Contents

Quick Selection Guide

Specifications	875C General Purpose Tubular		875CP Plastic Barrel Tubular	
				
Description	• Nickel-plated brass barrel		• Plastic barrel	
Features	• Capacitive technology senses metals and nonmetals, liquid and solids • Adjustable sensing distance • 3-wire DC and 2-wire AC models • DC models have short circuit, overload, transient noise, and reverse polarity protection • Cable or quick-disconnect styles		• Capacitive technology senses metals and nonmetals, liquid and solids • Adjustable sensing distance • 3-wire DC and 2-wire AC models • DC models have short circuit, overload, transient noise, and reverse polarity protection • Cable or quick-disconnect styles	
Operating Voltage	• 10…48V DC	• 24…240V AC	• 10…48V DC	• 24…240V AC
Diameter	• 12, 18, 30 mm	• 18, 30 mm	• 18, 30, 34 mm	• 18, 30, 34 mm
Available Models	• DC 3-Wire Nickel-Plated Brass Barrel	• AC 2-Wire Nickel-Plated Brass Barrel	• DC 3-Wire Plastic Barrel	• AC 2-Wire Plastic Barrel
Connection	• PVC Cable • Pico QD (18 mm) • Micro QD (30 mm)	• PVC Cable • Micro QD (30 mm)	• PVC Cable • Pico QD (18 mm) • Micro QD (30 & 34 mm)	• PVC Cable • Micro QD (30 & 34 mm)
Enclosure	• Nickel-plated brass barrel • NEMA 1, 3, 4, 6, 13; IP67	• Nickel-plated brass barrel • NEMA 1, 3, 4, 6, 13; IP67	• Plastic barrel • NEMA 12; IP67 (IEC 529)	• Plastic barrel • NEMA 1, 3, 4, 6, 13; IP67
Additional Info	• See page 4-10	• See page 4-16	• See page 4-13	• See page 4-18

Technical Definitions and Terminology

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.

Differential Travel: 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.

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 used to indicate sensor status.

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

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

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

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

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, 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: See Switching Frequency.

Reverse Polarity Protection: Proximity sensors which are protected against a reversal in voltage polarity.

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

Sensing Range: The rated operating distance.

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.

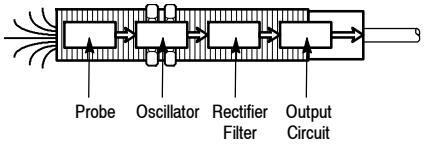
Three-Wire Proximity Switch: An AC or DC proximity sensor with three leads, two of which supply power and a third that switches the load.

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.

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

Notes

Principles of Operation for Capacitive Proximity Sensors



Capacitive proximity sensors are designed to operate by generating an electrostatic field and detecting changes in this field caused when a target approaches the sensing face. The sensor's internal workings consist of a capacitive probe, an oscillator, a signal rectifier, a filter circuit and an output circuit.

In the absence of a target, the oscillator is inactive. As a target approaches, it raises the capacitance of the probe system. When the capacitance reaches a specified threshold, the oscillator is activated which triggers the output circuit to change between "on" and "off."

The capacitance of the probe system is determined by the target's size, dielectric constant and distance from the probe. The larger the size and dielectric constant of a target, the more it increases capacitance. The shorter the distance between target and probe, the more the target increases capacitance.

Standard Target and Grounding for Capacitive Proximity Sensors

The standard target for capacitive sensors is the same as for inductive proximity sensors. The target is grounded per IEC test standards. However, a target in a typical application does not need to be grounded to achieve reliable sensing.

Shielded vs. Unshielded Capacitive Sensors

Shielded capacitive proximity sensors are best suited for sensing low dielectric constant (difficult to sense) materials due to their highly concentrated electrostatic fields. This allows them to detect targets which unshielded sensors cannot. However, this also makes them more susceptible to false triggers due to the accumulation of dirt or moisture on the sensor face.

The electrostatic field of an unshielded sensor is less concentrated than that of a shielded model. This makes them well suited for detecting high dielectric constant (easy to sense) materials or for differentiating between materials with high and low constants. For the right target materials, unshielded capacitive proximity sensors have longer sensing distances than shielded versions.

Unshielded capacitive sensors are also more suitable than shielded types for use with plastic sensor wells, an accessory designed for liquid level applications. The well is mounted through a hole in a tank and the sensor is slipped into the well's receptacle. The sensor detects the liquid in the tank through the wall of the sensor well. This allows the well to serve both as a plug for the hole and a mount for the sensor.

Target Correction Factors for Capacitive Proximity Sensors

For a given target size, correction factors for capacitive sensors are determined by a property of the target material called the dielectric constant. Materials with higher dielectric constant values are easier to sense than those with lower values. A partial listing of dielectric constants for some typical industrial materials follows. For more information, refer to the *CRC Handbook of Chemistry and Physics (CRC Press), the CRC Handbook of Tables for Applied Engineering Science (CRC Press),* or other applicable sources.

Dielectric Constants of Common Industrial Materials

Acetone	19.5
Acrylic Resin	2.7-4.5
Air	1.000264
Alcohol	25.8
Ammonia	15-25
Aniline	6.9
Aqueous Solutions	50-80
Bakelite	3.6
Benzene	2.3
Carbon Dioxide	1.000985
Carbon Tetrachloride	2.2
Celluloid	3.0
Cement Powder	4.0
Cereal	3-5
Chlorine Liquid	2.0
Ebonite	2.7-2.9
Epoxy Resin	2.5-6
Ethanol	24
Ethylene Glycol	38.7
Fired Ash	1.5-1.7
Flour	1.5-1.7
Freon R22 & 502 (liquid)	6.11
Gasoline	2.2
Glass	3.7-10
Glycerine	47
Marble	8.0-8.5
Melamine Resin	4.7-10.2
Mica	5.7-6.7
Nitrobenzine	36
Nylon	4-5
Oil Saturated Paper	4.0
Paraffin	1.9-2.5
Paper	1.6-2.6
Perspex	3.2-3.5
Petroleum	2.0-2.2
Phenol Resin	4-12
Polyacetal	3.6-3.7
Polyamide	5.0
Polyester Resin	2.8-8.1
Polyethylene	2.3
Polypropylene	2.0-2.3
Polystyrene	3.0
Polyvinyl Chloride Resin	2.8-3.1
Porcelain	4.4-7
Powdered Milk	3.5-4
Press Board	2-5
Quartz Glass	3.7
Rubber	2.5-35
Salt	6.0
Sand	3-5
Shellac	2.5-4.7
Shell Lime	1.2
Silicon Varnish	2.8-3.3
Soybean Oil	2.9-3.5
Styrene Resin	2.3-3.4
Sugar	3.0
Sulphur	3.4
Teflon	2.0
Toluene	2.3
Transformer Oil	2.2
Turpentine Oil	2.2
Urea Resin	5-8
Vaseline	2.2-2.9
Water	80
Wood, Dry	2-7
Wood, Wet	10-30

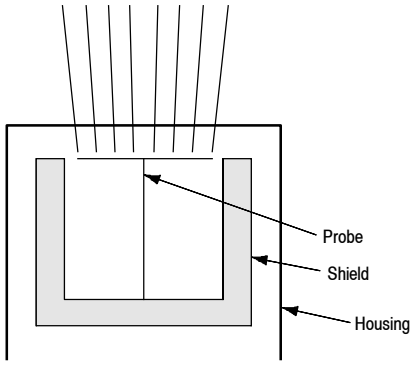
Shielded vs. Unshielded Construction

Each capacitive sensor can be classified as having either a shielded or unshielded construction.

Shielded Probe

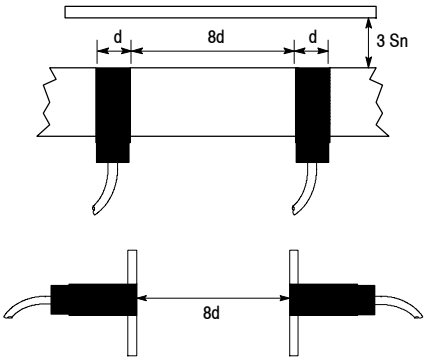
Shielded sensors are constructed with a metal band surrounding the probe. This helps to direct the electrostatic field to the front of the sensor and results in a more concentrated field.

Shielded Probe



Shielded construction allows the sensor to be mounted flush in surrounding material without causing false trigger.

Shielded Sensors Flush Mounted

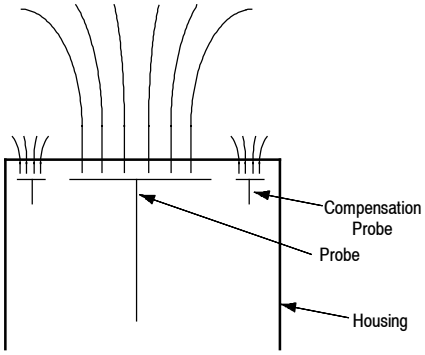


Shielded capacitive proximity sensors are best suited for sensing materials with low dielectric constants (difficult to sense) as a result of their highly concentrated electrostatic fields. This allows them to detect targets that unshielded sensors cannot.

Unshielded Probe

Unshielded sensors do not have a metal band surrounding the probe and hence have a less concentrated electrostatic field. Many unshielded models are equipped with compensation probes, which provide increased stability for the sensor. Compensation probes are discussed later in this section.

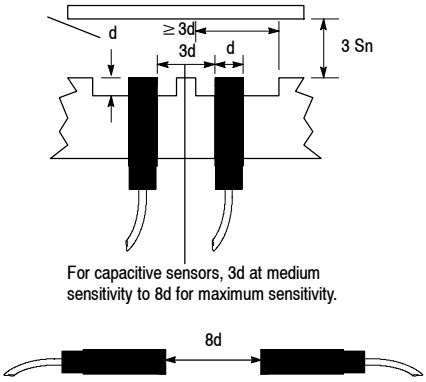
Unshielded Probe



Unshielded capacitive sensors are also more suitable than shielded types for use with plastic sensor wells, an accessory designed for liquid level applications. The well is mounted through a hole in a tank and the sensor is slipped into the well's receptacle. The sensor detects the liquid in the tank through the wall of the sensor well.

Unshielded Construction Mounted Above Metal and Mounted in Plastic Sensor Well

d for capacitive sensors if mounted in plastic. 3d (12, 18 mm models) or 1.5d (30, 34 mm models) if mounted in metal.

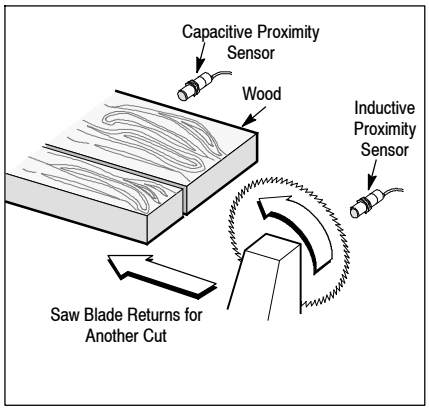


d = diameter or width of active sensing face
Sn = nominal sensing distance

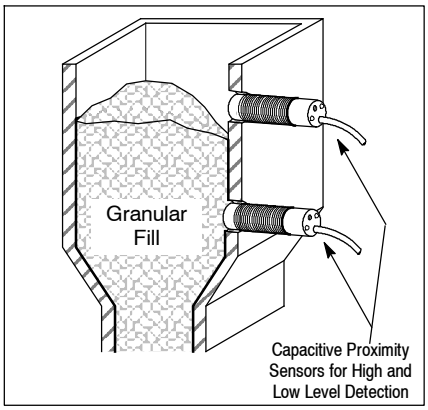
The electrostatic field of an unshielded sensor is less concentrated than that of a shielded model. This makes them well suited for detecting high dielectric constant (easy to sense) materials or for differentiating between materials with high and low constants. For certain target materials, unshielded capacitive proximity sensors have longer sensing distances than shielded versions.

Applications

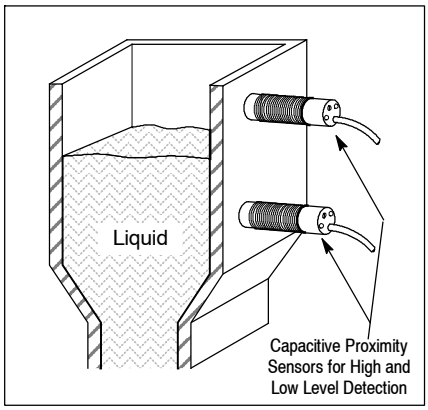
Wood Industry



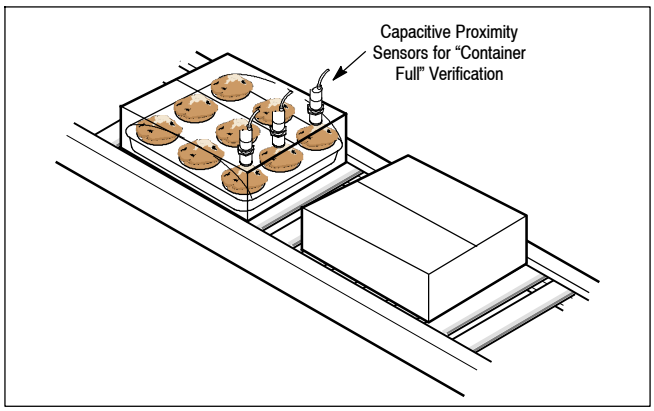
Level Detection



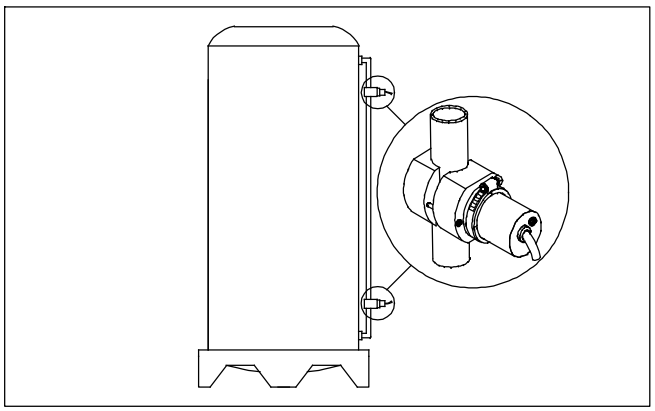
Liquid Level Detection



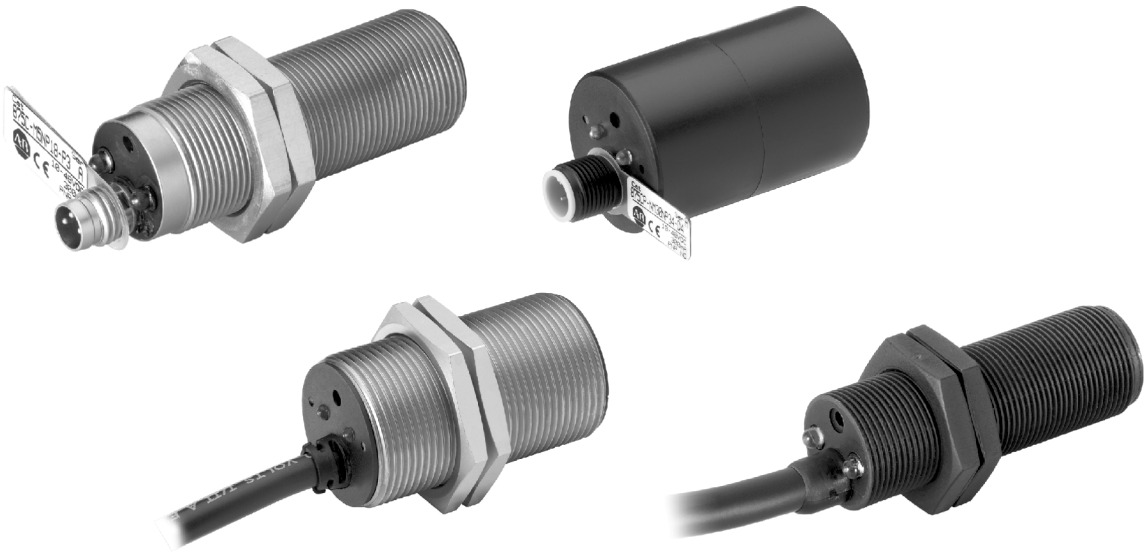
Food Processing



Sight-Tube Level Detection



Notes



Description

Bulletin 875C and 875CP capacitive proximity sensors are self-contained solid-state devices designed for noncontact sensing of a wide range of materials.

Unlike inductive proximity sensors, the 875C and 875CP can detect nonmetal solids and liquids in addition to standard metal targets. They can even sense the presence of some targets through certain other materials, making them an ideal choice in some applications where inductive proximity and photoelectric sensors cannot be used.

Each unit has an adjustable sensing distance and is equipped with two LEDs to indicate power and output. They are housed in either a nickel-plated brass barrel (shielded models) or a plastic barrel (unshielded models) which meets NEMA 12 and IP67 (IEC 529) enclosure standards. Connection options include PVC cable as well as micro and pico quick-disconnect.

Features

- Metal, nonmetal solid and liquid sensing capability
- Adjustable sensing distance
- Cable or quick-disconnect styles
- Short circuit❶, overload❶, reverse polarity❶, and transient noise protection
- Plastic models have glass filled nylon housings
- Meets NEMA 12 and IP67 (IEC 529) enclosure standards
- cULus Listed and CE Marked for all applicable directives

Styles

Accessories

❶ DC models only.

875C 3-Wire DC

Plastic Face/Threaded Nickel-Plated Brass Barrel

875C DC Cable Style
12, 18, 30 mm
page 4-11

875C DC Micro
Quick-Disconnect Style
18 and 30 mm
page 4-12

875C DC Pico
Quick-Disconnect Style
18 mm
page 4-12

Features

- Metal, nonmetal solid and liquid sensing capability
- Adjustable sensing distance for 18 mm and 30 mm models
- 3-wire operation
- 3 conductor, 3-pin or 4-pin connection
- Normally open or normally closed output
- Short circuit, overload, reverse polarity, and transient noise protection
- cULus Listed and CE Marked for all applicable directives

Specifications

	12 mm	18 mm	30 mm
Load Current	300 mA	300 mA	300 mA
Leakage Current	0.3 mA	0.1 mA	0.1 mA
Operating Voltage	10…48V DC	10…48V DC	10…48V DC
Voltage Drop	≤2V	≤2V	≤2V
Current Consumption	≦10 mA		
Repeatability	≤10%		
Hysteresis	≤20%		
Transient Noise Protection	Incorporated		
Reverse Polarity Protection	Incorporated		
Short Circuit Protection	Incorporated		
Overload Protection	Incorporated		
Certifications	cULus Listed and CE Marked for all applicable directives		
Enclosure	NEMA 1, 3, 4, 6, 13 and IP67; Nickel-plated brass barrel		
Connections	Cable: 2 meter length; 3 conductor PVC Quick-Disconnect: 4-pin micro; 3-pin pico		
LEDs	Green: Power Yellow: Output		
Operating Temperature [C (F)]	-25…+75° (-13…+167°)		
Shock	30 g, 11 ms		
Vibration	55 Hz, 1 mm amplitude, 3 planes		

Correction Factors

Target Material	Correction Factor
Acetone	0.75
Acrylic Resin	0.10…0.25
Air	0.0
Alcohol	0.85
Ammonia	0.70…0.85
Aniline	0.40
Aqueous Solutions	0.98…1.0
Bakelite	0.20
Benzene	0.10
Carbon Dioxide	0.0
Carbon Tetrachloride	0.10
Celluloid	0.15
Cement Powder	0.25
Cereal	0.15…0.30
Chlorine Liquid	0.10
Ebonite	0.15
Epoxy Resin	0.15…0.35
Ethanol	0.85
Ethylene Glycol	0.93
Fired Ash	0.05
Flour	0.05
Freon R22 & 502 (liquid)	0.35
Gasoline	0.10
Glass	0.20…0.55
Glycerine	0.98
Marble	0.50
Melamine Resin	0.25…0.55
Mica	0.35
Nitrobenzine	0.93
Nylon	0.20…0.30
Oil Saturated Paper	0.25
Paraffin	0.10
Paper	0.10

Correction Factors

Target Material	Correction Factor
Perspex	0.15
Petroleum	0.05
Phenol Resin	0.20…0.60
Polyacetal	0.20
Polyamide	0.30
Polyester Resin	0.15…0.50
Polyethylene	0.10
Polypropylene	0.10
Polystyrene	0.15
Polyvinyl Chloride Resin	0.15
Porcelain	0.25…0.40
Powdered Milk	0.20
Press Board	0.10…0.30
Quartz Glass	0.20
Rubber	0.15…0.90
Salt	0.35
Sand	0.15…0.30
Shellac	0.15…0.25
Shell Lime	<0.05
Silicon Varnish	0.15
Soybean Oil	0.15
Styrene Resin	0.15
Sugar	0.15
Sulphur	0.15
PTFE	0.10
Toluene	0.10
Transformer Oil	0.10
Turpentine Oil	0.10
Urea Resin	0.30…0.45
Vaseline	0.10
Water	1.0
Wood, Dry	0.10…0.40
Wood, Wet	0.60…0.85

New

Product Selection

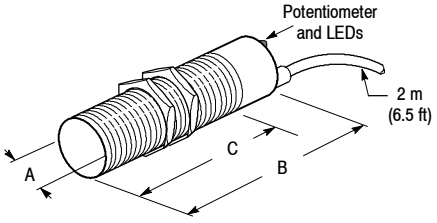
Barrel Dia. & Type	Nominal Sensing Distance [mm (in.)]	Shielded	Output Configuration		Switching Frequency (Hz)	Cat. No.		
						Cable Style	Micro QD Style	Pico QD Style
12 mm Threaded	2.5 (0.09)	Y	N.O.	PNP	100	875C-M2NP12-A2	—	—
18 mm Threaded	1 (0.04)…5 (0.20)					875C-M5NP18-A2	—	875C-M5NP18-P3
				NPN		875C-M5NN18-A2	—	875C-M5NN18-P3
			N.C.	PNP		875C-M5CP18-A2	—	875C-M5CP18-P3
				NPN		875C-M5CN18-A2	—	875C-M5CN18-P3
30 mm Threaded	2 (0.08)…10 (0.39)		N.O.	PNP		875C-M10NP30-A2	**875C-M10NP30-D4**	—
				NPN		875C-M10NN30-A2	875C-M10NN30-D4	—
			N.C.	PNP		875C-M10CP30-A2	875C-M10CP30-D4	—
				NPN		875C-M10CN30-A2	875C-M10CN30-D4	—
Recommended standard QD cordset (-2 = 2 m (6.5 ft))							889D-F4AC-2	889P-F3AB-2

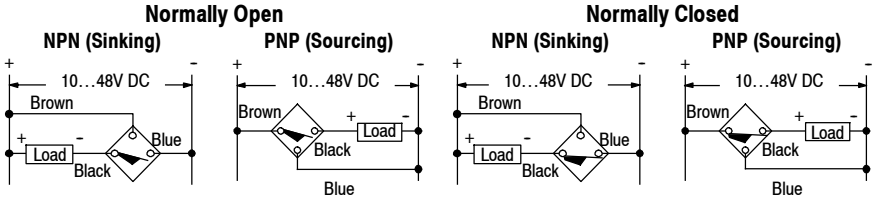
QD Cordsets and Accessories

Description	Page Number
Mounting Brackets	2-210…2-214
Mounting Nuts	2-221…2-222
Terminal Chambers	8-1
Other Cordsets Available	8-1

Approximate Dimensions [mm (in.)] Wiring Diagram

Cable Style





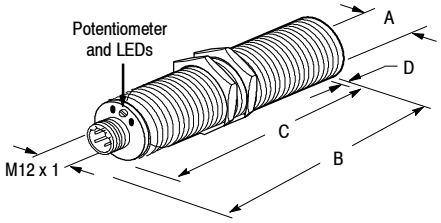
Thread Size	mm (inches)		
	A	B	C
M12 x 1	12.0 (0.47)	50.0 (1.96)	42.0 (1.65)
M18 x 1	18.0 (0.71)	52.0 (2.04)	47.4 (1.87)
M30 x 1.5	30.0 (1.18)	53.0 (2.08)	53.0 (2.08)

875C 3-Wire DC

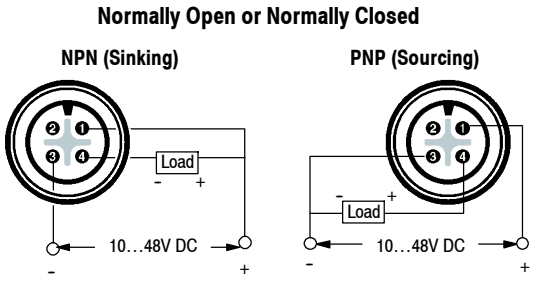
Plastic Face/Threaded Nickel-Plated Brass Barrel

Approximate Dimensions [mm (in.)]

Micro QD Style

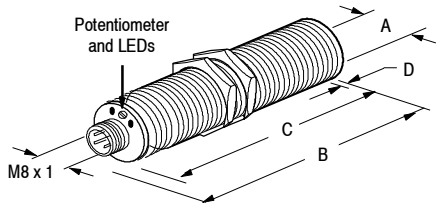


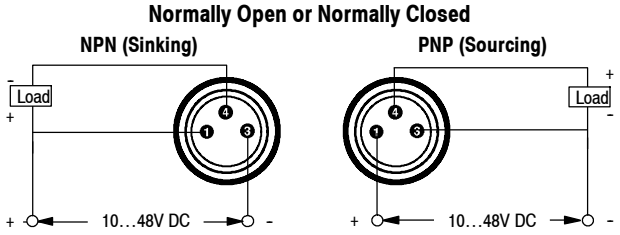
Wiring Diagram



Thread Size	mm (inches)			
	A	B	C	D
M30 x 1.5	30.0 (1.18)	66.0 (2.60)	53.0 (2.08)	1.0 (0.04)

Pico QD Style





Thread Size	mm (inches)			
	A	B	C	D
M18 x 1	18.0 (0.71)	61.5 (2.42)	52.0 (2.04)	1.0 (0.04)

875CP DC Micro
Quick-Disconnect Style
Smooth Barrel 34 mm
page 4-14

875CP DC Pico
Quick-Disconnect Style
Threaded Barrel 18 mm
page 4-14

Features

- Metal, nonmetal solid and liquid sensing capability
- Adjustable sensing distance
- 3-wire operation
- 3 conductor, 3-pin or 4-pin connection
- 10…48V DC
- Normally open or normally closed output
- Short circuit, overload, reverse polarity and transient noise protection
- cULus Listed and CE Marked for all applicable directives

Specifications

Load Current	≤ 300 mA
Leakage Current	0.01 mA
Operating Voltage	10…48V DC
Voltage Drop	<2V
Current Consumption	≦ 10 mA
Repeatability	≤ 10%
Hysteresis	≤ 20%
Transient Noise Protection	Incorporated
Reverse Polarity Protection	Incorporated
Short Circuit Protection	Incorporated
Overload Protection	Incorporated
Certifications	cULus Listed and CE Marked for all applicable directives
Enclosure	NEMA 12; IP67 (IEC 529)
Housing Material	Plastic (PBT)
Connections	Cable: 2 meter length; 3 conductor PVC Quick-Disconnect: 4-pin micro; 3-pin pico
LEDs	Green: Power Yellow: Output
Operating Temperature [C (F)]	-25…+70° (-13…+158°)
Shock	30 g, 11 ms
Vibration	55 Hz, 1 mm amplitude, 3 planes

Correction Factors

Target Material	Correction Factor
Acetone	0.75
Acrylic Resin	0.10…0.25
Air	0.0
Alcohol	0.85
Ammonia	0.70…0.85
Aniline	0.40
Aqueous Solutions	0.98…1.0
Bakelite	0.20
Benzene	0.10
Carbon Dioxide	0.0
Carbon Tetrachloride	0.10
Celluloid	0.15
Cement Powder	0.25
Cereal	0.15…0.30
Chlorine Liquid	0.10
Ebonite	0.15
Epoxy Resin	0.15…0.35
Ethanol	0.85
Ethylene Glycol	0.93
Fired Ash	0.05
Flour	0.05
Freon R22 & 502 (liquid)	0.35
Gasoline	0.10
Glass	0.20…0.55
Glycerine	0.98
Marble	0.50
Melamine Resin	0.25…0.55
Mica	0.35
Nitrobenzine	0.93
Nylon	0.20…0.30
Oil Saturated Paper	0.25
Paraffin	0.10
Paper	0.10

Correction Factors

Target Material	Correction Factor
Perspex	0.15
Petroleum	0.05
Phenol Resin	0.20…0.60
Polyacetal	0.20
Polyamide	0.30
Polyester Resin	0.15…0.50
Polyethylene	0.10
Polypropylene	0.10
Polystyrene	0.15
Polyvinyl Chloride Resin	0.15
Porcelain	0.25…0.40
Powdered Milk	0.20
Press Board	0.10…0.30
Quartz Glass	0.20
Rubber	0.15…0.90
Salt	0.35
Sand	0.15…0.30
Shellac	0.15…0.25
Shell Lime	<0.05
Silicon Varnish	0.15
Soybean Oil	0.15
Styrene Resin	0.15
Sugar	0.15
Sulphur	0.15
PTFE	0.10
Toluene	0.10
Transformer Oil	0.10
Turpentine Oil	0.10
Urea Resin	0.30…0.45
Vaseline	0.10
Water	1.0
Wood, Dry	0.10…0.40
Wood, Wet	0.60…0.85

875CP 3-Wire DC

Plastic Face/Threaded or Smooth Plastic Barrel

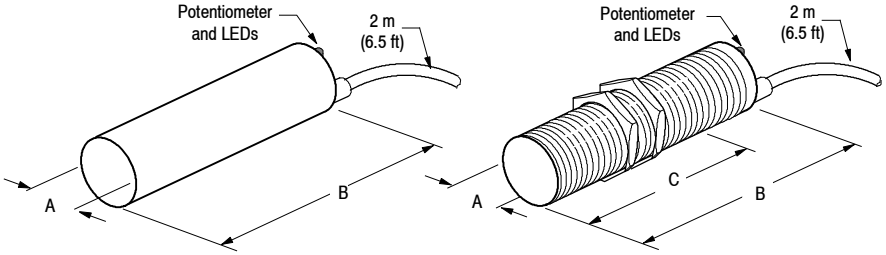
Product Selection

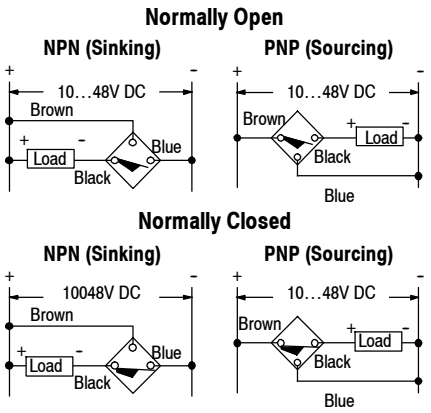
Barrel Dia. & Type	Nominal Sensing Distance [mm (in.)]	Shielded	Output Configuration		Switching Frequency (Hz)	Cat. No.		
						Cable Style	Micro QD Style	Pico QD Style
18 mm Threaded	2 (0.08)…8 (0.31)	N	N.O.	PNP	100	875CP-N8NP18-A2	—	875CP-N8NP18-P3
				NPN		875CP-N8NN18-A2	—	875CP-N8NN18-P3
			N.C.	PNP		875CP-N8CP18-A2	—	875CP-N8CP18-P3
				NPN		875CP-N8CN18-A2	—	875CP-N8CN18-P3
30 mm Threaded	5 (0.20)…20 (0.79)		N.O.	PNP		875CP-N20NP30-A2	**875CP-N20NP30-D4**	—
				NPN		875CP-N20NN30-A2	875CP-N20NN30-D4	—
			N.C.	PNP		875CP-N20CP30-A2	875CP-N20CP30-D4	—
				NPN		875CP-N20CN30-A2	875CP-N20CN30-D4	—
34 mm Smooth	7 (0.28)…30 (1.18)		N.O.	PNP		875CP-NM30NP34-A2	875CP-NM30NP34-D4	—
				NPN		875CP-NM30NN34-A2	875CP-NM30NN34-D4	—
			N.C.	PNP		875CP-NM30CP34-A2	875CP-NM30CP34-D4	—
				NPN		875CP-NM30CN34-A2	875CP-NM30CN34-D4	—
Recommended standard QD cordset (-2 = 2 m (6.5 ft))							889D-F4AC-2	889P-F3AB-2

QD Cordsets and Accessories

Description	Page Number
Mounting Brackets	2-210…2-214
Mounting Nuts	2-221…2-222
Sensor Wells	4-22
Terminal Chambers	8-1
Other Cordsets Available	8-1

Cable Style



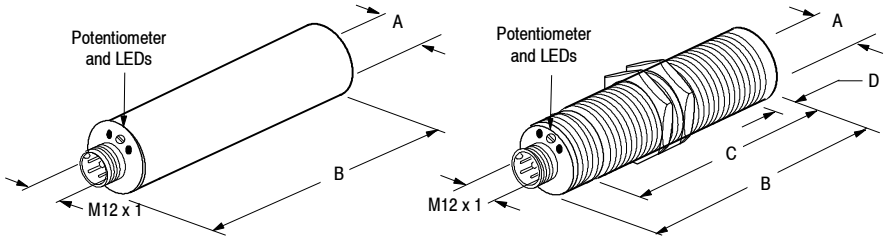


Diameter or Thread Size	mm (inches)		
	A	B	C
M18 x 1	18.0 (0.71)	52.0 (2.04)	52.0 (2.04)
M30 x 1.5	30.0 (1.18)		46.1 (1.81)
∅34	34.0 (1.34)		N/A

Visit our website: *www.ab.com/catalogs*.
Preferred availability cat. nos. are printed in **bold**.

Approximate Dimensions [mm (in.)]

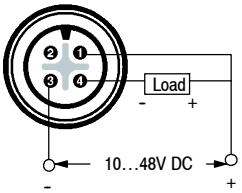
Micro QD Style



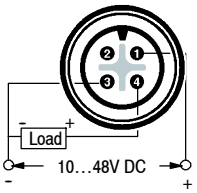
Wiring Diagram

Normally Open or Normally Closed

NPN (Sinking)

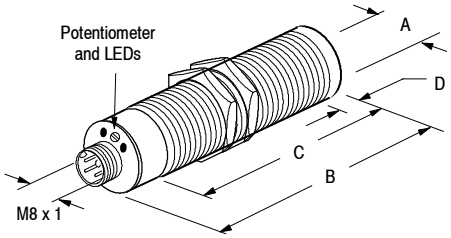


PNP (Sourcing)



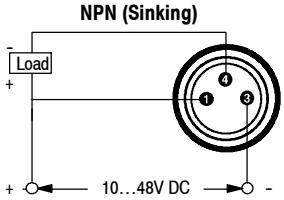
Diameter or Thread Size	mm (inches)			
	A	B	C	D
M30 x 1.5	30.0 (1.18)	65.0 (2.56)	52.0 (2.04)	1.0 (0.04)
∅34	34.0 (1.34)	65.0 (2.56)	N/A	N/A

Pico QD Style

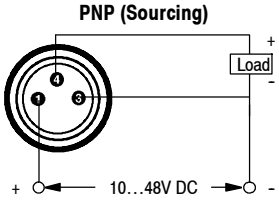


Normally Open or Normally Closed

NPN (Sinking)



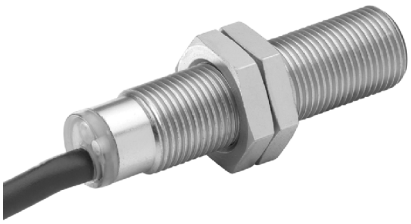
PNP (Sourcing)



Diameter or Thread Size	mm (inches)			
	A	B	C	D
M18 x 1	18.0 (0.71)	61.5 (2.42)	52.0 (2.04)	1.0 (0.04)

875C 2-Wire AC

Plastic Face/Threaded Nickel-Plated Brass Barrel



875CP AC Cable Style
Threaded Barrel
18, 30 mm
page 4-17

875CP AC Micro Quick-Disconnect Style
Threaded Barrel
30 mm
page 4-17

Features

- Metal, nonmetal solid and liquid sensing capability
- Adjustable sensing distance
- 2-wire operation
- 2 conductor or 3-pin connection
- 24…240V AC
- Normally open or normally closed output
- Transient noise protection
- cULus Listed and CE Marked for all applicable directives

Specifications

Load Current	≤ 300 mA
Inrush Current	2A
Leakage Current	<1.5 mA
Operating Voltage	24…240V AC
Voltage Drop	<7.5V AC
Repeatability	≤ 10%
Hysteresis	≤ 20%
Transient Noise Protection	Incorporated
Enclosure	NEMA 1, 3, 4, 6, 13 and IP67
Certifications	cULus Listed and CE Marked for all applicable directives
Connections	Cable: 2 meter length; 2 conductor PVC Quick-Disconnect: 3-pin micro
LEDs	Green: Power Yellow: Output
Operating Temperature [C (F)]	-25…+70° (-13…+158°)
Shock	30 g, 11 ms
Vibration	55 Hz, 1 mm amplitude, 3 planes

Correction Factors

Target Material	Correction Factor
Acetone	0.75
Acrylic Resin	0.10…0.25
Air	0.0
Alcohol	0.85
Ammonia	0.70…0.85
Aniline	0.40
Aqueous Solutions	0.98…1.0
Bakelite	0.20
Benzene	0.10
Carbon Dioxide	0.0
Carbon Tetrachloride	0.10
Celluloid	0.15
Cement Powder	0.25
Cereal	0.15…0.30
Chlorine Liquid	0.10
Ebonite	0.15
Epoxy Resin	0.15…0.35
Ethanol	0.85
Ethylene Glycol	0.93
Fired Ash	0.05
Flour	0.05
Freon R22 & 502 (liquid)	0.35
Gasoline	0.10
Glass	0.20…0.55
Glycerine	0.98
Marble	0.50
Melamine Resin	0.25…0.55
Mica	0.35
Nitrobenzine	0.93
Nylon	0.20…0.30
Oil Saturated Paper	0.25
Paraffin	0.10
Paper	0.10

Correction Factors

Target Material	Correction Factor
Perspex	0.15
Petroleum	0.05
Phenol Resin	0.20…0.60
Polyacetal	0.20
Polyamide	0.30
Polyester Resin	0.15…0.50
Polyethylene	0.10
Polypropylene	0.10
Polystyrene	0.15
Polyvinyl Chloride Resin	0.15
Porcelain	0.25…0.40
Powdered Milk	0.20
Press Board	0.10…0.30
Quartz Glass	0.20
Rubber	0.15…0.90
Salt	0.35
Sand	0.15…0.30
Shellac	0.15…0.25
Shell Lime	<0.05
Silicon Varnish	0.15
Soybean Oil	0.15
Styrene Resin	0.15
Sugar	0.15
Sulphur	0.15
PTFE	0.10
Toluene	0.10
Transformer Oil	0.10
Turpentine Oil	0.10
Urea Resin	0.30…0.45
Vaseline	0.10
Water	1.0
Wood, Dry	0.10…0.40
Wood, Wet	0.60…0.85

New

Product Selection

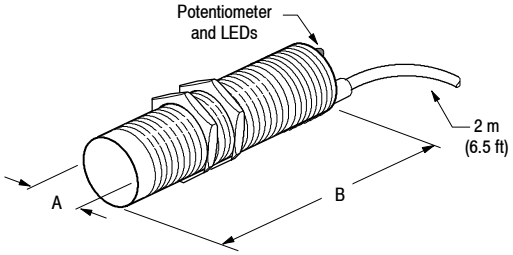
Barrel Diameter and Type	Nominal Sensing Distance [mm (in.)]	Shielded	Output Configuration	Switching Frequency (Hz)	Cat. No.	
					Cable Style	Micro QD Style
18 mm Threaded	1 (0.04)…5 (0.20)	Y	N.O.	25	875C-F5N18-A2	—
			N.C.		875C-F5C18-A2	—
30 mm Threaded	2 (0.08)…10 (0.39)		N.O.		875C-F10N30-A2	875C-F10N30-R3
			N.C.		875C-F10C30-A2	875C-F10C30-R3
Recommended standard QD cordset (-2 = 2 m (6.5 ft))						889R-F3ECA-2

QD Cordsets and Accessories

Description	Page Number
Mounting Brackets	2-210…2-214
Mounting Nuts	2-221…2-222
Sensor Wells	4-22
Terminal Chambers	8-1
Other Cordsets Available	8-1

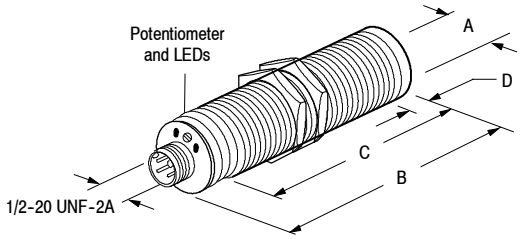
Approximate Dimensions [mm (in.)]

Cable Style



Diameter or Thread Size	mm (inches)	
	A	B
M18 x 1	18.0 (0.71)	52.0 (2.04)
M30 x 1.5	30.0 (1.18)	53.0 (2.08)

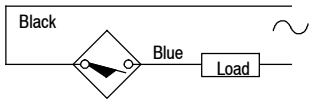
Micro QD Style



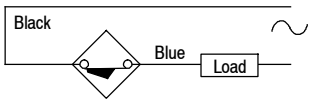
Diameter or Thread Size	mm (inches)			
	A	B	C	D
M30 x 1.5	30.0 (1.18)	66.0 (2.60)	53.0 (2.08)	1.0 (0.04)

Wiring Diagram

Normally Open

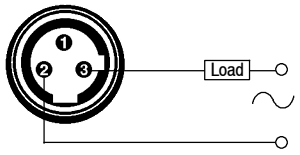


Normally Closed



Note: Load can be switched to black wire.

Normally Open or Normally Closed



Note: Load can be switched to pin 2.

875CP 2-Wire AC

Plastic Face/Threaded or Smooth Plastic Barrel

875CP AC Cable Style
Smooth Barrel
34 mm
page 4-19

875CP AC Cable Style
Threaded Barrel
18, 30 mm
page 4-19

875CP AC Micro Quick-Disconnect Style
Smooth Barrel
34 mm
page 4-20

875CP AC Micro Quick-Disconnect Style
Threaded Barrel
30 mm
page 4-20

Features

- Metal, nonmetal solid and liquid sensing capability
- Adjustable sensing distance
- 2-wire operation
- 2 conductor or 3-pin connection
- 24…240V AC
- Normally open or normally closed output
- Transient noise protection
- cULus Listed and CE Marked for all applicable directives

Specifications

Load Current	≤ 300 mA
Inrush Current	2A
Leakage Current	<1.5 mA
Operating Voltage	24…240V AC
Voltage Drop	<7.5V AC
Repeatability	≤ 10%
Hysteresis	≤ 20%
Transient Noise Protection	Incorporated
Enclosure	NEMA 1, 3, 4, 6, 13 and IP67
Housing Material	Plastic (PBT)
Certifications	cULus Listed and CE Marked for all applicable directives
Connections	Cable: 2 meter length; 2 conductor PVC Quick-Disconnect: 3-pin micro
LEDs	Green: Power Yellow: Output
Operating Temperature [C (F)]	-25…+70° (-13…+158°)
Shock	30 g, 11 ms
Vibration	55 Hz, 1 mm amplitude, 3 planes

Correction Factors

Target Material	Correction Factor
Acetone	0.75
Acrylic Resin	0.10…0.25
Air	0.0
Alcohol	0.85
Ammonia	0.70…0.85
Aniline	0.40
Aqueous Solutions	0.98…1.0
Bakelite	0.20
Benzene	0.10
Carbon Dioxide	0.0
Carbon Tetrachloride	0.10
Celluloid	0.15
Cement Powder	0.25
Cereal	0.15…0.30
Chlorine Liquid	0.10
Ebonite	0.15
Epoxy Resin	0.15…0.35
Ethanol	0.85
Ethylene Glycol	0.93
Fired Ash	0.05
Flour	0.05
Freon R22 & 502 (liquid)	0.35
Gasoline	0.10
Glass	0.20…0.55
Glycerine	0.98
Marble	0.50
Melamine Resin	0.25…0.55
Mica	0.35
Nitrobenzine	0.93
Nylon	0.20…0.30
Oil Saturated Paper	0.25
Paraffin	0.10
Paper	0.10

Correction Factors

Target Material	Correction Factor
Perspex	0.15
Petroleum	0.05
Phenol Resin	0.20…0.60
Polyacetal	0.20
Polyamide	0.30
Polyester Resin	0.15…0.50
Polyethylene	0.10
Polypropylene	0.10
Polystyrene	0.15
Polyvinyl Chloride Resin	0.15
Porcelain	0.25…0.40
Powdered Milk	0.20
Press Board	0.10…0.30
Quartz Glass	0.20
Rubber	0.15…0.90
Salt	0.35
Sand	0.15…0.30
Shellac	0.15…0.25
Shell Lime	<0.05
Silicon Varnish	0.15
Soybean Oil	0.15
Styrene Resin	0.15
Sugar	0.15
Sulphur	0.15
PTFE	0.10
Toluene	0.10
Transformer Oil	0.10
Turpentine Oil	0.10
Urea Resin	0.30…0.45
Vaseline	0.10
Water	1.0
Wood, Dry	0.10…0.40
Wood, Wet	0.60…0.85

New

Product Selection

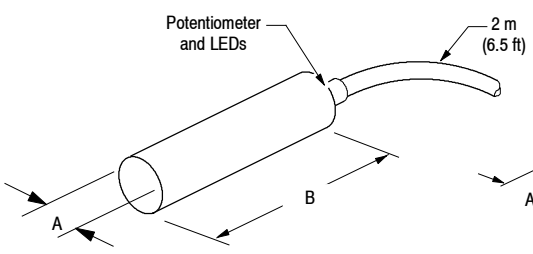
Barrel Diameter and Type	Nominal Sensing Distance [mm (in.)]	Shielded	Output Configuration	Switching Frequency (Hz)	Cat. No.	
					Cable Style	Micro QD Style
18 mm Threaded	2 (0.08)…8 (0.31)	N	N.O.	25	**875CP-G8N18-A2**	—
			N.C.		875CP-G8C18-A2	—
30 mm Threaded	5 (0.20)…20 (0.79)		N.O.		**875CP-G20N30-A2**	875CP-G20N30-R3
			N.C.		875CP-G20C30-A2	875CP-G20C30-R3
34 mm Smooth	7 (0.28)…30 (1.18)		N.O.		875CP-GM30N34-A2	875CP-GM30N34-R3
			N.C.		875CP-GM30C34-A2	875CP-GM30C34-R3
Recommended standard QD cordset (-2 = 2 m (6.5 ft))						889R-F3ECA-2

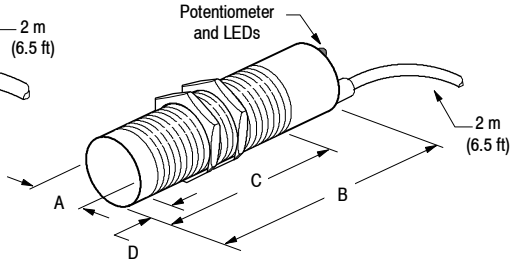
QD Cordsets and Accessories

Description	Page Number
Mounting Brackets	2-210…2-214
Mounting Nuts	2-221…2-222
Sensor Wells	4-22
Terminal Chambers	8-1
Other Cordsets Available	8-1

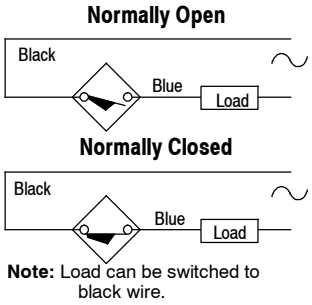
Approximate Dimensions [mm (in.)]

Cable Style





Wiring Diagram



Note: Load can be switched to black wire.

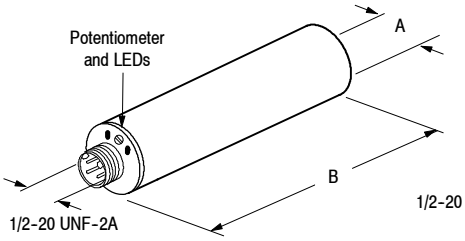
Diameter or Thread Size	mm (inches)			
	A	B	C	D
M18 x 1	18.0 (0.71)	52.0 (2.04)	52.0 (2.04)	1.0 (0.04)
M30 x 1.5	30.0 (1.18)	52.0 (2.04)	46.1 (1.81)	1.0 (0.04)
∅34	34.0 (1.34)	52.0 (2.04)	N/A	N/A

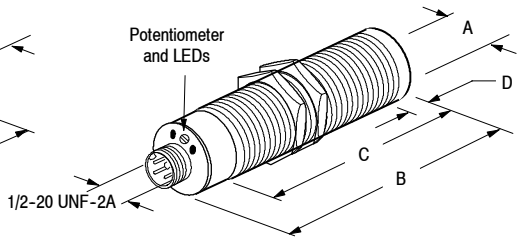
875CP 2-Wire AC

Plastic Face/Threaded or Smooth Plastic Barrel

Approximate Dimensions [mm (in.)]

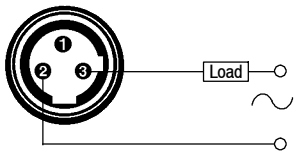
Micro QD Style





Wiring Diagram

Normally Open or Normally Closed

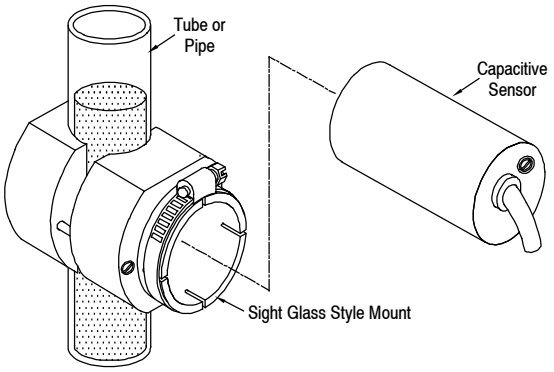


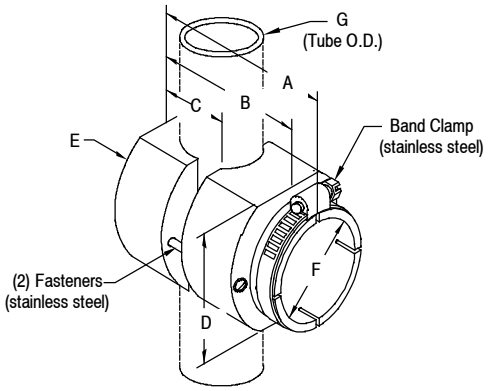
Note: Load can be switched to pin 2.

Diameter or Thread Size	mm (inches)			
	A	B	C	D
M30 x 1.5	30.0 (1.18)	65.0 (2.56)	52.0 (2.04)	1.0 (0.04)
∅34	34.0 (1.34)	65.0 (2.56)	N/A	N/A

Description

Sight glass style sensor mounts provide simple and convenient mounting of capacitive sensors to sight tubes for high/low level sensing. Sight glass style sensor mounts are available to fit 3/8 inch through 1¾ inch diameter plastic or glass tubing. These mounts are designed for use with 12, 18, and 30 mm diameter capacitive sensors. All sight glass style sensor mounts are made of Delrin™ plastic with stainless steel fasteners and band clamp included.

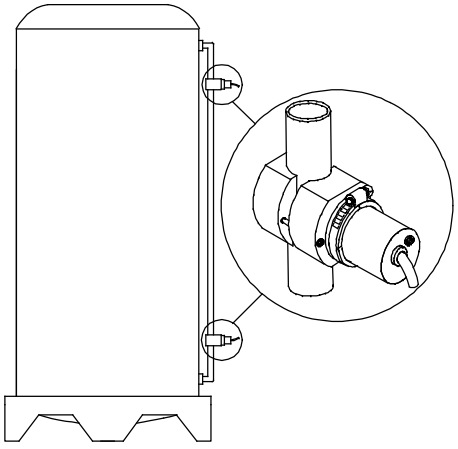




Approximate Dimensions [mm (in.)]

A	B	C	D	E	F- Sensor Diameter	G- Tube O.D.	Cat. No.
44.5 (1.75)	33.0 (1.30)	12.7 (0.50)	25.4 (1.00)	31.8 (1.25)	12 mm (threaded)	9.40…20.6 (0.37…0.81)	871A-BGD12
48.3 (1.90)	36.8 (1.45)	15.2 (0.60)	31.5 (1.24)	37.5 (1.75)	18 mm (threaded)	16.0…28.4 (0.63…1.12)	871A-BGD18
87.6 (3.45)	76.3 (3.00)	31.8 (1.50)	37.5 (1.75)	50.8 (2.00)	30 mm (threaded)	25.4…44.5 (1.00…1.75)	871A-BGD30

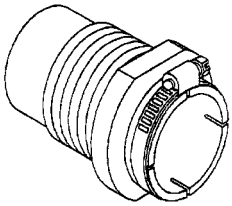
Typical Application



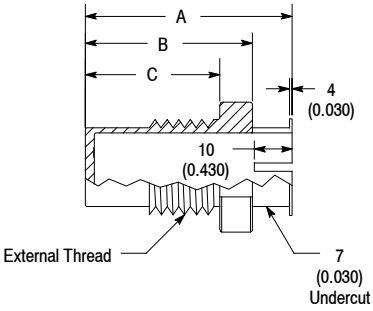
Accessories

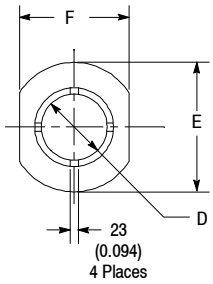
Sensor Wells for Capacitive Proximities

Threaded Sensor Well



12, 18, 30, 34 mm

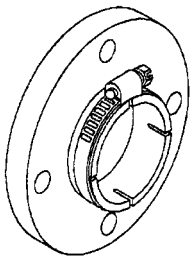




Approximate Dimensions [mm (in.)]

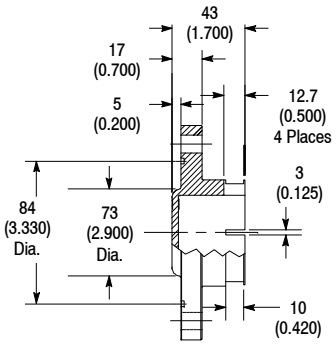
Sensor Diameter	A	B	C	D	E	F	Pressure Rating (psi)	External Thread	Material	Cat. No,
12 mm	44 (1.750)	33 (1.300)	26 (1.050)	11…12 (0.47…0.48)	31 (1.250)	25 (0.995)	200	1/2-14 NPT	Delrin	871A-WTD12
									PTFE	871A-WTT12
18 mm	59 (2.350)	48 (1.900)	38 (1.530)	18 (0.72…0.725)	37 (1.470)	31 (1.245)		3/4-14 NPT	Delrin	871A-WTD18
									PTFE	871A-WTT18
30 mm				29…30 (1.18…1.185)	50 (1.970)	44 (1.745)		1-1/4-11.5 NPT	Delrin	871A-WTD30
									PTFE	871A-WTT30
34 mm				34 (1.34…1.345)	69 (2.750)	31 (1.245)		1-1/2-11.5 NPT	Delrin	871A-WTD34
									PTFE	871A-WTT34

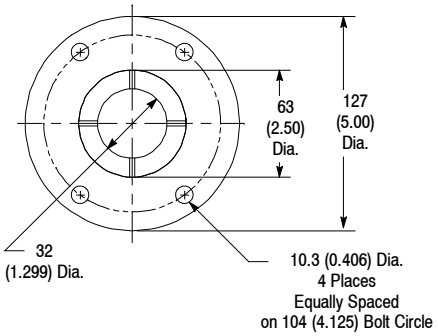
Bolt-on Sensor Well



30 mm Bolt-on

Material: High Density Polyethylene
Pressure Rating: 150 PSI





Description	Cat. No.
Bolt on sensor well	871A-WSPE30

Note: All 871A Series sensor wells are made of FDA approved materials