-D4	—
			N.C.	NPN		872C-D8CN18-E2	872C-D8CN18-N4	872C-D8CN18-D4	—
				PNP		872C-D8CP18-E2	872C-D8CP18-N4	872C-D8CP18-D4	—
30mm	10 (0.39)	Y	N.O.	NPN	500	872C-D10NN30-E2	872C-D10NN30-N4	872C-D10NN30-D4	—
				PNP		872C-D10NP30-E2	872C-D10NP30-N4	872C-D10NP30-D4	—
			N.C.	NPN		872C-D10CN30-E2	872C-D10CN30-N4	872C-D10CN30-D4	—
				PNP		872C-D10CP30-E2	872C-D10CP30-N4	872C-D10CP30-D4	—
	15 (0.59)	N	N.O.	NPN		872C-D15NN30-E2	872C-D15NN30-N4	872C-D15NN30-D4	—
				PNP		872C-D15NP30-E2	872C-D15NP30-N4	872C-D15NP30-D4	—
			N.C.	NPN		872C-D15CN30-E2	872C-D15CN30-N4	872C-D15CN30-D4	—
				PNP		872C-D15CP30-E2	872C-D15CP30-N4	872C-D15CP30-D4	—
Recommended Standard QD Cordset (–6F = 1.8m (6ft), –2 = 2m (6.5ft))							889N-F4AFC-6F	889D-F4AC-2	889P-F3AB-2

QD Cordsets and Accessories

Description	Page Number
Other Cordsets Available	7–8, 7–41, 7–88
Terminal Chambers	7–20
Mounting Brackets	2–186 – 2–190
End Caps	2–196
Mounting Nuts	2–197 – 2–198

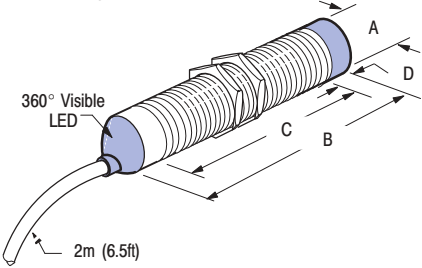
Inductive Proximity Sensors

872C WorldProx™ 3-Wire DC

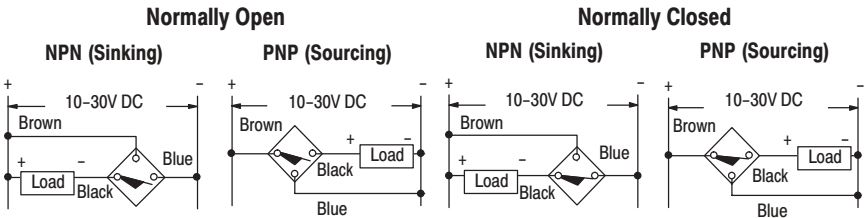
Plastic Face/Threaded Nickel-Plated Brass Barrel

Dimensions—mm (inches)

Cable Style

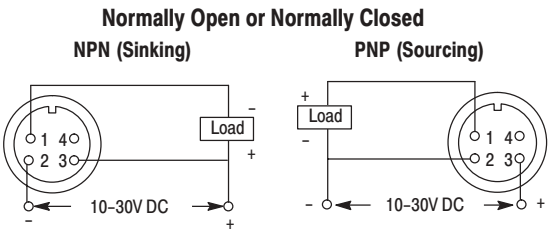
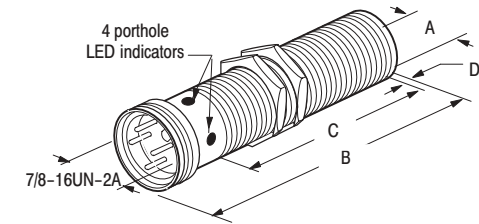


Wiring Diagrams



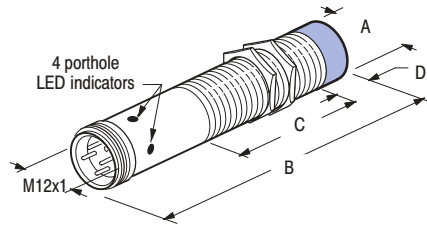
Thread Size	Smooth Diameter	Shielded	mm (inches)			
			A	B (max)	C (min)	D (max)
—	6.5	Y	6.5 (0.26)	33 (1.3)	—	—
M8 X 1	—	Y	8.0 (0.31)	33.7 (1.33)	32.5 (1.28)	0.5 (0.02)
		N		32.0 (1.26)	28.0 (1.10)	5.0 (0.20)
M12 X 1	—	Y	12 (0.47)	50.8 (2.00)	46.7 (1.84)	—
		N		58.7 (2.31)		7.9 (0.31)
M18 X 1	—	Y	18 (0.71)	50.8 (2.00)		—
		N		63.0 (2.48)		12.2 (0.48)
M30 X 1.5	—	Y	30 (1.18)	50.8 (2.00)		—
		N		63.0 (2.48)		12.2 (0.48)

Mini QD Style

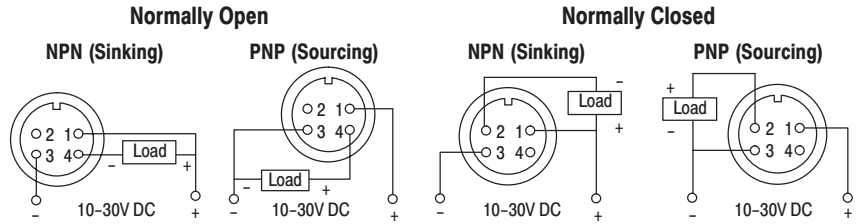


Thread Size	Shielded	mm (inches)			
		A	B (max)	C (min)	D (max)
M18 X 1	Y	18.0 (0.71)	65.0 (2.56)	38.1 (1.50)	—
	N		76.5 (3.01)		12.2 (0.48)
M30 X 1.5	Y	30.0 (1.18)	65.0 (2.56)		—
	N		76.5 (3.01)		12.2 (0.48)

Dimensions—mm (inches)
Micro QD Style

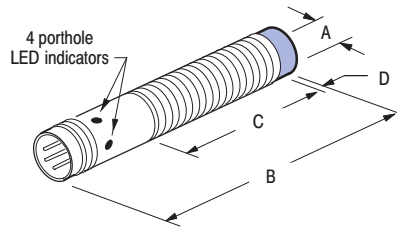


Wiring Diagrams

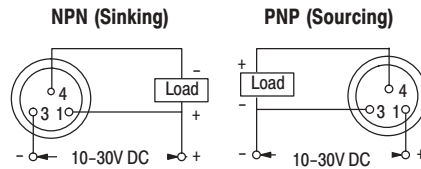


Thread Size	Shielded	mm (inches)			
		A	B (max)	C (min)	D (max)
M8 X 1	Y	8.0 (0.31)	58.0 (2.28)	27.5 (1.08)	0.5 (0.02)
	N			23.0 (0.91)	5.0 (0.20)
M12 X 1	Y	12.0 (0.47)	65.0 (2.56)	38.1 (1.50)	—
	N		72.4 (2.85)		7.9 (0.31)
M18 X 1	Y	18.0 (0.71)	65.0 (2.56)		—
	N		76.5 (3.01)		12.2 (0.48)
M30 X 1.5	Y	30.0 (1.18)	65.0 (2.56)	46.7 (1.87)	—
	N		76.5 (3.01)		12.2 (0.48)

Pico QD Style



Normally Open or Normally Closed



Thread Size	Smooth Diameter	Shielded	mm (inches)			
			A	B (max)	C (min)	D (max)
—	6.5	Y	6.5 (0.26)	49 (1.93)	—	—
M8 X 1	—	Y	8.0 (0.31)	50.3 (1.98)	34.0 (1.34)	0.3 (0.01)
		N	8.0 (0.31)	50.0 (1.97)	29.0 (1.14)	5.0 (0.20)

872C WorldProx™ Short Barrel 3-Wire DC

Plastic Face/Threaded Nickel-Plated Brass Barrel



872C DC Cable Style
12, 18, 30mm
page 2-49



872C DC Micro
Quick-Disconnect Style
12, 18, 30mm
page 2-49



872C DC Mini
Quick-Disconnect Style
18, 30mm
page 2-49



872C DC Pico
Quick-Disconnect Style
12, 18mm
page 2-49

**Specifications**

Load Current	≤200mA
Leakage Current	≤10μA
Operating Voltage	10–30V DC
Voltage Drop	≤1.64V
Repeatability	≤2%
Hysteresis	≤10% 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 for Canada, and CE marked for all applicable directives
Enclosure	NEMA 1, 2, 3, 4, 6P, 12, 13 IP67 (IEC 529) Nickel plated brass barrel, plastic face
Connections	Cable: 2m (6.5ft) length, 4.4mm (0.175in) diameter 3-conductor #26AWG PVC Quick-Disconnect: 4-pin mini style 4-pin micro style 3-pin pico style
LED	Red: Output Energized, 360° visibility
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

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

Inductive Proximity Sensors

872C WorldProx™ Short Barrel 3-Wire DC

Plastic Face/Threaded Nickel-Plated Brass Barrel

Product Selection

Barrel Dia.	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration	Switching Frequency (Hz)	Catalog Number				
					Cable Style	Mini QD Style	Micro QD Style	Pico QD Style	
12mm	3 (0.12)	Y	N.O.	NPN	2000	872C-DH3NN12-E2	—	872C-DH3NN12-D4	872C-DH3NN12-P3
				PNP		872C-DH3NP12-E2	—	872C-DH3NP12-D4	872C-DH3NP12-P3
	4 (0.16)	N		NPN		872C-DH4NN12-E2	—	872C-DH4NN12-D4	872C-DH4NN12-P3
				PNP		872C-DH4NP12-E2	—	872C-DH4NP12-D4	872C-DH4NP12-P3
	3 (0.12)	Y	N.C.	NPN		872C-DH3CN12-E2	—	872C-DH3CN12-D4	872C-DH3CN12-P3
				PNP		872C-DH3CP12-E2	—	872C-DH3CP12-D4	872C-DH3CP12-P3
	4 (0.16)	N		NPN		872C-DH4CN12-E2	—	872C-DH4CN12-D4	872C-DH4CN12-P3
				PNP		872C-DH4CP12-E2	—	872C-DH4CP12-D4	872C-DH4CP12-P3
18mm	5 (0.20)	Y	N.O.	NPN	1000	872C-DH5NN18-E2	872C-DH5NN18-N4	872C-DH5NN18-D4	872C-DH5NN18-P3
				PNP		872C-DH5NP18-E2	872C-DH5NP18-N4	872C-DH5NP18-D4	872C-DH5NP18-P3
	8 (0.31)	N		NPN		872C-DH8NN18-E2	872C-DH8NN18-N4	872C-DH8NN18-D4	872C-DH8NN18-P3
				PNP		872C-DH8NP18-E2	872C-DH8NP18-N4	872C-DH8NP18-D4	872C-DH8NP18-P3
	5 (0.20)	Y	N.C.	NPN		872C-DH5CN18-E2	872C-DH5CN18-N4	872C-DH5CN18-D4	872C-DH5CN18-P3
				PNP		872C-DH5CP18-E2	872C-DH5CP18-N4	872C-DH5CP18-D4	872C-DH5CP18-P3
	8 (0.31)	N		NPN		872C-DH8CN18-E2	872C-DH8CN18-N4	872C-DH8CN18-D4	872C-DH8CN18-P3
				PNP		872C-DH8CP18-E2	872C-DH8CP18-N4	872C-DH8CP18-D4	872C-DH8CP18-P3
30mm	10 (0.39)	Y	N.O.	NPN	500	872C-DH10NN30-E2	872C-DH10NN30-N4	872C-DH10NN30-D4	—
				PNP		872C-DH10NP30-E2	872C-DH10NP30-N4	872C-DH10NP30-D4	—
	15 (0.59)	N		NPN		872C-DH15NN30-E2	872C-DH15NN30-N4	872C-DH15NN30-D4	—
				PNP		872C-DH15NP30-E2	872C-DH15NP30-N4	872C-DH15NP30-D4	—
	10 (0.39)	Y	N.C.	NPN		872C-DH10CN30-E2	872C-DH10CN30-N4	872C-DH10CN30-D4	—
				PNP		872C-DH10CP30-E2	872C-DH10CP30-N4	872C-DH10CP30-D4	—
	15 (0.59)	N		NPN		872C-DH15CN30-E2	872C-DH15CN30-N4	872C-DH15CN30-D4	—
				PNP		872C-DH15CP30-E2	872C-DH15CP30-N4	872C-DH15CP30-D4	—
Recommended Standard QD Cordset (–6F = 1.8m (6ft), –2 = 2m (6.5ft))							889N-F4AFC-6F	889D-F4AC-2	889P-F3AB-2

QD Cordsets and Accessories

Description	Page Number
Other Cordsets Available	7-8, 7-41, 7-88
Terminal Chambers	7-20
Mounting Brackets	2-186 - 2-190
End Caps	2-196
Mounting Nuts	2-197 - 2-198

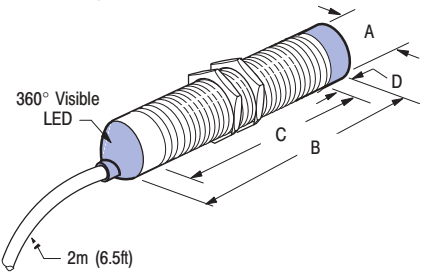
Inductive Proximity Sensors

872C WorldProx™ Short Barrel 3-Wire DC

Plastic Face/Threaded Nickel-Plated Brass Barrel

Dimensions—mm (inches)

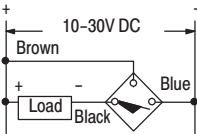
Cable Style



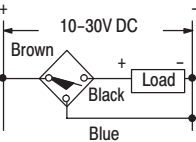
Wiring Diagrams

Normally Open

NPN (Sinking)

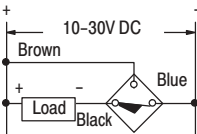


PNP (Sourcing)

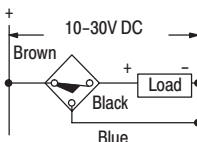


Normally Closed

NPN (Sinking)

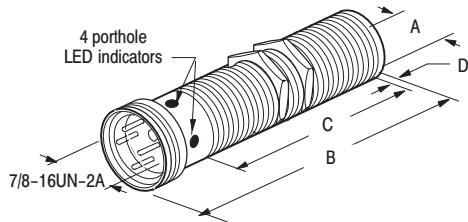


PNP (Sourcing)



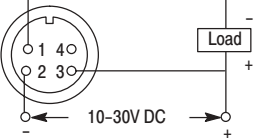
Thread Size	Shielded	mm (inches)			
		A	B (max)	C (min)	D (max)
M12 X 1	Y	12 (0.47)	34.8 (1.37)	31.8 (1.25)	—
	N		42.7 (1.68)		7.9 (0.31)
M18 X 1	Y	18 (0.71)	34.8 (1.37)		—
	N		42.7 (1.68)		12.2 (0.48)
M30 X 1.5	Y	30 (1.18)	34.8 (1.37)		—
	N		42.7 (1.68)		12.2 (0.48)

Mini QD Style

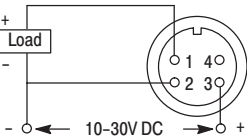


Normally Open or Normally Closed

NPN (Sinking)



PNP (Sourcing)



Thread Size	Shielded	mm (inches)			
		A	B (max)	C (min)	D (max)
M18 X 1	Y	18.0 (0.71)	47.5 (1.87)	26.7 (1.05)	—
	N		59.7 (2.35)		12.2 (0.48)
M30 X 1.5	Y	30.0 (1.18)	47.5 (1.87)		—
	N		59.7 (2.35)		12.2 (0.48)

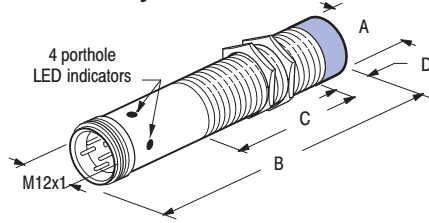
Inductive Proximity Sensors

872C WorldProx™ Short Barrel 3-Wire DC

Plastic Face/Threaded Nickel-Plated Brass Barrel

Dimensions—mm (inches)

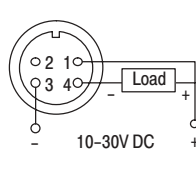
Micro QD Style



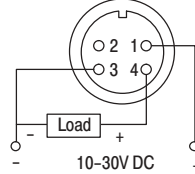
Wiring Diagrams

Normally Open

NPN (Sinking)

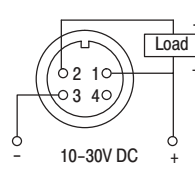


PNP (Sourcing)

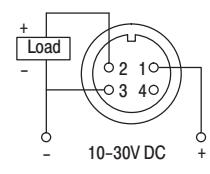


Normally Closed

NPN (Sinking)

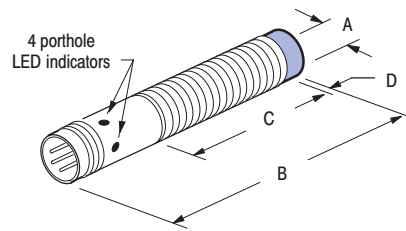


PNP (Sourcing)



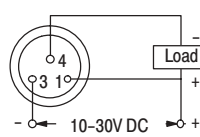
Thread Size	Shielded	mm (inches)			
		A	B (max)	C (min)	D (max)
M12 X 1	Y	12.0 (0.47)	47.5 (1.87)	27.4 (1.08)	—
	N		55.4 (2.18)		7.9 (0.31)
M18 X 1	Y	18.0 (0.71)	47.5 (1.87)		—
	N		59.7 (2.35)		12.2 (0.48)
M30 X 1.5	Y	30.0 (1.18)	47.5 (1.87)	31.8 (1.25)	—
	N		59.7 (2.35)		12.2 (0.48)

Pico QD Style

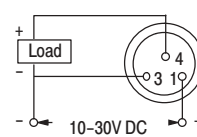


Normally Open or Normally Closed

NPN (Sinking)



PNP (Sourcing)



Thread Size	Shielded	mm (inches)			
		A	B (max)	C (min)	D (max)
M12 X 1	Y	12.0 (0.47)	44.9 (1.77)	28.95 (1.14)	—
	N		52.8 (2.07)		7.9 (0.31)
M18 X 1	Y	18.0 (0.71)	44.9 (1.77)		—
	N		52.8 (2.07)		12.2 (0.48)

872C WorldProx™ Extended Sensing 3-Wire DC

Plastic Face/Threaded Nickel-Plated Brass Barrel



872C DC Cable Style
12, 18, 30mm



872C DC
Quick-Disconnect Micro Style
12, 18, 30mm

**Features**

- 3-wire operation
- 3-conductor, 4-pin connection
- 10–30V DC
- Normally open or normally closed
- Reverse polarity, short circuit, overload, false pulse, and transient noise protection
- UL and c-UL recognized and CE marked for all applicable directives

Specifications

	12mm	18 & 30mm
Load Current	≤200mA	≤400mA
Leakage Current	≤50μA	
Operating Voltage	10–30V DC	
Voltage Drop	≤1.2V	
Repeatability	≤5%	
Hysteresis	10% typical	
Reverse Polarity Protection	Incorporated	
Transient Noise Protection	Incorporated	
Short Circuit Protection	Incorporated	
Overload Protection	Incorporated	
False Pulse Protection	Incorporated	
Approvals	UL and c-UL recognized and CE marked for all applicable directives	
Enclosure	NEMA 1, 2, 3, 4, 6P, 12, 13, IP67 (IEC529) Nickel-plated brass barrel, plastic face (PBT)	
Connections	Cable: 2m (6.5ft) length, 4.4mm (0.175in) diameter 3-conductor #26AWG PVC Quick-Disconnect: 4-pin micro style	
LED	Yellow: Output energized, 360° visibility	
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 Factors
Steel	1.0
Stainless Steel	0.7–0.8
Brass	0.5–0.6
Aluminum	0.5–0.6
Copper	0.4–0.5

Inductive Proximity Sensors

872C WorldProx™ Extended Sensing 3-Wire DC

Plastic Face/Threaded Nickel-Plated Brass Barrel

Product Selection

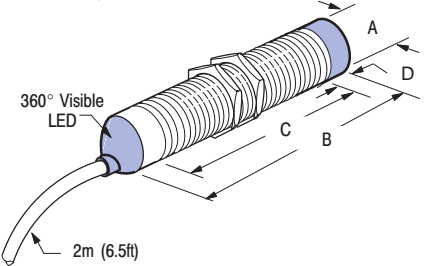
Barrel Dia.	Nominal Sensing Distance mm (in)	Shielded	Output Configuration		Switching Frequency (Hz)	Catalog Number	
						Cable Style	Micro QD Style
12mm	4 (0.16)	Y	N.O.	NPN	900	872C-M4NN12-A2	872C-M4NN12-D4
				PNP		872C-M4NP12-A2	872C-M4NP12-D4
			N.C.	NPN		872C-M4CN12-A2	872C-M4CN12-D4
				PNP		872C-M4CP12-A2	872C-M4CP12-D4
	8 (0.31)	N	N.O.	NPN		872C-N8NN12-A2	872C-N8NN12-D4
				PNP		872C-N8NP12-A2	872C-N8NP12-D4
			N.C.	NPN		872C-N8CN12-A2	872C-N8CN12-D4
				PNP		872C-N8CP12-A2	872C-N8CP12-D4
18mm	8 (0.31)	Y	N.O.	NPN	300	872C-M8NN18-A2	872C-M8NN18-D4
				PNP		872C-M8NP18-A2	872C-M8NP18-D4
			N.C.	NPN		872C-M8CN18-A2	872C-M8CN18-D4
				PNP		872C-M8CP18-A2	872C-M8CP18-D4
	12 (0.47)	N	N.O.	NPN		872C-N12NN18-A2	872C-N12NN18-D4
				PNP		872C-N12NP18-A2	872C-N12NP18-D4
			N.C.	NPN		872C-N12CN18-A2	872C-N12CN18-D4
				PNP		872C-N12CP18-A2	872C-N12CP18-D4
30mm	15 (0.59)	Y	N.O.	NPN	150	872C-M15NN30-A2	872C-M15NN30-D4
				PNP		872C-M15NP30-A2	872C-M15NP30-D4
			N.C.	NPN		872C-M15CN30-A2	872C-M15CN30-D4
				PNP		872C-M15CP30-A2	872C-M15CP30-D4
	20 (0.79)	N	N.O.	NPN		872C-N20NN30-A2	872C-N20NN30-D4
				PNP		872C-N20NP30-A2	872C-N20NP30-D4
			N.C.	NPN		872C-N20CN30-A2	872C-N20CN30-D4
				PNP		872C-N20CP30-A2	872C-N20CP30-D4
Recommended Standard QD Cordset (-2 = 2m (6.5ft))							889D-F4AC-2

QD Cordsets and Accessories

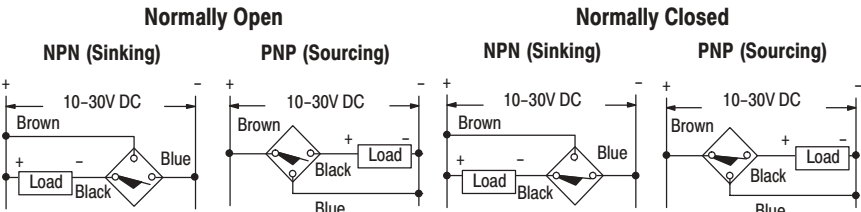
Description	Page Number
Other Cordsets Available	7-41
Terminal Chambers	7-20
Mounting Brackets	2-186 - 2-190
End Caps	2-196
Mounting Nuts	2-197 - 2-198

Inductive Proximity Sensors
872C WorldProx™ Extended Sensing 3-Wire DC
Plastic Face/Threaded Nickel-Plated Brass Barrel

Dimensions—mm (inches)
Cable Style

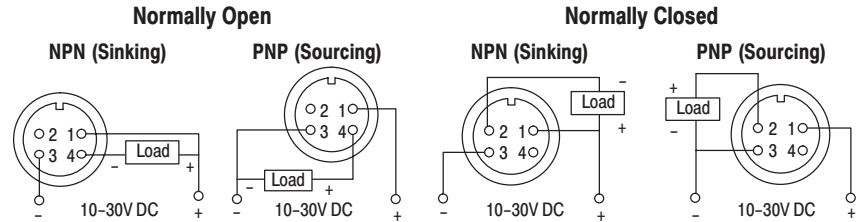
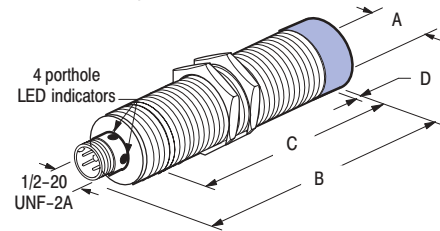


Wiring Diagrams



Thread Size	Shielded	mm (inches)			
		A	B (max)	C (min)	D (max)
M12 X 1	Y	12.0 (0.47)	54.0 (2.12)	45.0 (1.77)	0.5 (0.02)
	N			40.0 (1.57)	5.0 (0.19)
M18 X 1	Y	18.0 (0.71)	50.0 (1.96)	40.0 (1.57)	0.5 (0.02)
	N			35.0 (1.37)	8.0 (0.31)
M30 X 1.5	Y	30.0 (1.18)	60.0 (2.36)	50.0 (1.96)	0.5 (0.02)
	N			38.0 (1.49)	12.2 (0.48)

Micro QD Style



Thread Size	Shielded	mm (inches)			
		A	B (max)	C (min)	D (max)
M12 X 1	Y	12.0 (0.47)	70.0 (2.75)	43.0 (1.70)	0.5 (0.02)
	N			38.0 (1.49)	5.0 (0.19)
M18 X 1	Y	18.0 (0.71)	64.0 (2.52)	48.0 (1.89)	0.5 (0.02)
	N			40.0 (1.57)	8.0 (0.31)
M30 X 1.5	Y	30.0 (1.18)	76.0 (2.99)	50.0 (1.96)	0.5 (0.02)
	N			38.0 (1.49)	12.2 (0.48)



872CP DC Cable Style
12, 18, 30mm



872CP DC Micro QD Style
12, 18, 30mm



Features

- 3-wire operation
- 3-conductor connection
- 10–30V DC
- Normally open or normally closed output
- Transient noise, short circuit and reverse polarity protection
- Cable and micro quick-disconnect models
- UL recognized and CE marked for all applicable directives

Specifications

Load Current	≤200mA
Leakage Current	≤10μA
Operating Voltage	10–30V DC
Voltage Drop	≤1.6V
Repeatability	5%
Hysteresis	≤10% Typical
Transient Noise Protection	Incorporated
Reverse Polarity Protection	Incorporated
Short Circuit Protection	Incorporated
Overload Protection	Incorporated
False Pulse Protection	Incorporated
Approvals	UL listed, c-UL certified and CE marked for all applicable directives
Enclosure	NEMA 1, 2, 3, 4, 4X, 6P, 12, 13 IP67 (IEC 529) Plastic barrel
Connection	Cable: 2m (6.5ft) length 3-conductor PVC Quick-Disconnect: 4-pin micro style
LED	Red: Output Energized, 360° visibility
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

Inductive Proximity Sensors

872CP WorldProx™ 3-Wire DC

Plastic Face/Threaded Plastic Barrel

Product Selection

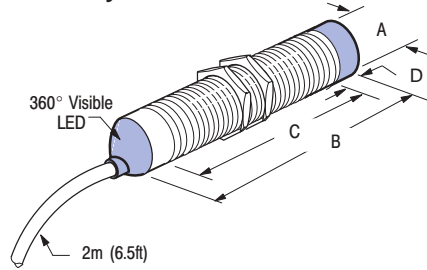
Barrel Dia.	Nominal Sensing Distance mm (in)	Shielded	Output Configuration		Switching Frequency (Hz)	Catalog Number	
						Cable Style	Micro QD
12mm	3 (0.12)	Y	N.O.	NPN	2000	872CP-M3NN12-E2	872CP-M3NN12-D4
				PNP		872CP-M3NP12-E2	872CP-M3NP12-D4
			N.C.	NPN		872CP-M3CN12-E2	872CP-M3CN12-D4
				PNP		872CP-M3CP12-E2	872CP-M3CP12-D4
	4 (0.16)	N	N.O.	NPN		872CP-N4NN12-E2	872CP-N4NN12-D4
				PNP		872CP-N4NP12-E2	872CP-N4NP12-D4
			N.C.	NPN		872CP-N4CN12-E2	872CP-N4CN12-D4
				PNP		872CP-N4CP12-E2	872CP-N4CP12-D4
18mm	5 (0.20)	Y	N.O.	NPN	872CP-M5NN18-E2	872CP-M5NN18-D4	
				PNP	872CP-M5NP18-E2	872CP-M5NP18-D4	
			N.C.	NPN	872CP-M5CN18-E2	872CP-M5CN18-D4	
				PNP	872CP-M5CP18-E2	872CP-M5CP18-D4	
	8 (0.31)	N	N.O.	NPN	872CP-N8NN18-E2	872CP-N8NN18-D4	
				PNP	872CP-N8NP18-E2	872CP-N8NP18-D4	
			N.C.	NPN	872CP-N8CN18-E2	872CP-N8CN18-D4	
				PNP	872CP-N8CP18-E2	872CP-N8CP18-D4	
30mm	10 (0.39)	Y	N.O.	NPN	872CP-M10NN30-E2	872CP-M10NN30-D4	
				PNP	872CP-M10NP30-E2	872CP-M10NP30-D4	
			N.C.	NPN	872CP-M10CN30-E2	872CP-M10CN30-D4	
				PNP	872CP-M10CP30-E2	872CP-M10CP30-D4	
	15 (0.59)	N	N.O.	NPN	872CP-N15NN30-E2	872CP-N15NN30-D4	
				PNP	872CP-N15NP30-E2	872CP-N15NP30-D4	
			N.C.	NPN	872CP-N15CN30-E2	872CP-N15CN30-D4	
				PNP	872CP-N15CP30-E2	872CP-N15CP30-D4	
Recommended Standard QD Cordset (-6F = 1.8m (6ft), -2 = 2m (6.5ft))							889D-F4AC-2

QD Cordsets and Accessories

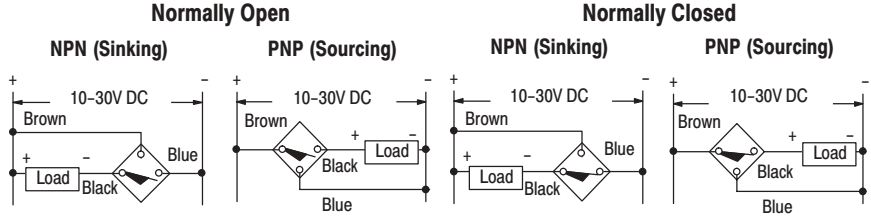
Description	Page Number
Other Cordsets Available	7-36
Terminal Chambers	7-63
Mounting Brackets	2-186 - 2-190
End Caps	2-196
Mounting Nuts	2-197 - 2-198

Dimensions—mm (inches)

Cable Style

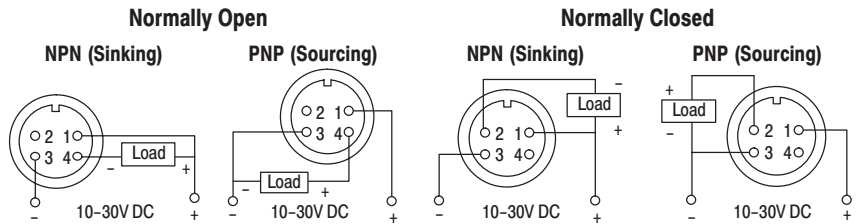
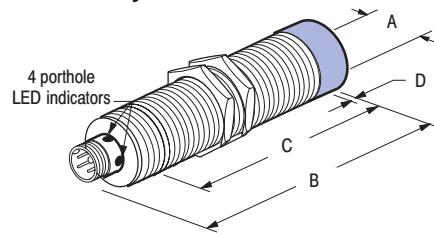


Wiring Diagrams



Thread Size	Shielded	mm (inches)			
		A	B (max)	C (min)	D (max)
M12 X 1	Y	12.0 (0.47)	71 (2.80)	60 (2.36)	2 (0.08)
	N				
M18 X 1	Y	18.0 (0.71)	61 (2.40)	57 (2.24)	
	N				
M30 X 1.5	Y	30.0 (1.18)			
	N				

Micro QD Style



Thread Size	Shielded	mm (inches)							
		A	B (max)	C (min)	D (max)				
M12 X 1	Y	12.0 (0.47)	77 (3.03)	54 (2.13)	2 (0.08)				
	N								
M18 X 1	Y	18.0 (0.71)	80 (3.15)	57 (2.24)					
	N								
M30 X 1.5	Y	30.0 (1.18)							
	N								

872C WorldProx™ 2-Wire DC

Plastic Face/Threaded Nickel-Plated Brass Barrel



872C DC Cable Style
12, 18, 30mm
page 2-59



872C DC Micro
Quick-Disconnect Style
12, 18, 30mm
page 2-59

**Features**

- 2-wire operation
- 2-conductor or 4-pin connection
- 10–30V DC
- Normally open or normally closed output
- Reverse polarity, short circuit, overload, false pulse, and transient noise protection
- UL listed, c–UL listed, and CE marked for all applicable directives

Specifications

Load Current	≤100mA
Minimum Load Current	5mA
Leakage Current	≤0.9mA
Operating Voltage	10–30V DC
Voltage Drop	≤6V
Repeatability	≤2%
Hysteresis	10% typical
Reverse Polarity Protection	Incorporated
Transient Noise Protection	Incorporated
Short Circuit Protection	Incorporated
Overload Protection	Incorporated
False Pulse Protection	Incorporated
Approvals	UL listed, c–UL certified for Canada, and CE marked for all applicable directives
Enclosure	NEMA 1, 2, 3, 4, 6P, 12, 13 IP67 (IEC529) Nickel-plated brass barrel, plastic face (PBT)
Connections	Cable: 2m (6.5ft) length, 4.4mm (0.175in) diameter, 2-conductor #26AWG PVC Quick-Disconnect: 4-pin micro style
LED	Red: Output energized, 360° visibility
Operating Temperature	–25°C to +70°C (–13°F to +158°F)
Shock	30g, 11ms
Vibration	55Hz, 1mm amplitude, 3 planes

Correction Factors

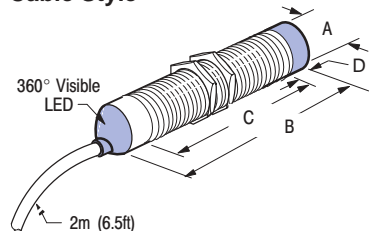
Target Material	Correction Factor
Steel	1.0
Stainless Steel	0.7–0.8
Brass	0.4–0.5
Aluminum	0.3–0.4
Copper	0.2–0.3

Product Selection

Barrel Diameter	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration	Switching Frequency (Hz)	Catalog Number	
					Cable Style	Micro QD Style
12mm	3 (0.12)	Y	N.O.	2000	872C-D3NE12-A2	872C-D3NE12-D4
			N.C.		872C-D3CE12-A2	872C-D3CE12-D4
	4 (0.16)	N	N.O.		872C-D4NE12-A2	872C-D4NE12-D4
			N.C.		872C-D4CE12-A2	872C-D4CE12-D4
18mm	5 (0.20)	Y	N.O.	1000	872C-D5NE18-A2	872C-D5NE18-D4
			N.C.		872C-D5CE18-A2	872C-D5CE18-D4
	8 (0.31)	N	N.O.		872C-D8NE18-A2	872C-D8NE18-D4
			N.C.		872C-D8CE18-A2	872C-D8CE18-D4
30mm	10 (0.39)	Y	N.O.	500	872C-D10NE30-A2	872C-D10NE30-D4
			N.C.		872C-D10CE30-A2	872C-D10CE30-D4
	15 (0.59)	N	N.O.		872C-D15NE30-A2	872C-D15NE30-D4
			N.C.		872C-D15CE30-A2	872C-D15CE30-D4
Recommended Standard QD Cordset (-2 = 2m (6.5ft))						889D-F4AC-2

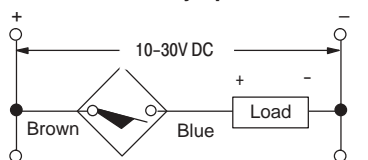
Dimensions—mm (inches)

Cable Style

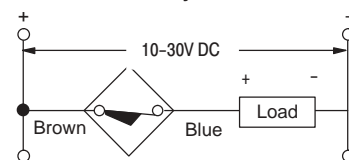


Wiring Diagrams

Normally Open



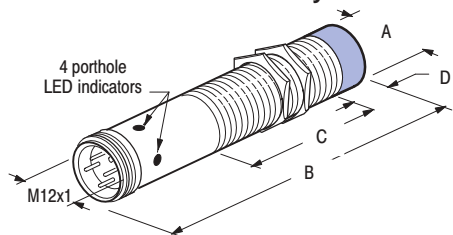
Normally Closed



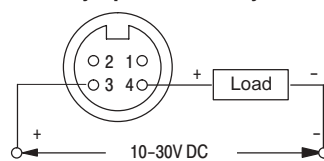
Note: Load can be switched to brown wire.

Thread Size	Shielded	mm (inches)			
		A	B (max)	C (min)	D (max)
M12 X 1	Y	12 (0.47)	50.8 (2.00)	46.7 (1.84)	—
	N		58.7 (2.31)		7.9 (0.31)
M18 X 1	Y	18 (0.71)	50.8 (2.00)		—
	N		63.0 (2.48)		12.2 (0.48)
M30 X 1.5	Y	30 (1.18)	50.8 (2.00)		—
	N		63.0 (2.48)		12.2 (0.48)

Micro Quick-Disconnect Style



Normally Open or Normally Closed



Note: Load can be switched to pin 3.

Thread Size	Shielded	mm (inches)			
		A	B (max)	C (min)	D (max)
M12 X 1	Y	12.0 (0.47)	65.0 (2.56)	38.1 (1.50)	—
	N		72.4 (2.85)		7.9 (0.31)
M18 X 1	Y	18.0 (0.71)	65.0 (2.56)	38.1 (1.50)	—
	N		76.5 (3.01)		12.2 (0.48)
M30 X 1.5	Y	30.0 (1.18)	65.0 (2.56)	46.7 (1.84)	—
	N		76.5 (3.01)		12.2 (0.48)

872C WorldProx™ QuadroPlex 2-Wire DC

Plastic Face/Threaded Nickel-Plated Brass Barrel



872C DC Micro
Quick-Disconnect Style
12, 18, 30mm
page 2-59

**Features**

- 2-wire operation
- 4-pin connection
- 10–30V DC
- Normally open or normally closed output
- Short circuit, overload, false pulse, and transient noise protection
- UL listed, c-UL listed, and CE marked for all applicable directives

Specifications

Barrel Diameter	12mm	18mm & 30mm
Load Current	100mA	200mA
Minimum Load Current	5mA	
Leakage Current	≤1mA	
Operating Voltage	10–30V DC	
Voltage Drop	≤6V @ 100mA	≤6.5V @ 200mA ≤6.0V @ 100mA
Repeatability	≤10% at constant temperature	
Hysteresis	10% typical	
Transient Noise Protection	Incorporated	
Short Circuit Protection	Incorporated	
Overload Protection	Incorporated	
False Pulse Protection	Incorporated	
Approvals	UL listed, c-UL certified for Canada, and CE marked for all applicable directives	
Enclosure	NEMA 1, 2, 3, 4, 6P, 12, 13 IP67 (IEC529) Nickel-plated brass barrel, plastic face (PBT)	
Connections	Quick-Disconnect: 4-pin micro style	
LED	Red: Output energized, 360° visibility	
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

Inductive Proximity Sensors

872C WorldProx™ QuadroPlex 2-Wire DC

Plastic Face/Threaded Nickel-Plated Brass Barrel

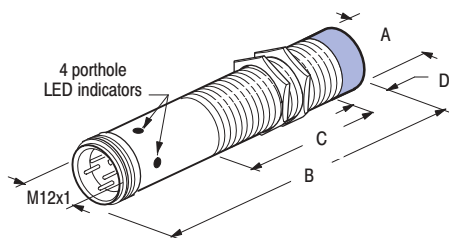
Product Selection

Barrel Diameter	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration	Switching Frequency (Hz)	Catalog Number
					Micro QD Style
12mm	3 (0.12)	Y	N.O. or N.C. ❶	2000	872C-M3Q12-D4
	4 (0.16)	N			872C-N4Q12-D4
18mm	5 (0.20)	Y		1000	872C-M5Q18-D4
	8 (0.31)	N			872C-N8Q18-D4
30mm	10 (0.39)	Y		500	872C-M10Q30-D4
	15 (0.59)	N			872C-N15Q30-D4
Recommended Standard QD Cordset (-2 = 2m (6.5ft))					889D-F4AC-2

❶ Depending upon wiring diagram.

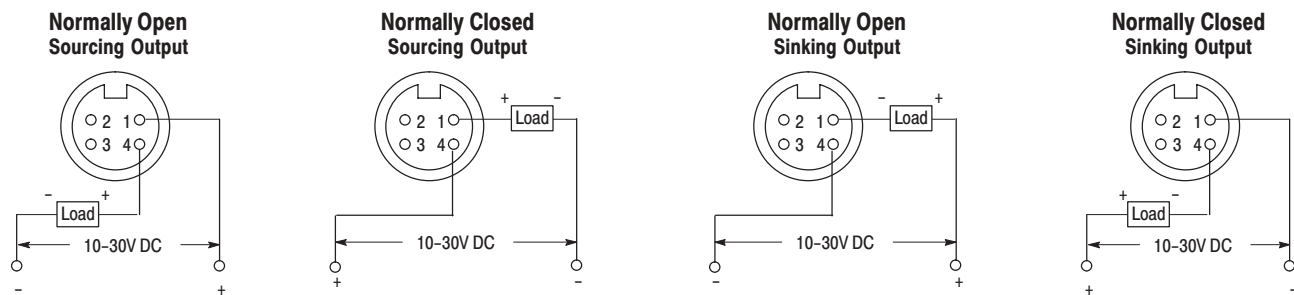
Dimensions—mm (inches)

Micro Quick-Disconnect Style



Thread Size	Shielded	mm (inches)			
		A	B (max)	C (min)	D (max)
M12 X 1	Y	12.0 (0.47)	65.0 (2.56)	38.1 (1.50)	—
	N		72.4 (2.85)		7.9 (0.31)
M18 X 1	Y	18.0 (0.71)	65.0 (2.56)		—
	N		76.5 (3.01)		12.2 (0.48)
M30 X 1.5	Y	30.0 (1.18)	65.0 (2.56)		—
	N		76.5 (3.01)		12.2 (0.48)

Wiring Diagrams



QD Cordsets and Accessories

Description	Page Number
Other Cordsets Available	7-8
Terminal Chambers	7-20
Mounting Brackets	2-186 - 2-190
End Caps	2-196
Mounting Nuts	2-197 - 2-198

872C WorldProx™ 4-Wire DC Complementary Output

Plastic Face/Threaded Nickel-Plated Brass Barrel



872C DC Cable Style
12, 18, 30mm
page 2-63



872C DC Micro
Quick-Disconnect Style
12, 18, 30mm
page 2-63

**Specifications**

Load Current	≤200mA
Leakage Current	≤10μA
Operating Voltage	10–30V DC
Voltage Drop	≤1.6V
Repeatability	≤8%
Hysteresis	≤10% 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 directives
Enclosure	NEMA 1, 2, 3, 4, 6P, 12, 13, IP67 (IEC 529); Nickel-plated brass barrel
Connections	Cable: 2m (6.5ft) length 4-conductor PVC Quick-Disconnect: 4-pin micro style
LED	Red: Output Energized, 360° visibility
Operating Temperature	–25°C to +70°C (–13°F to +158°F)
Shock	30g, 11ms
Vibration	55Hz, 1mm amplitude, 3 planes

Description

Bulletin 872C inductive proximity sensors are self-contained, solid-state devices designed to sense the presence of metal objects without touching them. These special 4-wire complementary output models provide both a normally open and a normally closed output in a single sensor. They are ideal for applications in which one load must be turned on and a second turned off in response to the same event.

Each device is enclosed by a plastic face and a nickel-plated brass housing which meet NEMA 1, 2, 3, 4, 12, 13 and IP67 (IEC 529) enclosure standards. The electronic circuitry is potted for protection against shock, vibration, and contamination.

These sensors are available in 12, 18 and 30mm diameters. Connection options include 2m (6.5ft.) PVC cable or micro quick-disconnect.

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-conductor or 4-pin connection
- 10–30V DC
- Complementary normally open and normally closed outputs
- Short circuit, false pulse, reverse polarity, overload and transient noise protection
- UL listed, c-UL certified and CE marked for all applicable directives

Inductive Proximity Sensors

872C WorldProx™ 4-Wire DC Complementary Output

Plastic Face/Threaded Nickel-Plated Brass Barrel

Product Selection

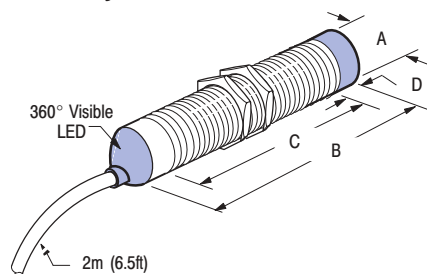
Barrel Diameter	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration		Switching Frequency (Hz)	Catalog Number	
						Cable Style	Micro QD Style
12mm	3 (0.12)	Y	N.O. and N.C.	PNP	2000	872C-D3BP12-E2	872C-D3BP12-D4
18mm	5 (0.20)				1000	872C-D5BP18-E2	872C-D5BP18-D4
30mm	10 (0.39)				500	872C-D10BP30-E2	872C-D10BP30-D4
Recommended Standard QD Cordset (-2 = 2m (6.5ft))							889D-F4AC-2

QD Cordsets and Accessories

Description	Page Number
Other Cordsets Available	7-8
Terminal Chambers	7-20
Mounting Brackets	2-186 - 2-190
End Caps	2-196
Mounting Nuts	2-197 - 2-198

Dimensions—mm (inches)

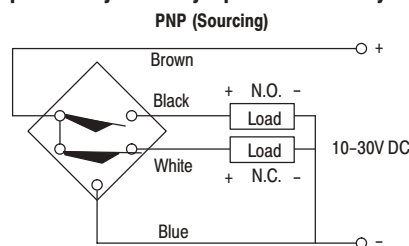
Cable Style



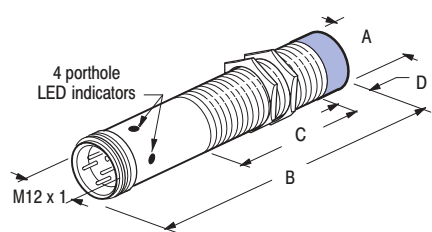
Thread Size	Shielded	mm (inches)		
		A	B	C
M12 X 1	Y	12.0 (0.47)	50.8 (2.00)	46.7 (1.84)
M18 X 1	Y	18.0 (0.71)		
M30 X 1.5	Y	30.0 (1.18)		

Wiring Diagram

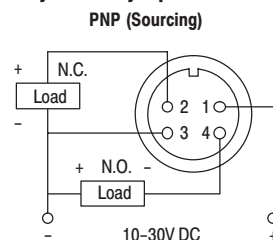
Complementary Normally Open and Normally Closed



Micro QD Style



Complementary Normally Open and Normally Closed



Thread Size	Shielded	mm (inches)		
		A	B	C
M12 X 1	Y	12.0 (0.47)	65.0 (2.56)	38.1 (1.50)
M18 X 1	Y	18.0 (0.71)		48.7 (1.88)
M30 X 1.5	Y	30.0 (1.18)		

872C WorldProx™ 2-Wire AC

Plastic Face/Threaded Nickel-Plated Brass Barrel



872C AC Cable Style
8mm



872C AC Cable Style
12, 18, 30mm
page 2-65



872C AC Mini
Quick-Disconnect Style
18, 30mm
page 2-65



872C AC Micro
Quick-Disconnect Style
12, 18, 30mm
page 2-65

**Specifications**

	8mm	12mm	30mm
Load Current	100mA max	≤300mA	≤500mA
Minimum Load Current	5mA		
Inrush Current (1 cycle)	≤2A		≤8A (18 & 30mm)
Leakage Current	≤2mA		
Operating Voltage	20–240V AC	20–250V AC	
Voltage Drop	≤5V		
Repeatability	≤5%		
Hysteresis	15%	≤15% typical	
False Pulse Protection	Incorporated		
Transient Noise Protection	Incorporated		
Approvals	CE marked for all applicable directives		
Enclosure	NEMA 1, 2, 3, 4, 12, 13 IP67 (IEC 529) Nickel-plated brass barrel		
Connections	Cable: 2m (6.5ft) length 3-conductor PVC Quick-Disconnect: 3-pin micro style 3-pin mini style		
LED	Red: Output Energized, 360° visibility		
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	0.9
Brass	0.5
Aluminum	0.45
Copper	0.4

Features

- 2-wire operation
- 3-conductor or 3-pin connection
- 20–250V AC (20–240V AC for 8mm)
- Normally open or normally closed output
- False pulse and transient noise protection
- Extended sensing distance on 18mm unshielded models
- CE marked for all applicable directives

Product Selection

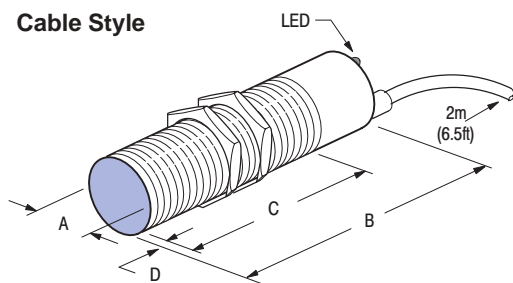
Barrel Diameter	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration	Switching Frequency (Hz)	Catalog Number		
					Cable Style	Mini QD Style	Micro QD Style
8mm	1.5 (0.06)	Y	N.O.	25	872C-A1N8-A2	—	—
			N.C.		872C-A1C8-A2	—	—
	2 (0.08)	N	N.O.		872C-A2N8-A2	—	—
			N.C.		872C-A2C8-A2	—	—
12mm	2 (0.08)	Y	N.O.	15	872C-A2N12-A2	—	872C-A2N12-R3
			N.C.		872C-A2C12-A2	—	872C-A2C12-R3
	4 (0.16)	N	N.O.		872C-A4N12-A2	—	872C-A4N12-R3
			N.C.		872C-A4C12-A2	—	872C-A4C12-R3
18mm	5 (0.20)	Y	N.O.		872C-A5N18-A2	872C-A5N18-N3	872C-A5N18-R3
			N.C.		872C-A5C18-A2	872C-A5C18-N3	872C-A5C18-R3
	10 (0.39)	N	N.O.		872C-A10N18-A2	872C-A10N18-N3	872C-A10N18-R3
			N.C.		872C-A10C18-A2	872C-A10C18-N3	872C-A10C18-R3
30mm	10 (0.39)	Y	N.O.		872C-A10N30-A2	872C-A10N30-N3	872C-A10N30-R3
			N.C.		872C-A10C30-A2	872C-A10C30-N3	872C-A10C30-R3
	15 (0.59)	N	N.O.		872C-A15N30-A2	872C-A15N30-N3	872C-A15N30-R3
			N.C.		872C-A15C30-A2	872C-A15C30-N3	872C-A15C30-R3
Recommended Standard QD Cordset (-6F = 1.8m (6ft), -2 = 2m (6.5ft))						889N-F3AFC-6F	889R-F3ACA-2

QD Cordsets and Accessories

Description	Page Number
Other Cordsets Available	7-8, 7-68
Terminal Chambers	7-20, 7-81
Mounting Brackets	2-186 - 2-190
End Caps	2-196
Mounting Nuts	2-197 - 2-198

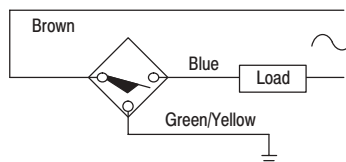
Dimensions—mm (inches)

Cable Style

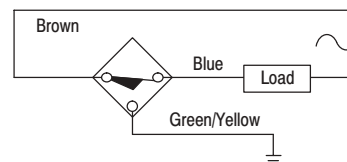


Wiring Diagrams

Normally Open



Normally Closed

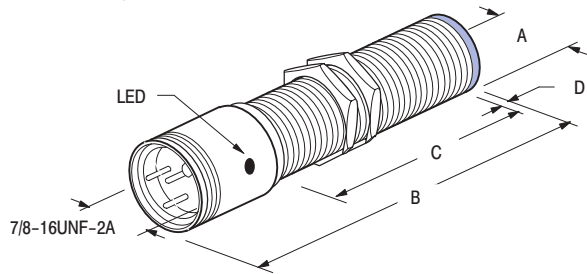


NOTE: Load can be switched to brown wire.

Thread Size	Shielded	mm (inches)			
		A	B	C	D
M8 X 1	Y	8.0 (0.32)	47.0 (1.85)	36.0 (1.42)	—
	N	6.0 (0.24)	47.0 (1.85)	36.0 (1.42)	6.0 (0.24)
M12 X 1	Y	12.0 (0.47)	70.0 (2.76)	60.0 (2.36)	—
	N			54.0 (2.13)	6.0 (0.24)
M18 X 1	Y	18.0 (0.71)	60.0 (2.36)	50.0 (1.96)	—
	N			42.0 (1.65)	8.0 (0.31)
M30 X 1.5	Y	30.0 (1.18)	60.0 (2.36)	50.0 (1.96)	—
	N			38.0 (1.50)	12.0 (0.47)

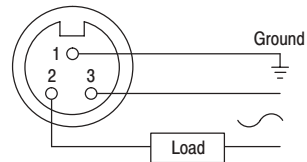
Dimensions—mm (inches)

Mini QD Style



Wiring Diagrams

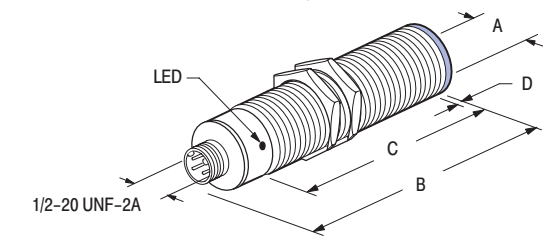
Normally Open or Normally Closed



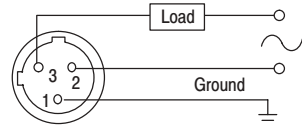
Note: Load can be switched to pin 3.

Thread Size	Shielded	mm (inches)			
		A	B	C	D
M18 X 1	Y	18.0 (0.71)	90.5 (3.56)	53.5 (2.09)	—
	N			45.5 (1.77)	8.0 (0.31)
M30 X 1.5	Y	30.0 (1.18)	90.0 (3.54)	56.0 (2.20)	—
	N			44.0 (1.73)	12.0 (0.47)

Micro Quick-Disconnect Style



Normally Open or Normally Closed



Note: Load can be switched to pin 2.

Thread Size	Shielded	mm (inches)			
		A	B	C	D
M12 X 1	Y	12.0 (0.47)	80.0 (3.15)	60.0 (2.36)	—
	N			54.0 (2.13)	6.0 (0.24)
M18 X 1	Y	18.0 (0.71)	80.0 (3.15)	60.0 (2.36)	—
	N			52.0 (2.05)	8.0 (0.31)
M30 X 1.5	Y	30.0 (1.18)	80.0 (3.15)	60.0 (2.36)	—
	N			48.0 (1.89)	12.0 (0.47)

Inductive Proximity Sensors

872C WorldProx™ 2-Wire AC/DC Relay Output

Threaded Nickel-Plated Brass Barrel



872C AC/DC Cable Style
30mm
page 2-68



Description

Bulletin 872C relay output inductive proximity sensors are self-contained, solid-state devices designed to sense the presence of metal objects without touching them. This special relay output model has a contact rating of 3amps.

The electronic circuitry is potted for protection against shock, vibration, and contamination. The switch is enclosed by a plastic face and a threaded nickel-plated brass barrel which meets NEMA 1, 2, 3, 3R, 4, 4X, 6, 6P, 12, 13 and IP67 (IEC 529) standards.

This sensor is available in a 30mm diameter cable version.

Features

- High output current capability—up to 3amps
- N.O. and N.C. contacts in the same unit
- Isolated outputs
- 360° LED
- 30–132V AC/DC supply voltage
- Reverse polarity protection (DC)
- Circuit protected against industrial noise and transients
- UL listed, c–UL certified and CE marked for all applicable directives

Specifications

Load Current	Switched Power, Max Switched Current, Max Switched Voltage, Max Relay Life	84W or 900VA 3amps SPDT 28V DC or 300V AC 20,000,000 operations (no load), 100,000 operations (full load)
Operating Voltage	30–132V AC/DC	
Repeatability	≤10% at constant temperature	
Hysteresis	10% typical	
False Pulse Protection	Incorporated	
Transient Noise Protection	Incorporated	
Reverse Polarity Protection	Incorporated	
Approvals	UL listed, c–UL certified and CE marked for all applicable directives	
Enclosure	NEMA 1, 2, 3, 3R 4, 4X, 6, 6P, 12, 13, IP67 (IEC 529); Nickel-plated brass barrel	
Connections	Cable: 2m (6.5ft) length 5-conductor 22AWG PVC cable	
LED	Red: Output Energized, 360° visibility	
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

Inductive Proximity Sensors

872C WorldProx™ 2-Wire AC/DC Relay Output

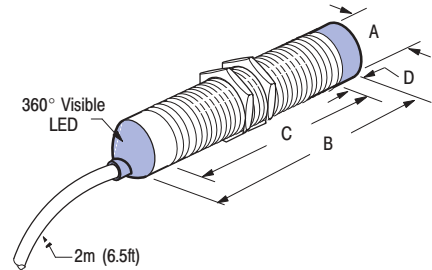
Threaded Nickel-Plated Brass Barrel

Product Selection

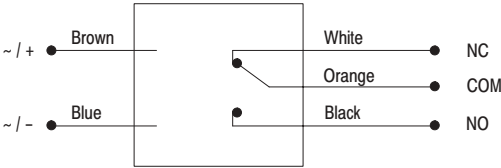
Barrel Diameter	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration	Switching Frequency (Hz)	Catalog Number
30mm	10 (0.39)	Y	SPDT Relay	100	872C-B10BR30-E2
	15 (0.59)	N			872C-B15BR30-E2

Dimensions—mm (inches)

Cable Style



Wiring Diagram



Thread Size	Shielded	mm (inches)			
		A	B (max)	C (min)	D (max)
M30 X 1.5	Y	30 (1.18)	61.0 (2.40)	57.0 (2.24)	—
	N		73.0 (2.87)		12.2 (0.48)



Description

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

The switch body consists of a plastic or stainless steel face and a threaded stainless steel barrel. It meets NEMA 1, 2, 3, 4, 12, 13 and IP67 (IEC 529) enclosure standards. The electronic circuitry is potted for protection against shock, vibration, and contamination.

These sensors are available in 12 and 18mm diameters. Connection options include a PVC cable and mini quick-disconnect.

Ferrous Selective Proximity Sensors

The Bulletin 871T ferrous (Fe) selective inductive proximity sensors operate in industrial environments where ferrous metal targets must be sensed without being touched. They are also an excellent replacement for standard inductive proximities that are sensing ferrous metals and subject to harsh environments. The 3mm nominal sensing distance models are designed to ignore all sizes of nonferrous chips and foils. The 5mm nominal sensing distance models are designed to replace standard inductive proximities when sensing ferrous metals or ignoring nonferrous chips smaller than 0.125 (3mm).

The Fe-selective proximity sensors have a stainless steel sensing face and body. The stainless steel sensing face provides extra protection in sensor applications where the sensing face is

subjected to abrasion and chemicals. Typical proximity sensors have plastic sensing faces.

These sensors are self-contained, solid state, dual output devices which will energize and de-energize external loads. Each sensor has a normally open (N.O.) and an isolated normally closed (N.C.) output which can be operated up to 500mA each. As with any sensor each application and target material should be reviewed before installing the sensor. Detailed specifications for these sensors are listed on page 2-74.

Features

- Threaded stainless steel barrel
- Cable or quick-disconnect styles
- Short circuit protection (DC models)
- Overload protection (DC models)
- Transient noise protection
- False pulse protection
- Reverse polarity protection (DC models)
- UL listed, CSA certified, and CE marked for all applicable directives

Styles

DC 3-Wire	page 2-70
AC 2-Wire	page 2-72
Ferrous Selective AC 2-Wire or 4-Wire	page 2-74

Accessories

Quick-Disconnect Cables ...	page 7-1
Conduit Adaptor	page 2-185
Mounting Bracket, Spring Return Style	page 2-186
Mounting Bracket, Right Angle Style	page 2-189
Mounting Bracket, Clamp Style	page 2-190
End Caps	page 2-196
Mounting Nuts	page 2-197
Lock Washers	page 2-199

General Information

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

Inductive Proximity Sensors

871T 3-Wire DC

Plastic Face/Threaded Stainless Steel Barrel



871T DC Cable Style
12, 18mm
page 2-71



871T DC Mini
Quick-Disconnect Style
18mm
page 2-71



Features

- 3-wire operation
- 3-conductor or 4-pin connection
- 10–30V DC
- Normally open output
- Short circuit, overload, false pulse, reverse polarity and transient noise protection
- UL listed, CSA certified, and CE marked for all applicable directives

Specifications

	12mm	18mm
Load Current	≤300mA	≤400mA
Leakage Current	≤10μA	
Operating Voltage	10–30V DC	
Voltage Drop	≤1V	
Repeatability	≤10%	
Hysteresis	≤10% typical	
False Pulse Protection	Incorporated	
Transient Noise Protection	Incorporated	
Reverse Polarity Protection	Incorporated	
Short Circuit Protection	Incorporated	
Overload Protection	Incorporated	
Approvals	UL listed, CSA certified, and CE marked for all applicable directives	
Enclosure	NEMA 1, 2, 3, 4, 12 and 13 IP67 (IEC 529) 303 Stainless steel barrel	
Connections	Cable: 3m (10ft) length 3-conductor PVC Quick-Disconnect: 4-pin mini style	
LED	Red: Output Energized	
Operating Temperature	–40°C to +70°C (–40°F to +158°F)	

Correction Factors

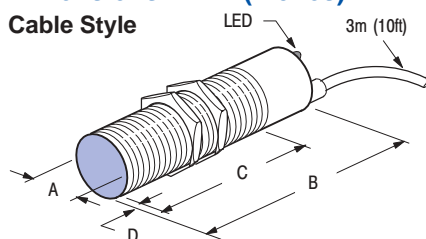
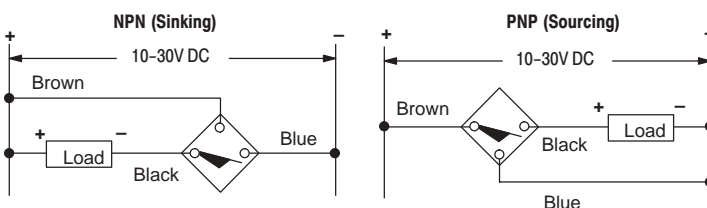
Target Material	Correction Factors
Steel	1.0
Stainless Steel	0.7–0.9
Brass	0.3–0.5
Aluminum	0.3–0.4
Copper	0.3–0.4

Product Selection

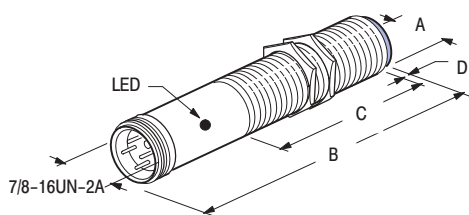
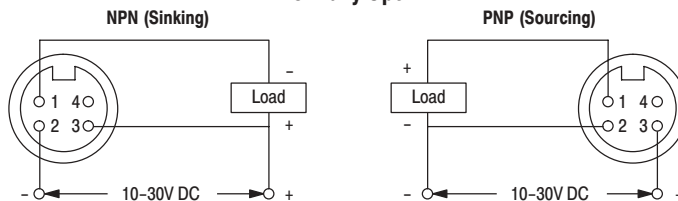
Barrel Diameter	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration		Switching Frequency (Hz)	Catalog Number	
						Cable Style	Mini QD Style
12mm	2 (0.08)	Y	N.O.	NPN	2000	871T-R2A12	—
	4 (0.16)	N		PNP		871T-L2A12	—
				NPN	1000	871T-R4B12	—
				PNP		871T-L4B12	—
18mm	5 (0.20)	Y	N.O.	NPN	1000	871T-R5A18	871T-R5J18
	8 (0.31)	N		PNP		871T-L5A18	871T-L5J18
				NPN	500	871T-R8B18	871T-R8K18
				PNP		871T-L8B18	871T-L8K18
Recommended Standard QD Cordset (–6F = 1.8m (6ft))							889N-F4AFC-6F

QD Cordsets and Accessories

Description	Page Number
Other Cordsets Available	7–8
Terminal Chambers	7–20
Mounting Brackets	2–186 – 2–190
End Caps	2–196
Mounting Nuts	2–197 – 2–198

Dimensions—mm (inches)**Cable Style****Wiring Diagrams****Normally Open**

Thread Size	Shielded	mm (inches)			
		A	B	C	D
M12 X 1	Y	12.0 (0.47)	80.0 (3.15)	53.8 (2.12)	0.8 (0.03)
	N			46.5 (1.83)	8.1 (0.32)
M18 X 1	Y	18.0 (0.71)	81.5 (3.21)	55.6 (2.19)	0.8 (0.03)
	N		81.3 (3.20)	43.7 (1.72)	12.3 (0.48)

Mini Quick-Disconnect Style**Normally Open**

Thread Size	Shielded	mm (inches)			
		A	B	C	D
M18 X 1	Y	18.0 (0.71)	96.9 (3.81)	51.9 (2.04)	0.8 (0.03)
	N		96.9 (3.81)	40.4 (1.59)	12.3 (0.48)

871T 2-Wire AC

Plastic Face/Threaded Stainless Steel Barrel



871T AC Cable Style
12, 18mm
page 2-73



871T AC Mini
Quick-Disconnect Style
18mm
page 2-73

**Features**

- 2-wire operation
- 2-conductor, 3-conductor, or 3-pin connection
- 20–132V AC
- False pulse and transient noise protection
- Normally open or normally closed output
- UL listed, CSA certified, and CE marked for all applicable directives

Specifications

	12mm	18mm
Load Current	≤300mA	≤500mA
Inrush Current (1 cycle)	≤3A	≤5A
Leakage Current	≤1.5mA	
Supply Current (minimum)	5mA	
Operating Voltage	20–132V AC	
Voltage Drop	6.5V AC at 500mA, 10V AC at 20mA (RMS)	
Repeatability	≤10%	
Hysteresis	≤10% typical	
False Pulse Protection	Incorporated	
Transient Noise Protection	Incorporated	
Approvals	UL listed, CSA certified, and CE marked for all applicable directives	
Enclosure	NEMA 1, 2, 3, 4, 12 and 13 IP67 (IEC 529) 303 Stainless steel barrel	
Connections	Cable: 3m (10ft) length 12mm—2 conductor PVC 18mm—3 conductor PVC Quick-Disconnect: 3-pin mini style	
LED	Red: Output Energized (none on 871T-G5Q18FT)	
Operating Temperature	–40°C to +70°C (–40°F to +158°F)	
Shock	30g, 11ms	
Vibration	55Hz, 1mm amplitude, 3 planes	

Correction Factors

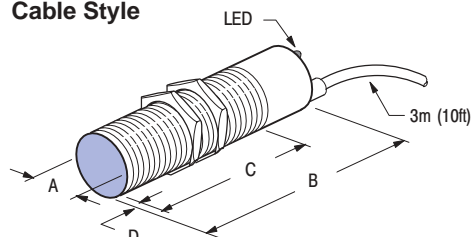
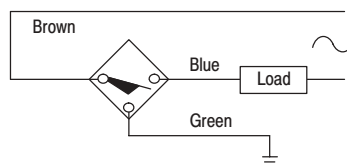
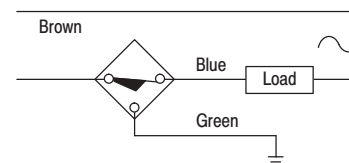
Target Material	Correction Factors
Steel	1.0
Stainless Steel	0.7–0.9
Brass	0.3–0.5
Aluminum	0.3–0.4
Copper	0.3–0.4

Product Selection

Barrel Diameter	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration	Switching Frequency (Hz)	Catalog Number	
					Cable Style	Mini QD Style
12mm	2 (0.08)	Y	N.O.	50	871T-G2A12	—
	4 (0.16)	N			871T-G4B12	—
	2 (0.08)	Y	871T-H2A12		—	
	4 (0.16)	N	871T-H4B12		—	
18mm	5 (0.20)	Y	N.O.		871T-G5A18	871T-G5J18
	8 (0.31)	N			—	871T-G5Q18FT
	5 (0.20)	Y	N.C.		871T-G8B18	871T-G8K18
	5 (0.20)	Y			871T-H5A18	871T-H5J18
	8 (0.31)	N			871T-H8B18	871T-H8K18
Recommended Standard QD Cordset (-6F = 1.8m (6ft))						889N-F3AFC-6F

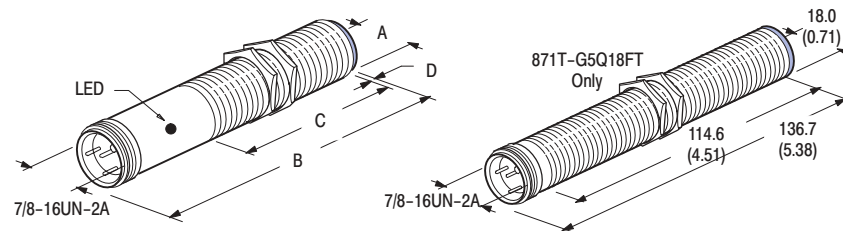
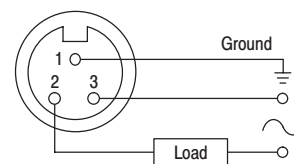
QD Cordsets and Accessories

Description	Page Number
Other Cordsets Available	7-8
Terminal Chambers	7-20
Mounting Brackets	2-186 - 2-190
End Caps	2-196
Mounting Nuts	2-197 - 2-198

Dimensions—mm (inches)**Cable Style****Wiring Diagrams****Normally Open****Normally Closed**

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

Thread Size	Shielded	mm (inches)			
		A	B	C	D
M12 X 1	Y	12.0 (0.47)	80.0 (3.15)	53.8 (2.12)	0.8 (0.03)
	N			46.5 (1.83)	8.1 (0.32)
M18 X 1	Y	18.0 (0.71)	81.5 (3.21)	55.6 (2.19)	0.8 (0.03)
	N		81.3 (3.20)	43.7 (1.72)	12.3 (0.48)

Mini Quick-Disconnect Style**Normally Open or Normally Closed**

Note: Load can be switched to pin 3.

Thread Size	Shielded	mm (inches)			
		A	B	C	D
M18 X 1	Y	18.0 (0.71)	96.9 (3.81)	51.9 (2.04)	0.8 (0.03)
	N			40.4 (1.59)	12.3 (0.48)

871T 2-Wire or 4-Wire AC Ferrous Selective

Stainless Steel Face/Threaded Stainless Steel Barrel



871T AC Cable Style
18mm
page 2-75



871T AC Mini
Quick-Disconnect Style
18mm
page 2-75

**Features**

- 2-wire or 4-wire operation
- 20–132V AC
- Normally open or complementary (N.O. and N.C.) outputs
- Ferrous selective sensing
- Stainless steel active sensing face
- False pulse and transient noise protection
- CE marked for all applicable directives

Specifications

Load Current	≤500mA
Inrush Current (1 cycle)	≤5A
Supply Current (minimum)	5mA
Leakage Current	≤1.7mA
Operating Voltage	20–132V AC
Voltage Drop	N.O. output: 6.5V AC at 500mA, 10V AC at 20mA (RMS) N.C. output: 1.7V AC at 500mA (RMS)
Isolation Voltage	800V AC (output to output); 1500V AC (output to housing)
Repeatability	≤10%
Hysteresis	≤10% typical
False Pulse Protection	Incorporated (Delay on power-up ≤100ms)
Transient Noise Protection	Incorporated
Approvals	CE marked for all applicable directives
Enclosure	NEMA 3, 4, 12 and 13, IP67 (IEC 529) Stainless steel face and barrel
Connections	Cable: 3.6m (12ft) length 5-conductor PVC Quick-Disconnect: 5-pin mini style 3-pin mini style
LEDs	Red: Output Energized Green: Power
Ambient Temperature	–0°C to +70°C (+32°F to +158°F)

Correction Factors

Target Material	Correction Factor
Steel	1.0
Stainless Steel ^❶	0.8–1.1
Brass	0.0
Aluminum	0.0
Copper	0.0

❶ Stainless Steel containing carbon

871T 2-Wire or 4-Wire AC Ferrous Selective

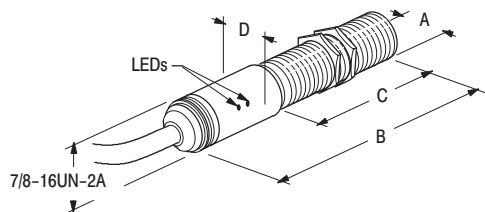
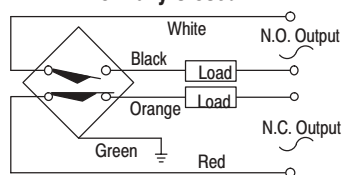
Stainless Steel Face/Threaded Stainless Steel Barrel

Product Selection

Barrel Diameter	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration	Switching Frequency (Hz)	Catalog Number		
					Cable Style	Mini QD 3-pin Style	Mini QD 5-pin Style
18mm	3 (0.12)	Y	N.O. and N.C.	10	871T-A3A18FE-12	—	871T-A3J18FE
	871T-A5A18FE-12				—	871T-A5J18FE	
	3 (0.12)		N.O.		—	871T-AX01	—
Recommended Standard QD Cordset (–6F = 1.8m (6ft))						889N-F3AFC-6F	889N-F5AFC-6F

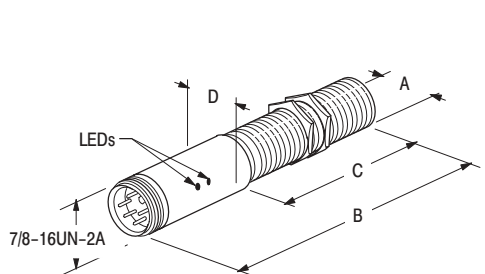
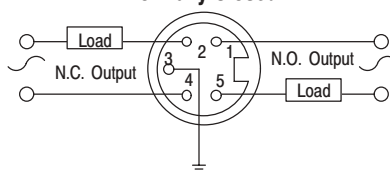
QD Cordsets and Accessories

Description	Page Number
Other Cordsets Available	7–8
Terminal Chambers	7–20
Mounting Brackets	2–186 – 2–190
End Caps	2–196
Mounting Nuts	2–197 – 2–198

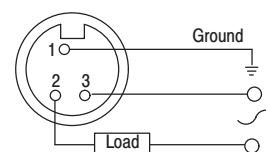
Dimensions—mm (inches)**Cable Style****Wiring Diagrams****Complementary Normally Open and Normally Closed****Notes:**

1. N.O. output must be wired for operation. N.C. output is optional.
2. N.O. load can be switched to white wire.
3. N.C. load can be switched to red wire.

Thread Size	mm (inches)				Catalog Number
	A	B	C	D	
M18x1	18.0 (0.71)	104.1 (4.10)	53.3 (2.10)	20.3 (0.80)	871T-A3A18FE-12
		101.6 (4.00)	50.8 (2.00)		871T-A5A18FE-12

Mini Quick-Disconnect Style**Normally Open and Normally Closed****Notes:**

1. N.O. output must be wired for operation. N.C. output is optional.
2. N.O. load can be switched to pin 1.
3. N.C. load can be switched to pin 3.

Normally Open**Note:** Load can be switched to pin 3.

Thread Size	mm (inches)				Catalog Number	
	A	B	C	D		
M18x1	18.0 (0.71)	104.1 (4.10)	53.3 (2.10)	20.3 (0.80)	871T-AX01	
		101.6 (4.00)	50.8 (2.00)		871T-A3J18FE	
					871T-A5J18FE	

Notes



Description

Bulletin 871C inductive proximity sensors are self-contained, general purpose, solid-state devices designed to sense the presence of ferrous and non-ferrous metal objects without touching them.

The switch body consists of a plastic face and either a nickel-plated brass barrel or plastic barrel. The electronic circuitry is potted for protection against shock, vibration, and contamination.

These sensors are available in 3, 4, 5, 8, 12, 18 and 30mm diameters, with smooth or threaded barrels. Connection options include a 2m cable, micro quick-disconnect, and pico quick-disconnect.

Features

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

Styles

- DC 3-Wire Small Diameter . . . page 2-78
- Extended Temperature Range
DC 3-Wire page 2-81
- AC 2-Wire Full-Featured . . . page 2-83
- AC 2-Wire Plastic Barrel . . . page 2-86
- NAMUR Intrinsically Safe . . page 2-88
- Analog Output page 2-91

Accessories

- Quick-Disconnect Cables . . . page 7-1
- Conduit Adaptors page 2-185
- Mounting Brackets,
Spring Return Style page 2-186
- Mounting Brackets,
Swivel/Tilt Style page 2-188
- Mounting Brackets,
Right Angle Style page 2-189
- Mounting Brackets,
Clamp Style page 2-190
- End Caps page 2-196
- Mounting Nuts page 2-197
- Lock Washers page 2-199

General Information

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

❶ AC full-featured and DC models only.

871C 3-Wire DC

Plastic Face/Small Threaded or Smooth Nickel-Plated Brass Barrel



871C DC Cable Style
Smooth Barrel
3, 4mm
page 2-79



871C DC Cable Style
Threaded Barrel
4, 5mm
page 2-79



871C DC Cable Style
Smooth Barrel
4mm
page 2-79



871C DC Pico Quick-Disconnect
Style Threaded Barrel
5mm
page 2-79

**Specifications**

Barrel Diameter	3mm	4, 5mm
Load Current	≤100mA	≤200mA
Leakage Current	≤0.1mA	
Operating Voltage	10–30V DC	
Voltage Drop	≤2.5V	
Repeatability	≤5%	
Hysteresis	15% typical	
False Pulse Protection	Incorporated	
Transient Noise Protection	No	Incorporated
Reverse Polarity Protection	Incorporated	
Short Circuit Protection	Incorporated (most models)	
Approvals	CE marked for all applicable directives (except for 3mm models)	
Enclosure	NEMA 1, 2, 3, 4, 12, 13 IP67 (cable only) IP65 (qd only) (IEC 529); Nickel-plated brass barrel	
Connections	Cable: 2m (6.5ft) length 3-conductor PVC Quick-Disconnect: 3-pin pico style	
LED	Red or Yellow: 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	0.3–0.4

Features

- 3-wire operation
- 3-conductor, 3-pin or 4-pin connection
- 10–30V DC
- Normally open or normally closed output
- False pulse, transient noise, reverse polarity and short circuit protections (most models)
- CE marked for all applicable directives (except for 3mm models)

Product Selection

Barrel Diameter	Barrel Type	Nominal Sensing Distance mm (in)	Shielded	Output Configuration		Switching Frequency (Hz)	Catalog Number		
							Cable Style	Pico QD Style	
3mm	Smooth	0.6 (0.02)	Y	N.O.	NPN	3000	871C-DM1NN3-E2	—	
					PNP		871C-DM1NP3-E2	—	
4mm	Smooth	0.8 (0.03)	Y	N.O.	NPN	3000	871C-DM1NN4-E2	871C-DM1NN4-P3	
					PNP		871C-DM1NP4-E2	—	
4mm	Threaded	0.6 (0.02)	Y	N.O.	NPN	3000	871C-D1NN4-E2	—	
					PNP		871C-D1NP4-E2	—	
5mm	Threaded	1 (0.04)	Y	N.O.	NPN	3000	871C-D1NN5-E2	871C-D1NN5-P3	
					PNP		871C-D1NP5-E2	871C-D1NP5-P3	
Recommended Standard QD Cordset (–2 = 2m (6.5ft))									889P-F3AB-2

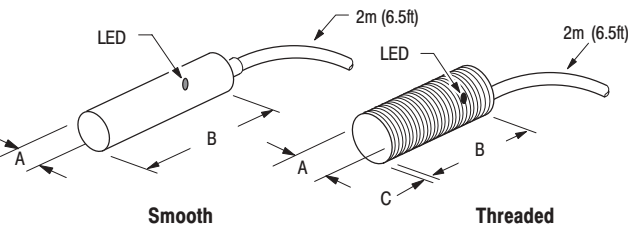
QD Cordsets and Accessories

Description	Page Number
Other Cordsets Available	7–88
Terminal Chambers	7–20
Mounting Brackets	2–186 – 2–190
End Caps	2–196
Mounting Nuts	2–197 – 2–198

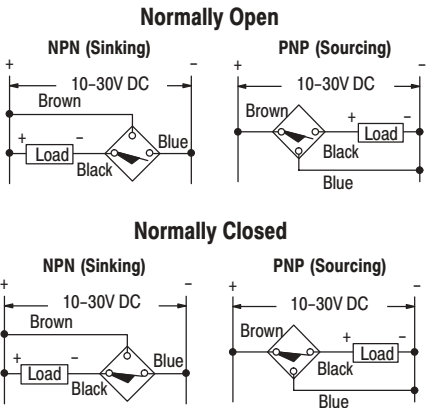
871C 3-Wire DC

Plastic Face/Small Threaded or Smooth Nickel-Plated Brass Barrel

Dimensions—mm (inches)
Cable Style

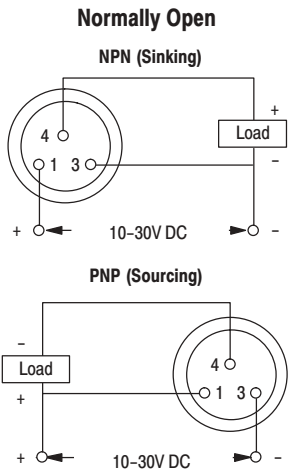
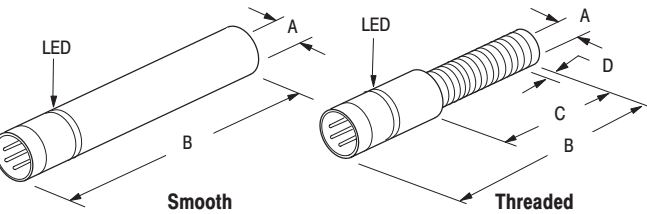


Wiring Diagram



Smooth Diameter	Thread Size	Shielded	mm (inches)		
			A	B	C
3.0	—	Y	3.0 (0.12)	22.0 (0.87)	—
4.0	—	Y	4.0 (0.16)	25.0 (0.98)	—
—	M4 x 0.5	Y	4.0 (0.16)	22.0 (0.87)	—
—	M5 x 0.5	Y	5.0 (0.20)	25.0 (0.98)	—

Pico QD Style



Smooth Diameter	Thread Size	Shielded	mm (inches)			
			A	B	C	D
4.0	—	Y	4.0 (0.16)	38.0 (1.50)	19.0 (0.74)	—
—	M5 x 0.5	Y	5.0 (0.20)	38.0 (1.50)	23.0 (0.90)	—

871C 3-Wire DC Extended Temperature

Plastic Face/Threaded Nickel-Plated Brass Barrel



871C DC Cable Style
12, 18, 30mm
page 2-82



871C DC Micro
Quick-Disconnect Style
12, 18, 30mm
page 2-82

**Specifications**

Load Current	1–200mA
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) Nickel-plated brass barrel
Connections	Cable: 2m (6.5ft) length 3-conductor PUR Quick-Disconnect: 4-pin micro style
LED	Orange: Output Energized
Operating Temperature	–40°C to +100°C (–40°F to +212°F)
Shock	30g, 11ms
Vibration	55Hz, 1mm amplitude, 3 planes

Description

Bulletin 871C inductive proximity sensors are self-contained, solid state devices designed for most industrial applications where it is required to sense the presence of metal objects without touching them. These special extended temperature models are ideal for industrial environments where temperatures can reach as high as 212°F (100°C) or as low as –40°F (–40°C). They are available for current source (PNP) operation with a normally open output.

Each switch has a plastic face and a nickel-plated brass housing which meet NEMA 1, 2, 3, 4, 12, 13 and IP67 (IEC 529) enclosure standards. The electronic circuitry is potted for protection against shock, vibration, and contamination.

These sensors are available in 12, 18, and 30mm diameters. Connection options include: 2m (6.5ft) PUR cable or micro quick-disconnect (4 pin, 1 keyway).

Features

- 3-wire operation
- 3-conductor or 4-pin connection
- 10–30V DC
- Extended temperature range
- Normally open output
- Short circuit, false pulse, reverse polarity, overload and transient noise protection
- CE marked for all applicable directives

Correction Factors

Target Material	Correction Factor
Steel	1.0
Stainless Steel	0.9
Brass	0.5
Aluminum	0.45
Copper	0.4

871C 3-Wire DC Extended Temperature

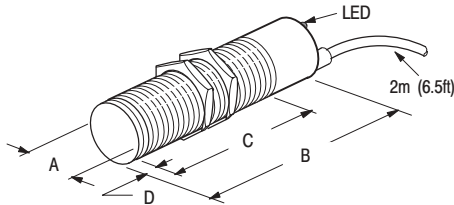
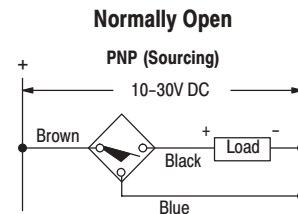
Plastic Face/Threaded Nickel-Plated Brass Barrel

Product Selection

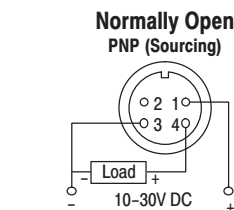
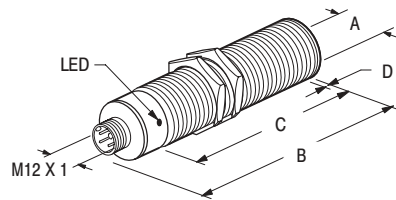
Barrel Diameter	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration		Switching Frequency (Hz)	Catalog Number	
						Cable Style	Micro QD Style
12mm	2 (0.08)	Y	N.O.	PNP	2000	871C-DT2NP12-U2	871C-DT2NP12-D4
	4 (0.16)	N			1000	871C-DT4NP12-U2	871C-DT4NP12-D4
18mm	5 (0.20)	Y	N.O.	PNP	1000	871C-DT5NP18-U2	871C-DT5NP18-D4
	8 (0.31)	N			500	871C-DT8NP18-U2	871C-DT8NP18-D4
30mm	10 (0.39)	Y	N.O.	PNP	500	871C-DT10NP30-U2	871C-DT10NP30-D4
	15 (0.59)	N			300	871C-DT15NP30-U2	871C-DT15NP30-D4
Recommended Standard QD Cordset (-2 = 2m (6.5ft))							889D-F4AC-2

QD Cordsets and Accessories

Description	Page Number
Other Cordsets Available	7-41
Terminal Chambers	7-20
Mounting Brackets	2-186 - 2-190
End Caps	2-196
Mounting Nuts	2-197 - 2-198

Dimensions—mm (inches)**Cable Style****Wiring Diagram**

Thread Size	Shielded	mm (inches)			
		A	B	C	D
M12 X 1	Y	12.0 (0.47)	40.0 (1.57)	40.0 (1.57)	—
	N			34.0 (1.34)	6.0 (0.24)
M18 X 1	Y	18.0 (0.71)		40.0 (1.57)	—
	N			32.0 (1.26)	8.0 (0.31)
M30 X 1.5	Y	30.0 (1.18)		40.0 (1.57)	—
	N			28.0 (1.12)	12.0 (0.47)

Micro QD Style

Thread Size	Shielded	mm (inches)			
		A	B	C	D
M12 X 1	Y	12.0 (0.47)	60.0 (2.36)	40.0 (1.57)	—
	N			34.0 (1.34)	6.0 (0.24)
M18 X 1	Y	18.0 (0.71)		40.0 (1.57)	—
	N			32.0 (1.26)	8.0 (0.31)
M30 X 1.5	Y	30.0 (1.18)		40.0 (1.57)	—
	N			28.0 (1.10)	12.0 (0.47)

871C 2-Wire AC Full Featured

Plastic Face/Threaded Nickel-Plated Brass Barrel



871C AC Cable Style
18, 30mm
page 2-84



871C AC Mini
Quick-Disconnect Style
12, 18, 30mm
page 2-84



871C AC Micro
Quick-Disconnect Style
12, 18, 30mm
page 2-84

**Features**

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

Specifications

Barrel Diameter	12mm	18mm
Load Current	≤250mA	≤400mA
Minimum Load Current	5mA	
Inrush Current (1 cycle)	≤2A	≤4A
Leakage Current	≤1.7mA at 120V AC	
Operating Voltage	40–250V AC	
Voltage Drop	≤5V at 250mA, 10V at 10mA	≤5V at 400mA 10V at 10mA
Repeatability	≤10% at constant temperature	
Hysteresis	10% typical	
False Pulse Protection	Incorporated	
Transient Noise Protection	Incorporated	
Short Circuit Protection	Incorporated	
Overload Protection	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) Nickel plated brass barrel	
Connections	Cable: 2m (6.5ft) length 2-conductor PVC Quick Disconnect: 3-pin micro style 3-pin mini style	
LED	Red: 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	0.9
Brass	0.5
Aluminum	0.45
Copper	0.4

Inductive Proximity Sensors

871C 2-Wire AC Full Featured

Plastic Face/Threaded Nickel–Plated 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	—	871C-A2N12-N3	871C-A2N12-R3
			N.C.	20	—	871C-A2C12-N3	871C-A2C12-R3
18mm	5 (0.20)	Y	N.O.	30	871C-A5N18-A2	871C-A5N18-N3	871C-A5N18-R3
			N.C.	20	871C-A5C18-A2	871C-A5C18-N3	871C-A5C18-R3
30mm	10 (0.39)	Y	N.O.	30	871C-A10N30-A2	871C-A10N30-N3	871C-A10N30-R3
			N.C.	20	871C-A10C30-A2	871C-A10C30-N3	871C-A10C30-R3
Recommended Standard QD Cordset (-6F = 1.8m (6ft), -2 = 2m (6.5ft))						889N-F3AFC-6F	889R-F3ACA-2

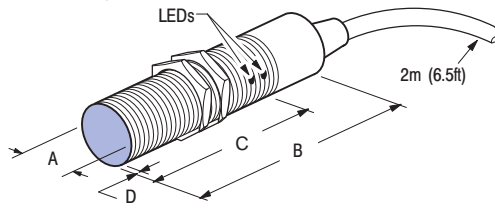
QD Cordsets and Accessories

Description	Page Number
Other Cordsets Available	7–8, 7–68
Mounting Brackets	2–186 – 2–190
End Caps	2–196
Mounting Nuts	2–197 – 2–198

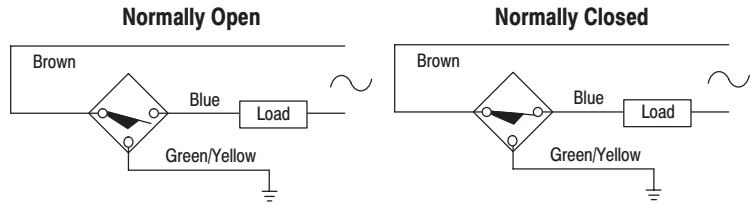
Inductive Proximity Sensors
871C 2-Wire AC Full Featured
 Plastic Face/Threaded Nickel-Plated Brass Barrel

Dimensions—mm (inches)

Cable Style



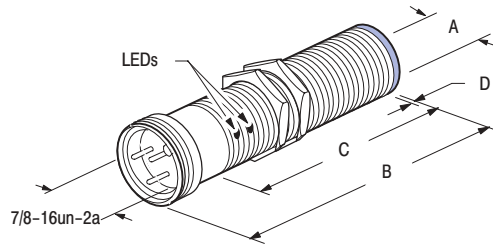
Wiring Diagram



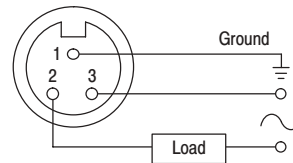
Note: Load can be switched to brown wire.

Thread Size	Shielded	mm (inches)			
		A	B	C	D
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)

Mini QD Style



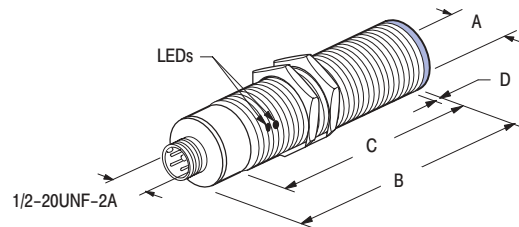
Normally Open or Normally Closed



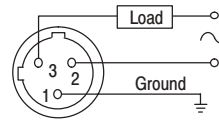
Note 1: No ground wire on 12mm. Attach housing to ground.
Note 2: Load can be switched to pin 3.

Thread Size	mm (inches)			
	A	B	C	D
M12 X 1	12.0 (0.47)	83.3 (3.28)	37.5 (1.48)	0.8 (0.03)
M18 X 1	18.0 (0.71)	72.5 (2.85)	52.4 (2.06)	
M30 X 1.5	30.0 (1.18)	86.5 (3.41)	62.6 (2.47)	

Micro QD Style



Normally Open or Normally Closed



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

Thread Size	mm (inches)			
	A	B	C	D
M12 X 1	12.0 (0.47)	85.3 (3.36)	38.11 (1.50)	0.8 (0.03)
M18 X 1	18.0 (0.71)	80.3 (3.16)	56.7 (2.23)	
M30 X 1.5	30.0 (1.18)	85.7 (3.37)	62.6 (2.47)	

871C 2-Wire AC

Plastic Face/Threaded Plastic Barrel



871C AC Cable Style
18, 30mm
page 2-87

**Specifications**

Barrel Diameter	18mm	30mm
Load Current	≤180mA	≤300mA
Inrush Current (1 cycle)	≤1A	≤3A
Leakage Current	≤1.7mA	
Operating Voltage	24–250V AC	
Voltage Drop	≤11V	
Hysteresis	≤20% typical	
Transient Noise Protection	Incorporated	
Approvals	CE marked for all applicable directives	
Enclosure	NEMA 1, 2, 3, 4, 4X, 12, 13 IP67 (IEC 529) Plastic barrel	
Connections	Cable: 2m (6.5ft) length 2-conductor PVC	
LED	Red: Output energized	
Operating Temperature	–25°C to +55°C (–13°F to +131°F)	
Shock	30g, 11ms	
Vibration	55Hz, 1mm amplitude, 3 planes	

Features

- 2-wire operation
- 2-conductor connection
- 24–250V AC
- Normally open or normally closed output
- 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

Product Selection

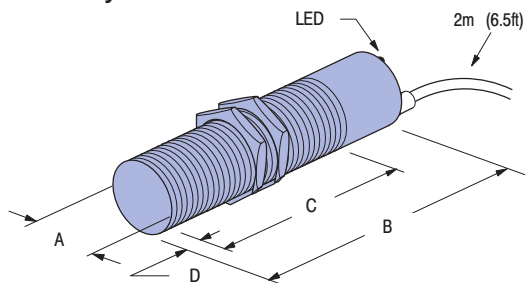
Barrel Diameter	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration	Switching Frequency (Hz)	Catalog Number
					Cable Style
18mm	5 (0.20)	Y	N.O.	8	871C-C5S18
			N.C.		871C-D5S18
	8 (0.31)	N	N.O.		871C-C8R18
			N.C.		871C-D8R18
30mm	10 (0.39)	Y	N.O.		871C-C10S30
			N.C.		871C-D10S30
	15 (0.59)	N	N.O.		871C-C15R30
			N.C.		871C-D15R30

Accessories

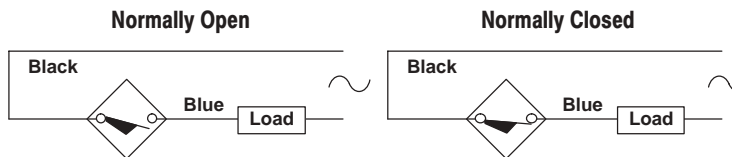
Description	Page Number
Terminal Chambers	7-20
Mounting Brackets	2-186 - 2-190
End Caps	2-196
Mounting Nuts	2-197 - 2-198

Dimensions—mm (inches)

Cable Style



Wiring Diagram



Note: Load can be switched to black wire.

Thread Size	Shielded	mm (inches)			
		A	B	C	D
M18 X 1	Y	18.0 (0.71)	81.0 (3.19)	61.0 (2.40)	2.0 (0.08)
	N ①				
M30 X 1.5	Y	30.0 (1.18)	81.0 (3.19)		
	N ①				

① Unshielded proximity sensors require a metal-free zone around the sensing face. Any metal immediately opposite the sensing face should be no closer than 3 times the rated nominal sensing distance of the sensor.

871C 2-Wire NAMUR

Nickel-Plated Brass Barrel, Plastic Face



871C NAMUR
Cable Style
8, 12, 18, 30mm
page 2-89



871C NAMUR
Micro Quick-Disconnect Style
8, 12, 18, 30mm
page 2-89

**Description**

For Allen-Bradley NAMUR style sensors, the sensor input and output conforms to NAMUR specifications (DIN 19 234) allowing these sensors to be used with any approved NAMUR style amplifier/ isolator. Allen-Bradley's NAMUR style sensors are Intrinsically Safe when used with an approved Intrinsically Safe NAMUR style isolator.

The 871C NAMUR style family of sensors can be used in Class I, II, III; Division 1 and 2; Groups A, B, C, D, E, F, and G as well as Zones 0, 1, 2; Groups IIA, IIB, IIC when used with Allen-Bradley's NAMUR style isolators/amplifiers. Installation must be in accordance with the National Electrical Code, ANSI/ISA RP12.6, or per other regulations by authority having jurisdiction over the installation site as appropriate.

Features

- 2-Wire NAMUR operation
- 8, 12, 18, and 30mm sizes
- Short barrel length
- Shielded and Unshielded models
- FM, CSA, and CENELEC (KEMA) approved

Specifications

Outputs	NAMUR (conforms to DIN 19 234)
Load Current Target Present	<1mA
Load Current Target Absent	>3mA
Operating Voltage	5–15V DC (8.2V DC nom., Ri = 1kohm, DIN 19 234)
Ripple Voltage	<5%
Repeatability	<10%
Hysteresis	10% typical
Reverse Polarity Protection	Incorporated
False Pulse Protection	Realized in amplifier
Transient Noise Protection	Realized in amplifier
Short Circuit Protection	Realized in amplifier
Overload Protection	Realized in amplifier
Enclosure	NEMA 4, IP67 (IEC 529)
Approvals	FM approved – Class I, II, III; Divisions 1, 2; Groups A, B, C, D, E, F, G – Class I; Zone 0, 1, 2; Groups IIC, IIB, IIA; T6 CSA approved – Class I, II, III; Divisions 1, 2; Groups A, B, C, D, E, F, G – Class I; Zone 0, 1, 2; Groups IIC, IIB, IIA CENELEC (KEMA) approved – Groups IIA, IIB, IIC; Zones 0, 1, 2 (EEx ia IIC T6) CE marked for all applicable directives
Connections	Cable: 2m (6.5ft) length 2 conductor #22AWG PVC Quick-Disconnect: 4-pin micro style
LED	None
Operating Temperature	–25°C to 60°C (–13°F to 140°F)
Shock	30g, 11ms
Vibration	55Hz, 1mm amplitude, 3 planes
Housing Material	Nickel-plated brass barrel, plastic 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

Entity Parameters

Sensor		Barrier
V_{max}	16V	$\geq V_t$
I_{max}	60mA	$\geq I_t$
C_i	150 _n F	$\leq C_a$
L_i	200 μ H	$\leq L_a$



WARNING: These parameters must be adhered to. If not, injury may be caused to person or property.

Inductive Proximity Sensors
871C 2-Wire NAMUR, Cable Style
 Nickel-Plated Brass Barrel, Plastic Face

Product Selection

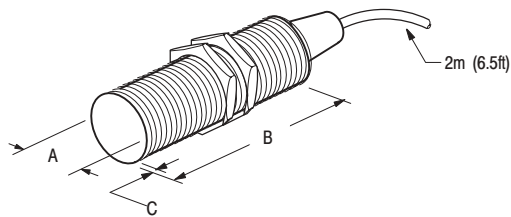
Barrel Diameter	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration	Switching Frequency (Hz)	Catalog Numbers	
					Cable Style	Micro QD Style
8mm	1 (0.03)	Y	NAMUR DIN 19 234	2000	871C-DH1M8-A2	871C-DH1M8-D4
	2 (0.06)	N		1000	871C-DH2M8-A2	871C-DH2M8-D4
12mm	2 (0.08)	Y		2000	871C-DH2M12-A2	871C-DH2M12-D4
	4 (0.16)	N		1000	871C-DH4M12-A2	871C-DH4M12-D4
18mm	5 (0.20)	Y		1000	871C-DH5M18-A2	871C-DH5M18-D4
	8 (0.31)	N		500	871C-DH8M18-A2	871C-DH8M18-D4
30mm	10 (0.39)	Y		500	871C-DH10M30-A2	871C-DH10M30-D4
	15 (0.59)	N		300	871C-DH15M30-A2	871C-DH15M30-D4
Recommended Standard QD Cordset (-2 = 2m (6.5ft))						889D-F4AC-2 ❶

① Intrinsically Safe wiring labels 897H-L1 or 897H-L2 must be applied every 7.6m (25ft).

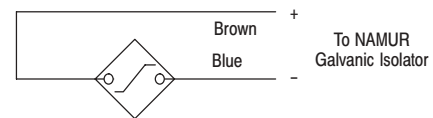
QD Cordsets and Accessories

Description	Page Number
Other Cordsets Available	7-41
Terminal Chambers	7-20
NAMUR Amplifiers/Isolators	7-115
Intrinsic Safety Wiring Labels	7-116
Mounting Brackets	2-186 - 2-190
End Caps	2-196
Mounting Nuts	2-197 - 2-198

Dimensions—mm (inches)
Cable Style



Wiring Diagram



Thread Size	Shielded	mm (inches)		
		A	B	C
M8 x 1	Y	8.0 (0.31)	30.0 (1.18)	—
	N			5.0 (0.20)
M12 x 1	Y	12.0 (0.47)		—
	N			6.0 (0.24)
M18 x 1	Y	18.0 (0.71)		—
	N			8.0 (0.31)
M30 x 1.5	Y	30.0 (1.18)	40.0 (1.57)	—
	N			12.0 (0.47)

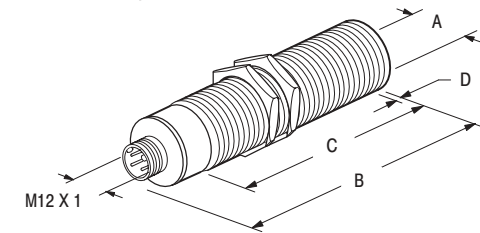
Inductive Proximity Sensors

871C 2-Wire NAMUR

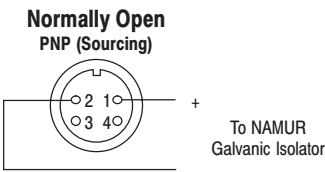
Nickel-Plated Brass Barrel, Plastic Face

Dimensions—mm (inches)

Micro QD Style



Wiring Diagram



Thread Size	Shielded	mm (inches)			
		A	B	C	D
M8 x 1	Y	8.0 (0.31)	50.0 (1.97)	28.0 (1.10)	—
	N			23.0 (0.91)	5.0 (0.20)
M12 x 1	Y	12.0 (0.47)		30.0 (1.18)	—
	N			24.0 (0.94)	6.0 (0.24)
M18 x 1	Y	18.0 (0.71)		30.0 (1.18)	—
	N			22.0 (0.87)	8.0 (0.31)
M30 x 1.5	Y	30.0 (1.18)	60.0 (2.36)	40.0 (1.57)	—
	N			28.0 (1.10)	12.0 (0.47)

Inductive Proximity Sensors

871C Analog Output, 3-Wire DC

Plastic Face/Nickel-Plated Brass Barrel



871C Cable Style
12, 18, 30mm

Description

Bulletin 871C inductive proximity sensors are self-contained, solid-state devices designed to sense the presence of metal objects without touching them. This special version provides a 0–10V sourcing analog output proportional to the sensing distance.

This device is enclosed by a plastic face and a nickel-plated brass housing which meets NEMA 1, 2, 3, 4, 12, 13 and IP67 (IEC 529) enclosure standards. The electronic circuitry is potted for protection against shock, vibration and contamination.

This sensor is available in 12, 18 and 30mm diameters with a 2m (6.5ft.) PVC cable connection.

Features

- 3-wire operation
- 18–30V DC
- Short circuit, overload, reverse polarity, and transient noise protection
- 0–10V sourcing analog output
- CE marked for all applicable directives

Specifications

	12mm	18mm	30mm
Analog Output	0–10V Sourcing		
Load Current	5mA		
Operating Voltage	18–30V DC		
Repeatability	≤ 1%		
Ripple	10%		
Slew Rate	1.0V/ms	0.7V/ms	0.1V/ms
Δ Output / Δ Distance	0.25mm/V	0.375mm/V	0.875mm/V
Linearity Tolerance	6.25%		
Temperature Tolerance	± 0.3V		
Transient Noise Protection	Incorporated		
Reverse Polarity Protection	Incorporated		
Short Circuit Protection	Incorporated		
Overload Protection	Incorporated		
Enclosure	NEMA 1, 2, 3, 4, 12, 13; IP67 (IEC 529), Nickel-plated brass barrel, plastic face (PBT)		
Connections	Cable: 2m (6.5ft) length 3 conductor PVC		
LED	None		
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

Inductive Proximity Sensors

871C Analog Output, 3-Wire DC

Plastic Face/Nickel-Plated Brass Barrel

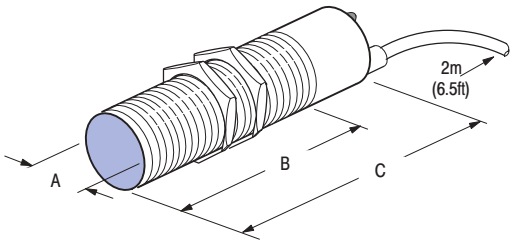
Product Selection

Barrel Diameter	Linear Sensing Distance mm (inches)	Shielded	Output Configuration		Switching Frequency (Hz)	Catalog Number
12mm	0.5–2.5 (0.02–0.10)	Y	Analog Voltage	Sourcing	100	871C-D3AP12-E2
18mm	1–4 (0.04–0.16)	Y	Analog Voltage	Sourcing	100	871C-D4AP18-E2
30mm	7–14 (0.27–0.55)	N	Analog Voltage	Sourcing	30	871C-D14AP30-E2

QD Cordsets and Accessories

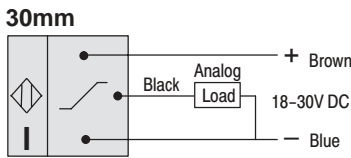
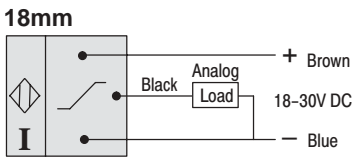
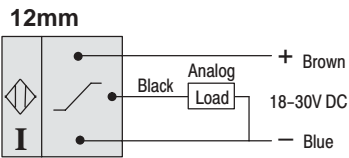
Description	Page Number
Terminal Chambers	7–20
Mounting Brackets	2–186 – 2–190
End Caps	2–196
Mounting Nuts	2–197 – 2–198

Dimensions—mm (inches)

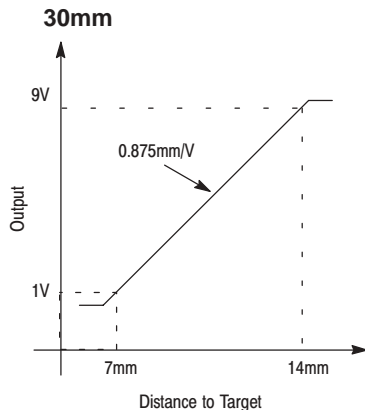
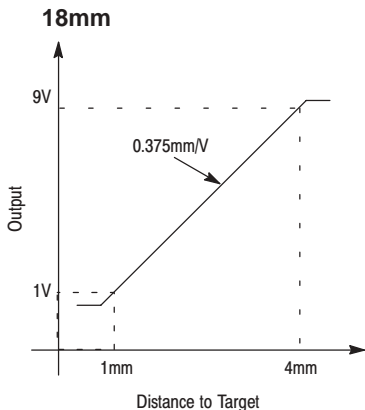
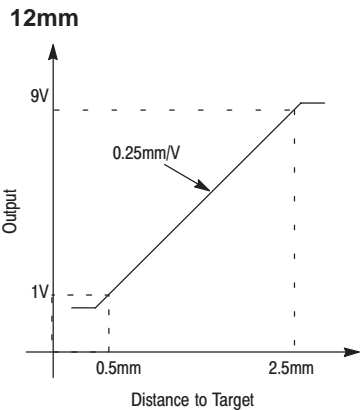


Thread Size	mm (inches)		
	A	B	C
12mm	12 (0.47)	70 (2.75)	80 (3.15)
18mm	18 (0.71)		
30mm	30 (1.18)	58 (2.28)	

Wiring Diagrams



Nominal Output





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.

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
AC/DC 2-Wire	page 2-96

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
PTFE End Caps	page 2-195
Mounting Nuts	page 2-197
Lock Washers	page 2-199

General Information

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

^❶ This distance varies with current line amperage. See page 2-8 of the Introduction section to determine the minimum distance for your application.

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**

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) PTFE 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

Inductive Proximity Sensors

871Z 3-Wire DC Weld Field Immune

PTFE Face/Threaded PTFE-Coated Brass Barrel

Product Selection

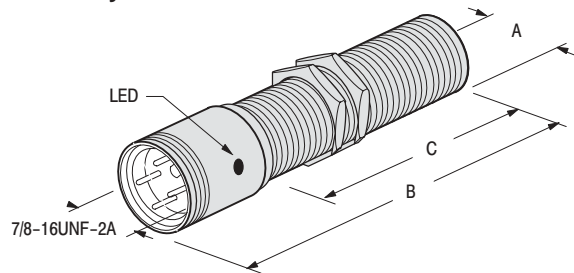
Barrel Diameter	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration		Switching Frequency (Hz)	Catalog Number	
						Mini QD Style	Micro QD Style
12mm	2 (0.08)	Y	N.O.	PNP	15	—	871Z-DW2NP12-D4
18mm	5 (0.20)	Y	N.O.	PNP	15	871Z-DW5NP18-N4	871Z-DW5NP18-D4
30mm	10 (0.39)	Y	N.O.	PNP	15	871Z-DW10NP30-N4	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)

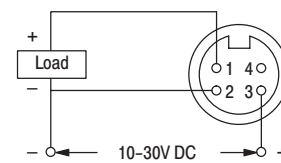
Mini QD Style



Wiring Diagram

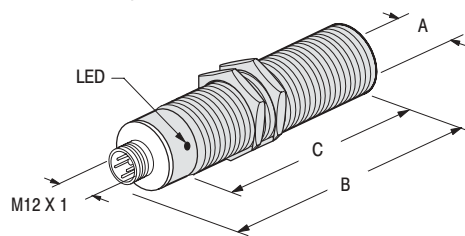
Normally Open

PNP (Sourcing)



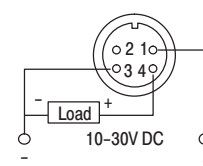
Thread Size	Shielded	mm (inches)		
		A	B	C
M18 X 1	Y	18.0 (0.71)	90 (3.54)	53 (2.09)
M30 X 1.5	Y	30.0 (1.18)	90 (3.54)	56 (2.20)

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)

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
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) PTFE 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

Thermoset Plastic Face/Threaded PTFE-Coated Brass Barrel

Product Selection

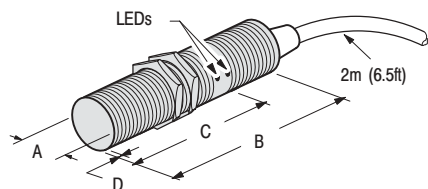
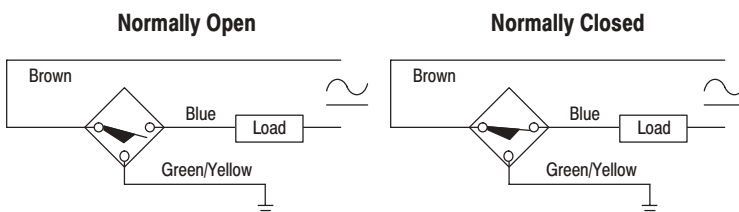
Barrel Diameter	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration	Switching Frequency (Hz)	Catalog Number		
					Cable Style①	Mini QD Style	Micro QD Style
12mm	2 (0.08)	Y	N.O.	30	871Z-BW2N12-C2	871Z-BW2N12-N3	871Z-BW2N12-R3
			N.C.	20	871Z-BW2C12-C2	871Z-BW2C12-N3	871Z-BW2C12-R3
18mm	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

^① 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)

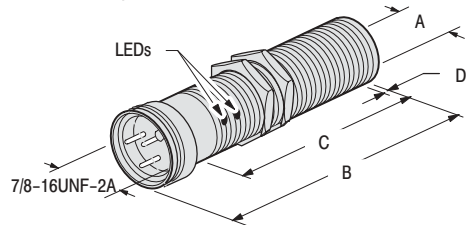
Inductive Proximity Sensors

871Z 2-Wire AC/DC Weld Field Immune

Thermoset Plastic Face/Threaded PTFE-Coated Brass Barrel

Dimensions—mm (inches)

Mini QD Style

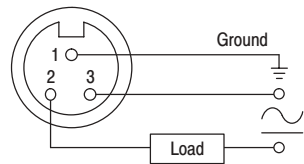


Note: Rear portion of barrel left uncoated for ground contact on 12mm models.

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)	

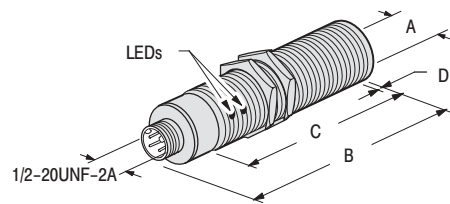
Wiring Diagram

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.

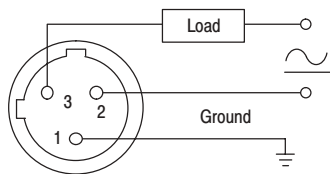
Micro QD Style



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)	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)	

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.



Description

Bulletin 871ZC 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 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, copper housing which meets NEMA 1, 2, 3, 3R, 4, 4X, 6, 6P, 12, 13 and IP67 (IEC 529) enclosure standards. The copper housing and mounting nuts and the thermoset plastic face offer a high degree of weld splatter 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 2–8 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 mini quick-disconnect and micro quick-disconnect.

Features

- Micro and mini quick-disconnect styles
- Copper 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 Weld Field Immune	page 2–100
AC/DC 2-Wire	page 2–102

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
PTFE End Caps	page 2–195
Mounting Nuts	page 2–197
Lock Washers	page 2–199

General Information

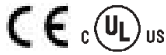
Torque Chart	page 2–201
Metric/English Conversion Chart	page 10–9

871ZC 3-Wire DC Weld Field Immune

Thermoset Plastic Face/Threaded Copper Barrel



871ZC DC Micro
Quick-Disconnect Style
18mm

**Features**

- 360° LED
- Copper barrel
- Weld field immunity
- 3-wire operation
- 4-pin micro QD connection
- 10–30V DC
- Normally open output
- Reverse polarity, short circuit, overload, false pulse and transient noise protection
- UL listed, c–UL certified and CE marked for all applicable directives

Specifications

Load Current	≤200mA
Minimum Load Current	1mA
Leakage Current	≤10μA
Operating Voltage	10–30V DC
Voltage Drop	≤2.4V
Repeatability	≤10%
Hysteresis	10% 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	UL listed, c–UL certified and CE marked for all applicable directives
Enclosure	NEMA 1, 2, 3, 4, 12 and 13, IP67 (IEC 529) Copper barrel, thermoset plastic face
Connections	Quick-Disconnect: 4-pin micro style
LED	Red: Target Present
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

Inductive Proximity Sensors

871ZC 3-Wire DC Weld Field Immune

Thermoset Plastic Face/Threaded Copper Barrel

Product Selection

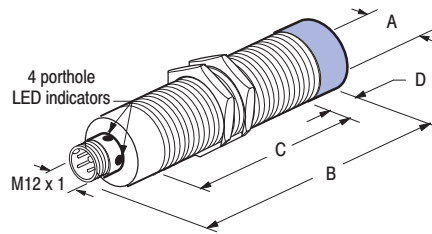
Barrel Diameter	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration		Switching Frequency (Hz)	Catalog Number
						Micro QD Style
12mm	2 (0.07)	Y	N.O.	PNP	15	871ZC-MW2NP12-D4
	4 (0.15)	N				871ZC-NW4NP12-D4
18mm	5 (0.19)	Y				871ZC-MW5NP18-D4
	8 (0.31)	N				871ZC-NW8NP18-D4
30mm	10 (0.39)	Y				871ZC-MW10NP30-D4
	15 (0.59)	N				871ZC-NW15NP30-D4
Recommended Standard QD Cordset (-6F = 1.8m (6ft), -2 = 2m (6.5ft))						889D-F4WE-2

QD Cordsets and Accessories

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

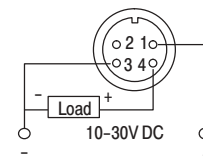
Dimensions—mm (inches)

Micro QD Style



Wiring Diagram

Normally Open PNP (Sourcing)



Thread Size	Shielded	mm (inches)			
		A	B	C	D
M12 X 1	Y	12.0 (0.47)	65 (2.56)	37.7 (1.48)	—
	N		70.6 (2.78)	37.7 (1.48)	6.3 (0.25)
M18 X 1	Y	18.0 (0.71)	80.0 (3.15)	52.8 (2.08)	—
	N		88.5 (3.48)	52.8 (2.08)	9.6 (0.38)
M30 X 1	Y	30.0 (1.18)	85.9 (3.38)	68.6 (2.70)	—
	N		99.0 (3.90)	68.6 (2.70)	14.5 (0.57)

871ZC 2-Wire AC/DC Weld Field Immune

Thermoset Plastic Face/Threaded Copper Barrel



871ZC AC/DC Mini
Quick-Disconnect Style
12, 18, 30mm
page 2-103

**Features**

- 2-wire operation
- 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) Copper barrel	
Connections	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

Inductive Proximity Sensors

871ZC 2-Wire AC/DC Weld Field Immune

Thermoset Plastic Face/Threaded Copper 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.	30	871ZC-BW2N12-N3	871ZC-BW2N12-R3
			N.C.	20	871ZC-BW2C12-N3	871ZC-BW2C12-R3
18mm	5 (0.20)	Y	N.O.	30	871ZC-BW5N18-N3	871ZC-BW5N18-R3
			N.C.	20	871ZC-BW5C18-N3	871ZC-BW5C18-R3
30mm	10 (0.39)	Y	N.O.	30	871ZC-BW10N30-N3	871ZC-BW10N30-R3
			N.C.	20	871ZC-BW10C30-N3	871ZC-BW10C30-R3
Recommended Standard QD Cordset (-6F = 1.8m (6ft), -2 = 2m (6.5ft))					889N-F3AFC-6F	889R-F3WEA-2

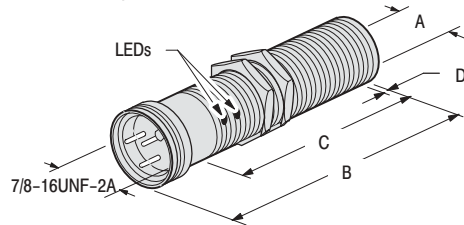
Note: This Allen-Bradley Weld Field Immune proximity sensor is also available with additional weld slag resistant material on the sensing face. Consult factory for details.

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

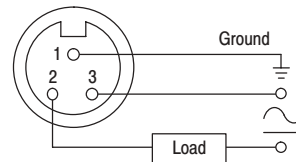
Dimensions—mm (inches)

Mini QD Style



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)	

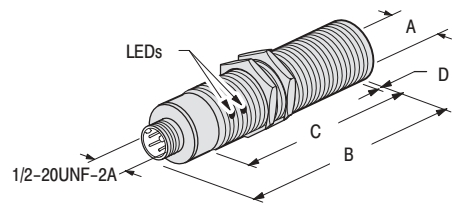
Inductive Proximity Sensors

871ZC 2-Wire AC/DC Weld Field Immune

Thermoset Plastic Face/Threaded Copper Barrel

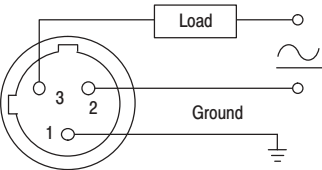
Dimensions—mm (inches)

Micro QD Style



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)	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)	



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

Weld Field Immune DC 4-Wire VersaCube	page 2-106
General Purpose DC 3-Wire VersaCube	page 2-107
Weld Field Immune DC 3-Wire VersaCube	page 2-107
Equal Sensing DC 3-Wire VersaCube	page 2-110
General Purpose AC/DC 2-Wire VersaCube	page 2-112
Weld Field Immune AC/DC 2-Wire VersaCube	page 2-112

Accessories

Quick-Disconnect Cables . . .	page 7-1
Mounting Kit	page 2-192
Limit Switch Style Mounting Bracket	page 2-193
PTFE Covers	page 2-194

General Information

Metric/English Conversion Chart	page 10-9
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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**

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

Features

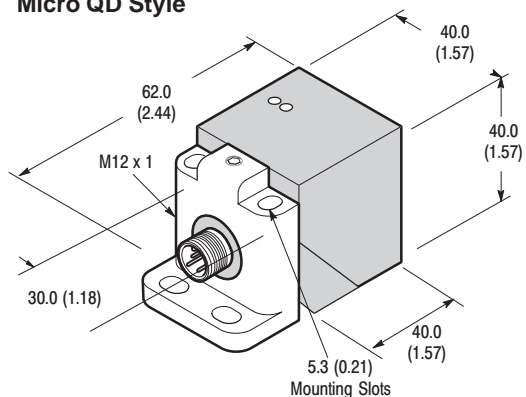
- New rugged housing
- Weld-slag resistant body and face
- Convenient mounting base
- Weld field immune
- Equal sensing capabilities
- Shielded or unshielded models
- 10–30V DC
- Complementary normally open and normally closed outputs

Correction Factors

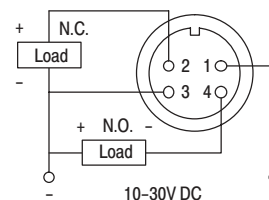
Target Material	Correction Factor
Steel	1.0
Stainless Steel	1.0
Brass	1.0
Aluminum	1.0
Copper	1.0

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
 page 2-108



871P DC WFI Micro
 Quick-Disconnect Style
 page 2-108



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
Load Current	≤200mA	≤200mA
Leakage Current	≤10μA	≤10μA
Operating Voltage	10–60V DC	10–60V DC
Voltage Drop	<2.5V @ 200mA	<2.5V @ 200mA
Repeatability	≤5%	≤10% of effective operating distance
Hysteresis	5% typical	12% typical
False Pulse Protection	Incorporated	Incorporated
Transient Noise Protection	Incorporated	Incorporated
Short Circuit Protection	Incorporated	Incorporated
Overload Protection	Incorporated	Incorporated
Reverse Polarity Protection	Incorporated	Incorporated
Weld Field Immunity	N/A	1000 Gauss ❶
Connections	Quick-Disconnect: 4-pin mini style 4-pin micro style	Quick-Disconnect: 4-pin mini style 4-pin micro style
Approvals	UL listed, c–UL certified and CE marked for all applicable directives	
Enclosure	NEMA 1, 2, 3, 4, 6, 6P, 12, 13; IP67 (IEC 529), 1200 psi (8270kPa) washdown; Plastic body, zinc base	
LED	Orange: Output Energized Green: Power	
Operating Temperature	–25°C to +70°C (–13°F to +158°F)	
Shock	30g, 11ms	
Vibration	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 ②	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.

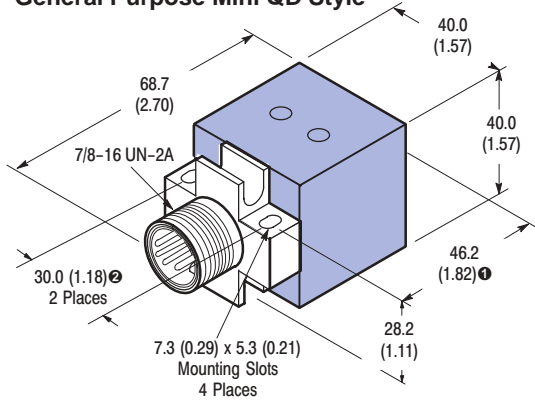
QD Cordsets and Accessories

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
PTFE Covers	2-194

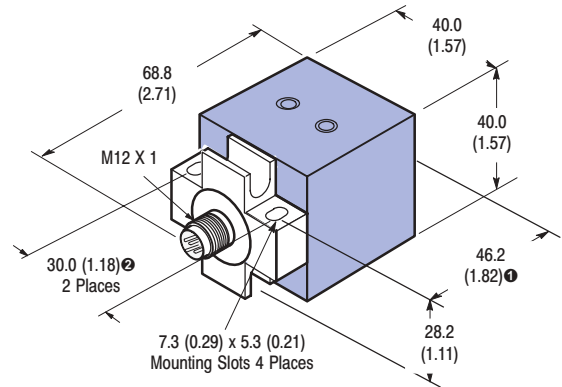
② Each Weld Field Immune unit is supplied with mounting hardware, a ground lug, a ground screw, and an optional adaptor for competitive retrofits. Additional sets of hardware are available under catalog number 871A-PKIT.

Dimensions—mm (inches)

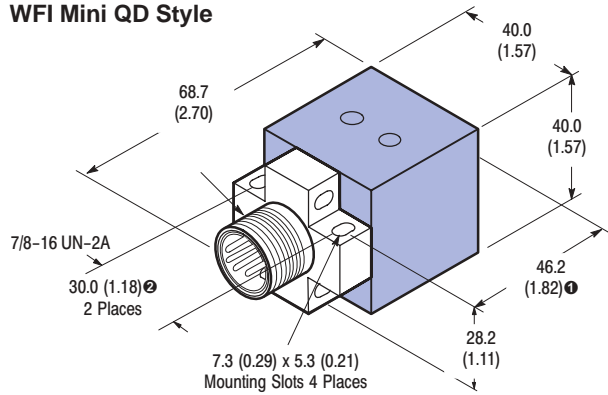
General Purpose Mini QD Style



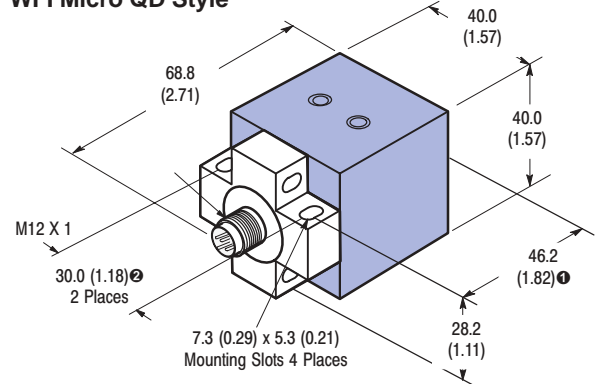
General Purpose Micro QD Style



WFI Mini QD Style



WFI Micro QD Style



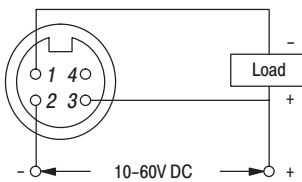
- ① With retrofit adaptor, distance from face to mounting holes becomes 60.0 (2.36).
- ② With retrofit adaptor, spacing between mounting holes becomes 20.0 (0.79).

Wiring Diagrams

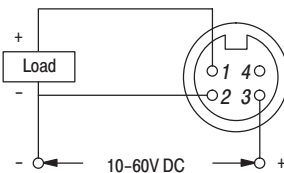
Mini QD Style

Normally Open or Normally Closed

NPN (Sinking)



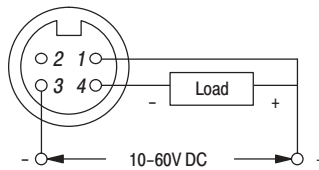
PNP (Sourcing)



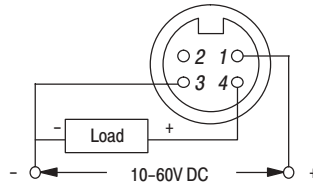
Micro QD Style

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.



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



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



Specifications

	General Purpose
Load Current	≤200mA
Leakage Current	≤10μA
Operating Voltage	10–30V DC
Voltage Drop	<2.5V @ 200mA
Repeatability	≤2%
Hysteresis	5% typical
False Pulse Protection	Incorporated
Transient Noise Protection	Incorporated
Short Circuit Protection	Incorporated
Overload Protection	Incorporated
Reverse Polarity Protection	Incorporated
Weld Field Immunity	1000 Gauss
Connections	Quick-Disconnect: 4-pin mini style 4-pin micro style
Approvals	UL listed, c-UL certified, and CE marked for all applicable directives
Enclosure	NEMA 1, 2, 3, 4, 6, 6P, 12, 13; IP67 (IEC 529), 1200 psi (8270kPa) washdown; Plastic body, zinc base
LED	Orange: Output Energized Green: Power
Operating Temperature	–25°C to +70°C (–13°F to +158°F)
Shock	30g, 11ms
Vibration	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

Inductive Proximity Sensors

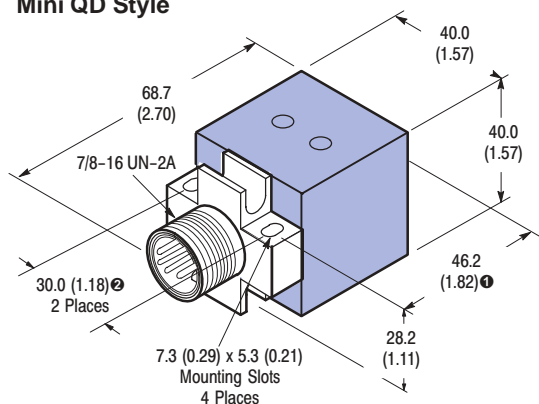
871P Equal Sensing VersaCube™ 3-Wire DC

Product Selection

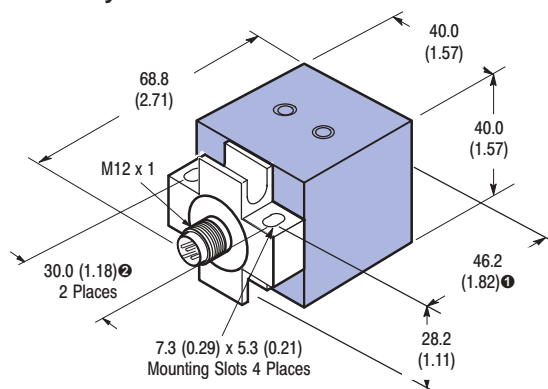
Head Size	Weld Field Immune	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration		Switching Frequency (Hz)	Catalog Number	
							Mini QD Style	Micro QD Style
40mm	Y	25 (0.98)	N	N.O.	PNP	100	871P-DB25NP40-N4	871P-DB25NP40-D4
					NPN		871P-DB25NN40-N4	871P-DB25NN40-D4
				N.C.	PNP		871P-DB25CP40-N4	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

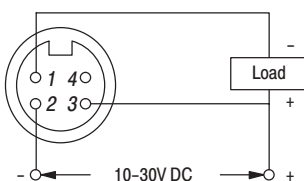


Wiring Diagrams

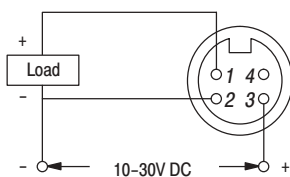
Mini QD Style

Normally Open or Normally Closed

NPN (Sinking)



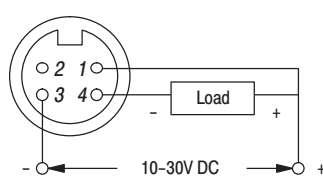
PNP (Sourcing)



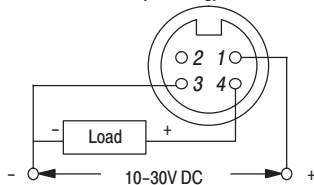
Micro QD Style

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
page 2-113



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
Load Current	2–100mA	2–300mA
Inrush Current (1 cycle)	≤ 2A	≤ 2A
Leakage Current	≤1.5mA@20V ≤1.7mA@120V ≤2.0mA@250V	≤1.5mA@20V ≤1.7mA@120V ≤2.0mA@250V
Operating Voltage	20–250V AC/DC	20–250V AC/DC
Voltage Drop	<10V	<10V
Repeatability	≤10% of effective operating distance	≤10% of effective operating distance
Hysteresis	12% typical	12% typical
False Pulse Protection	Incorporated	Incorporated
Transient Noise Protection	Incorporated	Incorporated
Short Circuit Protection	Incorporated	Incorporated
Overload Protection	Incorporated	Incorporated
Weld-Field Immunity	N/A	1000 Gauss ❶
Approvals	UL listed, c-UL certified, and CE marked for all applicable directives	
Enclosure	NEMA 1, 2, 3, 4, 6, 6P, 12, 13; IP67 (IEC 529), 1200 psi (8270kPa) washdown; Plastic body, zinc base	
Connections	Quick-Disconnect: 3-pin mini style 3-pin micro style	
LED	Red: Output Energized Green: Power (short circuit if flashing)	
Operating Temperature	–25°C to +70°C (–13°F to +158°F)	
Shock	30g, 11ms	
Vibration	55Hz, 1mm amplitude, 3 planes	

❶ 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
				N.O.		889N-F3AFC-6F	889R-F3ACA-2
				N.C.		889N-F3AFC-6F	889R-F3ACA-2

Recommended Standard QD Cordset (-6F = 1.8m (6ft), -2 = 2m (6.5ft))

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

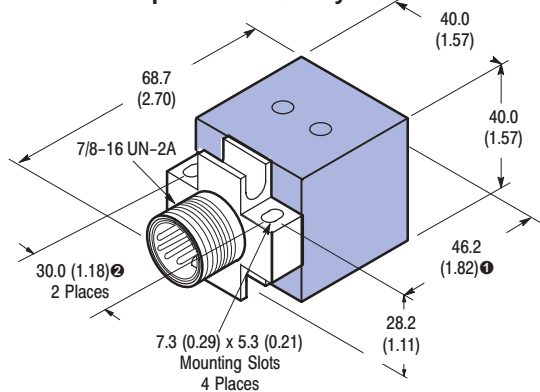
QD Cordsets and Accessories

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

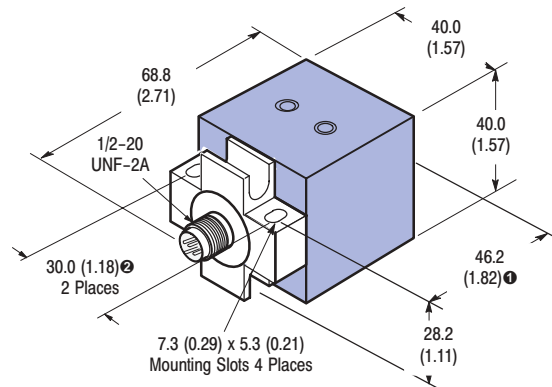
② Each Weld Field Immune unit is supplied with mounting hardware, a ground lug, a ground screw, and an optional adaptor for competitive retrofits. Additional sets of hardware are available under catalog number 871A-PKIT.

Dimensions—mm (inches)

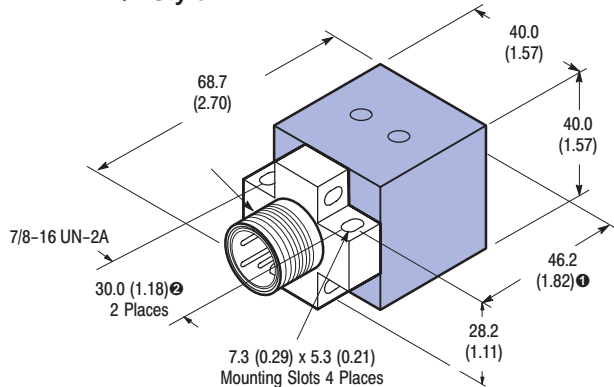
General Purpose Mini QD Style



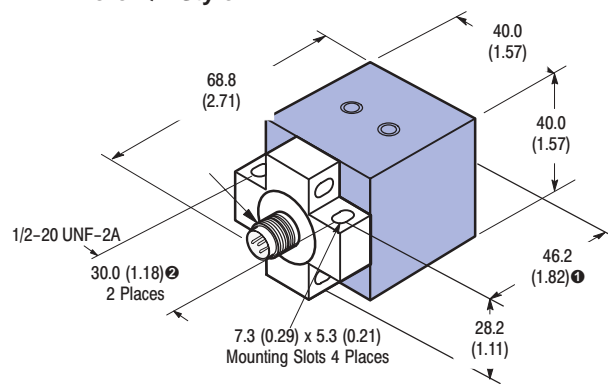
General Purpose Micro QD Style



WFI Mini QD Style



WFI Micro QD Style

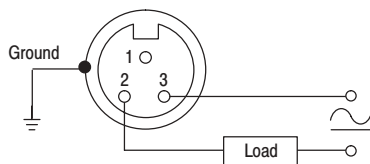


- ❶ With retrofit adaptor, distance from face to mounting holes becomes 60.0 (2.36).
- ❷ With retrofit adaptor, spacing between mounting holes becomes 20.0 (0.79).

Wiring Diagrams

Mini QD Style

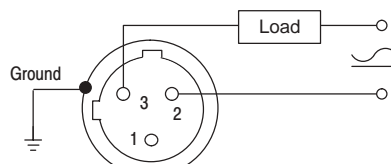
Normally Open or Normally Closed



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.



Description

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

Each switch is contained in a rectangular, self-extinguishing, glass-reinforced polyester body which meets NEMA 1, 2, 3, 4X, 12, 13, IP65 (IEC 529) enclosure standards.

These devices are available in top, front, left and right sensing models. Connection options include 2.5m (8ft) cable (with threaded conduit opening) and mini and micro quick-disconnect.

Features

- Cable or quick-disconnect styles
- Short-circuit protection
- Transient noise protection
- False pulse protection

Styles

AC 2-Wire page 2–116

Accessories

Quick-Disconnect Cables . . . page 7–1

General Information

Metric/English
Conversion Chart page 10–9

Inductive Proximity Sensors

871P Rectangular 2-Wire AC



871P AC Cable Style
page 2-117



871P AC Mini
Quick-Disconnect Style
page 2-117



871P AC Micro
Quick-Disconnect Style
page 2-117



Specifications

Load Current	≤0.5A
Inrush Current	≤5A for 1 cycle
Leakage Current	≤2mA
Operating Voltage	40–132V AC
Supply Current (minimum)	4mA
Voltage Drop	≤10V at ≥50mA ≤20V at <50mA
Repeatability	≤5%
Hysteresis	15% maximum
False Pulse Protection	Incorporated
Transient Noise Protection	Incorporated
Short Circuit Protection	Incorporated
Approvals	CE marked for all applicable directives
Enclosure	NEMA 1, 2, 3, 4X, 12, 13, IP65 (IEC 529) Self-extinguishing glass reinforced polyester
Connections	Cable: 2.5m (8ft) length 2-conductor #18 AWG PVC with threaded conduit opening Quick-Disconnect: 3-pin mini style 3-pin micro style
LED	Red: Output Energized
Operating Temperature	–25°C to +75°C (–13°F to +167°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 or 3-pin connection
- 40–132V AC
- Normally open output
- Short circuit, false pulse and transient noise protection
- CE marked for all applicable directives

Product Selection

Sensing Direction	Nominal Sensing Distance mm (inches)	Shielded	Inside Thread Type	Output Configuration	Switching Frequency (Hz)	Catalog Number Cable Style
Top	12.5 (0.49)	N	1/2-14 NPSC x 0.5 Deep	N.O.	16	871P-E13GCT
			ISO 20-1.5 x 12.5 Deep			871P-E13GCT-S6
Front			1/2-14 NPSC x 0.5 Deep			871P-E13GCF
			ISO 20-1.5 x 12.5 Deep			871P-E13GCF-S6
Left			1/2-14 NPSC x 0.5 Deep			871P-E13GCL
			ISO 20-1.5 x 12.5 Deep			871P-E13GCL-S6
Right			1/2-14 NPSC x 0.5 Deep			871P-E13GCR
			ISO 20-1.5 x 12.5 Deep			871P-E13GCR-S6

Sensing Direction	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration	Switching Frequency (Hz)	Catalog Number	
					Mini QD Style	Micro QD Style
Top	12.5 (0.49)	N	N.O.	16	871P-E13GRT	871P-E13GRT-R3
Front					871P-E13GRF	871P-E13GRF-R3
Left					871P-E13GRL	871P-E13GRL-R3
Right					871P-E13GRR	871P-E13GRR-R3
Recommended Standard QD Cordset (-6F = 1.8m (6ft), -2 = 2m (6.5ft))						889R-F3ACA-2

QD Cordsets and Accessories

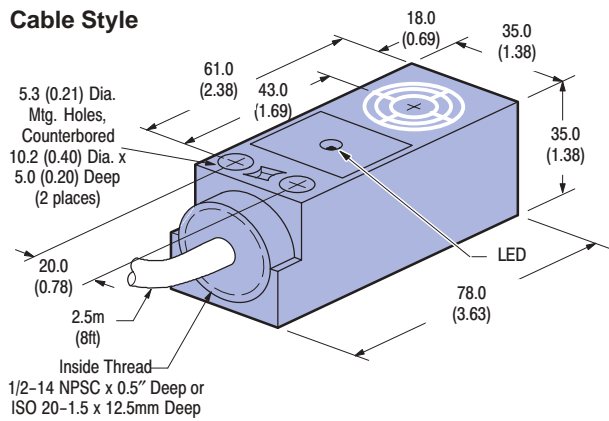
Description	Page Number
Other Cordsets Available	7-8, 7-68
Terminal Chambers	7-20

Inductive Proximity Sensors

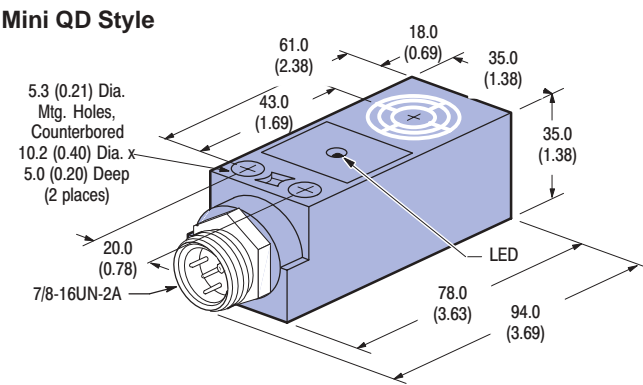
871P Rectangular 2-Wire AC

Dimensions—mm (inches)

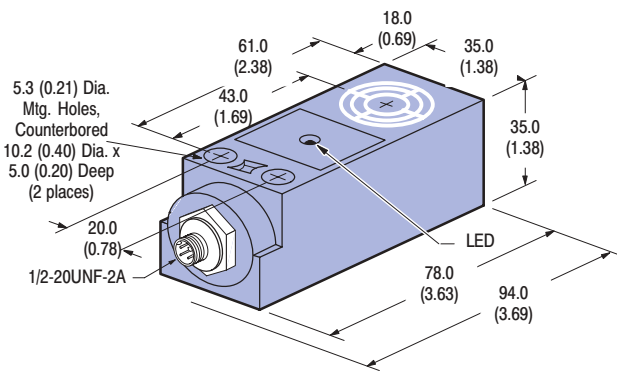
Cable Style



Mini QD Style

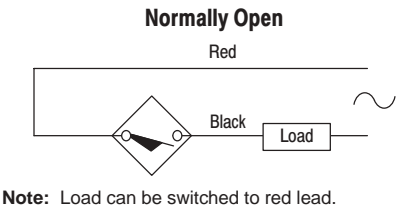


Micro QD Style

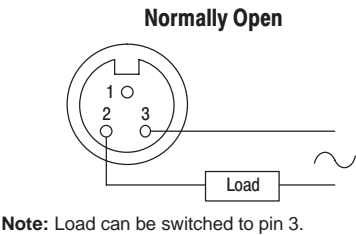


Wiring Diagram

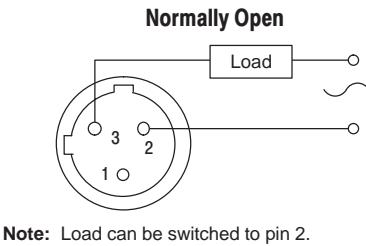
Cable Style



Mini QD Style



Micro QD Style





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 2–120
 DC Weld Field Immune . . . page 2–123
 2-Wire AC/DC Flat Pack . . . page 2–125
 AC/DC 2-Wire Flat Pack
 Weld Field Immune page 2–127
 DC 3-Wire Block page 2–129

Accessories

Quick-Disconnect Cables . . . page 7–1

General Information

Metric/English
 Conversion Chart page 10–9

871F 4-Wire DC Complementary Output**Flat Pack Style**

871F DC Cable Style
page 2-121



871F DC Mini
Quick-Disconnect Style
page 2-121



871F DC Micro
Quick-Disconnect Style
page 2-122

**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

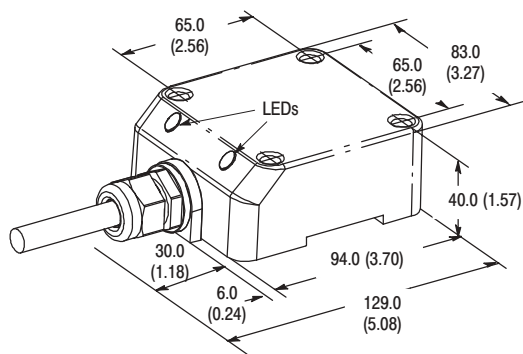
Head Size	Nominal Sensing Distance mm (in)	Shielded	Output Configuration		Switching Frequency (Hz)	Catalog Number				
						ToughLink™ Cable	Mini QD Style	Micro QD Style	Conduit 1/2 NPT	Conduit PG13.5
83 (3.27)	50 (1.97) ①	Y	N.O. and N.C.	PNP	100	871F-P50BP80-H2	871F-P50BP80-N4	871F-P50BP80-D4	871F-P50BP80-T4	871F-P50BP80-Q4
	65 (2.56)	N		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

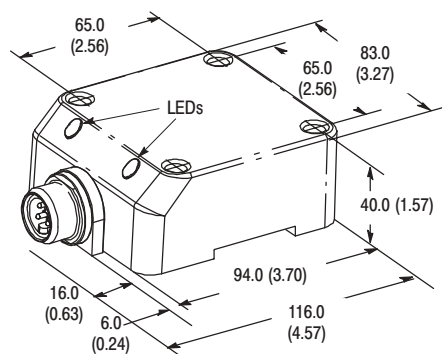


Dimensions—mm (inches)

Cable Style

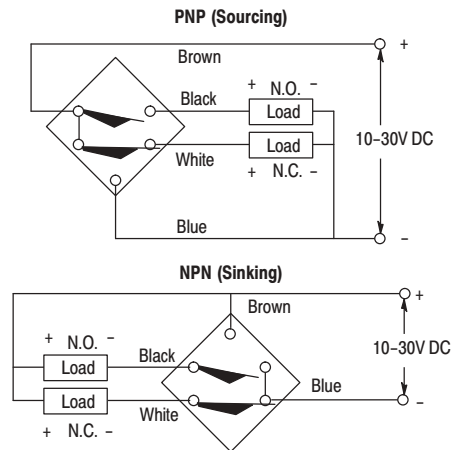


Mini QD Style

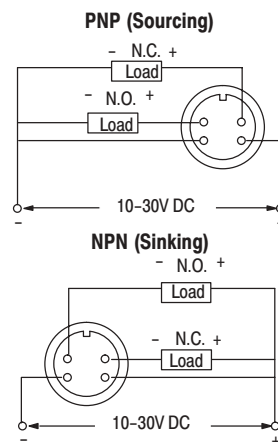


Wiring Diagram

Complementary Normally Open and Normally Closed



Complementary Normally Open and Normally Closed Outputs



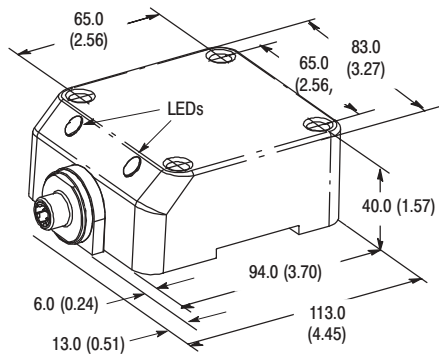
Inductive Proximity Sensors

871F 4-Wire DC Complementary Output

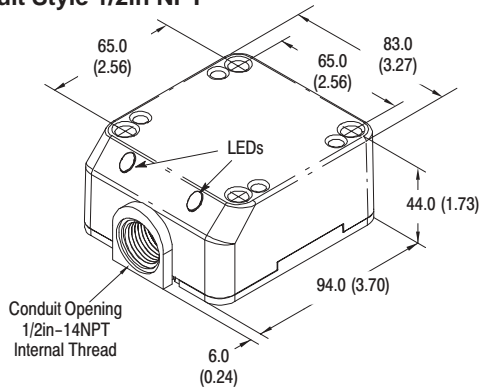
Flat Pack Style

Dimensions—mm (inches)

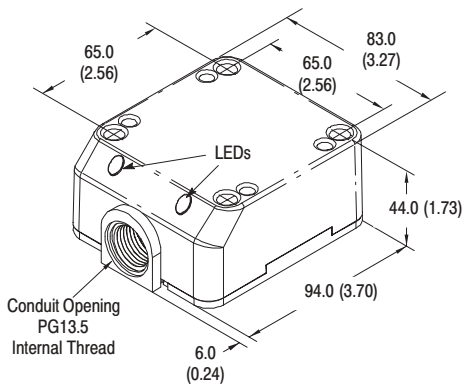
Micro QD Style



Conduit Style 1/2in NPT



Conduit Style PG13.5

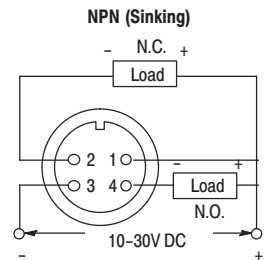
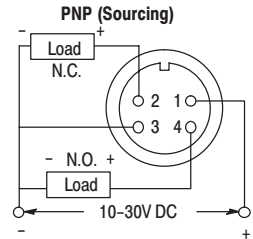


QD Cordsets and Accessories

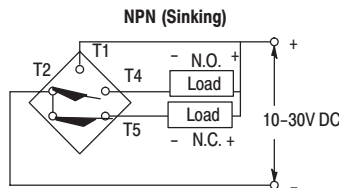
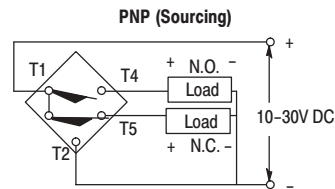
Description	Page Number
Other Cordsets Available	NO TAG, 7-68

Wiring Diagram

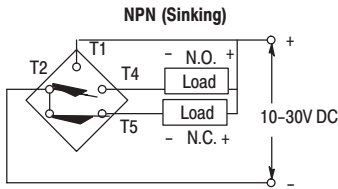
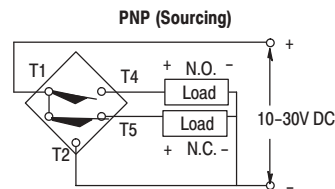
Complementary Normally Open and Normally Closed



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

Inductive Proximity Sensors

871F DC Weld Field Immune

Flat Pack Style

Product Selection

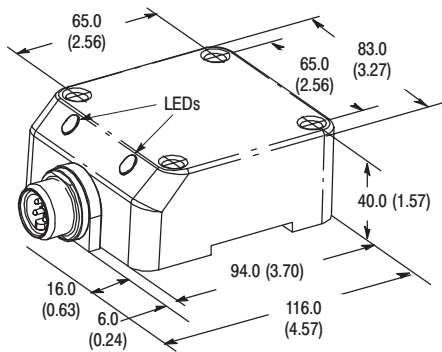
Head Size	Nominal Sensing Distance mm (in)	Shielded	Output Configuration		Switching Frequency (Hz)	Catalog Number	
						Mini QD Style	Micro QD Style
83 (3.27)	40 (1.57) ❶	Y	N.O. and N.C.	PNP	15	871F-PW40BP80-N4	871F-PW40BP80-D4
		NPN		871F-PW40BN80-N4		871F-PW40BN80-D4	
	50 (1.97)	N		PNP		871F-NW50BP80-N4	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

❶ 40mm when fully embedded in mild steel as shown

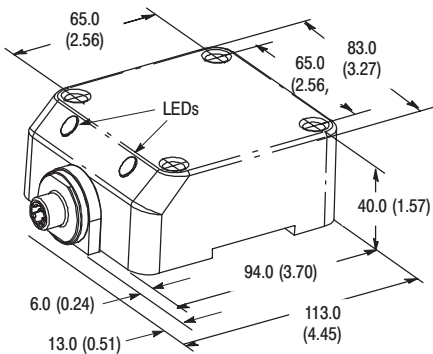


Dimensions—mm (inches)

Mini QD Style

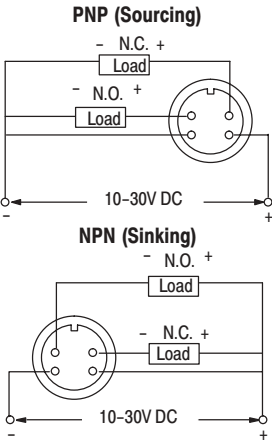


Micro QD Style

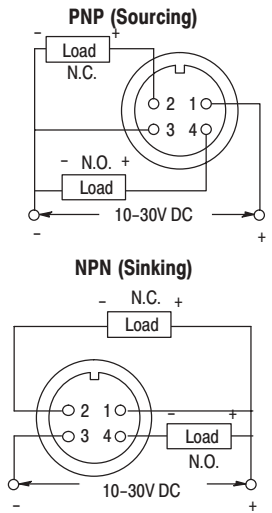


Wiring Diagram

Complementary Normally Open and Normally Closed Outputs



Complementary Normally Open and Normally Closed



871F 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	7-1

Inductive Proximity Sensors

871F 2-Wire AC/DC Weld Field Immune

Flat Pack Style

Product Selection

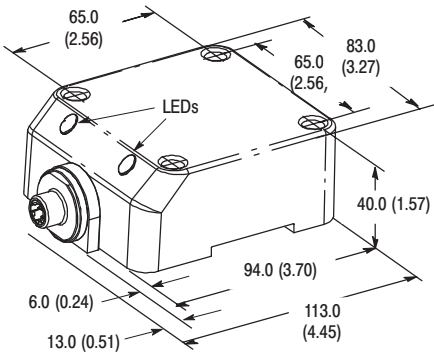
Head Size	Nominal Sensing Distance mm (in)	Shielded	Output Configuration	Switching Frequency (Hz)	Catalog Number Micro QD Style
83 (3.27)	40 (1.57) ❶	Y	N.O.	10	871F-JW40N80-R3
	50 (1.97)	N	N.O.	10	871F-KW50N80-R3
Recommended Standard QD Cordset (-2 = 2m (6.5ft))					889R-F3WEA-2

❶ 40mm when fully embedded in mild steel as shown

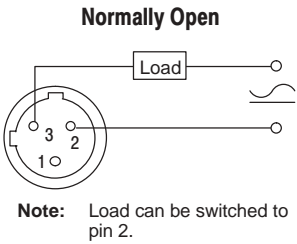


Dimensions—mm (inches)

Micro QD Style



Wiring Diagram



871F 2-Wire AC/DC Weld Field Immune

Flat Pack Style



871F AC/DC Mini and Micro
Quick-Disconnect Style
page 2-128



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 1 in 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

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.

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

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



871F DC Cable Style
page 2-130



871F DC Micro
Quick-Disconnect Style
page 2-130



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

871F 3-Wire DC

Block Style

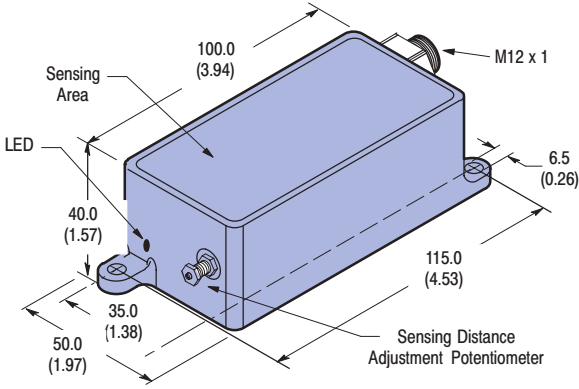
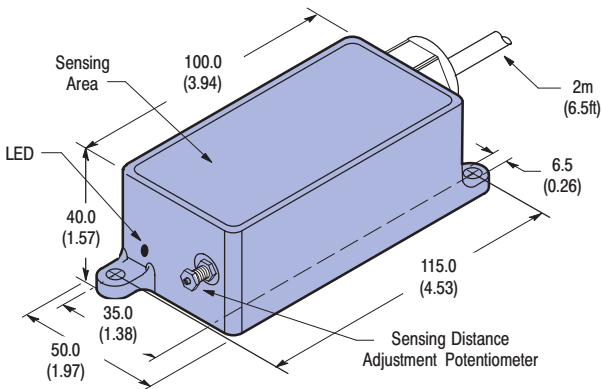
Product Selection

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	NO TAG
Terminal Chambers	NO TAG

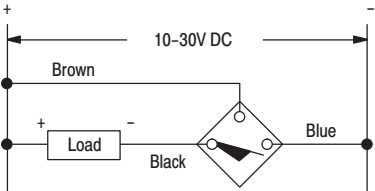
Dimensions—mm (inches)



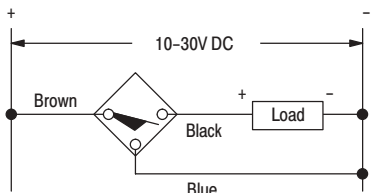
Wiring Diagrams

Cable Style

Normally Open
NPN (Sinking)

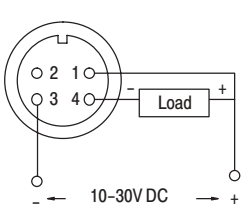


PNP (Sourcing)

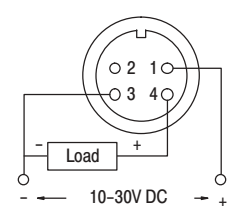


Micro QD Style

Normally Open
NPN (Sinking)



PNP (Sourcing)





Description

Bulletin 871L and 872L inductive proximity sensors are self-contained, general purpose, solid state devices designed to sense the presence of metal objects (ferrous and nonferrous) without touching them.

These devices provide mounting interchangeability, easily-wired terminations, rugged construction. The adjustable head can be positioned for top or side sensing. In side-sensing applications, the head can be rotated in 22.5-degree increments and locked in any of 16 positions.

These sensors are available with a 1/2–14NPT conduit opening, mini quick-disconnect, or micro quick-disconnect.

Features

- 17 sensing head positions (1 top, 16 side)
- Conduit or quick-disconnect styles
- Short circuit protection
- Overload protection
- Transient noise protection
- False pulse protection
- Reverse polarity protection
- Selectable normally open or normally closed output
- CE marked for all applicable directives

Styles

DC 3-Wire	page 2–132
AC 2-Wire	page 2–134
AC/DC 2-Wire	page 2–134

Accessories

Quick-Disconnect Cables . . .	page 7–1
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General Information

Metric/English Conversion Chart	page 10–9
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Inductive Proximity Sensors

871L & 872L 3-Wire DC

Limit Switch Style



871L & 872L DC
Mini Quick-Disconnect Style
page 2-133



871L & 872L DC
Micro Quick-Disconnect Style
page 2-133



871L & 872L DC
Conduit Style
page 2-133



Specifications

	871L Models	872L Models
Load Current	≤400mA	≤120mA
Leakage Current	≤10μA	≤10μA
Operating Voltage	10-60V DC	10-30V DC
Voltage Drop	≤2.4V	≤2.5V
Repeatability	≤5%	≤5%
Hysteresis	≤20% typical	≤20% typical
False Pulse Protection	Incorporated	Incorporated
Transient Noise Protection	Incorporated	Incorporated
Reverse Polarity Protection	Incorporated	Incorporated
Short Circuit Protection	Incorporated	Incorporated
Overload Protection	Incorporated	Incorporated
Approvals	CE marked for all applicable directives	
Enclosure	NEMA 3, 4, 6, 12, 13, IP67 (IEC 529) Polyloy	
Connections	Quick-Disconnect: 4-pin mini style 4-pin micro style Conduit Opening: 1/2-14 NPT internal thread with screw terminals	
LEDs	Green: Power (Blinks in SCP/Overload) Orange: Output Energized Red: Alignment Indicator	Green: Power (Blinks in SCP/Overload) 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

- 3-wire operation
- 3-terminal or 4-pin connection
- 10-60V DC for 871L models
- 10-30V DC for 872L models
- Switch selectable normally open or normally closed output on 871L models
- Normally open or normally closed outputs programmable via jumper on 872L models
- Alignment LED on 871L models
- False pulse, transient noise, reverse polarity, short circuit and overload protection
- CE marked for all applicable directives

Product Selection

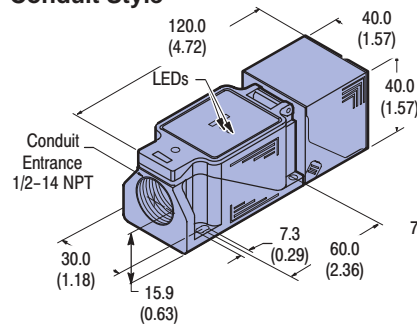
Head Size	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration		Switching Frequency (Hz)	Catalog Number		
						Conduit Style	Mini QD Style	Micro QD Style
40	20 (0.79)	Y	Selectable N.O. or N.C.	NPN	150	871L-D20EN40-T3	871L-D20EN40-N4	871L-D20EN40-D4
				PNP		871L-D20EP40-T3	871L-D20EP40-N4	871L-D20EP40-D4
	40 (1.57)	N		NPN	70	871L-D40EN40-T3	871L-D40EN40-N4	871L-D40EN40-D4
				PNP		871L-D40EP40-T3	871L-D40EP40-N4	871L-D40EP40-D4
	20 (0.79)	Y	Programmable N.O. or N.C.	NPN	100	872L-D20EN40-T3	872L-D20EN40-N4	872L-D20EN40-D4
				PNP		872L-D20EP40-T3	872L-D20EP40-N4	872L-D20EP40-D4
	40 (1.57)	N		NPN	50	872L-D40EN40-T3	872L-D40EN40-N4	872L-D40EN40-D4
				PNP		872L-D40EP40-T3	872L-D40EP40-N4	872L-D40EP40-D4
Recommended Standard QD Cordset (-6F = 1.8m (6ft), -2 = 2m (6.5ft))							889N-F4AFC-6F	889D-F4AC-2

QD Cordsets and Accessories

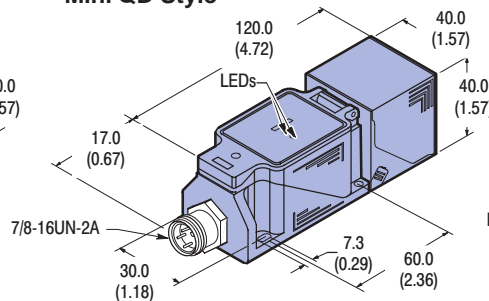
Description	Page Number
Other Cordsets Available	7-8, 7-68

Dimensions—mm (inches)

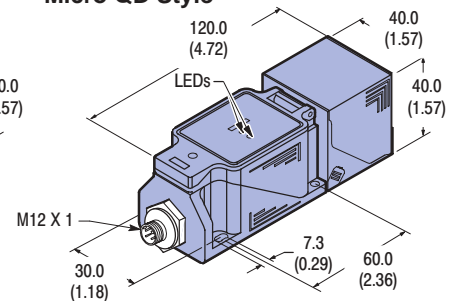
Conduit Style



Mini QD Style



Micro QD Style

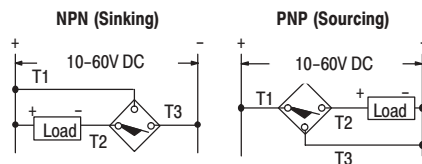


Note: Head can be rotated in 22.5° increments to provide 16 side-sensing positions or rotated for top-sensing.

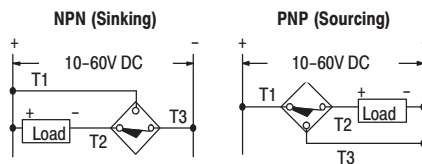
Wiring Diagram

Conduit Style

Normally Open



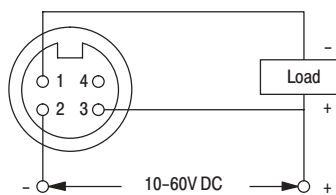
Normally Closed



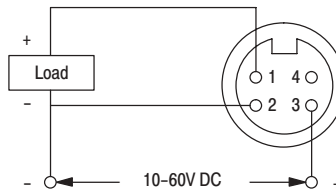
Mini QD Style

Normally Open or Normally Closed

NPN (Sinking)



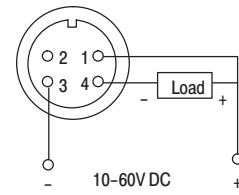
PNP (Sourcing)



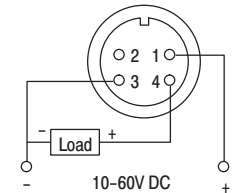
Micro QD Style

Normally Open or Normally Closed

NPN (Sinking)



PNP (Sourcing)



871L AC/DC & 872L AC 2-Wire**Limit Switch Style**

871L AC/DC & 872L AC
Mini Quick-Disconnect Style
page 2-135



871L AC/DC & 872L AC
Micro Quick-Disconnect Style
page 2-135



871L AC/DC & 872L AC
Conduit Style
page 2-135

**Specifications**

	871L Models	872L Models
Load Current	≤400mA	≤500mA
Minimum Load Current	2mA	2mA
Inrush Current (1 cycle)	≤8A	≤8A
Leakage Current	≤2mA	≤2mA
Operating Voltage	20-250V AC/DC	20-250V AC
Voltage Drop	≤5V	≤5V
Repeatability	≤5%	≤5%
Hysteresis	≤20%	≤20%
False Pulse Protection	Incorporated	Incorporated
Transient Noise Protection	Incorporated	Incorporated
Short Circuit Protection	Incorporated	Incorporated
Approvals	CE marked for all applicable directives	
Enclosure	NEMA 3, 4, 6, 12, 13, IP65 (IEC 529) Polyloy	
Connections	Quick Disconnect: 3-pin mini style 3-pin micro style Conduit Opening: 1/2-14 NPT internal thread with screw terminals	
LEDs	Green: Power (Blinks in SCP/Overload) 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-terminal or 3-pin connection
- 20-250V AC/DC on 871L models
- 20-250V AC on 872L models
- Switch selectable normally open or normally closed output on 871L models
- Normally open or normally closed output programmable via jumper on 872L models
- False pulse, transient noise, short circuit and overload protection
- CE marked for all applicable directives

Product Selection

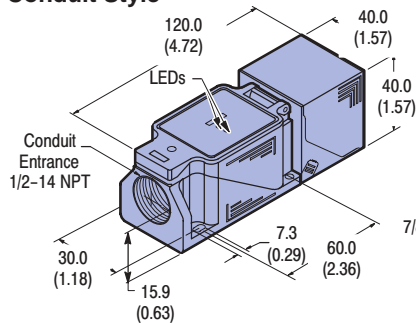
Head Size	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration	Switching Frequency (Hz)	Catalog Number		
					Conduit Style	Mini QD Style	Micro QD Style
40	20 (0.79)	Y	Selectable N.O. or N.C.	15	871L-B20E40-T2	871L-B20E40-N3	871L-B20E40-R3
	40 (1.57)	N			871L-B40E40-T2	871L-B40E40-N3	871L-B40E40-R3
	20 (0.79)	Y	Programmable N.O. or N.C.		872L-A20E40-T2	872L-A20E40-N3	872L-A20E40-R3
	40 (1.57)	N			872L-A40E40-T2	872L-A40E40-N3	872L-A40E40-R3
Recommended Standard QD Cordset (-6F = 1.8m (6ft), -2 = 2m (6.5ft))					889N-F3AFC-6F	889R-F3ACA-2	

QD Cordsets and Accessories

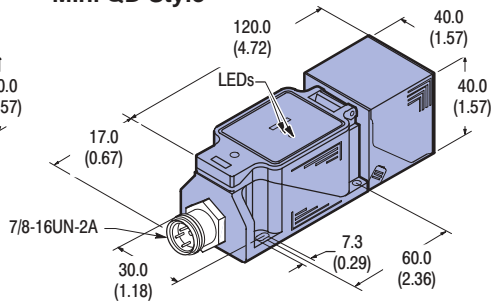
Description	Page Number
Other Cordsets Available	7-8, 7-68

Dimensions—mm (inches)

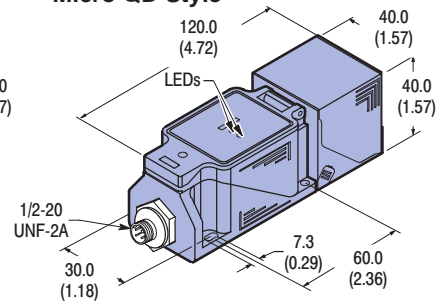
Conduit Style



Mini QD Style



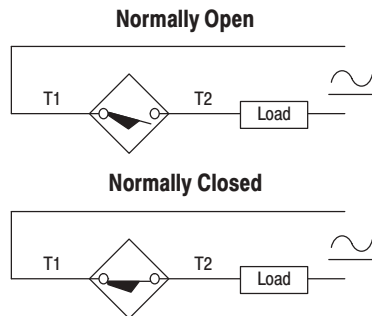
Micro QD Style



Note: Head can be rotated in 22.5° increments to provide 16 side-sensing positions or rotated for top-sensing.

Wiring Diagram

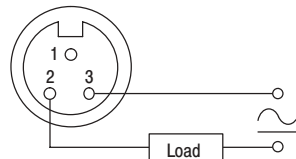
Conduit Style



Note: Load can be switched to Terminal 1.

Mini QD Style

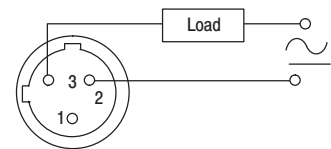
Normally Open or Normally Closed



Note: Load can be switched to pin 3.

Micro QD Style

Normally Open or Normally Closed



Note: Load can be switched to pin 2.

Notes



Description

Bulletin 802PR inductive proximity sensors are self-contained, 2-wire devices designed to detect the presence of ferrous and nonferrous metal objects without touching them. Types LA and XA are high-output AC models designed to switch current loads up to 1 A, while types LB and XB are AC/DC solid-state switches made to interface directly with programmable controllers.❶

Each sensor is housed in a self-extinguishing glass-reinforced polyester body. Special hazardous location models are available which meet Division 2 enclosure standards in Classes I, II, and III (see specifications). Switch constructions include top and side sensing models. The side-sensing head can be rotated in 90-degree increments to sense in four directions. These devices are available with a threaded conduit opening, conduit coupler, 3-pin mini connector, 3-pin micro connector, or pre-wired cable.

Features

- Multiple sensing directions
- Cable, conduit, or quick-disconnect styles
- Short circuit protection (AC/DC models)
- Overload protection (AC/DC models)
- Transient noise protection
- False pulse protection
- Hazardous location models are available
- UL listed, CSA certified, and CE marked for all applicable directives

Styles

AC/DC 2-Wire	page 2–138
Hazardous Location AC/DC 2-Wire	page 2–143
AC 2-Wire High-Output	page 2–145
Hazardous Location AC 2-Wire High-Output	page 2–149

Accessories

Quick-Disconnect Cables	page 7–1
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General Information

Metric/English Conversion Chart	page 10–9
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❶ High-output models should not be used in solid-state switching, TTL, or programmable controller operations.



802PR AC/DC
Cable Style
page 2-139



802PR AC/DC Mini
Quick-Disconnect Style
page 2-140



802PR AC/DC Micro
Quick-Disconnect Style
page 2-141



802PR AC/DC
Conduit Style
page 2-142



Specifications

Load Current	AC 4–25mA; DC 2–25mA
Leakage Current	≤1.7mA at 132V, ≤2.5mA at 250V
Operating Voltage	20–250V AC/DC
Voltage Drop	≤10V
Repeatability	≤10% typical
Hysteresis	≤10% typical
Transient Noise Protection	Incorporated
Short Circuit Protection	Incorporated
Overload Protection	Incorporated
False Pulse Protection	Incorporated
Radio Frequency Protection	10V per meter; Frequency range 20–1000 MHz
Approvals	UL listed, CSA certified, and CE marked for all applicable directives
Enclosure	NEMA 1, 2, 3, 4, 4X ^① , 12, 13, IP65 (IEC 529) Self extinguishing glass-reinforced polyester body
Connections	Cable: 2.4m (8ft) length 2-conductor ToughLink™ Quick-Disconnect: 3-pin micro style 3-pin mini style Conduit Opening or Conduit Coupler: Internal thread with screw terminals (use #18–14 AWG wire)
LEDs	Green: Power; Red: Output energized (both on in SCP/Overload)
Operating Temperature	–25°C to +75°C (–13°F to +167°F)
Shock	30g, 11ms
Vibration	55Hz, 1mm amplitude, 3 planes

① Corrosion resistant models

Features

- 2-wire operation
- 2-conductor or 3-pin connection
- 20–250V AC/DC (for solid state inputs)
- Normally open output
- Short circuit, overload, false pulse, RFI and transient noise protection
- Corrosion resistant models
- 2 LEDs
- UL listed, CSA certified, and CE marked for all applicable directives

Correction Factors

Target Material	Correction Factor
Steel	1.0
Stainless Steel	0.9
Brass	0.8
Aluminum	0.75
Copper	0.7

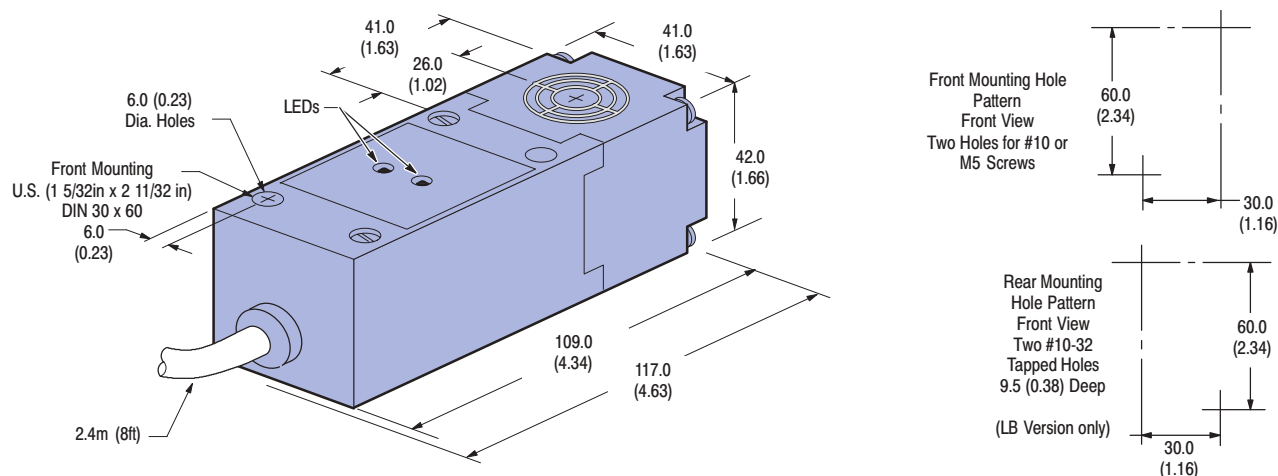
Product Selection

Sensing Direction	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration	Switching Frequency (Hz)	Cable Length m (ft)	Corrosion Resistant	Catalog Number Cable Style
Side	17 (0.67)	Y	N.O.	20	2.5 (8)	Y	802PR-XBAM1-08
						N	802PR-LBAM1-08
					3.6 (12)	Y	802PR-XBAM1-12
						N	802PR-LBAM1-12
Top	17 (0.67)	Y	N.O.	20	2.5 (8)	Y	802PR-XBAR1-08
						N	802PR-LBAR1-08
					3.6 (12)	Y	802PR-XBAR1-12
						N	802PR-LBAR1-12

Accessories

Description	Page Number
Terminal Chambers	7-20

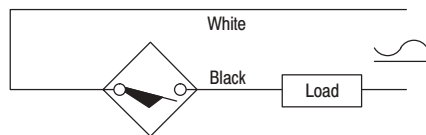
Dimensions—mm (inches)



Note: Side sensing model heads can be turned in 90° increments to accommodate 4 side sensing positions.

Wiring Diagram

Normally Open



Note: Load can be switched to white lead.

Inductive Proximity Sensors

802PR 2-Wire AC/DC, Mini Quick-Disconnect Style

Limit Switch Style

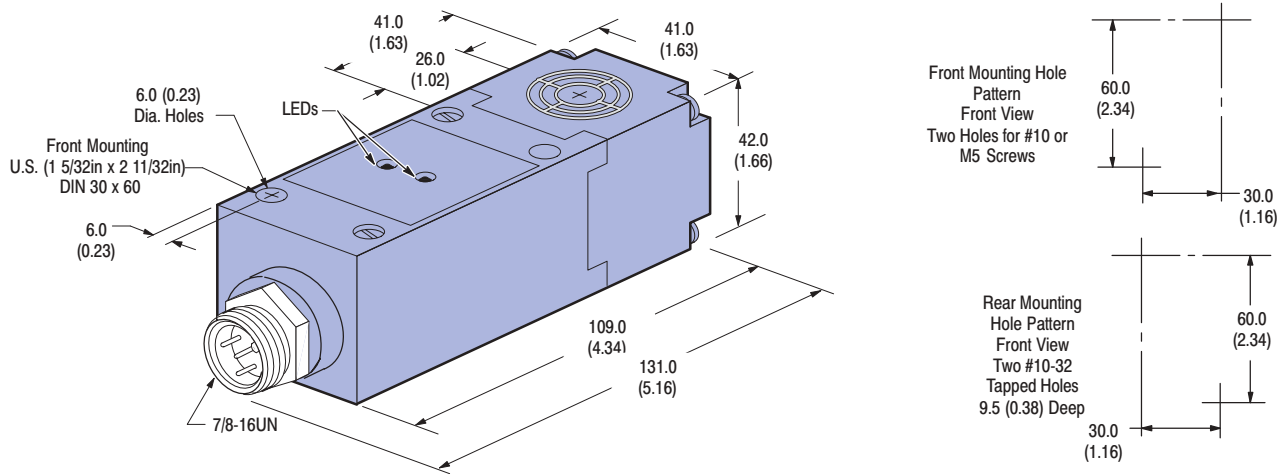
Product Selection

Sensing Direction	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration	Switching Frequency (Hz)	Catalog Number Mini QD Style
Side	17 (0.67)	Y	N.O.	20	802PR-LBAE1
Top					802PR-LBAK1
Recommended Standard QD Cordset Required (~6F = 1.8m (6ft))					889N-F3AFC-6F

QD Cordsets and Accessories

Description	Page Number
Other Cordsets Available	7-8
Terminal Chambers	7-20

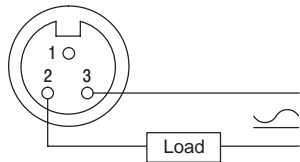
Dimensions—mm (inches)



Note: Side sensing model heads can be turned in 90° increments to accommodate 4 side sensing positions.

Wiring Diagram

Normally Open



Note: Load can be switched to Pin 3.

Inductive Proximity Sensors

802PR 2-Wire AC/DC, Micro Quick-Disconnect Style

Limit Switch Style

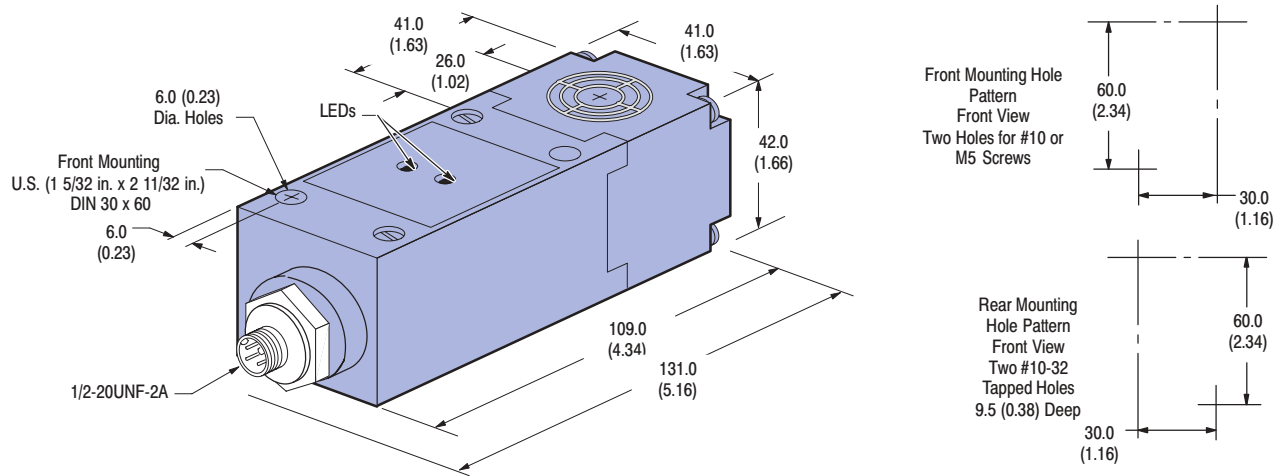
Product Selection

Sensing Direction	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration	Switching Frequency (Hz)	Catalog Number Micro QD Style
Side	17 (0.67)	Y	N.O.	20	802PR-LBAC1
Top					802PR-LBAF1
Recommended Standard QD Cordset Required (-2 = 2m (6.5ft))					889R-F3ACA-2

QD Cordsets and Accessories

Description	Page Number
Other Cordsets Available	7-8
Terminal Chambers	7-20

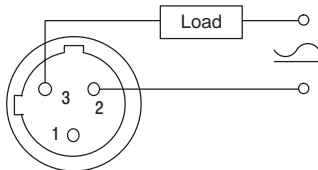
Dimensions—mm (inches)



Note: Side sensing model heads can be turned in 90° increments to accommodate 4 side sensing positions.

Wiring Diagram

Normally Open



Note: Load can be switched to pin 2.

Inductive Proximity Sensors

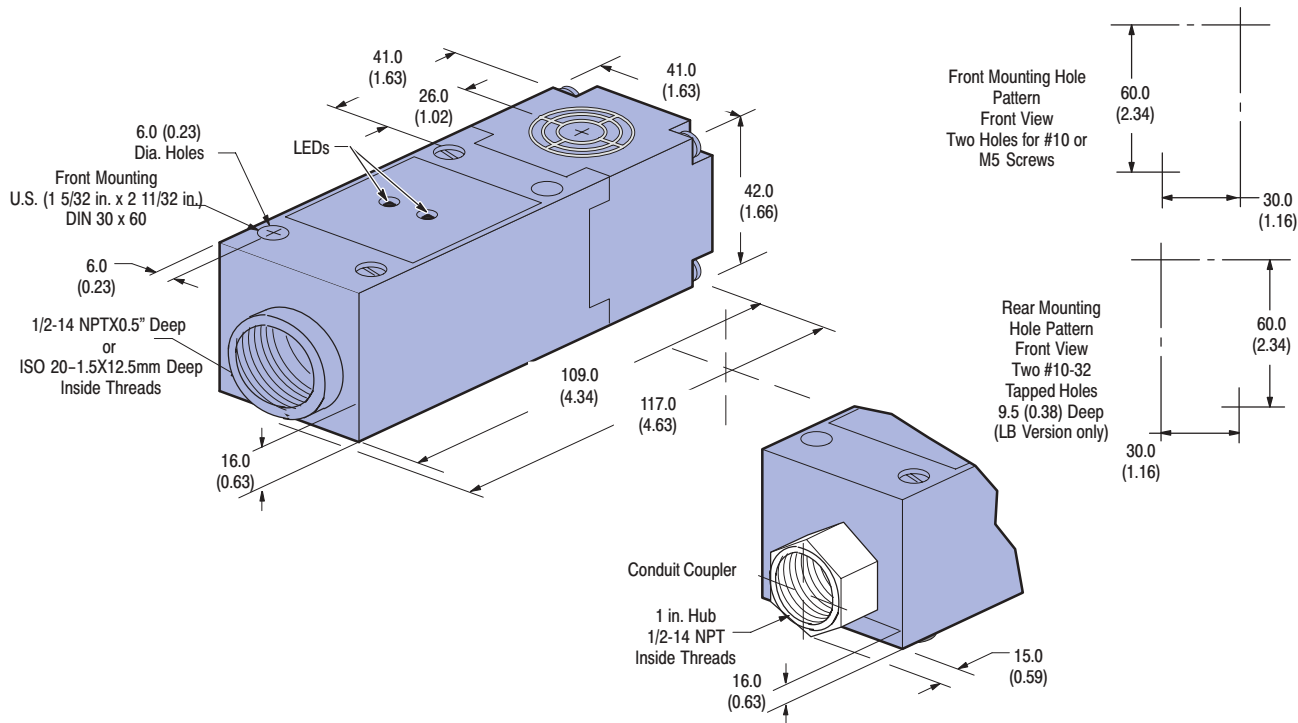
802PR 2-Wire AC/DC, Conduit Style

Limit Switch Style

Product Selection

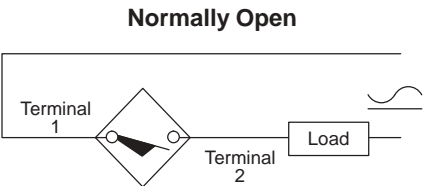
Sensing Direction	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration	Switching Frequency (Hz)	Corrosion Resistant	Connection Type	Catalog Number Conduit Style
Side	17 (0.67)	Y	N.O.	20	Y	1/2"-14NPT	802PR-XBAB1
					N		802PR-LBAB1
					Y	ISO 20-1.5	802PR-XBAB1-S6
					N		802PR-LBAB1-S6
					N	Conduit Coupler	802PR-LBAA1
Top	17 (0.67)	Y	N.O.	20	Y	1/2"-14NPT	802PR-XBAH1
					N		802PR-LBAH1
					Y	ISO 20-1.5	802PR-XBAH1-S6
					N		802PR-LBAH1-S6
					N	Conduit Coupler	802PR-LBAJ1

Dimensions—mm (inches)



Note: Side sensing model heads can be turned in 90° increments to accommodate 4 side sensing positions.

Wiring Diagram



Note: Load can be switched to Terminal 1.



802PR AC/DC
Conduit Style
page 2-144



Features

- 2-wire operation
- 2-terminal connection
- 20–250V AC/DC (for solid state inputs)
- Normally open output
- Short circuit, overload, false pulse, RFI, and transient noise protection
- Hazardous location rating
- 2 LEDs
- UL listed, CSA certified, and Factory Mutual approved

Specifications

Load Current	AC: 4–25mA DC: 2–25mA
Leakage Current	≤1.7mA at 132V, ≤2.5mA at 250V
Operating Voltage	20–250V AC/DC
Voltage Drop	≤10V
Repeatability	≤10% typical
Hysteresis	≤10% typical
Transient Noise Protection	Incorporated
Short Circuit Protection	Incorporated
Overload Protection	Incorporated
False Pulse Protection	Incorporated
Radio Frequency Protection	≤10V per meter Frequency range 20–1000 MHz
Approvals	UL listed, CSA certified, and Factory Mutual approved
Enclosure	NEMA 1, 2, 3, 4, 12, 13 IP65 (IEC 529) Division 2 Class I: Groups A, B, C & D; Class II: Groups F & G; Class III: All groups Self-extinguishing glass-reinforced polyester body
Connection	Conduit Coupler: 1/2–14 NPT internal thread with screw terminals use (#18–14 AWG wire)
LEDs	Green: Power Red: Output energized (both on in SCP/Overload)
Operating Temperature	–25°C to +75°C (–13°F to +167°F)
Shock	30g, 11ms
Vibration	55Hz, 1mm amplitude, 3 planes

Correction Factors

Target Material	Correction Factor
Steel	1.0
Stainless Steel	0.9
Brass	0.8
Aluminum	0.75
Copper	0.7

Inductive Proximity Sensors

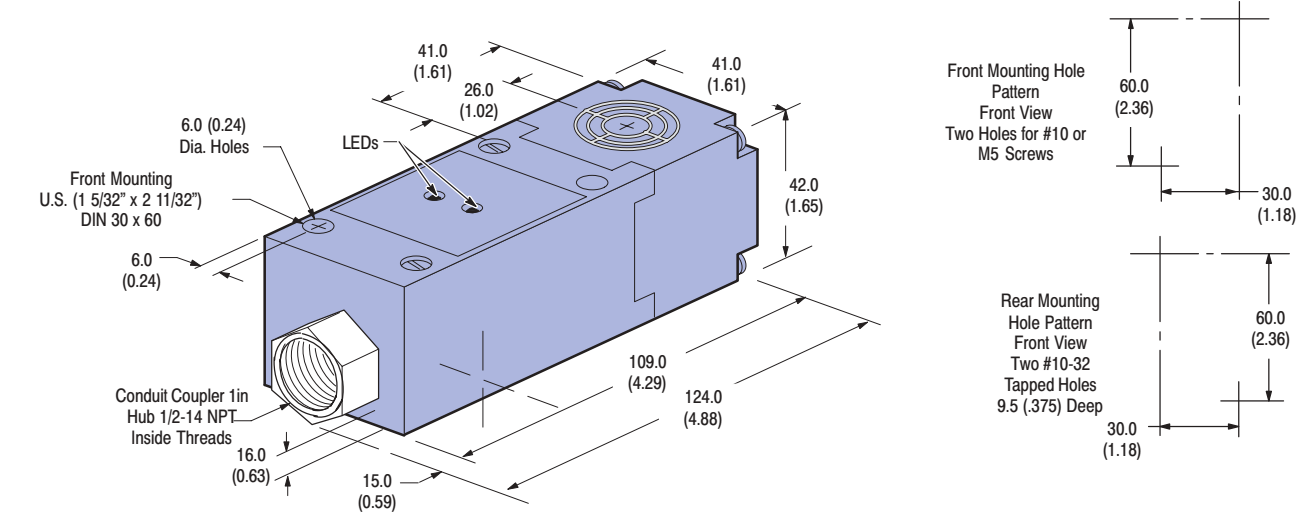
802PR 2-Wire AC/DC Hazardous Location, Conduit Style

Limit Switch Style

Product Selection

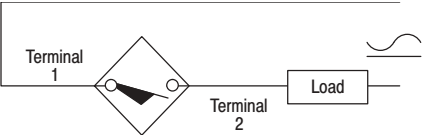
Sensing Direction	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration	Switching Frequency (Hz)	Catalog Number Conduit Style
Side	17 (0.67)	Y	N.O.	20	802PR-LBAA3
Top					802PR-LBAJ3

Dimensions—mm (inches)



Note: Side-sensing model heads can be turned in 90° increments to accommodate 4 side-sensing positions.

Wiring Diagram



Note: Load can be switched to Terminal 1.



802PR AC
Cable Style
page 2-146



802PR AC Mini
Quick-Disconnect Style
page 2-147



802PR AC
Conduit Style
page 2-148



Features

- 2-wire operation
- 2-conductor, 3-pin, or 2-terminal connection
- 60–132V AC or 102–132V AC
- Normally open or N.O./N.C. selectable output
- High output (1A)
- Transient noise and false pulse protection
- UL listed, CSA certified, and CE marked for all applicable directives

Specifications

Load Current	≤1A at +40°C linearly derated to 0.5A at 75°C
Inrush Current	≤10A/1s
Supply Current (minimum)	25mA
Leakage Current	≤3.5mA (60–132V AC); ≤6.5mA (102–132V AC)
Operating Voltage	60–132V AC or 102–132V AC
Voltage Drop	≤8.5V
Repeatability	≤0.025mm
Hysteresis	15% (max.)
False Pulse Protection	Incorporated
Transient Noise Protection	Incorporated
Approvals	UL listed, CSA certified, and CE marked for all applicable directives
Enclosure	NEMA 1, 2, 3, 4, 4X ^① , 12, 13, IP65 (IEC 529) Self-extinguishing glass-reinforced polyester body
Connections	Cable: 8ft or 12ft length 2-conductor 16 AWG STO (oil-resistant thermoplastic) Quick Disconnect: 3-pin mini style Conduit Opening or Conduit Coupler: 1/2–14NPT internal thread with screw terminals (use #18–14 AWG wire)
LED	Red: Output Energized
Operating Temperature	–25°C to +75°C (–13°F to +167°F)
Shock	30g, 11ms
Vibration	55Hz, 1mm amplitude, 3 planes

^① Corrosion resistant models

Correction Factors

Target Material	Correction Factor
Steel	1.0
Stainless Steel	0.80–0.85
Brass	0.50–0.55
Aluminum	0.45–0.50
Copper	0.40–0.45

Inductive Proximity Sensors

802PR 2-Wire AC High Output, Cable Style

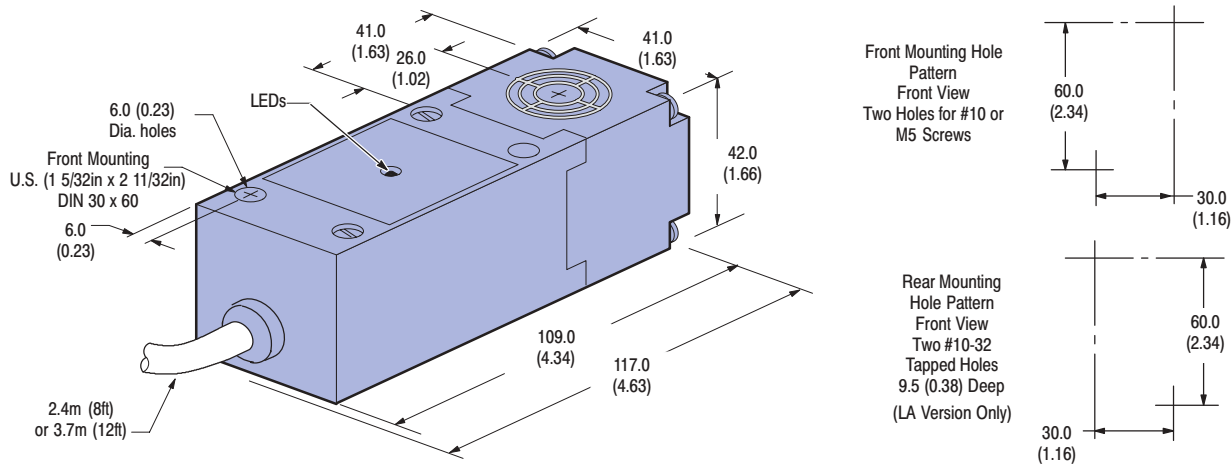
Limit Switch Style

Product Selection

Sensing Direction	Nominal Sensing Distance mm (inches)	Shielded	Voltage Range	Output Configuration	Corrosion Resistant	Switching Frequency (Hz)	Cable Length (Ft)	Catalog Number Cable Style				
Side	13 (0.51)	Y	60-132V AC	Selectable❶	N	20	8	802PR-LABM2-08				
							12	802PR-LABM2-12				
Top							8	802PR-LABR2-08				
							12	802PR-LABR2-12				
Side				Selectable❷			8	802PR-LACM2-08				
							12	802PR-LACM2-12				
Top			102-132V AC	N.O.		16	8	802PR-LACR2-08				
							12	802PR-LACR2-12				
Side							8	802PR-LAAM1-08				
							12	802PR-LAAM1-12				
Top							8	802PR-LAAR1-08				
							12	802PR-LAAR1-12				
Side			Y				8	802PR-XAAM1-08				
							12	802PR-XAAM1-12				
Top							8	802PR-XAAR1-08				
							12	802PR-XAAR1-12				

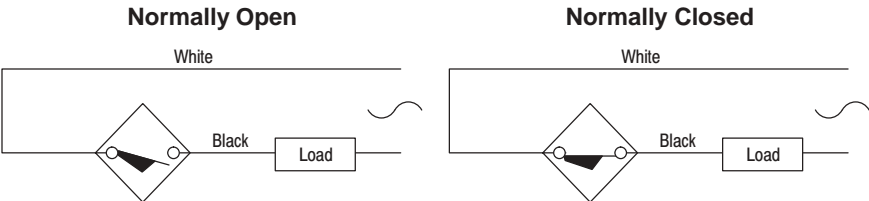
❶ Preset to N.O. at factory.
❷ Preset to N.C. at factory.

Dimensions—mm (inches)



Note 1: Side sensing model heads can be turned in 90° increments to accommodate 4 side sensing positions.
Note 2: Low voltage models have 2 LEDs.

Wiring Diagrams



Note: Load can be switched to white lead.

Accessories

Description	Page Number
Other Cordsets Available	7-8
Terminal Chambers	7-20

802PR 2-Wire AC High Output, Mini Quick-Disconnect Style

Limit Switch Style

Product Selection

Sensing Direction	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration	Voltage Range	Switching Frequency (Hz)	Catalog Number Mini QD Style
Side	13 (0.51)	Y	Selectable❶	60–132V AC	20	802PR-LABE2
Top						802PR-LABK2
Side			Selectable❷			802PR-LACE2
Top						802PR-LACK2
Side			N.O.	102–132V AC	16	802PR-LAAE1
Top						802PR-LAAK1
Recommended Standard QD Cordset Required (–6F = 1.8m (6ft))						889N-F3AFC-6F

❶ Preset to N.O. at factory.

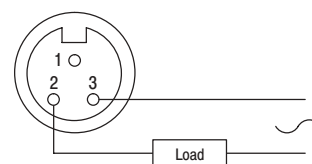
❷ Preset to N.C. at factory.

QD Cordsets and Accessories

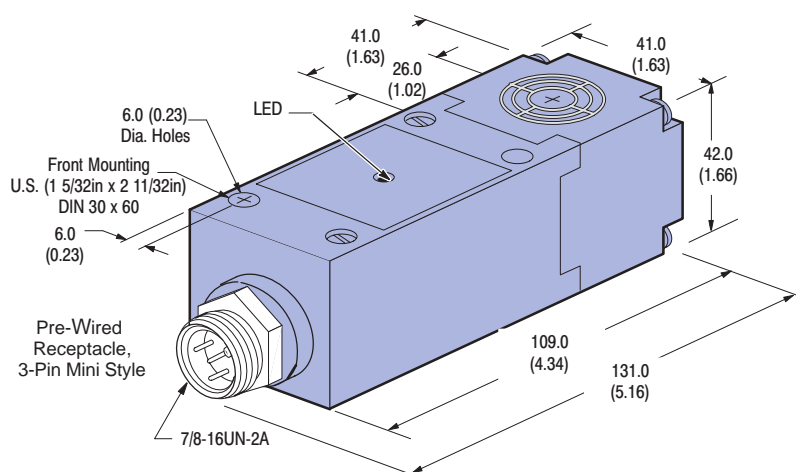
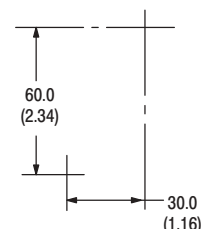
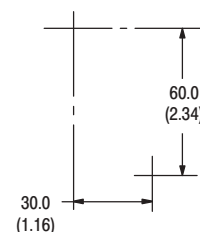
Description	Page Number
Other Cordsets Available	7–8
Terminal Chambers	7–20

Wiring Diagram

Normally Open or Normally Closed

**Note:** Load can be switched to pin 3.

Dimensions—mm (inches)

Front Mounting Hole Pattern
Front View
Two Holes for #10 or M5 ScrewsRear Mounting Hole Pattern
Front View
Two #10-32 Tapped Holes
9.5 (0.38) Deep
(LA Version Only)**Note 1:** Side sensing model heads can be turned in 90° increments to accommodate 4 side sensing positions.**Note 2:** Low voltage models have 2 LEDs.

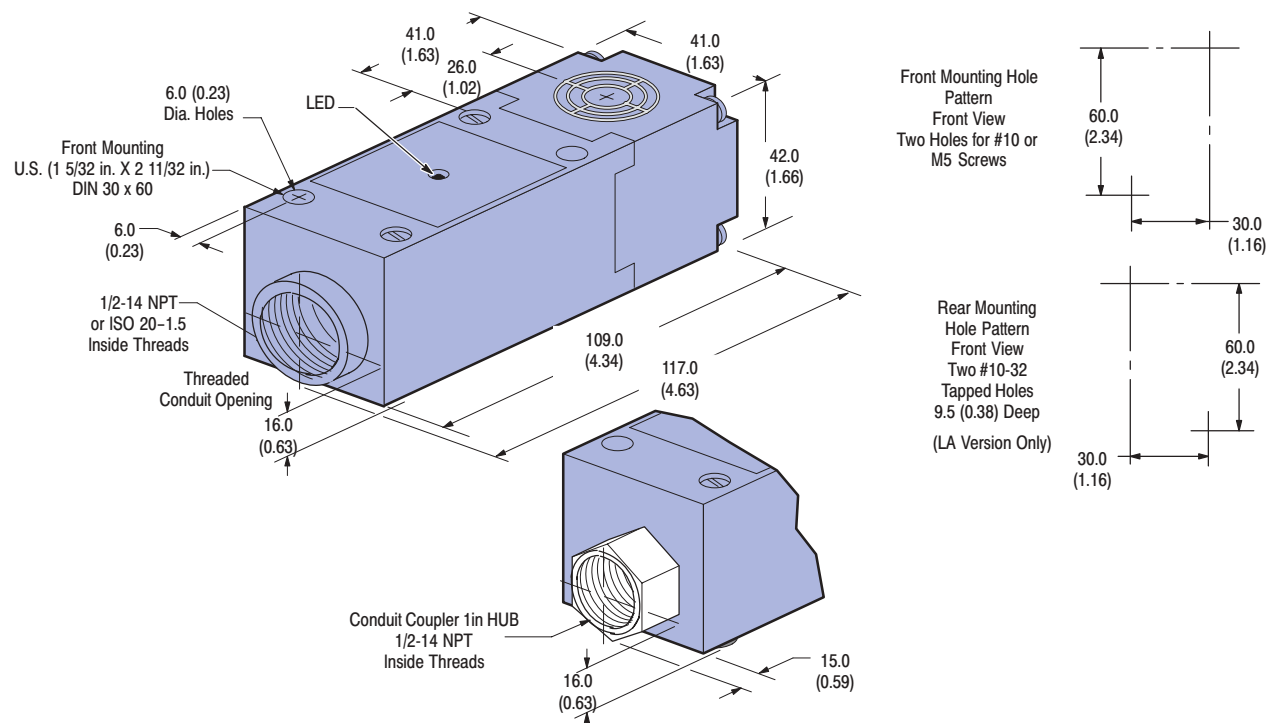
802PR 2-Wire AC High Output, Conduit Style**Limit Switch Style****Product Selection**

Sensing Direction	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration	Corrosion Resistant	Voltage Range	Switching Freq. (Hz)	Connection	Catalog Number Conduit Style					
Side	13 (0.51)	Y	Selectable❶	N	60–132V AC	20	Conduit Coupler	802PR-LABA2					
							Threaded 1/2–14 NPT❸	802PR-LABB2					
Top							Conduit Coupler	802PR-LABJ2					
							Threaded 1/2–14 NPT❸	802PR-LABH2					
Side			Selectable❷							Conduit Coupler	802PR-LACA2		
										Threaded 1/2–14 NPT❸	802PR-LACB2		
Top										Conduit Coupler	802PR-LACJ2		
										Threaded 1/2–14 NPT❸	802PR-LACH2		
Side			N.O.			102–132V AC	16	Conduit Coupler	802PR-LAAA1				
								Threaded 1/2–14 NPT❸	802PR-LAAB1				
Top								Conduit Coupler	802PR-LAAJ1				
								Threaded 1/2–14 NPT❸	802PR-LAAH1				
Side								Y				Threaded 1/2–14 NPT❸	802PR-XAAB1
Top												Threaded 1/2–14 NPT❸	802PR-XAAH1

❶ Preset to N.O. at factory.

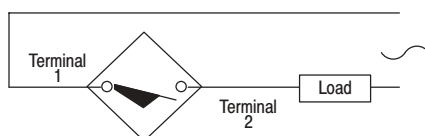
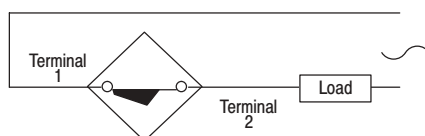
❷ Preset to N.C. at factory.

❸ To order ISO 20–1.5 add '–S6' to catalog number.

Dimensions—mm (inches)

Note 1: Side sensing model heads can be turned in 90° increments to accommodate 4 side sensing positions.

Note 2: Low voltage models have 2 LEDs.

Wiring Diagram**Normally Open****Normally Closed**

Note: Load can be switched to Terminal 1.

802PR 2-Wire AC Hazardous Location, High Output Limit Switch Style



802PR AC
Conduit Style
page 2-150



Features

- 2-wire operation
- 2-terminal connection
- 102–132V AC
- Hazardous location rating
- High output (1A)
- Normally open output
- Transient noise and false pulse protection
- UL listed, CSA certified, and Factory Mutual approved

Specifications

Load Current	1A at +40°C linearly derated to 0.5A at 75°C
Inrush Current	≤10A/1s
Supply Current	25mA min.
Leakage Current	≤6.5mA
Operating Voltage	102–132V AC
Voltage Drop	≤8.5V
Repeatability	≤.025mm
Hysteresis	15% maximum
False Pulse Protection	Incorporated
Transient Noise Protection	Incorporated
Approvals	UL listed, CSA certified, and FM approved
Enclosure	NEMA 1, 2, 3, 4, 12, 13 IP65 (IEC 529) Division 2 Class I: Groups A, B, C & D; Class II: Groups F & G; Class III: All groups Self-extinguishing glass reinforced polyester body
Connection	Conduit Coupler: 1/2–14 NPT internal thread with screw terminals use (#18–14 AWG wire)
LED	Red: Output Energized
Operating Temperature	–25°C to +75°C (–13°F to +167°F)
Shock	30g, 11ms
Vibration	55Hz, 1mm amplitude, 3 planes

Correction Factors

Target Material	Correction Factor
Steel	1.0
Stainless Steel	0.80–0.85
Brass	0.50–0.55
Aluminum	0.45–0.50
Copper	0.40–0.45

Inductive Proximity Sensors

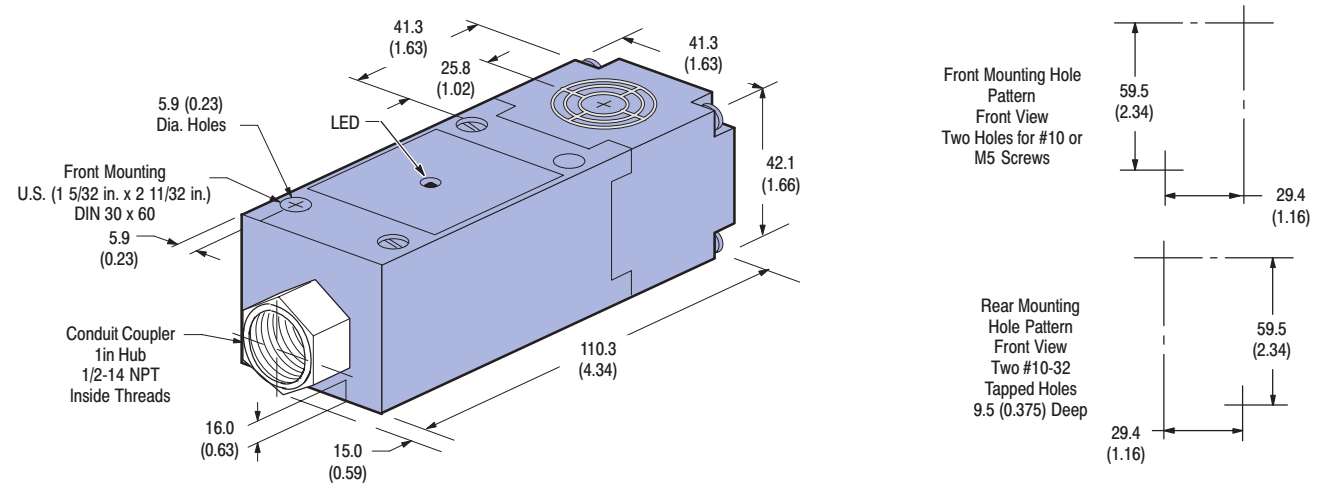
802PR 2-Wire AC Hazardous Location, High Output, Conduit Style

Limit Switch Style

Product Selection

Sensing Direction	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration	Switching Frequency (Hz)	Catalog Number Conduit Style
Side	13 (0.51)	Y	N.O.	16	802PR-LAAA3
Top					802PR-LAAJ3

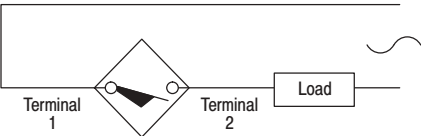
Dimensions—mm (inches)



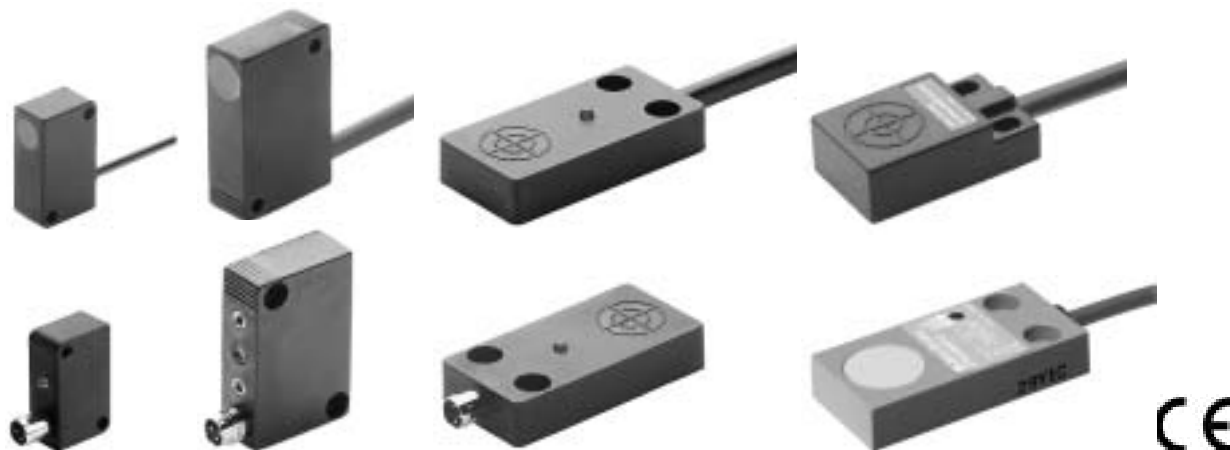
Note: Side sensing model heads can be turned in 90° increments to accommodate 4 side sensing positions.

Wiring Diagram

Normally Open



Note: Load can be switched to Terminal 1.

**Description**

Bulletin 871FM inductive flat pack proximity sensors are self-contained, general purpose, solid state devices designed to sense the presence of ferrous and non-ferrous metal objects without touching them.

These sensors are ideal for applications in which space is limited. They are available in three compact sizes. Connection options include 3-conductor PVC cable or pico quick-disconnect.

Features

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

Styles

DC 3-wire page 2–152

AC 2-wire page 2–155

Accessories

Quick-Disconnect Cables . . . page 7–1

General Information

Metric/English
Conversion Chart page 10–9

871FM 3-Wire DC**Miniature Flat Pack Style**

871FM DC Cable Style
28 x 16 x 11mm
page 2-153



871FM DC Pico
Quick-Disconnect Style
28 x 16 x 11mm
page 2-153



871FM DC Cable Style
40 x 26 x 12mm
page 2-153



871FM DC Pico
Quick-Disconnect Style
40 x 26 x 12mm
page 2-153



871FM DC Cable Style
25 x 50 x 10mm
page 2-153



871FM DC Pico
Quick-Disconnect Style
25 x 50 x 10mm
page 2-153

Specifications

	28 x 16 x 11mm	40 x 26 x 12mm	25 x 50 x 10mm	31 x 18 x 10mm
Supply Current	<11mA	<11mA	<8mA	10mA
Load Current	≤200mA	≤200mA	≤200mA	50mA @ 12V DC 100mA @ 24V DC
Leakage Current	<100μA	<100μA	<100μA	
Operating Voltage	10–30V DC	10–30V DC	10–24V DC	10–30V DC
Voltage Drop	≤1.8V	≤1.8V	≤2.5V	≤1V
Repeatability	≤5%			
Hysteresis	10% typical			
False Pulse Protection	Incorporated			
Transient Noise Protection	Incorporated			
Reverse Polarity Protection	Incorporated			
Short Circuit Protection	Incorporated			
Overload Protection	Incorporated			
Enclosure	NEMA 4, IP67 (IEC 529) Plastic			
Connections	Cable: 2m (6.5ft) length 3-conductor PVC Quick-Disconnect: 3-pin pico style			
LED	Yellow: Output Energized		Red: Output Energized	
Operating Temperature	–25°C to +70°C (–13°F to +158°F)			
Shock	30g, 11ms			50g (Approx)
Vibration	55Hz, 1mm amplitude, 3 planes			10–55Hz @ 1–5mm

Features

- 3-wire operation
- 3-conductor or 3-pin connection
- 10–30V DC
- Normally open or normally closed output
- False pulse, transient noise, reverse polarity, short-circuit and overload protection
- CE marked for all applicable directives

Correction Factors

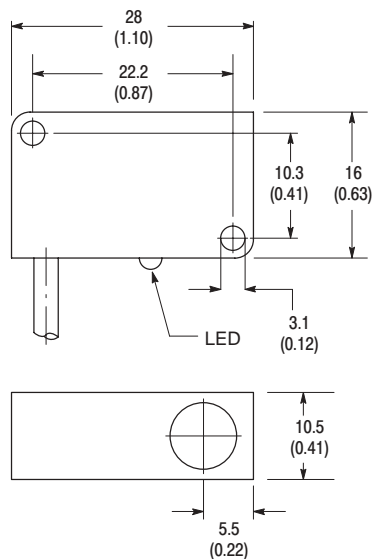
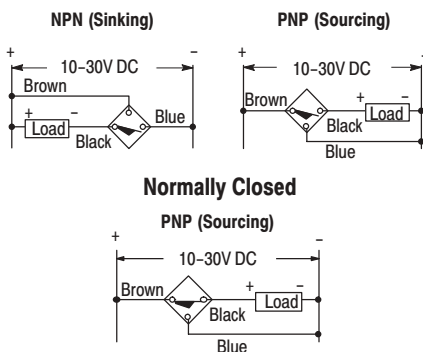
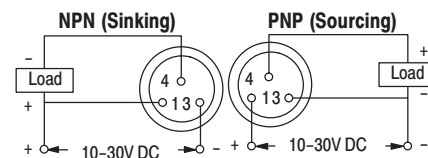
Target Material	Correction Factor
Steel	1.0
Stainless Steel	0.85
Brass	0.55
Aluminum	0.50
Copper	0.45

Product Selection

Sensor Size	Sensing Direction	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration		Switching Frequency (Hz)	Catalog Numbers	
							Cable Style	Pico QD Style
28 x 16 x 11mm	Side	2 (0.08)	Y	N.O.	PNP	600	871FM-D2NP11-E2	871FM-D2NP11-P3
		N.C.		PNP	871FM-D2CP11-E2		871FM-D2CP11-P3	
40 x 26 x 12mm		2 (0.08)		N.O.	PNP	800	871FM-D2NP12-E2	871FM-D2NP12-P3
				N.C.	NPN		871FM-D2CN12-E2	—
		N.C.	PNP	871FM-D2CP12-E2	—			
		4 (0.16)	N	N.O.	NPN	400	871FM-D4NN12-E2	871FM-D4NN12-P3
					PNP		—	871FM-D4NP12-P3
				N.C.	NPN		871FM-D4CN12-E2	—
				PNP	—		—	
25 x 50 x 10mm		Face	5 (0.20)	Y	N.O.	NPN	500	871FM-D5NN25-E2
					PNP	871FM-D5NP25-E2		871FM-D5NP25-P3
	N.C.				PNP	871FM-D5CP25-E2		—
					NPN	871FM-D5CN25-E2		—
	8 (0.31)		N	N.O.	NPN	200	871FM-D8NN25-E2	—
					PNP		871FM-D8NP25-E2	871FM-D8NP25-P3
				N.C.	PNP		871FM-D8CP25-E2	—
					PNP		—	—
38 x 18 x 10mm		5 (0.20)		N.O.	PNP		871FM-D5NP10-E2	—
Recommended Standard QD Cordset (–2 = 2m (6.5ft))								889P-F3AB-2

QD Cordsets and Accessories

Description	Page Number
Other Cordsets Available	7–88
Terminal Chambers	7–20

Dimensions—mm (inches)**Cable & Pico QD Style****28 x 16 x 11mm****Wiring Diagrams****Cable Style****Normally Open****Pico QD Style****Normally Open or Normally Closed**

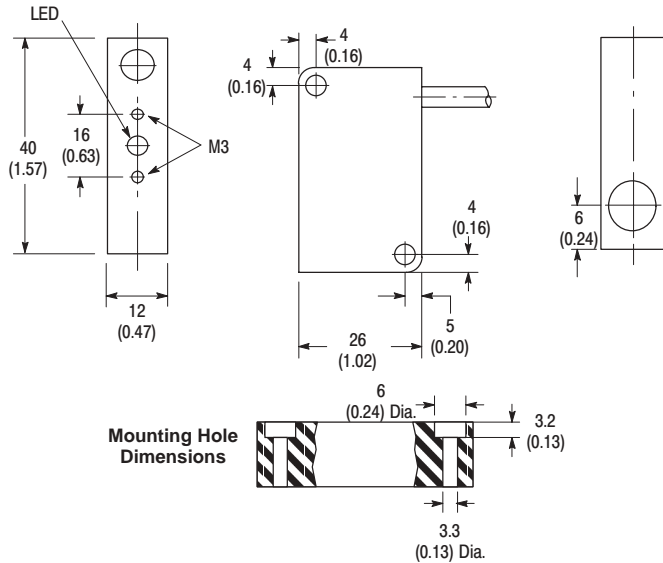
871FM 3-Wire DC

Miniature Flat Pack Style

Dimensions—mm (inches)

Cable & Pico QD Style

40 x 26 x 12mm

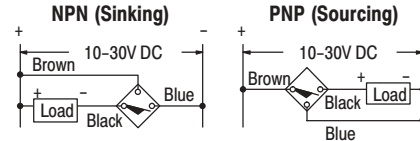


Mounting Hole Dimensions

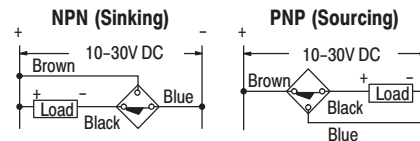
Wiring Diagram

Cable Style

Normally Open

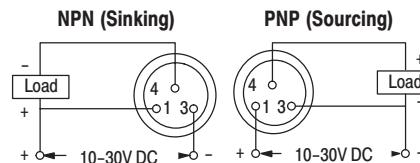


Normally Closed



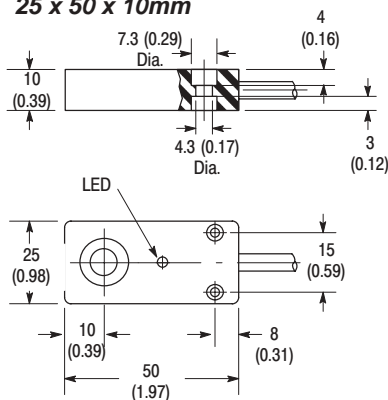
Pico QD Style

Normally Open



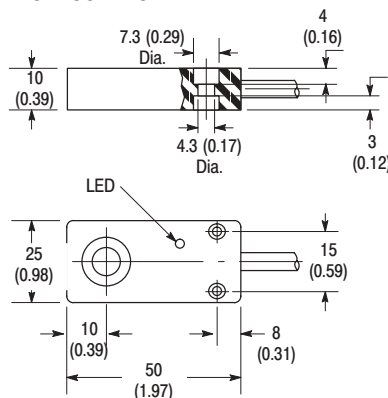
Unshielded Cable & Pico QD & Shielded Pico QD Style

25 x 50 x 10mm



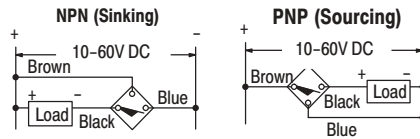
Shielded Cable Style

25 x 50 x 10mm

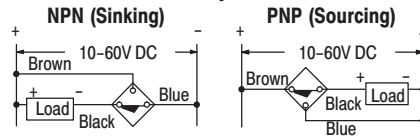


Cable Style

Normally Open

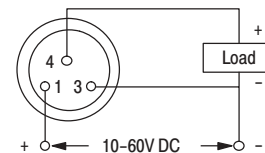


Normally Closed



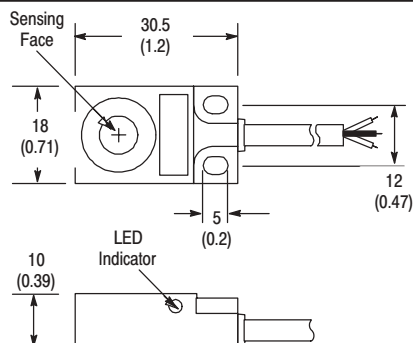
Pico QD Style

PNP (Sourcing)



Cable Style

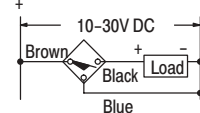
25 x 50 x 10mm



Cable Style

Normally Open

PNP (Sourcing)





871FM AC Cable Style
28 x 16 x 11mm
page 2-156



871FM AC Cable Style
40 x 26 x 12mm
page 2-156



Specifications

	28 x 16 x 11mm	40 x 26 x 12mm
Load Current	≤100mA	≤180mA
Minimum Load Current	4mA	
Leakage Current	<2mA	
Operating Voltage	90-250V AC	
Voltage Drop	≤15V	
Repeatability	≤5%	
Hysteresis	10% typical	
False Pulse Protection	Incorporated	
Transient Noise Protection	Incorporated	
Approval	CE marked for all applicable directives	
Enclosure	NEMA 4, IP67 (IEC 529) Plastic	
Connections	Cable: 2m (6.5ft) length 2-conductor PVC	
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

- 2-wire operation
- 2-conductor connection
- 90-250V AC
- Normally open or normally closed output
- False pulse and transient noise protection
- CE marked for all applicable directives

Correction Factors

Target Material	Correction Factor
Steel	1.0
Stainless Steel	0.85
Brass	0.55
Aluminum	0.50
Copper	0.45

871FM 2-Wire AC

Miniature Flat Pack Style

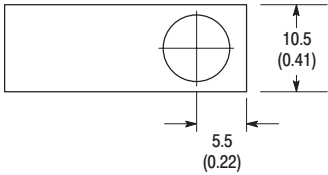
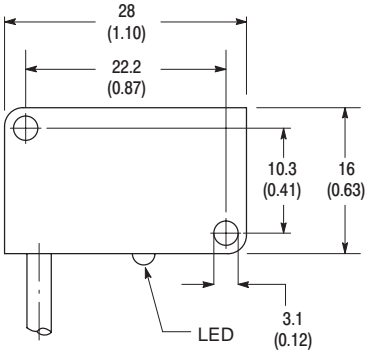
Product Selection

Sensor Size	Sensing Direction	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration	Switching Frequency (Hz)	Catalog Number Cable Style
28 x 16 x 11mm	Side	2 (0.08)	Y	N.O.	10	871FM-A2N11-A2
40 x 26 x 12mm				N.C.		871FM-A2C12-A2
		4 (0.16)	N	N.O.		871FM-A4N12-A2

Dimensions—mm (inches)

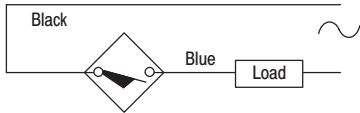
Cable Style

28 x 16 x 11mm



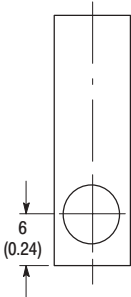
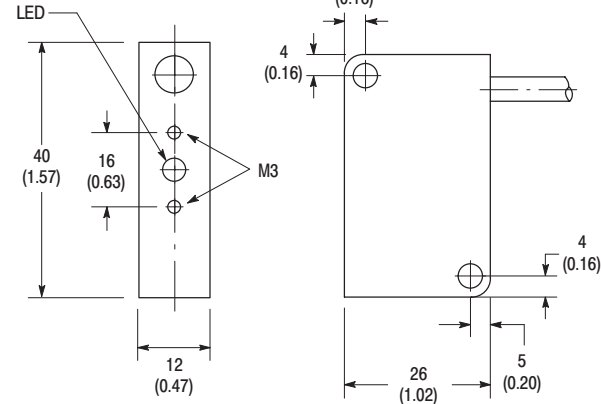
Wiring Diagram

Cable Style

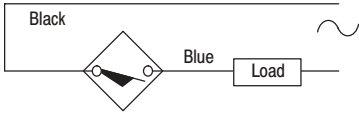
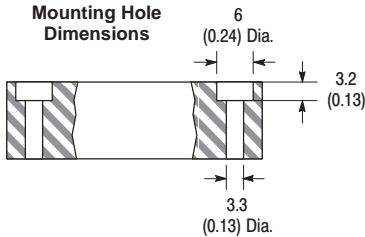


Note: Load can be switched to black wire.

40 x 26 x 12mm



Mounting Hole Dimensions



Note: Load can be switched to black wire.



Description

Bulletin 871P inductive proximity can sensors are self-contained solid state devices, designed specifically for sensing size 202 to 704 metal cans without physical contact. These sensors have been specifically designed for the canning industry in terms of both functionality and environmental ratings.

Short- and long-range can sensor models are available in both AC and DC versions. These models contain multiple coils to provide a wide sensing field which allows metal containers to be sensed on canning lines while the gaps between them are ignored. This type of sensor provides a “cans present” or “cans not present” signal and is the standard sensor type used in can line control. Rockwell Automation/Allen-Bradley provides two models for varying can sizes.

A DC powered can motion sensor is also available for applications which require can movement sensing. Designed with the same multiple coils and wide sensing field as the standard can sensor, an extra coil was added as a separate circuit, which can be set to sense the gaps between the cans. The signal from the wide sensing field circuit (which ignores the gaps between the cans) is combined with the signal from the second circuit (which senses the gaps between the cans) to achieve an output indicating true can motion. If cans are present and not moving, the sensor output turns on. If cans are present and moving or if no cans are present, the sensor will remain off.

Depending on the specific canning line setup, this true can motion sensor can help improve line efficiency or address problem areas on canning line conveyor systems by providing control equipment with motion/no motion information.

The 871P can sensor family combines rugged construction and superior sensing capability to provide long lasting durability and performance in hostile manufacturing and filling environments.

Allen-Bradley can sensors are designed to withstand repeated 1200psi washdowns common in the food and beverage industries and are mounted on industry standard brackets.

Features

- Short circuit protection
- Overload protection
- Transient noise protection
- False pulse protection
- Reverse polarity protection (DC models)
- Stainless steel housing
- NEMA 6P, IP67 enclosure
- 1200psi (8270kPa) washdown

Styles

Short-Range AC 2-Wire Inductive Can	page 2–158
Long-Range AC 2-Wire Inductive Can	page 2–158
Short-Range DC 4-Wire Inductive Can	page 2–160
Long-Range DC 4-Wire Inductive Can	page 2–160
Motion DC 4-Wire Inductive Can	page 2–162

Accessories

Quick-Disconnect Cables ...	page 7–1
Mounting Bracket	page 2–191

General Information

Metric/English Conversion Chart	page 10–9
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871P AC Short-Range
76 x 36 x 58mm
page 2-159



Features

- 2-wire operation
- 3-conductor connection
- 30–150V AC
- Normally open
- Short- and long-range models
- Stainless steel housing
- 1200psi (8270kPa) washdown
- False pulse, transient noise, short circuit, and overload protection

Specifications

Outputs	Normally Open
Load Current	300mA
Minimum Load Current	15mA
Leakage Current	<1.5mA
Inrush Current	<5A (20ms)
Operating Voltage	30 to 150V AC RMS
Line Frequency	40 to 60Hz
Voltage Drop	<15V @300mA
Repeatability	≤2%
Hysteresis	10% typical
False Pulse Protection	Incorporated
Transient Noise Protection	Incorporated
Short Circuit Protection	Incorporated
Overload Protection	Incorporated
Approvals	UL listed and CE marked for all applicable directives
Enclosure	NEMA 1, 3, 4, 4X, 6, 6P, 12, 13, IP67 (IEC 529), 1200psi (8270kPa) washdown
Connections	3-pin mini style
LEDs	Red: Output Energized
Operating Temperature	–20°C to +70°C (0°F to +160°F)
Housing Material	Stainless steel, plastic face
Mounting	2 stainless steel studs

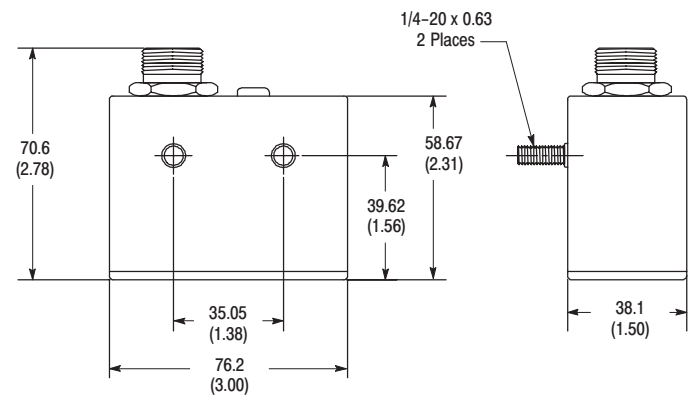
Product Selection

Style	Container Sizes	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration	Switching Frequency (Hz)	Catalog Numbers Mini QD Style
Short	202-401	Steel: 19mm (0.75in) Aluminum: 13mm (0.50in)	Y	N.O.	25	871P-AC19N76-N3
Long	202-704	Steel: 29mm (1.15in) Aluminum: 15mm (0.60in)				871P-AC29N140-N3
Recommended Standard QD Cordset (-6F = 1.8m (6ft))						889N-F3AFC-6F

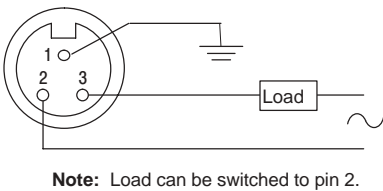
QD Cordsets

Description	Page Number
Other Cordsets Available	7-8
Terminal Chambers	7-20

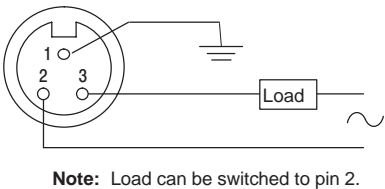
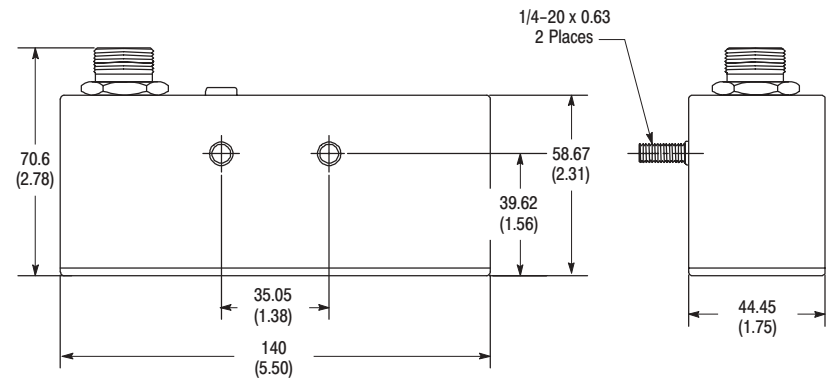
Dimensions—mm (inches)
Short-Range Mini QD Style



Wiring Diagram



Long-Range Mini QD Style



871P Can Sensors 4-Wire DC

871P DC Short Range
76 x 36 x 58mm
page 2-161

Features

- 4-conductor plus shield or 4-pin mini connection
- 10–30V DC
- Normally open NPN and PNP outputs
- Short- and long-range models
- Stainless steel housing
- 1200psi (8270kPa) washdown
- False pulse, transient noise, reverse polarity, short circuit, and overload protection

Specifications

Outputs	Normally Open NPN and PNP
Load Current	300mA
Operating Voltage	10–30V DC
Operating Current	25mA (off), 55mA (on)
Voltage Drop	≤2.5V
Repeatability	≤2%
Hysteresis	3%–15%
False Pulse Protection	Incorporated
Transient Noise Protection	Incorporated
Short Circuit Protection	Incorporated
Overload Protection	Incorporated
Reverse Polarity Protection	Incorporated
Enclosure	NEMA 1, 3, 4, 4X, 6, 6P, 12, 13, IP67 (IEC 529), 1200psi (8270kPa) washdown
Connections	A2: 2m shielded PVC jacketed cable, 4-wire, #22AWG, 1/2" NPT N4: 4-pin mini quick-disconnect
LEDs	Red: Output Energized
Operating Temperature	–20°C to +70°C (0°F to +160°F)
Housing Material	Stainless steel, plastic face
Mounting	2 stainless steel studs

Product Selection

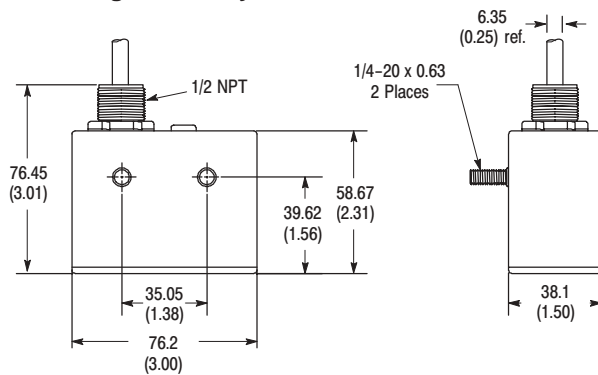
Style	Container Sizes	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration	Switching Frequency (Hz)	Catalog Numbers	
						Cable Style	Mini QD Style
Short	202-401	Steel: 19mm (0.75in) Aluminum: 13mm (0.50in)	Y	Normally Open NPN and PNP	35	871P-DC19NB76-A2	871P-DC19NB76-N4
Long	202-704	Steel: 29mm (1.15in) Aluminum: 15mm (0.60in)				871P-DC29NB140-A2	871P-DC29NB140-N4
Recommended Standard QD Cordset (-6F = 1.8m (6ft))							889N-F4AFC-6F

QD Cordsets

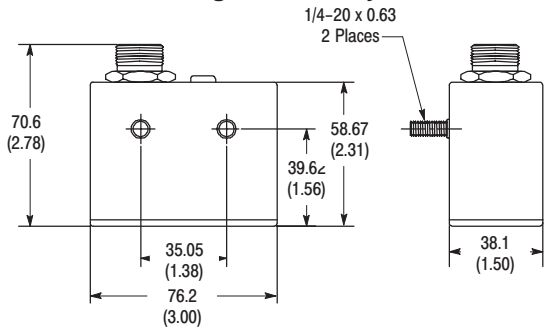
Description	Page Number
Other Cordsets Available	7-8
Terminal Chambers	7-20

Dimensions—mm (inches)

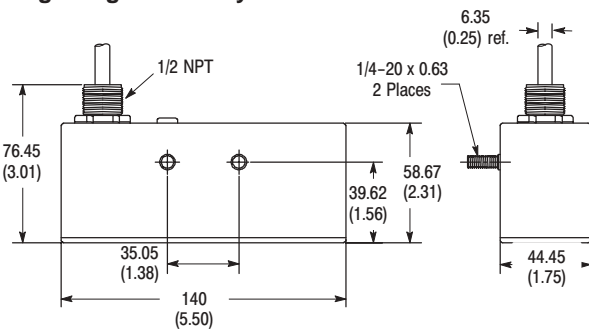
Short-Range Cable Style



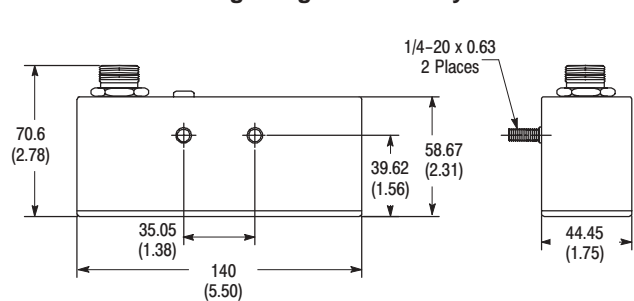
Short-Range Mini QD Style



Long-Range Cable Style

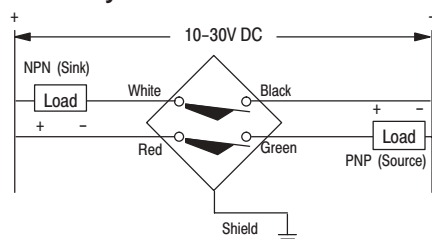


Long-Range Mini QD Style

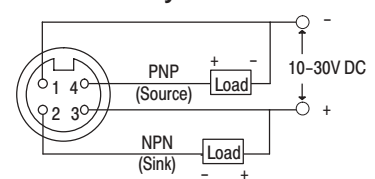


Wiring Diagram

Cable Style



Mini QD Style



Note: Red and black wires must be connected for proper operation.

871P Can Sensors 4-Wire DC Motion



871P DC Motion Style
140 x 45 x 58mm
page 2-163

Features

- 4-conductor plus shield or 4-pin mini connection
- 10–30V DC
- Normally open NPN and PNP outputs
- Stainless steel housing
- 1200psi (8270kPa) washdown
- Dual function output LED
Dim blink: cans moving
Bright steady: no motion
- Adjustable sensing distance
- False pulse, transient noise, reverse polarity, short circuit, and overload protection

Specifications

Outputs	Normally Open NPN and PNP
Load Current	300mA
Operating Voltage	10–30V DC
Operating Current	25mA (off), 55mA (on)
Voltage Drop	≤2.5V
Repeatability	≤2%
Hysteresis	3%–15%
Output Time Delay	0.5 sec after motion stops
False Pulse Protection	Incorporated
Transient Noise Protection	Incorporated
Short Circuit Protection	Incorporated
Overload Protection	Incorporated
Reverse Polarity Protection	Incorporated
Enclosure	NEMA 1, 3, 4, 4X, 6, 6P, 12, 13, IP67 (IEC 529), 1200psi (8270kPa) washdown
Connections	A2: 2m shielded PVC jacketed cable, 4-wire, #22AWG, 1/2" NPT N4: 4-pin mini quick-disconnect
LED	Red: Output Energized Dim Blink: Cans moving Bright Steady: No motion
Potentiometer	Sensing range adjust
Operating Temperature	–20°C to +70°C (0°F to +160°F)
Housing Material	Stainless steel, plastic face
Mounting	2 stainless steel studs

Product Selection

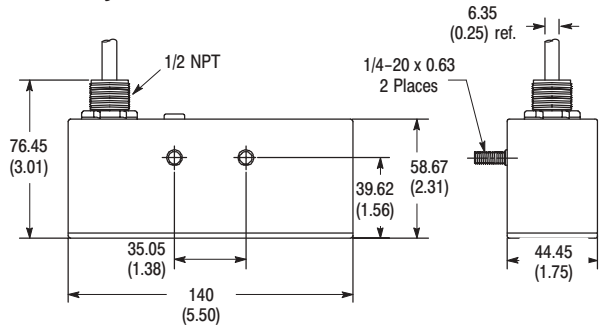
Container Sizes	Nominal Presence Sensing Distance mm (inches)	Nominal Motion Sensing Distance mm (inches)	Shielded	Output Configuration	Catalog Numbers	
					Cable Style	Mini QD Style
202-704	Steel: 29mm (1.15in) Aluminum: 15mm (0.60in)	Steel: 19mm (0.75in) Aluminum: 13mm (0.50in)	Y	Normally Open NPN and PNP	871P-DD29NB140-A2	871P-DD29NB140-N4
Recommended Standard QD Cordset (-6F = 1.8m (6ft))						889N-F4AFC-6F

QD Cordsets

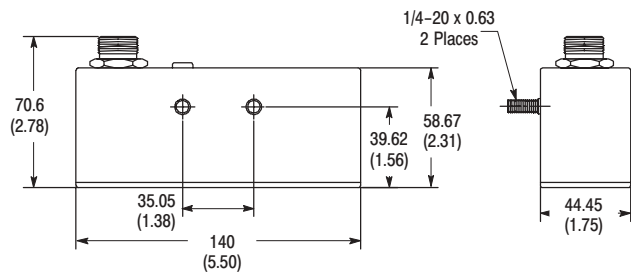
Description	Page Number
Other Cordsets Available	7-8
Terminal Chambers	7-20

Dimensions—mm (inches)

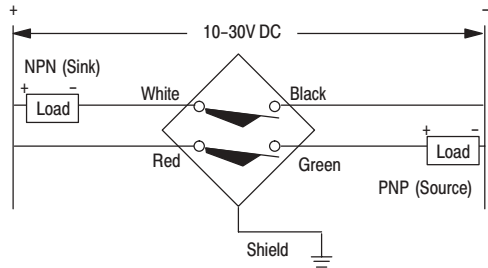
Cable Style



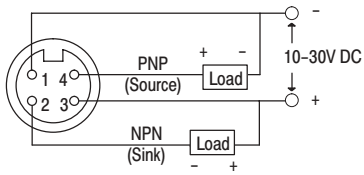
Mini QD Style



Wiring Diagram



Note: Red and black wires must be connected for proper operation.



Notes



Description

Bulletin 871D WorldClamp™ proximity sensors are specifically designed for use in power clamp and gripper applications. These devices incorporate two sensors into one unit, reducing the number of sensors and connection systems required for applications. Each sensor has two sensing coils (chicklets) that are used to detect whether the clamp/gripper is in the open or closed position.

The 871D WorldClamp has a compatible mounting configuration for the cartridges used by the major clamp manufacturers. These models are weld-field immune and have full electrical protections including short circuit, overload, false pulse, reverse polarity (DC models), and transient noise protection. All units meet IEC IP67 enclosure standards and are CE marked for all applicable directives.

Bulletin 871D WorldClamp™ proximity sensors are available in both 4-wire DC and 5-wire AC/DC micro quick-disconnect styles. Each sensor type is available in 100mm, 165mm, and 200mm lead lengths with either the large or small chicklet size.

Features

- Superior LED visibility
- Weld-field immune
- Shielded construction
- Short circuit protection
- Overload protection
- Transient noise protection
- False pulse protection
- Reverse polarity protection (DC models)
- UL listed, c-UL certified, and CE marked for all applicable directives

Styles

DC 4-wire page 2–166

AC/DC 5-wire page 2–168

Accessories

Quick-Disconnect Cables . . . page 7–1

General Information

Torque Chart page 2–201

Metric/English
Conversion Chart page 10–9



Features

- 2 normally open outputs
- Superior LED visibility
- 10–30V DC
- Weld field immune
- Short circuit, overload, false pulse, reverse polarity, and transient noise protection
- 100, 165, and 200mm lead length for chicklets
- Small or large chicklet sizes
- Impact resistant housing
- 4-pin micro quick-disconnect
- UL listed, c–UL certified, and CE marked for all applicable directives

Specifications

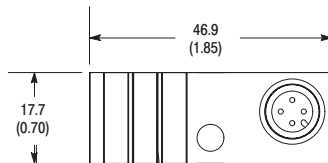
Load Current	150mA max
Leakage Current	< 10μA
Operating Voltage	10–30V DC
Voltage Drop	< 2.5V
Repeatability	< 2%
Hysteresis	5% typical
False Pulse Protection	Incorporated
Transient Noise Protection	Incorporated
Short Circuit Protection	Incorporated
Overload Protection	Incorporated
Weld Field Immunity	1600 Gauss
Approvals	UL listed, c–UL certified, and CE marked for all applicable directives
Enclosure	IP67
Connections	4-pin micro quick-disconnect
LED	Green: power; orange: S1 output; red: S2 output
Operating Temperature	–25°C to +70°C (–13°F to +158°F)
Shock	30g, 11ms
Vibration	55Hz, 1mm amplitude, 3 planes

Product Selection

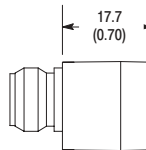
Nominal Sensing Distance mm (in)	Shielded	Output Configuration	Switching Frequency (Hz)	Lead Length mm (inches)	Chicklet Size	Catalog Number
2 (0.08)	Y	2 N.O. PNP Outputs	15	100 (3.94)	Large	871D-MW2GP100A-D4
					Small	871D-MW2GP100B-D4
				165 (6.50)	Large	871D-MW2GP165A-D4
					Small	871D-MW2GP165B-D4
				200 (7.88)	Large	871D-MW2GP200A-D4
					Small	871D-MW2GP200B-D4
Recommended Standard QD Cordset (-2 = 2m (6.5ft))						889D-F4AC-2

Dimensions—mm (inches)

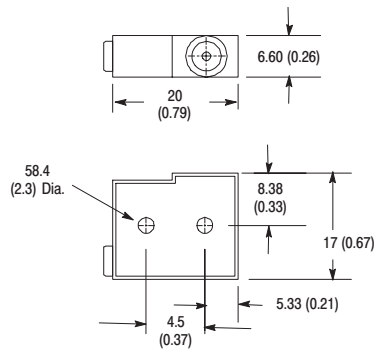
Front View



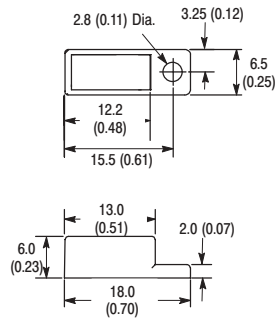
Side View



Large Chicklet

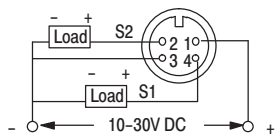


Small Chicklet



Wiring Diagram

Normally Open Output
PNP (Sourcing)





871D AC/DC
100, 165, 200mm



Specifications

Load Current	100mA max
Inrush Current (1 cycle)	≤ 2A (1 cycle)
Leakage Current	< 1.7mA
Operating Voltage	20–150V AC/DC
Voltage Drop	< 10V
Repeatability	< 2%
Hysteresis	5% typical
False Pulse Protection	Incorporated
Transient Noise 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 directives
Enclosure	IP67
Connections	5-pin AC micro quick-disconnect
LED	2 green: power S1 and S2; orange: S1 output; red: S2 output
Operating Temperature	–25°C to +70°C (–13°F to +158°F)
Shock	30g, 11ms
Vibration	55Hz, 1mm amplitude, 3 planes

Features

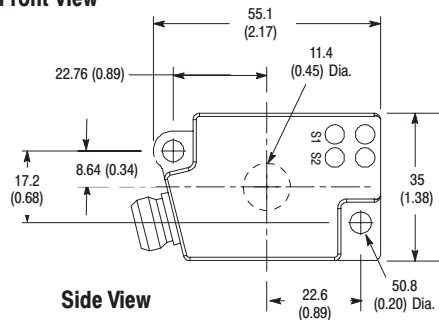
- 2 normally open outputs
- 20–150V AC/DC
- Weld field immune
- Short circuit, overload, false pulse, and transient noise protection
- 100, 165, and 200mm lead length for chicklets
- Small or large chicklet sizes
- Impact resistant housing
- 5-pin micro quick-disconnect
- UL listed, c-UL certified, and CE marked for all applicable directives

Product Selection

Nominal Sensing Distance mm (in)	Shielded	Output Configuration	Switching Frequency (Hz)	Lead Length mm (inches)	Chicklet Size	Catalog Number
2 (0.08)	Y	2 N.O. Outputs	20	100 (3.94)	Large	871D-JW2G100A-R5
					Small	871D-JW2G100B-R5
				165 (6.50)	Large	871D-JW2G165A-R5
					Small	871D-JW2G165B-R5
				200 (7.88)	Large	871D-JW2G200A-R5
					Small	871D-JW2G200B-R5
Recommended Standard QD Cordset (-2 = 2m (6.5ft))						889R-F5AEA-2

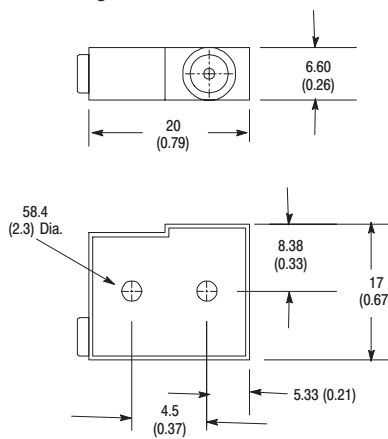
Dimensions—mm (inches)

Front View

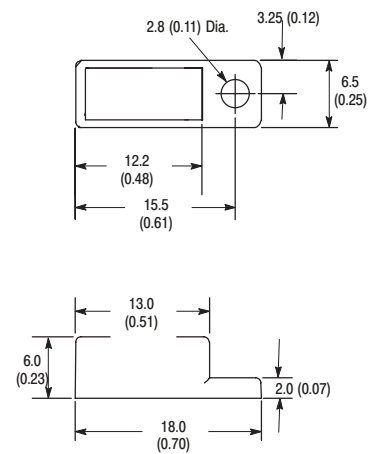


Side View

Large Chicklet

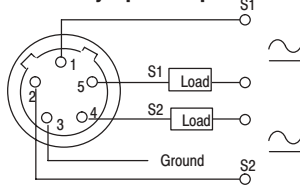


Small Chicklet



Wiring Diagram

Normally Open Outputs



Note: Load can be switched to pin 1 (S1) and pin 2 (S2).



Description

Bulletin 871D cylinder position inductive proximity sensors are self-contained solid state devices. These devices are designed for sensing metal objects without physical contact. Bulletin 871D cylinder position sensors are specifically designed for end of stroke detection of both hydraulic and pneumatic cylinders.

The innovative design of the 871D product family allows 304° of rotational movement of the sensor body after installation without breaking the seal. The sensor body is locked into place through the use of one of two set screws on the sensor mounting flange. This system provides simpler and faster sensor installation as well as neat cable runs.

Each 871D sensor mounts into the industry standard in-port cylinder position sensor bolt pattern with two (1/4"–20UNC x 3/4") grade 8 screws and is sealed with an O-ring to withstand pressures of 3000psi (207 BAR). All models are weld field immune and employ full electrical protections including short circuit, overload, false pulse, reverse polarity (DC models), and transient noise protection. All units meet IEC IP67 enclosure standards and are CE rated for all applicable directives.

Bulletin 871D sensors are available in both 3-wire DC and 2-wire AC/DC versions with either mini- or micro-style connectors. Each sensor type is available in six industry standard probe lengths from 26mm to 115.9mm (1.025in to 4.560in). Custom probe lengths and special spacers are also available for specific applications.

Features

- Stainless steel probe with ceramic face
- Low profile housing can be rotated 304° after installation without breaking pressure seal
- Shielded construction
- Weld-field immune
- Short circuit protection
- Overload protection
- Transient noise protection
- False pulse protection
- Reverse polarity protection (DC models)
- UL listed, c-UL certified, and CE marked for all applicable directives

Styles

- DC 3-wire page 2–172
AC/DC 2-wire page 2–174

Accessories

- Quick-Disconnect Cables ... page 7–1
Spacer Kits page 2–200

General Information

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



871D DC Mini
 Quick-Disconnect Style
 12mm
 page 2-173



871D DC Micro
 Quick-Disconnect Style
 12mm
 page 2-173



Specifications

Outputs	Normally Open
Max. Load Current	<200mA
Leakage Current	< 80uA
Operating Voltage	10–30VDC
Voltage Drop	< 2.5VDC @200mA
Switching Frequency	10Hz
Repeatability	5% typical
Hysteresis	15% typical
Reverse Polarity Protection	Incorporated
False Pulse Protection	Incorporated
Transient Noise Protection	Incorporated
Short Circuit Protection	Incorporated
Overload Protection	Incorporated
Weld Field Immunity	20,000A at 1in
Approvals	UL listed, c-UL certified for Canada, and CE marked for all applicable directives
Enclosure	NEMA 1, 2, 3, 3R, 4, 6, 12, 13, IP67 (IEC 529)
Connections	Quick Disconnect: 4-pin mini style 4-pin micro style
LED	Green: Power; Orange: Output
Operating Temperature	–25°C to 70°C (–13°F to 158°F)
Shock	30g, 11ms
Vibration	55Hz, 1mm amplitude, 3 planes
Housing Material	Machined aluminum
Probe Material	Stainless steel, ceramic face

Features

- Rugged low profile housing
- 3-wire operation
- Housing 304° rotatable after installation without breaking pressure seal
- 10–30V DC
- Normally open output
- Weld-field immune
- Short circuit, overload, false pulse, transient noise, and reverse polarity protection
- UL listed, c-UL certified, and CE marked for all applicable directives

Product Selection

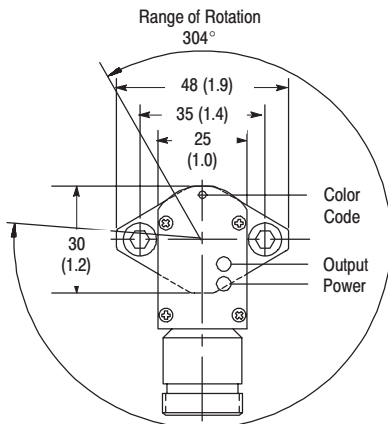
Barrel Dia.	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration	Probe Length mm (inches)	Color Code	Catalog Numbers	
						Mini QD	Micro QD
12mm	2 (0.08)	Y	N.O.	26.0 (1.025)	Blue	871D-DW2NP260-N4	871D-DW2NP260-D4
				31.7 (1.250)	White	871D-DW2NP317-N4	871D-DW2NP317-D4
				52.4 (2.062)	Red	871D-DW2NP524-N4	871D-DW2NP524-D4
				73.0 (2.875)	Orange	871D-DW2NP730-N4	871D-DW2NP730-D4
				95.9 (3.775)	Silver	871D-DW2NP959-N4	871D-DW2NP959-D4
				115.9 (4.560)	Gold	871D-DW2NP1159-N4	871D-DW2NP1159-D4
Recommended Standard QD Cordset (-6F = 1.8m (6ft), -2 = 2m (6.5ft))						889N-F4AFC-6F	889D-F4AC-2

QD Cordsets and Accessories

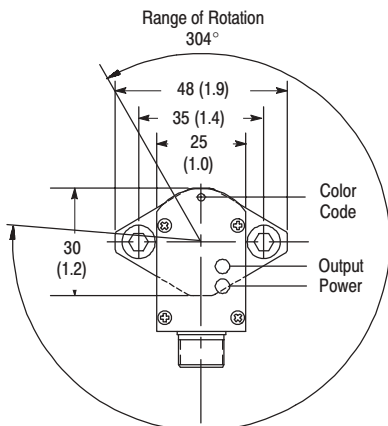
Description	Page Number
Other Cordsets Available	7-8, 7-41
Terminal Chambers	7-20
Spacer Kits	2-200

Dimensions—mm (inches)

Mini Connector Models

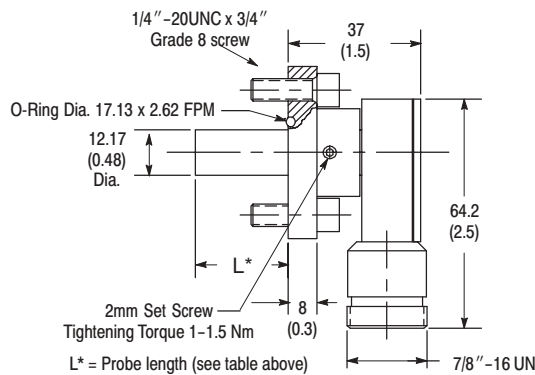
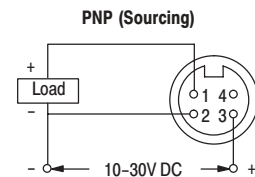


Micro Connector Models

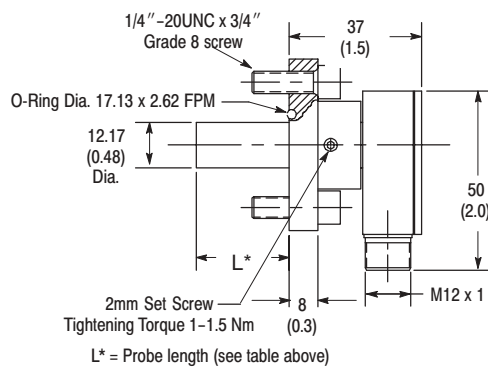
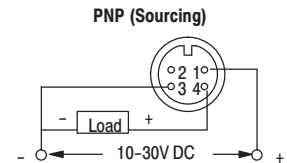


Wiring Diagrams

Mini Quick-Disconnect Style Normally Open



Micro Quick-Disconnect Style Normally Open



Bulletin 871D 2-Wire AC/DC**Cylinder Position Inductive Style**

871D AC/DC Mini
Quick-Disconnect Style
12mm
page 2-175



871D AC/DC Micro
Quick-Disconnect Style
12mm
page 2-175

**Specifications**

Outputs	Normally Open
Load Current	5-400mA
Inrush Current (1 cycle)	< 3A (t < 20msec)
Leakage Current	< 1.7mA @120V AC
Operating Voltage	20-250V AC/DC
Voltage Drop	< 6V at 400mA
Switching Frequency	50Hz
Repeatability	5% typical
Hysteresis	15% typical
False Pulse Protection	Incorporated
Transient Noise Protection	Incorporated
Short Circuit Protection	Incorporated
Overload Protection	Incorporated
Weld Field Immunity	20,000A at 1in
Approvals	UL listed, c-UL certified for Canada, and CE marked for all applicable directives
Enclosure	NEMA 1, 2, 3, 3R, 4, 6, 12, 13, IP67 (IEC 529)
Connections	Quick Disconnect: 3-pin mini style 3-pin micro style
LED	Green: Power; Orange: Output
Operating Temperature	-25°C to 70°C (-13°F to 158°F)
Shock	30g, 11ms
Vibration	55Hz, 1mm amplitude, 3 planes
Housing Material	Nickel plated brass
Probe Material	Stainless steel, ceramic face

Features

- Rugged low profile housing
- 2-wire operation
- Housing 304° rotatable after installation without breaking pressure seal
- 20-250V AC/DC
- Normally open output
- Weld-field immune
- Short circuit, overload, false pulse, and transient noise protection
- UL listed, c-UL certified, and CE marked for all applicable directives

Product Selection

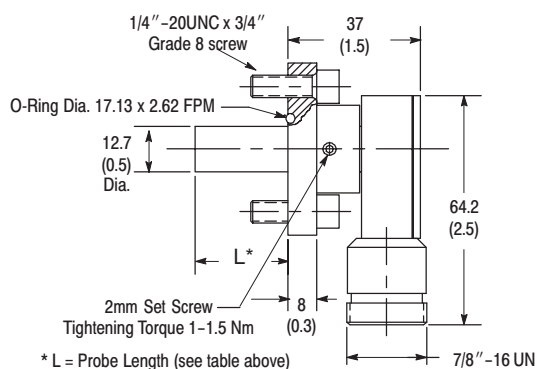
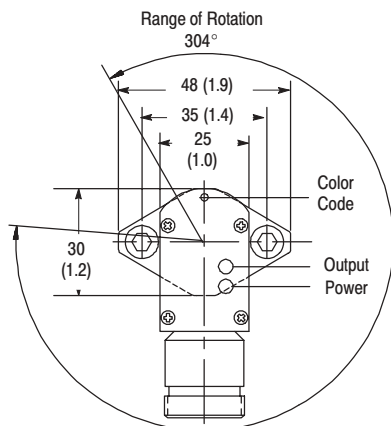
Barrel Dia.	Nominal Sensing Distance mm (inches)	Shielded	Output Configuration	Probe Length mm (inches)	Color Code	Catalog Numbers	
						Mini QD	Micro QD
12mm	2 (0.08)	Y	N.O.	26.0 (1.025)	Blue	871D-BW2N260-N3	871D-BW2N260-R3
				31.7 (1.250)	White	871D-BW2N317-N3	871D-BW2N317-R3
				52.4 (2.062)	Red	871D-BW2N524-N3	871D-BW2N524-R3
				73.0 (2.875)	Orange	871D-BW2N730-N3	871D-BW2N730-R3
				95.9 (3.775)	Silver	871D-BW2N959-N3	871D-BW2N959-R3
				115.9 (4.560)	Gold	871D-BW2N1159-N3	871D-BW2N1159-R3
Recommended Standard QD Cordset (-6F = 1.8m (6ft), -2 = 2m (6.5ft))						889N-F3AFC-6F	889R-F3ACA-2

QD Cordsets and Accessories

Description	Page Number
Other Cordsets Available	7-8, 7-41
Terminal Chambers	7-20
Spacer Kits	2-200

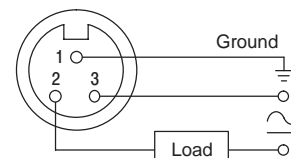
Dimensions—mm (inches)

Mini Connector Models

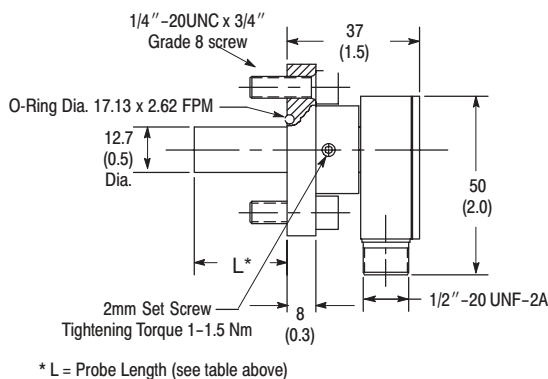
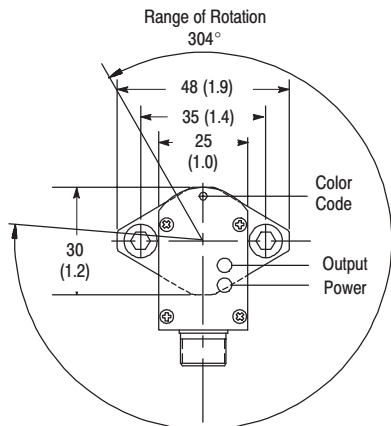


Wiring Diagrams

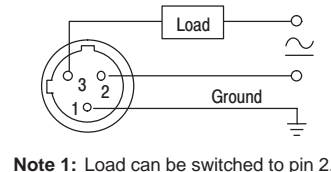
Mini Quick-Disconnect Style Normally Open



Micro Connector Models



Micro Quick-Disconnect Style Normally Open or Normally Closed



Notes



Description

Bulletin 871R Ring and 871S Slot sensors are self-contained, general purposed, solid-state devices designed to sense the presence of ferrous and nonferrous metal objects that pass through their sensing field.

Ring sensors are available in 12, 20, 50 and 100mm ring diameter sizes with minimum ball sizes ranging from 2.5mm to 8.0mm.

Slot sensors are available in 30mm slot gap. When mounting two slot sensors side by side, it is necessary to use different models with different operating frequencies.

Features

- Cable or micro QD style
- Short circuit protection
- Reverse polarity protection
- CE marked for all applicable directives.

Styles

871R DC 3-Wire Ring page 2–178
871S DC 3-Wire Slot page 2–181

QD Cordsets

Quick-Disconnect Cables . . . page 7–1

General Information

Torque Chart page 2–201
Metric/English
Conversion Chart page 10–9



871R DC Cable Style
12, 20mm
page 2-179



871R DC Micro
Quick-Disconnect Style
50, 100mm
page 2-180



871R DC Micro
Quick-Disconnect Style
100mm
page 2-180



Specifications

Load Current	≤200mA
Leakage Current	≤10μA
Operating Voltage	10–30V DC
Voltage Drop	≤2.4V
Repeatability	≤2%
Hysteresis	10% typical
Reverse Polarity Protection	Incorporated
Transient Noise Protection	Incorporated
Short Circuit Protection	Incorporated
Overload Protection	Incorporated
False Pulse Protection	Incorporated
Approvals	CE marked for all applicable directives
Enclosure	NEMA 4 IP67 (IEC529)
Connections	Cable: 2m (6.5ft) length 3-conductor #26AWG PVC Quick-Disconnect: 4-pin micro style
LED	Red: Output energized
Operating Temperature	–25°C to +70°C (–13°F to +158°F)
Shock and Vibration	5g, 10–55Hz

Features

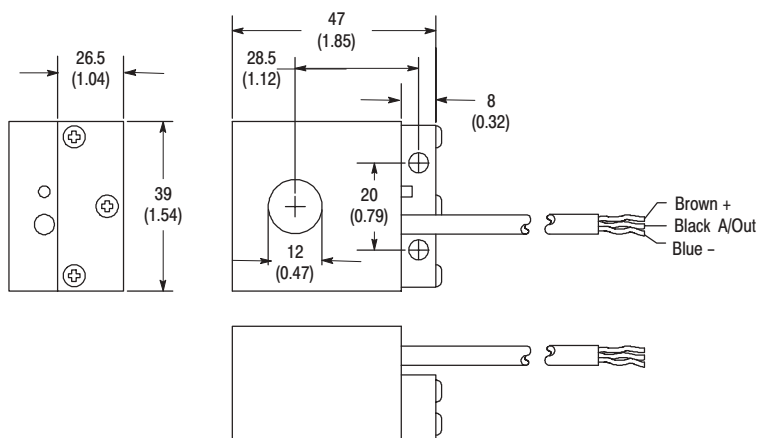
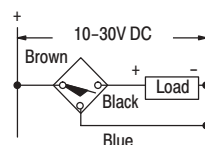
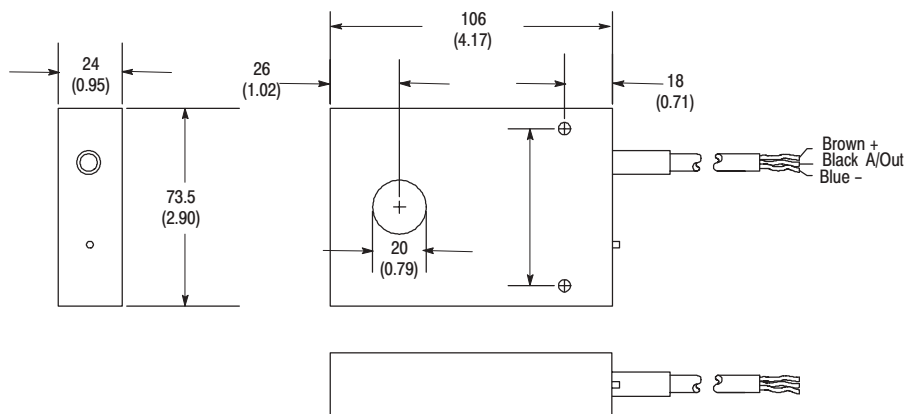
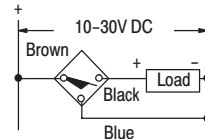
- 3-wire operation
- 3-conductor, 4-pin micro QD style
- 10–30V DC
- Reverse polarity, short circuit, overload, false pulse, and transient noise protection
- CE marked for all applicable directives

Product Selection

Ring Diameter	Minimum Ball Size mm (inches)	Output Configuration		Switching Frequency (Hz)	Catalog Number	
					Cable Style	Micro QD Style
12mm	2.5 (0.10)	N.O.	PNP	800	871R-D12NP39-E2	—
20mm	6 (0.24)			1000	871R-D20NP73-E2	—
50mm	3 (0.12)	N.O. and N.C.	PNP	500	—	871R-D50NP90-D4
			NPN			871R-D50NN90-D4
100mm	8 (0.31)		PNP			871R-D100NP120-D4
			NPN			871R-D100NN120-D4
Recommended Standard QD Cordset (-6F = 1.8m (6ft), -2 = 2m (6.5ft))						889D-F4AC-2

QD Cordsets

Description	Page Number
Other Cordsets Available	7-41
Terminal Chambers	7-20

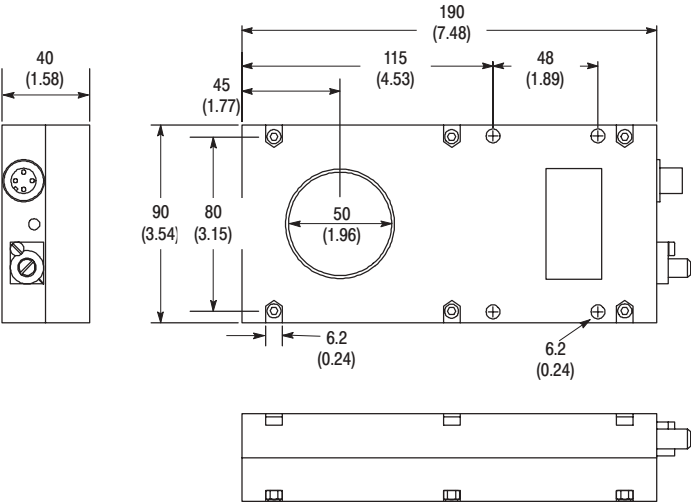
Dimensions—mm (inches)**Cable Style (871R-D12NP39-E2)****Wiring Diagrams****Normally Open****PNP (Sourcing)****Cable Style (871R-D20NP73-E2)****Normally Open****PNP (Sourcing)**

871R 3-Wire DC

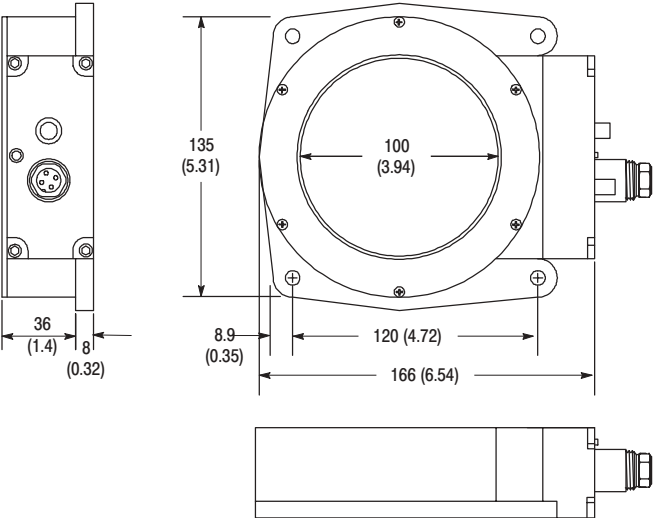
Ring Style

Dimensions—mm (inches)

Micro Quick-Disconnect Style (871R–D50NP90–D4 & 871R–D50NN90–D4)

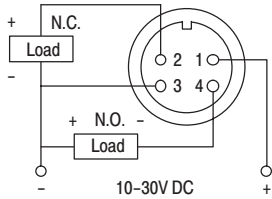


Micro Quick-Disconnect Style (871R–D100NP120–D4 & 871R–D100NN120–D4)

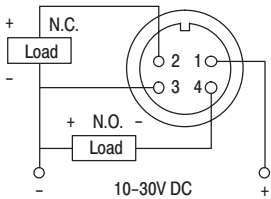


Wiring Diagrams

Complementary Normally Open and Normally Closed PNP (Sourcing)



Complementary Normally Open and Normally Closed PNP (Sourcing)





871R DC Cable Style
30mm Slot Gap
page 2-182



Specifications

Load Current	≤200mA
Leakage Current	≤10μA
Operating Voltage	18–30V DC
Voltage Drop	≤2.4V
Repeatability	≤2%
Hysteresis	15% typical
Transient Noise Protection	Incorporated
False Pulse Protection	Incorporated
Approvals	CE marked for all applicable directives
Enclosure	NEMA 4 IP65 (IEC529)
Connections	Cable: 2m (6.5ft) length 3-conductor #26AWG PVC
LED	None
Operating Temperature	–25°C to +70°C (–13°F to +158°F)
Shock and Vibration	5g, 10–55Hz

Features

- 3-wire operation
- 3-conductor
- 18–30V DC
- False pulse and transient noise protection
- CE marked for all applicable directives

871S 3-Wire DC

Slot Style

Product Selection

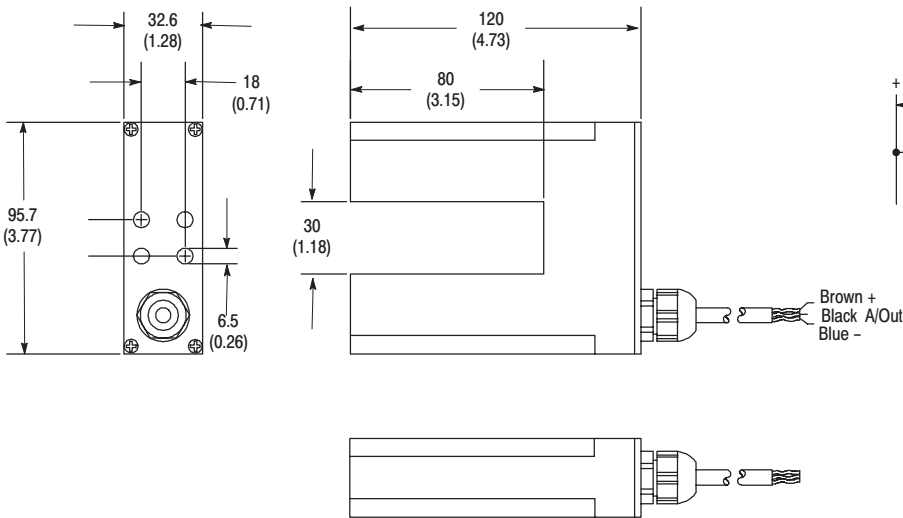
Slot Gap	Output Configuration		Switching Frequency (Hz)	Operating Frequency (KHz)	Catalog Number
					Cable Style
30mm	N.O.	PNP	500	75	871S-D20NP30-E2
				110	871S-DX20NP30-E2

QD Cordsets

Description	Page Number
Terminal Chambers	7-20

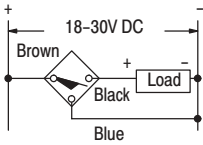
Dimensions—mm (inches)

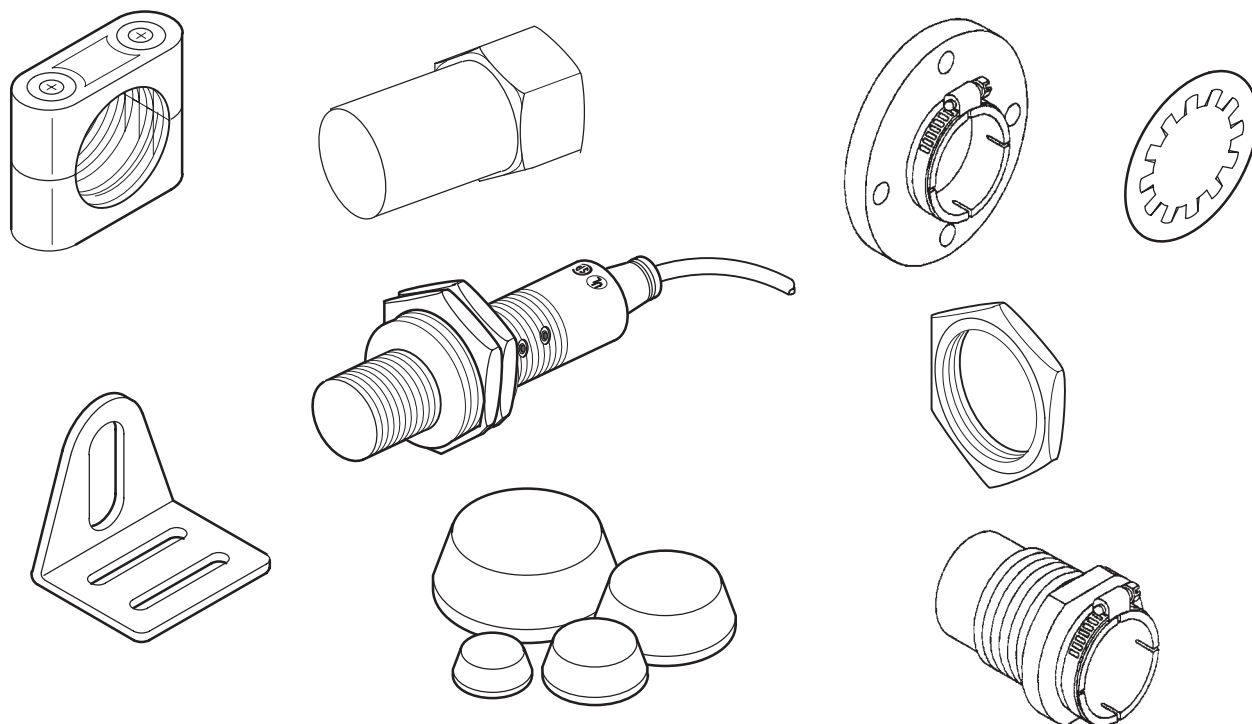
Cable Style



Wiring Diagrams

Normally Open
PNP (Sourcing)





Accessories

Banking Screw Adaptors	page 2–184
Conduit Adaptors	page 2–185
Mounting Brackets, Spring Return Style	page 2–186
Mounting Brackets, Quick-Change Style	page 2–187
Mounting Brackets, Swivel/Tilt Style	page 2–188
Mounting Brackets, Right Angle Style	page 2–189
Mounting Brackets, Clamp Style	page 2–190
Mounting Bracket, Can Sensor Style	page 2–191
Mounting Kit, VersaCube Sensors	page 2–192
Mounting Bracket, Limit Switch Style, VersaCube	page 2–193
PTFE Covers VersaCube	page 2–194
PTFE End Caps	page 2–195
End Caps	page 2–196
Mounting Nuts	page 2–197
Lock Washers	page 2–199
Spacer Kits	page 2–200

General Information

Torque Chart	page 2–201
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Description

A large variety of accessories is available for use with Rockwell Automation/Allen-Bradley products offering convenience in mounting and applying proximity sensors.

Conduit adaptors allow easy connection of most threaded-barrel models to a conduit line. Banking screw adaptors provide a mechanical interface to applications allowing a proximity sensor to be utilized as a mechanical stop switch.

Our clamp, swivel/tilt, and right-angle brackets are designed for convenient mounting and adjustable positioning of tubular-style proximity sensors. Quick-change sensor mounting brackets are designed to allow quick and simple sensor replacement without readjustment. The spring return mounting bracket and end caps help to protect your sensor from damage due to collisions.

VersaCube mounting hardware provides superior mounting stability and convenience when retrofitting rectangular or limit switch style proximity sensors.

Plastic and PTFE end caps and covers provide additional protection to sensors from abrasion corrosion, chemicals, other weld slag and debris.

Sensor wells allow for quick and easy mounting of capacitive sensors in tanks and silos for level detection. Sight-glass mount sensor brackets allow convenient and simple mounting of capacitive sensors to sight tubes for level detection.

All threaded-barrel sensors are shipped with mounting nuts and lock washers. Replacement hardware is available if these become lost or damaged.

Accessories

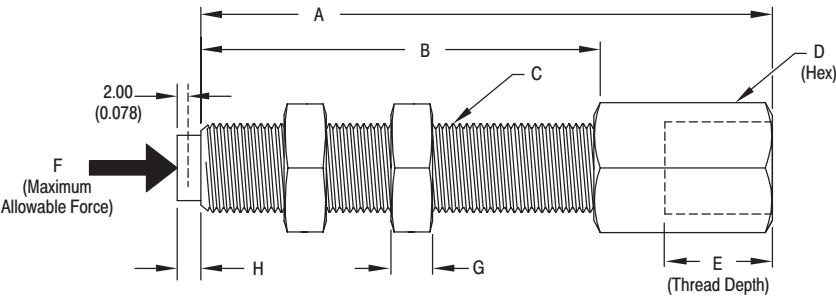
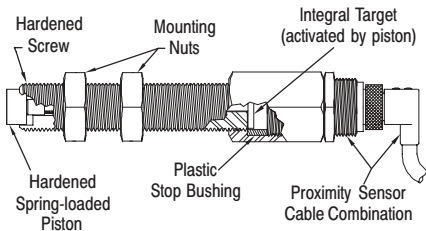
Banking Screw Adaptors

Description

Banking screw adaptors provide the flexibility to utilize inductive proximity sensors as mechanical stop switches. These banking screw adaptors are designed for use only with shielded sensors. Each banking screw adaptor is made of heat treated alloy steel

components and comes complete with two mounting nuts. Standard models require 252g (9oz) of force to activate the switch.

NOTE: Models are available requiring more force to activate the switch, contact factory for details.



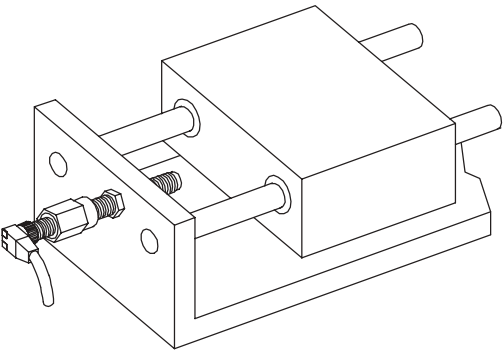
Dimensions—mm (inches)

For Use with:	A	B	C	D	E	F	G	H	Catalog Number
8mm Shielded Sensors	57.2 (2.25)	25.0 (1.00)	M8 x 1	11.0 (0.43)	18.4 (0.72)	2,000N (450lb)	5.08 (0.20)	2.93 (0.115)	871A-AK8-25
	82.6 (3.25)	50.0 (2.00)							871A-AK8-50
12mm Shielded Sensors	57.2 (2.25)	25.0 (1.00)	M12 x 1	15.7 (0.62)	17.4 (0.67)	20,500N (4,608lb)	6.35 (0.25)	4.22 (0.166)	871A-AK12-25
	82.6 (3.25)	50.0 (2.00)							871A-AK12-50
	108 (4.25)	75.0 (3.00)							871A-AK12-75
	133 (5.25)	100 (4.00)							871A-AK12-100
18mm Shielded Sensors	57.2 (2.25)	25.0 (1.00)	M18 x 1	22.1 (0.87)	22.1 (0.87)	45,000N (10,115lb)	6.35 (0.25)	4.22 (0.166)	871A-AK18-25
	82.6 (3.25)	50.0 (2.00)							871A-AK18-50
	108 (4.25)	75.0 (3.00)							871A-AK18-75
	133 (5.25)	100 (4.00)							871A-AK18-100

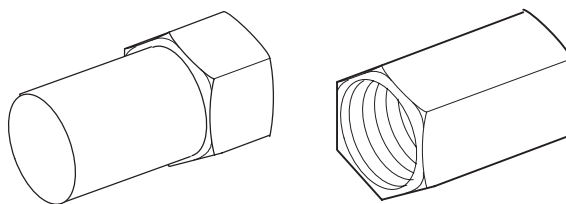
Recommended Sensors for Banking Screw Adaptors

Sensor Diameter	Specifications	Catalog Number
8mm	(10–30V DC, N.O., PNP, Micro QD)	872C-DX15-D4
12mm		872C-DX34-D4
18mm		872C-DX33-D4
12mm	(20–250V AC, N.O., Micro QD)	872C-A2N12-R3
18mm		872C-A5N18-R3

Typical Application



Conduit Adaptors for Tubular Proximities—Nickel-Plated Brass



12, 18, 30mm

For All Bulletin Numbers Except 871U

Tube Diameter	Tube Thread Size	Dimensions—mm (Inches)	Catalog Number
12mm (0.47)	M12 x 1		871C-N13
18mm (0.71)	M18 x 1		871C-N19
30mm (1.18)	M30 x 1.5		871C-N31
12mm (0.47)	M12 x 1		871T-N5
18mm (0.71)	M18 x 1		871T-N6
30mm (1.18)	M30 x 1.5		871T-N7

Accessories

Mounting Brackets for Tubular Proximities—Spring Return Style

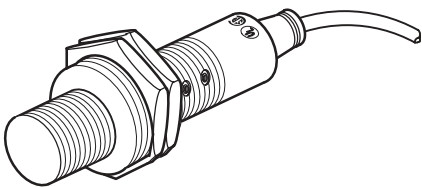
Description

Spring return mounting brackets provide protection for the sensor in the event of a target collision. The bracket is designed to allow the sensor to retract axially when force is applied to its face, then to return to its original position when the force is removed. The bracket is simply threaded onto a

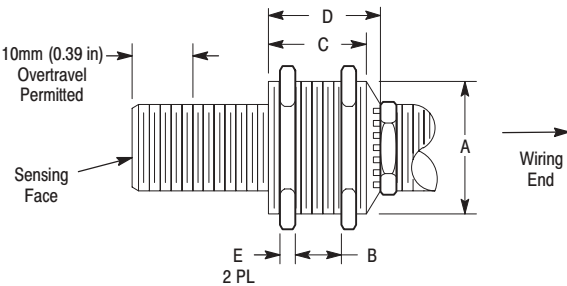
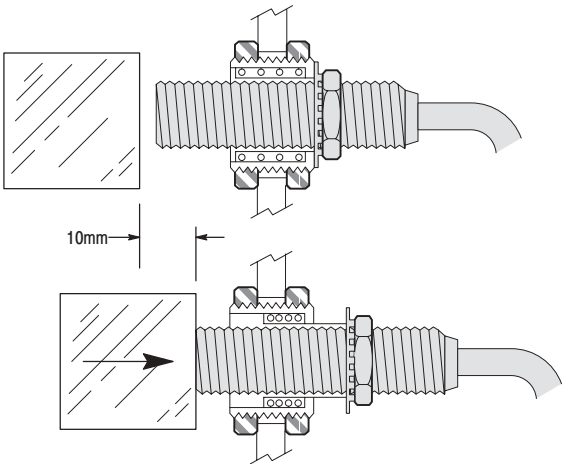
tubular proximity sensor and locked into place by using the mounting nut provided with the sensor.

For protection against lateral collisions, the addition of a plastic deflecting cap is recommended (see page 2–196).

Note: Right angle mounting brackets are available for use with these spring return brackets (see page 2–189).



8, 12, 18, 30mm



NOTE 1: Any overtravel greater than 10mm (0.39in) or improper installation can damage sensor and/or mount. **Do not exceed** torque specifications listed or distortion of mounting sleeve will result.

NOTE 2: Use a single jam nut, provided with the sensor, to lock the inner sleeve to the sensor body. A bonding agent such as low strength Loctite adhesive is recommended. Tip holes for retaining ring pliers are provided for grasping the inner sleeve.

Dimensions—mm (inches)

Sensor Diameter	mm (inches)						Catalog Number	
	Clearance Hole Diameter	A	B	C	D	E	Anodized Aluminum	Stainless Steel
8mm	15.9 (0.63)	M16 X 1.5	11.0 (0.43)	19.0 (0.75)	22.0 (0.87)	3.5 (0.14)	871A-BXN8	871A-BXS8
12mm	22.2 (0.88)	M22 X 1.5	11.0 (0.43)	19.0 (0.75)	22.0 (0.87)	4.0 (0.16)	871A-BXN12	871A-BXS12
12mm	17.9 (0.70)	M18 X 1	10.0 (0.40)	19.0 (0.75)	21.2 (0.84)	4.0 (0.16)	—	871A-BXS12-LP
18mm	31.0 (1.22)	M30 X 1.5	15.0 (0.59)	26.0 (1.02)	30.0 (1.18)	5.0 (0.20)	871A-BXN18	871A-BXS18
30mm	47.5 (1.87)	M47 X 1.5	25.4 (1.0)	35.0 (1.38)	37.9 (1.49)	5.0 (0.20)	871A-BXN30	871A-BXS30

Note: Each spring return mounting bracket is supplied with two mounting nuts.

Mounting Brackets for Tubular Proximities—Quick-Change Style

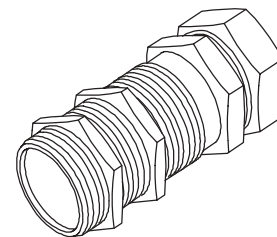
Description

Quick-change sensor brackets provide the ability to install or remove shielded proximity sensors quickly and easily. Quick sensor change-out is achieved with a single collet-style locknut, while maintaining the original sensing distance setup thus eliminating time

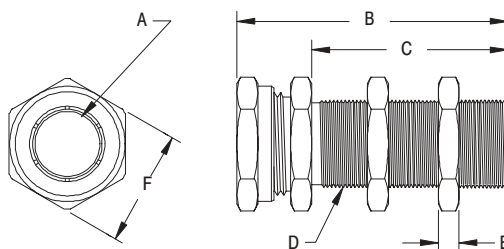
consuming readjustments. Each quick-change sensor bracket is made of heat treated alloy steel components and comes complete with two mounting nuts.

NOTE 1: Consult the factory for use with ferrous selective proximity sensors.

NOTE 2: Stainless steel models are also available, contact factory for details.



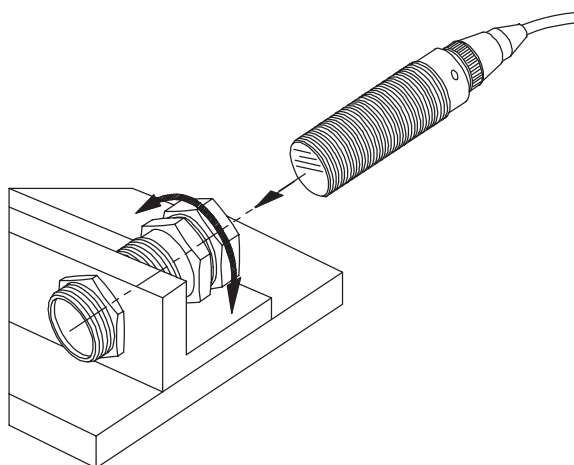
8, 12, 18, 30mm



Dimensions—mm (inches)

Sensor Diameter	A	B	C	D	E	F	Catalog Number
8mm	8.10 (0.32)	32.0 (1.25)	18.0 (0.71)	M12 X 1	3.05 (0.12)	17.4 (0.68)	871A-BQN8
		48.0 (1.89)	34.0 (1.34)				871A-BQN8-L
12mm	12.5 (0.50)	34.0 (1.34)	20.0 (0.79)	M16 X 1	3.30 (0.13)	22.2 (0.88)	871A-BQN12
		44.0 (1.73)	30.0 (1.18)				871A-BQN12-L
18mm	18.5 (0.73)	38.0 (1.50)	20.0 (0.79)	M24 X 1.5	5.08 (0.20)	30.2 (1.19)	871A-BQN18
		58.0 (2.28)	40.0 (1.57)				871A-BQN18-L
30mm	31.0 (1.22)	38.0 (1.50)	20.0 (0.79)	M36 X 1.5	5.84 (0.23)	41.3 (1.63)	871A-BQN30
		58.0 (2.28)	40.0 (1.57)				871A-BQN30-L

Typical Application

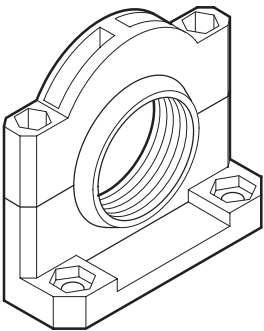


Accessories

Mounting Brackets for Tubular Proximities—Swivel/Tilt Style

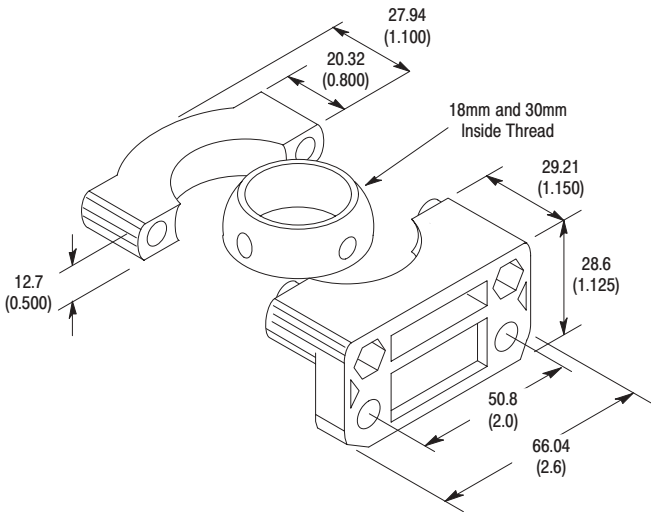
Description

The swivel/tilt mounting bracket provides both axial and 10° tilt adjustment for our 18mm and 30mm tubular-style products. It is ideal for convenient mounting and alignment of 873C ultrasonic sensors.



18mm and 30mm

Dimensions—mm (inches)



Note: Each swivel/tilt mounting bracket is supplied with two screws and two locking nuts.

Description	Catalog Number
30mm Mounting Bracket	60-2439
18mm Mounting Bracket	60-2649

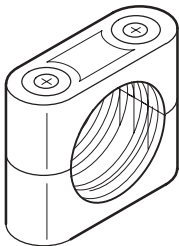
Mounting Brackets for Tubular Proximities—Right Angle Style

Proximity Tube Diameter	Dimensions—mm (inches)	Material	Catalog Number
8mm (0.31)		Zinc-Plated Steel	871A-BRN8
		Stainless Steel	871A-BRS8
12mm (0.47)		Zinc-Plated Steel	871A-BRN12
		Stainless Steel	871A-BRS12
18mm (0.71) Also for use with the 871A-BXN8 or 871A-BXS8 Spring Return Brackets		Zinc-Plated Steel	871A-BRN18
		Stainless Steel	871A-BRS18
For use with 871A-BXN12 or 871A-BXS12 Spring Return Brackets		Zinc-Plated Steel	871A-BRN22
		Stainless Steel	871A-BRS22
30mm (1.18) Also for use with the 871A-BXN18 or 871A-BXS18 Spring Return Brackets		Zinc-Plated Steel	871A-BRN30
		Stainless Steel	871A-BRS30
For use with 871A-BXN30 or 871A-BXS30 Spring Return Brackets		Zinc-Plated Steel	871A-BRN47
		Stainless Steel	871A-BRS47

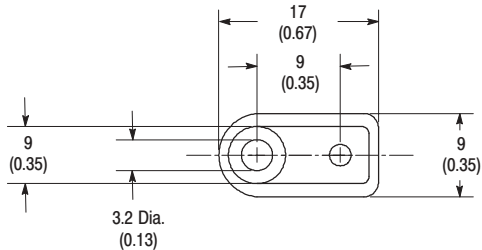
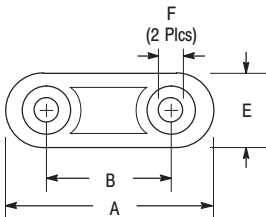
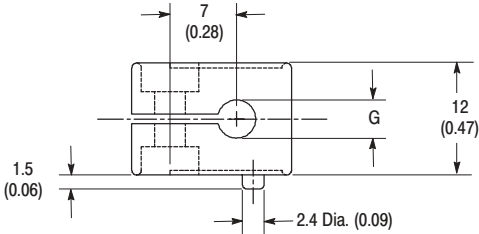
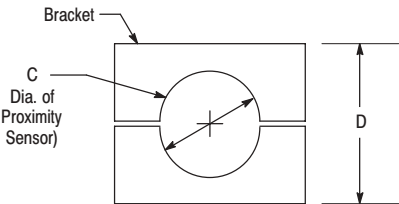
Accessories

Mounting Brackets for Tubular Proximities—Clamp Style

Stainless Steel Mounting Hardware
and Chemical Resistant Material
for Harsh Environment



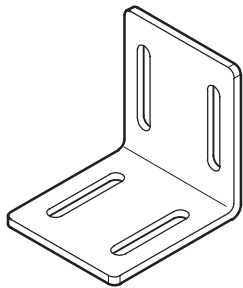
4, 5, 6.5, 8, 12, 18, 30, 34mm



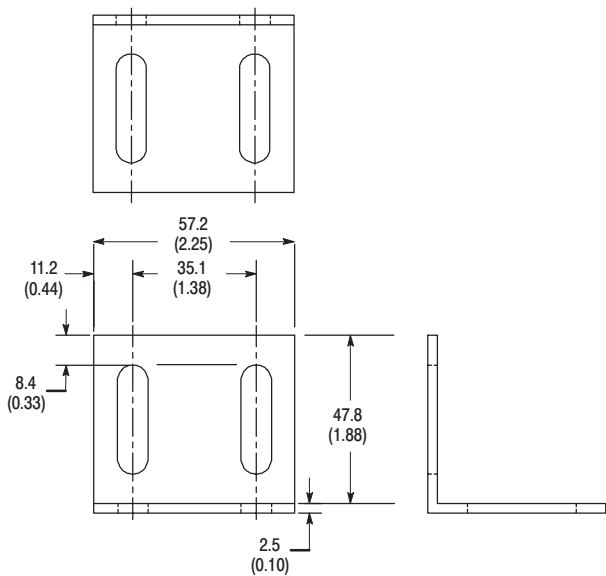
Dimensions—mm (inches)

Sensor Diameter	A	B	C	D	E	F	G	Catalog Number
4mm	—	—	—	—	—	—	4 (0.16)	871A-BP4
5mm	—	—	—	—	—	—	5 (0.20)	871A-BP5
6.5mm	—	—	—	—	—	—	6.5 (0.26)	871A-BP7
8mm	29.0 (1.14)	18.0 (0.708)	8.0 (0.31)	18.3 (0.72)	11.0 (0.432)	4.4 (0.172)	—	871A-BP8
12mm	36.0 (1.42)	24.0 (0.944)	12.0 (0.47)		12.0 (0.472)		—	871A-BP12
18mm	45.0 (1.772)	32.0 (1.26)	18.0 (0.71)	29.4 (1.16)	13.0 (0.512)	5.4 (0.212)	—	871A-BP18
30mm	60.0 (2.40)	45.0 (1.772)	30.0 (1.18)	48.4 (1.91)	15.8 (0.624)	5.5 (0.218)	—	871A-BP30
34mm	65.8 (2.59)	50.0 (1.97)	34.0 (1.34)	48.3 (1.90)			—	871A-BP34

Stainless Steel Mounting Bracket Assembly



Dimensions—mm (inches)



Description	Catalog Number
Mounting Bracket	871A-BR58

Accessories

Mounting Bracket for VersaCube™ Proximities

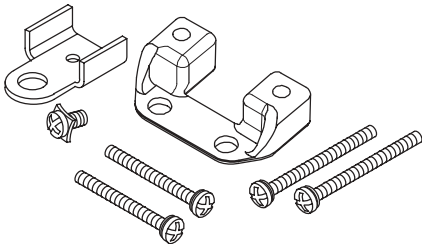
Description

The mounting kit for VersaCube sensors provides additional mounting flexibility to 871P VersaCube style sensors. This kit includes an accessory mounting bracket that allows the VersaCube to bolt in place of existing 871P rectangular and similar competitive sensors. Appropriately sized mounting screws are also supplied. Additionally a ground lug terminal and green color-coded binding screw are provided for grounding the VersaCube sensor in the event that the unit is not mounted to a grounded metal frame.

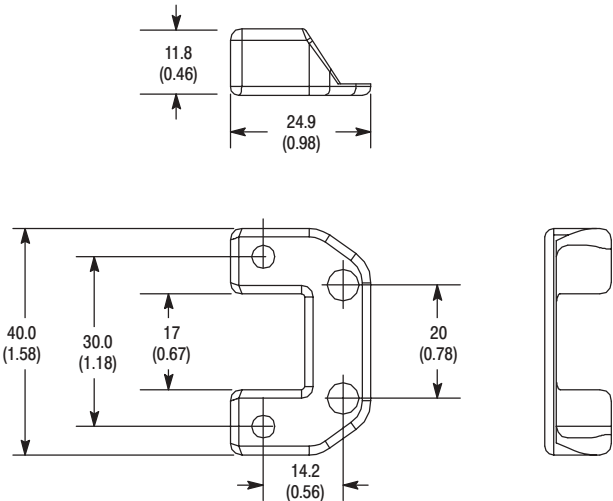
Note: An 871A–PKIT mounting kit is included with all Weld Field Immune 871P VersaCube style sensors. An 871A–PKIT mounting kit is not included with General Purpose VersaCube models.

Kit includes:

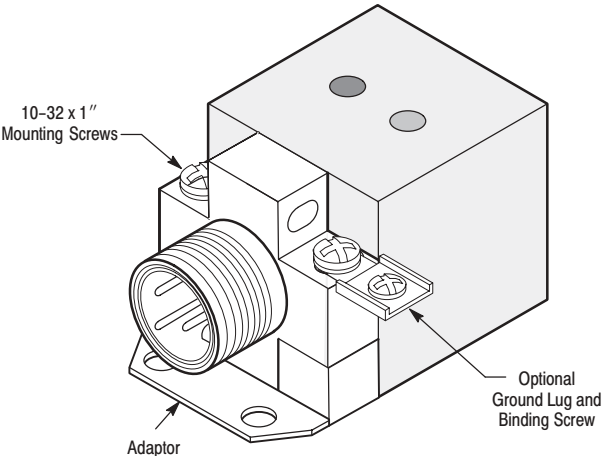
- (1) Threaded mounting bracket
- (1) Through-hole mounting bracket
- (2) 10–32 x 1" mounting screw
- (2) 10–32 x 1½" mounting screw
- (1) Ground terminal lug
- (1) Green color-coded binding screw



Dimensions—mm (inches)



Typical Application



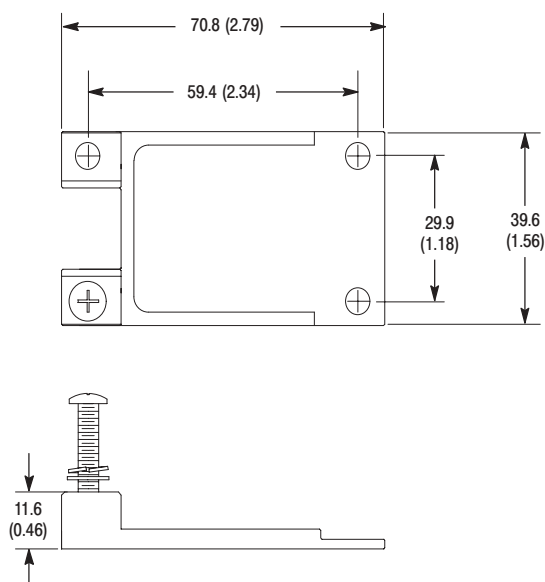
Description	Catalog Number
Mounting Kit	871A–PKIT

Limit Switch Style Mounting Bracket for VersaCube™ Proximities

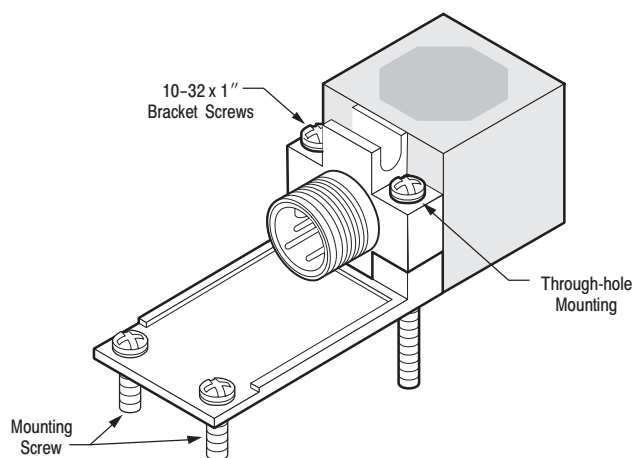
Description

The limit switch style mounting bracket (871A-PKITLS) has the same mounting pattern as limit switch style proximity sensors. It provides superior mounting stability and convenience when retrofitting a limit switch style proximity sensor with a VersaCube.

Dimensions—mm (inches)



Typical Application

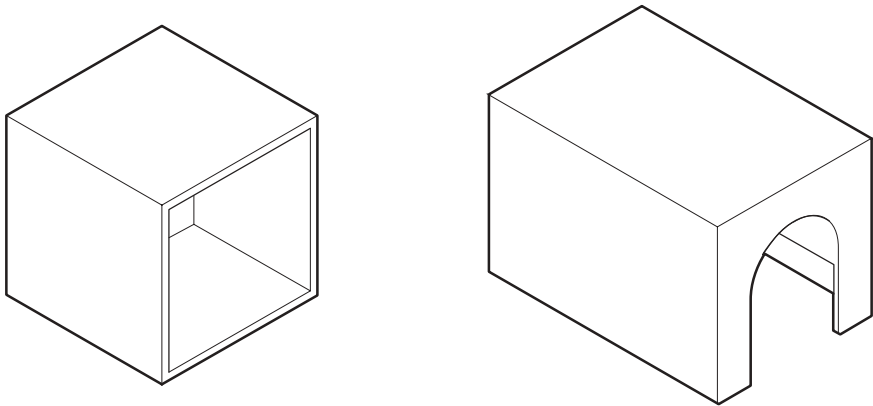


Accessories

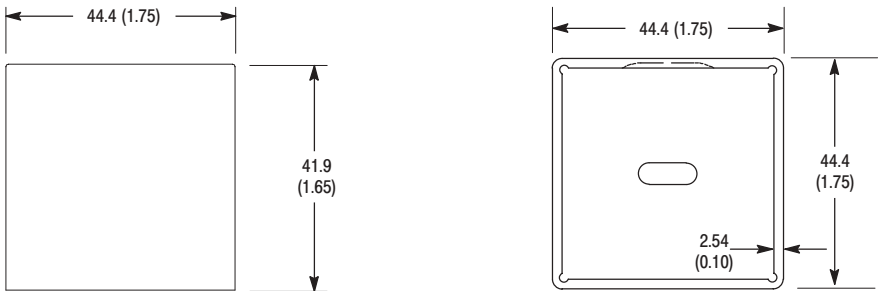
PTFE Cover for VersaCube

Description

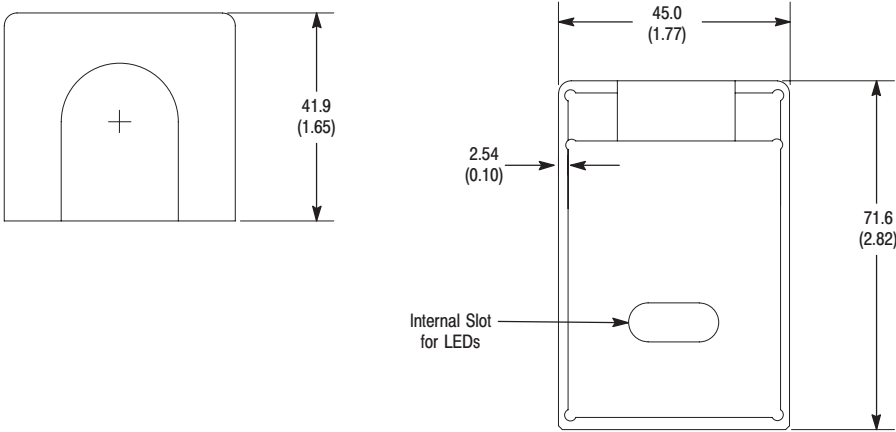
These PTFE covers are designed to protect the VersaCube from weld slag and other debris.



871A-KCT40-F



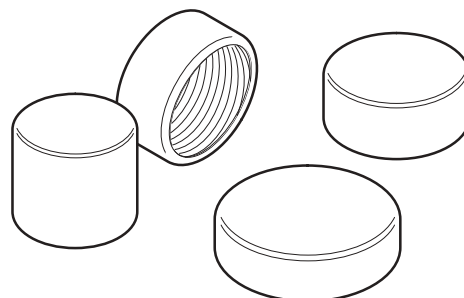
871A-KCT40-T



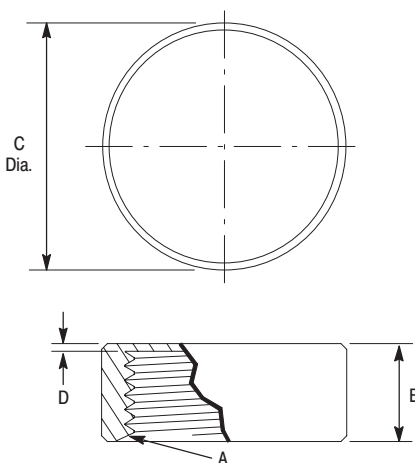
NOTE: Internal slot for LED visibility.

Description

PTFE end caps protect tubular proximity sensors from abrasion, corrosion, chemical exposure, weld slag, and other debris.



8, 12, 18, 30mm

**Dimensions—mm (inches)****Shielded**

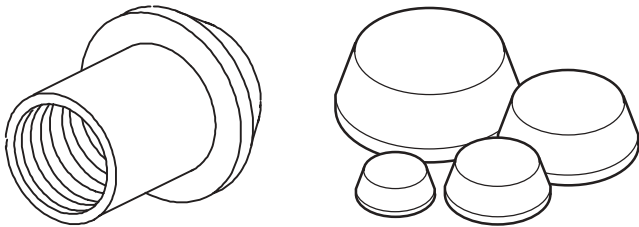
Sensor Diameter	A	B	C	D	Catalog Number
8mm	M8 x 1	5.0 (0.20)	10.8 (0.43)	0.50 (0.02)	871A-KT8
12mm	M12 x 1	8.9 (0.35)	14.8 (0.58)	0.89 (0.035)	871A-KT12
18mm	M18 x 1	8.8 (0.35)	24.4 (0.96)	1.27 (0.05)	871A-KT18
30mm	M30 x 1.5	10.0 (0.39)	38.1 (1.50)	2.03 (0.08)	871A-KT30

Unshielded

Sensor Diameter	A	B	C	D	Catalog Number
8mm	M8 x 1	9.6 (0.38)	10.8 (0.43)	0.50 (0.02)	871A-KUT8
12mm	M12 x 1	15.0 (0.60)	14.8 (0.58)	0.89 (0.035)	871A-KUT12
18mm	M18 x 1	18.8 (0.70)	24.4 (0.96)	1.27 (0.05)	871A-KUT18
30mm	M30 x 1.5	23.0 (0.90)	38.1 (1.50)	2.03 (0.08)	871A-KUT30

Accessories

End Caps for Tubular Proximities



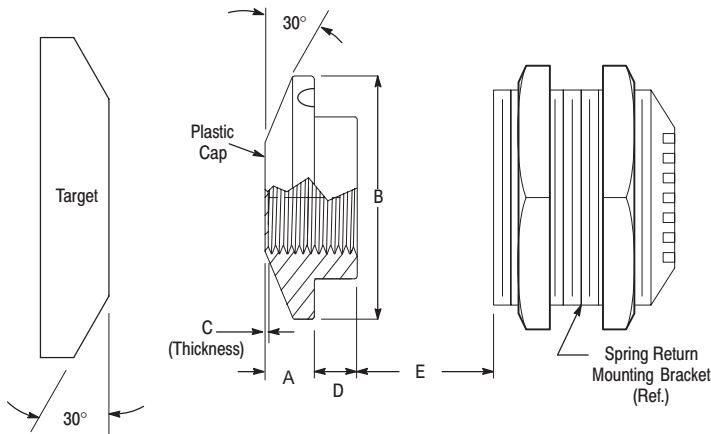
8, 12, 18, 30mm

Description

Plastic deflecting caps are designed to be utilized with spring return brackets when lateral collisions might occur. The

cap is simply threaded onto the front of the proximity sensor. The 30° slope

allows the sensor and spring bracket to retract when a lateral collision occurs.



Dimensions—mm (inches)

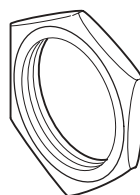
Shielded

Sensor Diameter	A	B	C	D	E	Catalog Number
8mm	5.1 (0.20)	15.1 (0.59)	0.25 (0.01)	0	10.0 (0.39)	871A-KP8
12mm	6.4 (0.25)	22.9 (0.90)	0.89 (0.04)			871A-KP12
18mm	8.0 (0.31)	31.4 (1.34)				871A-KP18
30mm		44.5 (1.75)			12.7 (0.50)	871A-KP30

Unshielded

Sensor Diameter	A	B	C	D	E	Catalog Number
8mm	5.1 (0.20)	15.1 (0.59)	0.25 (0.01)	9.51 (0.37)	10.0 (0.39)	871A-KPU8
12mm	6.4 (0.25)	22.9 (0.90)	0.89 (0.04)	17.3 (0.68)		871A-KPU12
18mm	8.0 (0.31)	31.4 (1.34)		20.0 (0.79)		871A-KPU18
30mm		44.5 (1.75)		12.7 (0.50)	871A-KPU30	

Mounting Nuts for Tubular Proximities—Brass, Stainless Steel, and Plastic



8, 12, 18, 30mm

Brass

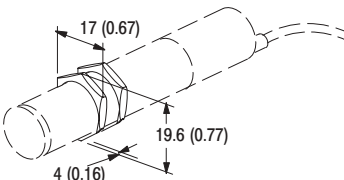
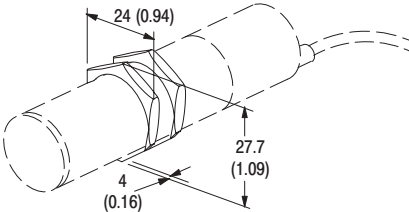
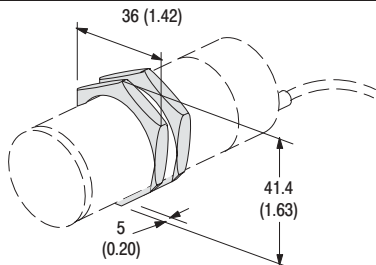
Proximity Tube Diameter	Thread Size ISO Metric	Dimensions—mm (Inches)	Catalog Number
8mm (0.31)	M8 x 1		871C-N1 Nickel-Plated 871A-NBT12 PTFE-Coated
12mm (0.47)	M12 x 1		871C-N2 Nickel-Plated 871A-NBT12 PTFE-Coated
18mm (0.71)	M18 x 1		871C-N3 Nickel-Plated 871A-NBT18 PTFE-Coated
30mm (1.18)	M30 x 1.5		871C-N4 Nickel-Plated 871A-NBT30 PTFE-Coated

Note: Each catalog number includes 2 mounting nuts.

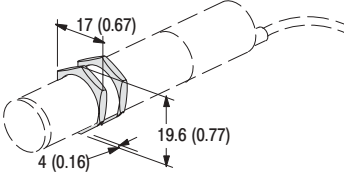
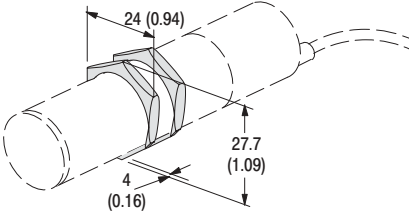
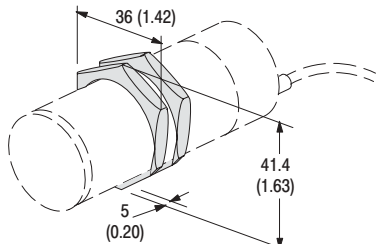
Accessories

Mounting Nuts for Tubular Proximities—Brass, Stainless Steel, and Plastic

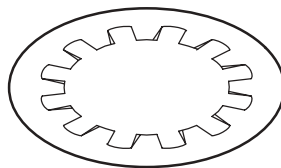
Stainless Steel

Proximity Tube Diameter	Thread Size ISO Metric	Dimensions—mm (Inches)	Catalog Number
12mm (0.47)	M12 x 1		871T-N2
18mm (0.71)	M18 x 1		871T-N4
30mm (1.18)	M30 x 1.5		871T-N8

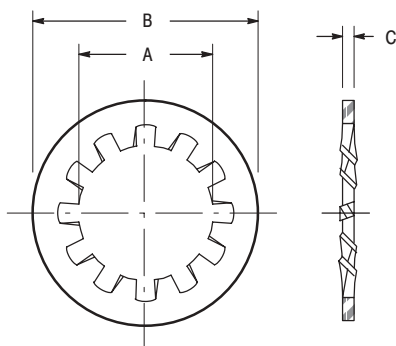
Plastic

Proximity Tube Diameter	Thread Size ISO Metric	Dimensions—mm (Inches)	Catalog Number
12mm (0.47)	M12 x 1		871T-N1
18mm (0.71)	M18 x 1		871T-N3
30mm (1.18)	M30 x 1.5		871C-N5

Note: Each catalog number includes 2 mounting nuts.



8, 12, 18, 30mm



Dimensions—mm (inches)

Nominal Washer Size mm (inches)	A		B		C		Catalog Number
	Inside Diameter mm (inches)		Outside Diameter mm (inches)		Material Thickness mm (inches)		
8.0 (0.031)	8.5 (0.33)	8.2 (0.32)	15.5 (0.61)	14.75 (0.58)	0.85 (0.03)	0.7 (0.03)	871A-LWN8
12.0 (0.047)	12.7 (0.5)	12.3 (0.48)	20.25 (0.8)	19.5 (0.77)	1.0 (0.04)	0.8 (0.03)	871A-LWN12
18.0 (0.071)	19.1 (0.75)	18.5 (0.73)	29.6 (1.17)	28.6 (1.13)	1.3 (0.051)	1.1 (0.04)	871A-LWN18
30.0 (1.18)	31.4 (1.24)	30.6 (1.2)	46.3 (1.82)	45.1 (1.78)	1.7 (0.07)	1.5 (0.06)	871A-LWN30

Note: Each catalog number includes 2 lock washers.

Selection Guide

Spacer kits are available for use with 871D in-port tubular position sensors for nonstandard tubular probe lengths. Example from chart below: Sensor probe length required is 4.00". Using

sensor 871D–DW2NP1159–D4 and spacer 871A–S1427 results in a probe length of 3.998". Any difference between desired probe length and

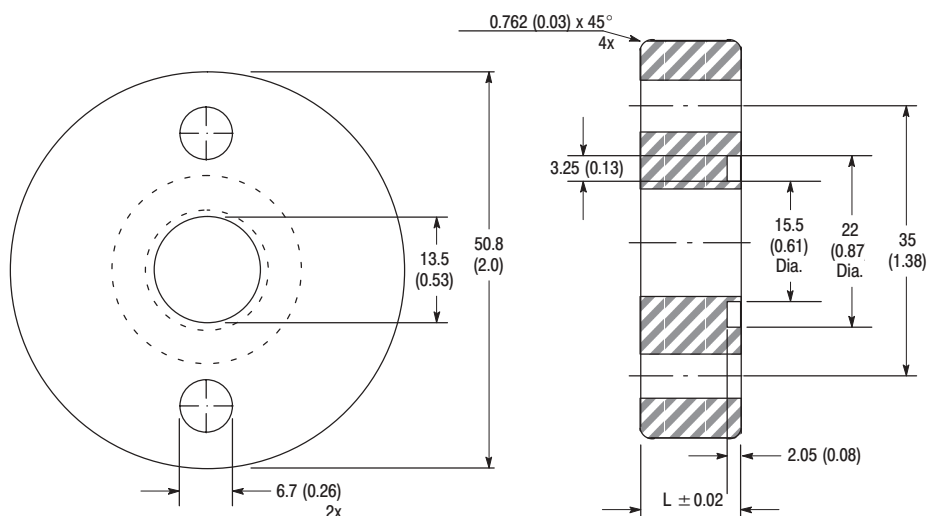
length resulting from sensor and spacer combination should be carefully considered to ensure proper clearance in application.

Spacer Kit Part Number	Sensor Part Number	Probe Length mm (inch)	871D–xxxxx260–xx	871D–xxxxx317–xx	871D–xxxxx524–xx	871D–xxxxx730–xx	871D–xxxxx959–xx	871D–xxxxx1159–xx
			26.0 (1.025)	31.7 (1.250)	52.4 (2.062)	73.0 (2.875)	95.9 (3.775)	115.9 (4.560)
871A–S478	4.78 (0.188)		21.26 (0.837)	26.97 (1.062)	47.60 (1.874)	68.25 (2.687)	91.11 (3.587)	111.05 (4.372)
871A–S572	5.72 (0.225)		20.32 (0.800)	26.04 (1.025)	46.66 (1.837)	67.31 (2.650)	90.17 (3.550)	110.11 (4.335)
871A–S780	7.80 (0.307)		18.24 (0.718)	23.95 (0.943)	44.58 (1.755)	65.23 (2.568)	88.09 (3.468)	108.03 (4.253)
871A–S945	9.45 (0.372)		16.59 (0.653)	22.30 (0.878)	42.93 (1.690)	63.58 (2.503)	86.44 (3.403)	106.38 (4.188)
871A–S953	9.53 (0.375)		16.51 (0.650)	22.23 (0.875)	42.85 (1.687)	63.50 (2.500)	86.36 (3.400)	106.30 (4.185)
871A–S1270	12.70 (0.500)		13.34 (0.525)	19.05 (0.750)	39.67 (1.562)	60.33 (2.375)	83.19 (3.275)	103.12 (4.060)
871A–S1382	13.82 (0.544)		12.22 (0.481)	17.93 (0.706)	38.56 (1.518)	59.21 (2.331)	82.07 (3.231)	102.01 (4.016)
871A–S1427	14.27 (0.562)		11.76 (0.463)	17.48 (0.688)	38.10 (1.500)	58.75 (2.313)	81.61 (3.213)	101.55 (3.998)
871A–S1524	15.24 (0.600)		10.80 (0.425)	16.51 (0.650)	37.13 (1.462)	57.79 (2.275)	80.65 (3.175)	100.58 (3.960)
871A–S1737	17.37 (0.684)		8.66 (0.341)	14.38 (0.566)	35.00 (1.378)	55.65 (2.191)	78.51 (3.091)	98.45 (3.876)
871A–S1809	18.09 (0.712)		7.95 (0.313)	13.67 (0.538)	34.29 (1.350)	54.94 (2.163)	77.80 (3.063)	97.74 (3.848)
871A–S2057	20.57 (0.810)		5.46 (0.215)	11.18 (0.440)	31.80 (1.252)	52.45 (2.065)	75.31 (2.965)	95.25 (3.750)
871A–S2380	23.80 (0.937)		2.24 (0.088)	7.95 (0.313)	28.58 (1.125)	49.23 (1.938)	72.09 (2.838)	92.02 (3.623)

Each spacer kit contains:

- (1) Spacer
- (1) O-ring
- (2) Appropriate length mounting bolts

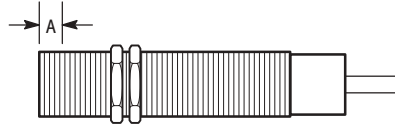
Dimensions—mm (inches)



L = Spacer height as indicated in Selection Guide above.

Spring Loaded Brackets

Catalog Number	Mounting Nut Torque	Sensor Nut Torque
871A-BXN8	8.4 N-m (75 in-lbs)	3.3 N-m (30 in-lbs)
871A-BXN12	15.2 N-m (136 in-lbs)	5.5 N-m (50 in-lbs)
871A-BXN18	22.0 N-m (195 in-lbs)	11.3 N-m (100 in-lbs)



Bulletin 871C/872C

Diameter	Shielded	“A” Length			Remainder of Thread Length	
		A—mm (inches)	Torque N.m (in-lbs)	Turns	Torque N.m (in-lbs)	Turns
8mm	Y	—	6.2 (55)	1 1/2	6.2 (55)	1 1/2
12mm	Y	11.7 (0.46)	4.0 (35)	1/4	9.6 (85)	1/2
	N	5.6 (0.22)				
18mm	Y	13.7 (0.54)	11.3 (100)	1/3	19.8 (175)	1/2
	N	5.6 (0.22)				
30mm	Y/N	—	33.9 (300)	1/8	33.9 (300)	1/8

Bulletin 871T

Diameter	Shielded	“A” Length			Remainder of Thread Length	
		A—mm (inches)	Torque N.m (in-lbs)	Turns	Torque N.m (in-lbs)	Turns
12mm	Y	11.7 (0.46)	9.0 (80)	2/3	14.1 (125)	3/4
	N	5.6 (0.22)				
18mm	Y	13.7 (0.54)	19.8 (175)	1/2	28.3 (250)	2/3
	N	5.6 (0.22)				

Bulletin 871TM

Diameter	Shielded	Torque N.m (in-lbs)	Turns
12mm	Y	14.1 (125)	3/4
	N		
18mm	Y	28.3 (250)	2/3
	N		
30mm	Y	33.9 (300)	1/8
	N		

① For metal housing using supplied hardware.

Proximity Sensors

Torque Chart ①

Bulletin 871U

Diameter	Shielded	“A” Length			Remainder of Thread Length	
		A—mm (inches)	Torque N.m (in-lbs)	Turns	Torque N.m (in-lbs)	Turns
12mm	Y	11.7 (0.46)	4.0 (35)	1/4	9.6 (85)	1/2
	N	5.6 (0.22)				
18mm	Y	13.7 (0.54)	11.3 (100)	1/3	19.8 (175)	1/2
	N	5.6 (0.22)				

Bulletin 871Z

Diameter	Shielded	Remainder of Thread Length	
		Torque N.m (in-lbs)	Turns
12mm	Y	9.6 (85)	1/2
	N		
18mm	Y	19.8 (175)	1/2
	N		
30mm	Y	33.9 (300)	1/8
	N		

① For metal housing using supplied hardware.

Bulletin 871ZC

Diameter	Shielded	Remainder of Thread Length	
		Torque N.m (in-lbs)	Turns
12mm	Y	13.4 (120)	1/2
18mm		16.8 (150)	
30mm		19.8 (175)	1/8

60-2439	2-188	802PR-LBAE1	2-140
60-2649	2-188	802PR-LBAF1	2-141
802PR-LAAA1	2-148	802PR-LBAH1	2-142
802PR-LAAA3	2-150	802PR-LBAH1-S6	2-142
802PR-LAAB1	2-148	802PR-LBAJ1	2-142
802PR-LAAE1	2-147	802PR-LBAJ3	2-144
802PR-LAAH1	2-148	802PR-LBAK1	2-140
802PR-LAAJ1	2-148	802PR-LBAM1-08	2-139
802PR-LAAJ3	2-150	802PR-LBAM1-12	2-139
802PR-LAAK1	2-147	802PR-LBAR1-08	2-139
802PR-LAAM1-08	2-146	802PR-LBAR1-12	2-139
802PR-LAAM1-12	2-146	802PR-XAAB1	2-148
802PR-LAAR1-08	2-146	802PR-XAAH1	2-148
802PR-LAAR1-12	2-146	802PR-XAAM1-08	2-146
802PR-LABA2	2-148	802PR-XAAM1-12	2-146
802PR-LABB2	2-148	802PR-XAAR1-08	2-146
802PR-LABE2	2-147	802PR-XAAR1-12	2-146
802PR-LABH2	2-148	802PR-XBAB1	2-142
802PR-LABJ2	2-148	802PR-XBAB1-S6	2-142
802PR-LABK2	2-147	802PR-XBAH1	2-142
802PR-LABM2-08	2-146	802PR-XBAH1-S6	2-142
802PR-LABM2-12	2-146	802PR-XBAM1-08	2-139
802PR-LABR2-08	2-146	802PR-XBAM1-12	2-139
802PR-LABR2-12	2-146	802PR-XBAR1-08	2-139
802PR-LACA2	2-148	802PR-XBAR1-12	2-139
802PR-LACB2	2-148	871A-AK12-100	2-184
802PR-LACE2	2-147	871A-AK12-25	2-184
802PR-LACH2	2-148	871A-AK12-50	2-184
802PR-LACJ2	2-148	871A-AK12-75	2-184
802PR-LACK2	2-147	871A-AK18-100	2-184
802PR-LACM2-08	2-146	871A-AK18-25	2-184
802PR-LACM2-12	2-146	871A-AK18-50	2-184
802PR-LACR2-08	2-146	871A-AK18-75	2-184
802PR-LACR2-12	2-146	871A-AK8-25	2-184
802PR-LBAA1	2-142	871A-AK8-50	2-184
802PR-LBAA3	2-144	871A-BP12	2-190
802PR-LBAB1	2-142	871A-BP18	2-190
802PR-LBAB1-S6	2-142	871A-BP30	2-190
802PR-LBAC1	2-141	871A-BP34	2-190
		871A-BP4	2-190

871A-BP5	2-190	871A-KP30	2-196
871A-BP7	2-190	871A-KP8	2-196
871A-BP8	2-190	871A-KPU12	2-196
871A-BQN12	2-187	871A-KPU18	2-196
871A-BQN12-L	2-187	871A-KPU30	2-196
871A-BQN18	2-187	871A-KPU8	2-196
871A-BQN18-L	2-187	871A-KT12	2-195
871A-BQN30	2-187	871A-KT18	2-195
871A-BQN30-L	2-187	871A-KT30	2-195
871A-BQN8	2-187	871A-KT8	2-195
871A-BQN8-L	2-187	871A-KUT12	2-195
871A-BR58	2-191	871A-KUT18	2-195
871A-BRN12	2-189	871A-KUT30	2-195
871A-BRN18	2-189	871A-KUT8	2-195
871A-BRN22	2-189	871A-LWN12	2-199
871A-BRN30	2-189	871A-LWN18	2-199
871A-BRN47	2-189	871A-LWN30	2-199
871A-BRN8	2-189	871A-LWN8	2-199
871A-BRS12	2-189	871A-NBT12	2-197
871A-BRS18	2-189	871A-NBT18	2-197
871A-BRS22	2-189	871A-NBT30	2-197
871A-BRS30	2-189	871A-PKIT	2-192
871A-BRS47	2-189	871A-PKITLS	2-193
871A-BRS8	2-189	871A-S1270	2-200
871A-BXN12	2-186	871A-S1382	2-200
2-201		871A-S1427	2-200
871A-BXN18	2-186	871A-S1524	2-200
2-201		871A-S1737	2-200
871A-BXN30	2-186	871A-S1809	2-200
871A-BXN8	2-186	871A-S2057	2-200
2-201		871A-S2380	2-200
871A-BXS12	2-186	871A-S478	2-200
871A-BXS12-LP	2-186	871A-S572	2-200
871A-BXS18	2-186	871A-S780	2-200
871A-BXS30	2-186	871A-S945	2-200
871A-BXS8	2-186	871A-S953	2-200
871A-KCT40-F	2-194	871C-A10C30-A2	2-84
871A-KCT40-T	2-194	871C-A10C30-N3	2-84
871A-KP12	2-196	871C-A10C30-R3	2-84
871A-KP18	2-196	871C-A10N30-A2	2-84

871C-A10N30-N3	2-84	871C-DH4M12-A2	2-89
871C-A10N30-R3	2-84	871C-DH4M12-D4	2-89
871C-A2C12-N3	2-84	871C-DH5M18-A2	2-89
871C-A2C12-R3	2-84	871C-DH5M18-D4	2-89
871C-A2N12-N3	2-84	871C-DH8M18-A2	2-89
871C-A2N12-R3	2-84	871C-DH8M18-D4	2-89
871C-A5C18-A2	2-84	871C-DM1NN3-E2	2-79
871C-A5C18-N3	2-84	871C-DM1NN4-E2	2-79
871C-A5C18-R3	2-84	871C-DM1NN4-P3	2-79
871C-A5N18-A2	2-84	871C-DM1NP3-E2	2-79
871C-A5N18-N3	2-84	871C-DM1NP4-E2	2-79
871C-A5N18-R3	2-84	871C-DT10NP30-D4	2-82
871C-C10S30	2-87	871C-DT10NP30-U2	2-82
871C-C15R30	2-87	871C-DT15NP30-D4	2-82
871C-C5S18	2-87	871C-DT15NP30-U2	2-82
871C-C8R18	2-87	871C-DT2NP12-D4	2-82
871C-D10S30	2-87	871C-DT2NP12-U2	2-82
871C-D14AP30-E2	2-92	871C-DT4NP12-D4	2-82
871C-D15R30	2-87	871C-DT4NP12-U2	2-82
871C-D1NN4-E2	2-79	871C-DT5NP18-D4	2-82
871C-D1NN5-E2	2-79	871C-DT5NP18-U2	2-82
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871TM-DH8NN18-D4	2-21	871TM-DN5NN18-H2	2-24
871TM-DH8NN18-H2	2-21	871TM-DN5NN18-N4	2-24
871TM-DH8NN18-N4	2-21	871TM-DN5NP18-A2	2-24
871TM-DH8NP18-A2	2-21	871TM-DN5NP18-D4	2-24
871TM-DH8NP18-D4	2-21	871TM-DN5NP18-H2	2-24
871TM-DH8NP18-H2	2-21	871TM-DN5NP18-N4	2-24
871TM-DH8NP18-N4	2-21	871TM-DR10NE30-A2	2-32
871TM-DN10CN30-D4	2-24	871TM-DR10NE30-D4	2-32
871TM-DN10CN30-H2	2-24	871TM-DR10NE30-H2	2-32
871TM-DN10CN30-N4	2-24	871TM-DR15NE30-A2	2-32
871TM-DN10CP30-D4	2-24	871TM-DR15NE30-D4	2-32
871TM-DN10CP30-H2	2-24	871TM-DR15NE30-H2	2-32
871TM-DN10CP30-N4	2-24	871TM-DR2NE12-A2	2-32
871TM-DN10NN30-D4	2-24	871TM-DR2NE12-C2	2-32
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871TM-DN10NP30-H2	2-24	871TM-DR5NE18-A2	2-32
871TM-DN10NP30-N4	2-24	871TM-DR5NE18-D4	2-32
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871Z-BW10C30-N3	2-97	871ZC-MW8NP18-D4	2-101
871Z-BW10C30-R3	2-97	872C-A10C18-A2	2-65
871Z-BW10N30-H2	2-97	872C-A10C18-N3	2-65
871Z-BW10N30-N3	2-97	872C-A10C18-R3	2-65
871Z-BW10N30-R3	2-97	872C-A10C30-A2	2-65
871Z-BW2C12-C2	2-97	872C-A10C30-N3	2-65
871Z-BW2C12-N3	2-97	872C-A10C30-R3	2-65
871Z-BW2C12-R3	2-97	872C-A10N18-A2	2-65
871Z-BW2N12-C2	2-97	872C-A10N18-N3	2-65
871Z-BW2N12-N3	2-97	872C-A10N18-R3	2-65
871Z-BW2N12-R3	2-97	872C-A10N30-A2	2-65
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871ZC-BW5N18-R3	2-103	872C-A5C18-N3	2-65
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872C-D4NN12-D4	2-45	872C-DH10CN30-E2	2-49
872C-D4NN12-E2	2-45	872C-DH10CN30-N4	2-49
872C-D4NP12-D4	2-45	872C-DH10CP30-D4	2-49
872C-D4NP12-E2	2-45	872C-DH10CP30-E2	2-49
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872C-D5CE18-D4	2-59	872C-DH10NN30-N4	2-49
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872C-DH4CN12-D4	2-49	872C-DH8NN18-P3	2-49
872C-DH4CN12-E2	2-49	872C-DH8NP18-D4	2-49
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872C-DH5CP18-D4	2-49	872C-M15NP30-D4	2-53
872C-DH5CP18-E2	2-49	872C-M3Q12-D4	2-61
872C-DH5CP18-N4	2-49	872C-M4CN12-A2	2-53
872C-DH5CP18-P3	2-49	872C-M4CN12-D4	2-53
872C-DH5NN18-D4	2-49	872C-M4CP12-A2	2-53
872C-DH5NN18-E2	2-49	872C-M4CP12-D4	2-53
872C-DH5NN18-N4	2-49	872C-M4NN12-A2	2-53
872C-DH5NN18-P3	2-49	872C-M4NN12-D4	2-53
872C-DH5NP18-D4	2-49	872C-M4NP12-A2	2-53
872C-DH5NP18-E2	2-49	872C-M4NP12-D4	2-53
872C-DH5NP18-N4	2-49	872C-M5Q18-D4	2-61
872C-DH5NP18-P3	2-49	872C-M8CN18-A2	2-53
872C-DH8CN18-D4	2-49	872C-M8CN18-D4	2-53
872C-DH8CN18-E2	2-49	872C-M8CP18-A2	2-53
872C-DH8CN18-N4	2-49	872C-M8CP18-D4	2-53
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872C-DH8CP18-D4	2-49	872C-M8NN18-D4	2-53
872C-DH8CP18-E2	2-49	872C-M8NP18-A2	2-53
872C-DH8CP18-N4	2-49	872C-M8NP18-D4	2-53
872C-DH8CP18-P3	2-49	872C-MM1CN7-E2	2-45
872C-DH8NN18-D4	2-49	872C-MM1CN7-P3	2-45
872C-DH8NN18-E2	2-49	872C-MM1CP7-E2	2-45
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872C-MM1NN7-P3	2-45	872CP-M3CN12-E2	2-56
872C-MM1NP7-E2	2-45	872CP-M3CP12-D4	2-56
872C-MM1NP7-P3	2-45	872CP-M3CP12-E2	2-56
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872C-N12CN18-D4	2-53	872CP-M3NN12-E2	2-56
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872L-D20EN40-N4	2-133
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872L-D20EP40-N4	2-133
872L-D20EP40-T3	2-133
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872L-D40EN40-T3	2-133
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