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 IP65 (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.
- CE marked for all applicable directives

Styles

DC 3-Wire . . . . . page 4–10

DC 3-Wire Plastic Barrel . . . page 4–13

AC 2-Wire Plastic Barrel . . . page 4–16

Accessories

Quick-Disconnect Cables . . . page 5–1

Mounting Brackets
Sight Glass Style . . . . . page 4–22

Sensor Wells . . . . . page 4–23

General Information

Metric/English
Conversion Chart . . . . . page 11–1

❶ DC models only.

875C 3-Wire DC

Plastic Face/Threaded Nickel-Plated Brass Barrel

875C DC Cable Style
12, 18, 30mm
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875C DC Micro
Quick-Disconnect Style
30mm
page 4–11

875C DC Pico
Quick-Disconnect Style
12, 18mm
page 4–11

CE

Features

- Metal, nonmetal solid and liquid sensing capability
- Adjustable sensing distance
- 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
- CE marked for all applicable directives

Specifications

	12mm	18mm	30mm
Load Current	≤200mA	≤200mA	≤400mA
Leakage Current	0.3mA	0.1mA	0.1mA
Operating Voltage	10–36V DC	10–60V DC	10–60V DC
Voltage Drop	≤2V	≤2V	≤3V
Repeatability	≤10%		
Hysteresis	≤20%		
Transient Noise Protection	Incorporated		
Reverse Polarity Protection	Incorporated		
Short Circuit Protection	Incorporated		
Overload Protection	Incorporated		
Approval	CE marked for all applicable directives		
Enclosure	NEMA 12, IP65 (IEC 529) 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	–25°C to +70°C (–13°F to +158°F)		

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
Teflon	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

Selection Guide

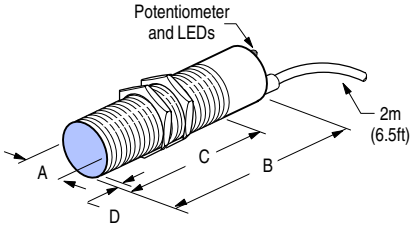
Barrel Dia. & Type	Nominal Sensing Distance mm(inches)	Shielded	Output Configuration		Switching Frequency (Hz)	Catalog Number		
						Cable Style	Micro QD Style	Pico QD Style
12mm Threaded	0.04 (0.02) to 2 (0.08)	Y	N.O.	PNP	25	875C–D2NP12–A2	—	—
	2 (0.08)					—	—	875C–D2NP12–P3
18mm Threaded	1 (0.04) to 5 (0.20)					875C–D5NP18–A2	—	875C–D5NP18–P3
				NPN		875C–D5NN18–A2	—	875C–D5NN18–P3
			N.C.	PNP		875C–D5CP18–A2	—	875C–D5CP18–P3
				NPN		875C–D5CN18–A2	—	875C–D5CN18–P3
30mm Threaded	2 (0.08) to 10 (0.39)		N.O.	PNP		875C–D10NP30–A2	875C–D10NP30–D4	—
				NPN		875C–D10NN30–A2	875C–D10NN30–D4	—
			N.C.	PNP		875C–D10CP30–A2	875C–D10CP30–D4	—
				NPN		875C–D10CN30–A2	875C–D10CN30–D4	—
Recommended Standard QD Cordset (–2 = 2m (6.5ft))							889D–F4AC–2	889P–F3AB–2

QD Cordsets and Accessories

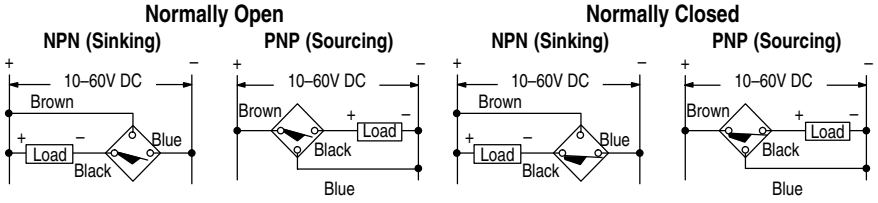
Description	Page Number
Mounting Brackets	2–188 – 2–192
Mounting Nuts	2–199 – 2–200
Terminal Chambers	5–19
Other Cordsets Available	5–25, 5–52

Dimensions—mm (inches)

Cable Style



Wiring Diagram



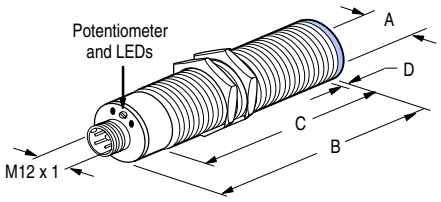
Thread Size	mm (inches)			
	A	B	C	D
M12 x 1	12.0 (0.47)	61.5 (2.42)	40.5 (1.59)	1.0 (0.04)
M18 x 1	18.0 (0.71)	82.0 (3.23)	61.0 (2.40)	1.0 (0.04)
M30 x 1.5	30.0 (1.18)	82.0 (3.23)	61.0 (2.40)	1.0 (0.04)

875C 3-Wire DC

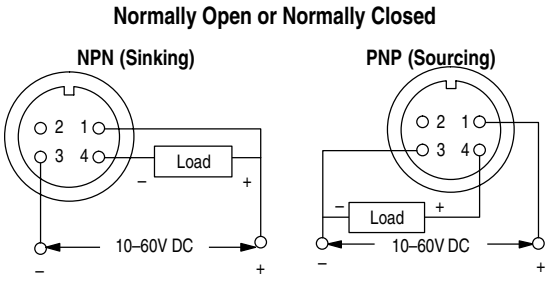
Plastic Face/Threaded Nickel-Plated Brass Barrel

Dimensions—mm (inches)

Micro QD Style

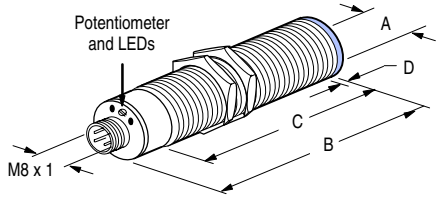


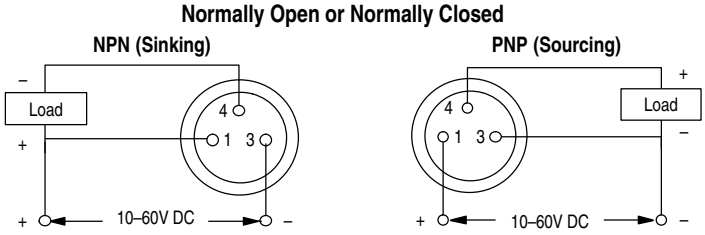
Wiring Diagram



Thread Size	mm (inches)			
	A	B	C	D
M30 x 1.5	30.0 (1.18)	82.0 (3.23)	61.0 (2.40)	1.0 (0.04)

Pico QD Style





Thread Size	mm (inches)			
	A	B	C	D
M12 x 1	12.0 (0.47)	63.5 (2.50)	40.5 (1.59)	1.0 (0.04)
M18 x 1	18.0 (0.71)	82.0 (3.23)	61.0 (2.40)	1.0 (0.04)

875CP DC Cable Style
Smooth Barrel 34mm
page 4–14

875CP DC Cable Style
Threaded Barrel 18, 30mm
page 4–14

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

875CP DC Micro
Quick-Disconnect Style
Threaded Barrel 30mm
page 4–14

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

CE

Features

- Metal, nonmetal solid and liquid sensing capability
- Adjustable sensing distance
- 3-wire operation
- 3-conductor, 3-pin or 4-pin connection
- 10–60V DC
- Normally open or normally closed output
- Short circuit, overload, reverse polarity and transient noise protection
- CE marked for all applicable directives

Specifications

	18mm	30, 34mm
Load Current	≤200mA	≤400mA
Leakage Current	0.1mA	
Operating Voltage	10–60V	
Voltage Drop	<2V	<3V
Repeatability	≤10%	
Hysteresis	≤20%	
Transient Noise Protection	Incorporated	
Reverse Polarity Protection	Incorporated	
Short Circuit Protection	Incorporated	
Overload Protection	Incorporated	
Approval	CE marked for all applicable directives	
Enclosure	NEMA 12, IP65 (IEC 529) Plastic barrel	
Connections	Cable: 2-meter length 3-conductor PVC Quick-Disconnect: 4-pin micro 3-pin pico	
LEDs	Green: Power Yellow: Output	
Operating Temperature	–25°C to +70°C (–13°F to +158°F)	

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
Teflon	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

Selection Guide

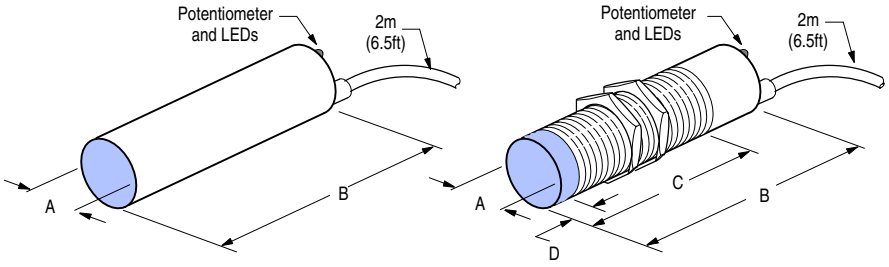
Barrel Dia. & Type	Nominal Sensing Distance—mm (in)	Shielded	Output Configuration		Switching Frequency (Hz)	Catalog Number		
						Cable Style	Micro QD Style	Pico QD Style
18mm Threaded	2 (0.08) to 8 (0.31)	N	N.O.	PNP	25	875CP–D8NP18–A2	—	875CP–D8NP18–P3
				NPN		875CP–D8NN18–A2	—	875CP–D8NN18–P3
			N.C.	PNP		875CP–D8CP18–A2	—	875CP–D8CP18–P3
				NPN		875CP–D8CN18–A2	—	875CP–D8CN18–P3
30mm Threaded	5 (0.20) to 20 (0.79)		N.O.	PNP		875CP–D20NP30–A2	875CP–D20NP30–D4	—
				NPN		875CP–D20NN30–A2	875CP–D20NN30–D4	—
			N.C.	PNP		875CP–D20CP30–A2	875CP–D20CP30–D4	—
				NPN		875CP–D20CN30–A2	875CP–D20CN30–D4	—
34mm Smooth	7 (0.28) to 30 (1.18)		N.O.	PNP		875CP–DM30NP34–A2	875CP–DM30NP34–D4	—
				NPN		875CP–DM30NN34–A2	875CP–DM30NN34–D4	—
			N.C.	PNP		875CP–DM30CP34–A2	875CP–DM30CP34–D4	—
				NPN		875CP–DM30CN34–A2	875CP–DM30CN34–D4	—
Recommended Standard QD Cordset (–2 = 2m (6.5ft))							889D–F4AC–2	889P–F3AB–2

QD Cordsets and Accessories

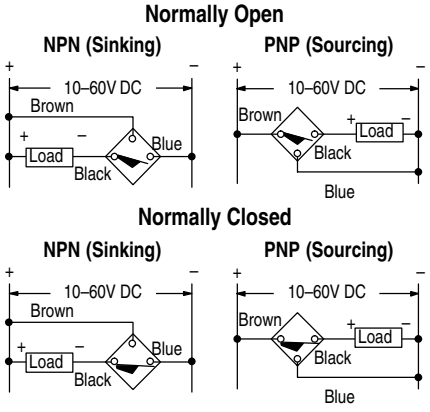
Description	Page Number
Mounting Brackets	2–188 – 2–192
Mounting Nuts	2–199 – 2–200
Sensor Wells	4–23
Terminal Chambers	5–19
Other Cordsets Available	5–25, 5–52

Dimensions—mm (inches)

Cable Style



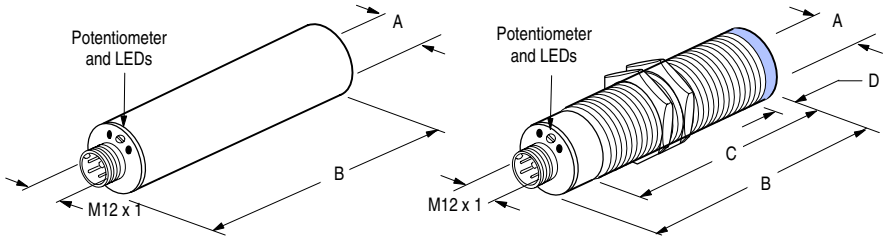
Wiring Diagram



Diameter or Thread Size	mm (inches)			
	A	B	C	D
M18 x 1	18.0 (0.71)	81.0 (3.19)	60.0 (2.36)	20.0 (0.79)
M30 x 1.5	30.0 (1.18)	81.0 (3.19)	60.0 (2.36)	20.0 (0.79)
∅34	34.0 (1.34)	82.0 (3.23)	N/A	N/A

Dimensions—mm (inches)

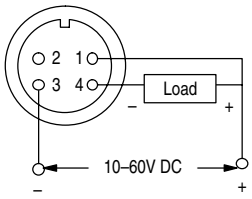
Micro QD Style



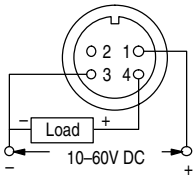
Wiring Diagram

Normally Open or Normally Closed

NPN (Sinking)

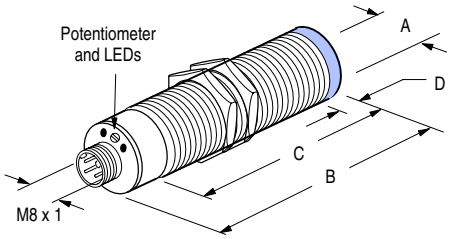


PNP (Sourcing)



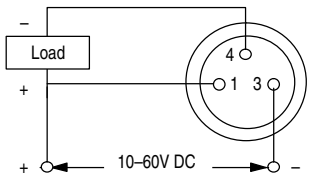
Diameter or Thread Size	mm (inches)			
	A	B	C	D
M30 x 1.5	30.0 (1.18)	81.0 (3.19)	60.0 (2.36)	20.0 (0.79)
∅34	34.0 (1.34)	82.0 (3.23)	N/A	N/A

Pico QD Style

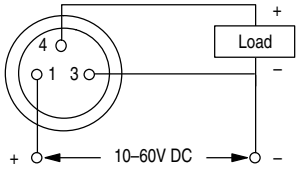


Normally Open or Normally Closed

NPN (Sinking)



PNP (Sourcing)



Diameter or Thread Size	mm (inches)			
	A	B	C	D
M18 x 1	18.0 (0.71)	81.0 (3.19)	60.0 (2.36)	20.0 (0.79)

875CP 2-Wire AC

Plastic Face/Threaded or Smooth Plastic Barrel

875CP AC Cable Style
Smooth Barrel
34mm
page 4–17

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

875CP AC Micro Quick-Disconnect Style
Smooth Barrel
34mm
page 4–17

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

CE

Features

- Metal, nonmetal solid and liquid sensing capability
- Adjustable sensing distance
- 2-wire operation
- 2-conductor or 3-pin connection
- 20–250V AC
- Normally open or normally closed output
- Transient noise protection
- CE marked for all applicable directives

Specifications

Load Current	≤300mA
Inrush Current	2A
Leakage Current	3.0mA at 132V AC 3.5mA at 250V AC
Operating Voltage	20–250V
Voltage Drop	<10V
Repeatability	≤10%
Hysteresis	≤20%
Transient Noise Protection	Incorporated
Enclosure	NEMA 12, IP65 (IEC 529) Plastic barrel
Approval	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	–25°C to +70°C (–13°F to +158°F)

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
Teflon	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

Selection Guide

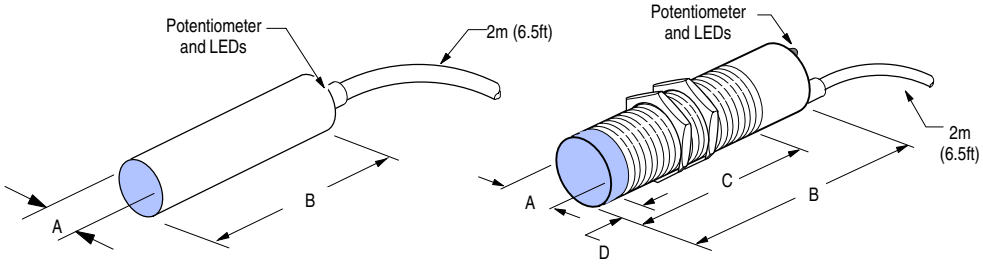
Barrel Diameter and Type	Nominal Sensing Distance mm(inches)	Shielded	Output Configuration	Switching Frequency (Hz)	Catalog Number	
					Cable Style	Micro QD Style
18mm Threaded	2 (0.08) to 8 (0.31)	N	N.O.	15	875CP–A8N18–A2	—
			N.C.		875CP–A8C18–A2	—
30mm Threaded	5 (0.20) to 20 (0.79)		N.O.		875CP–A20N30–A2	875CP–A20N30–R3
			N.C.		875CP–A20C30–A2	875CP–A20C30–R3
34mm Smooth	7 (0.28) to 30 (1.18)		N.O.		875CP–AM30N34–A2	875CP–AM30N34–R3
			N.C.		875CP–AM30C34–A2	875CP–AM30C34–R3
Recommended Standard QD Cordset (–2 = 2m (6.5ft))						889R–F3ACA–2

QD Cordsets and Accessories

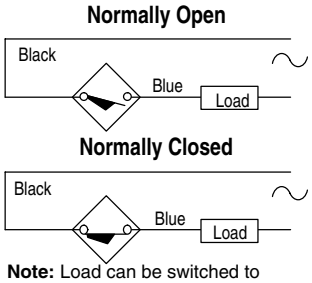
Description	Page Number
Mounting Brackets	2–188 – 2–192
Mounting Nuts	2–199 – 2–200
Sensor Wells	4–23
Terminal Chambers	5–19
Other Cordsets Available	5–44

Dimensions—mm (inches)

Cable Style



Wiring Diagram



Note: Load can be switched to black wire.

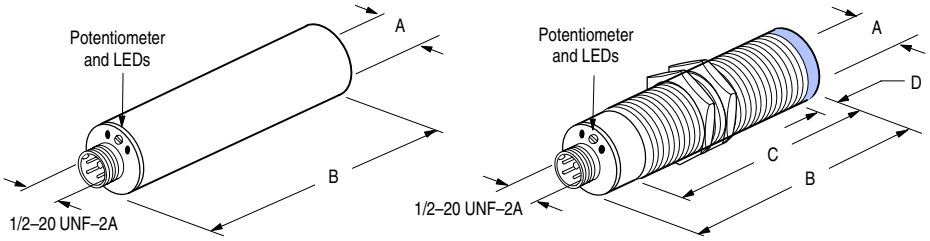
Diameter or Thread Size	mm (inches)			
	A	B	C	D
M18 x 1	18.0 (0.71)	81.0 (3.19)	60.0 (2.36)	20.0 (0.79)
M30 x 1.5	30.0 (1.18)	81.0 (3.19)	60.0 (2.36)	20.0 (0.79)
∅34	34.0 (1.34)	82.0 (3.23)	N/A	N/A

875CP 2-Wire AC

Plastic Face/Threaded or Smooth Plastic Barrel

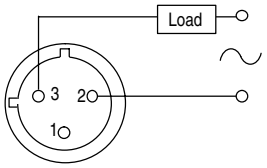
Dimensions—mm (inches)

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)	81.0 (3.19)	60.0 (2.36)	20.0 (0.79)
∅34	34.0 (1.34)	82.0 (3.23)	N/A	N/A