

871C 2-wire AC Full Featured Tubular Sensors

Specifications



871C Cable Style
18 mm and 30 mm Diameter



871C Mini Quick Disconnect Style
12 mm, 18 mm, and 30 mm Diameter



871C AC Micro Quick Disconnect Style
12 mm, 18 mm, and 30 mm Diameter

Attribute	12 mm Diameter	18 mm and 30 mm Diameter
Load current	5...200 mA	5...250 mA
Inrush current (one cycle)	≤ 2 A	≤ 4 A
Leakage current	≤ 1.9 mA at 120V AC	
Operating voltage	20...250V AC	
Voltage drop	≤ 10V at 5...200 mA	≤ 10V at 5...250 mA
Repeatability	≤ 10% at constant temperature	
Hysteresis	10% typical	
Protection type	False pulse, transient noise, short circuit, overload (trigger at 250 mA typical)	False pulse, transient noise, short circuit, overload (trigger at 320 mA typical)
Certifications	UL Listed, CSA Certified, CE Marked for all applicable directives, and UKCA Marked for all applicable regulations	
Enclosure type rating	NEMA 1, 2, 3, 3R, 4, 4X, 6, 6P, 12, 13; IP67 (IEC529)	
Housing material	Plastic face, threaded nickel-plated brass barrel	
Connection type	- Cable: 2 m (6.5 ft) length, 2-conductor PVC - Quick disconnect: 3-pin AC micro, 3-pin mini	
Status indicator	- Red: Output energized/short circuit (flashing) - Green: Power	
Operating temperature	-25...+70 °C (-13...+158 °F)	
Shock	30 g (1.06 oz), 11 ms	
Vibration	55 Hz, 1 mm (0.04 in.) amplitude, 3 planes	

Correction Factors

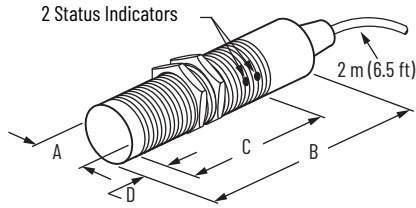
Target Material	Correction Factors
Steel	1.0
Stainless steel	0.9
Brass	0.5
Aluminum	0.45
Copper	0.4

Product Selection

Barrel Diameter [mm (in.)]	Nominal Sensing Distance [mm (in.)]	Shielded	Output Configuration	Switching Frequency [Hz]	Cat. No.		
					Cable Style	Mini QD Style	AC Micro QD Style
12 (0.47)	2 (0.08)	Yes	N.O.	30	871C-A2N12-A2	871C-A2N12-N3	871C-A2N12-R3
			N.C.	20	871C-A2C12-A2	871C-A2C12-N3	871C-A2C12-R3
18 (0.71)	5 (0.2)	Yes	N.O.	30	871C-A5N18-A2	871C-A5N18-N3	871C-A5N18-R3
			N.C.	20	871C-A5C18-A2	871C-A5C18-N3	871C-A5C18-R3
30 (1.18)	10 (0.39)	Yes	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 = 1.8 m (6 ft), -2 = 2 m (6.5 ft)						889N-F3AFC-6F	889R-F3ECA-2

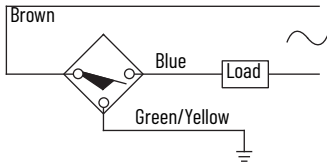
Approximate Dimensions

Cable Style

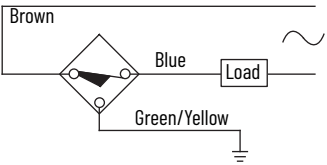


Wiring Diagrams

Normally Open



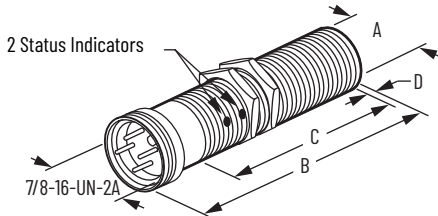
Normally Closed



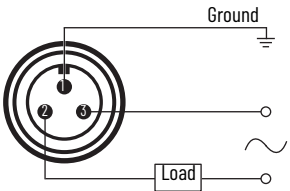
IMPORTANT Load can be switched to brown wire.

Thread Size	Shielded	Dimensions [mm (in.)]			
		A	B	C	D
M12 x 1	Yes	12 (0.47)	78.99 (3.11)	47.24 (1.86)	0.8 (0.03)
M18 x 1	Yes	18 (0.71)	74.68 (2.94)	61.6 (2.43)	
M30 x 1.5	Yes	30 (1.18)	77.52 (3.05)	64.31 (2.53)	

Mini QD Style



Normally Open or Normally Closed

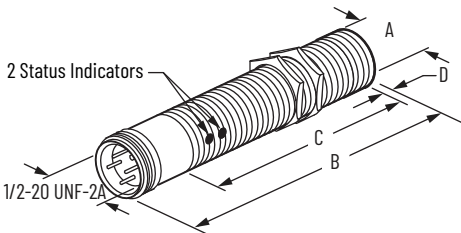


IMPORTANT

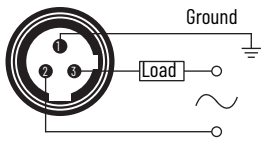
- No ground wire on 12 mm. Attach housing to ground.
- Load can be switched to pin 3.

Thread Size	Dimensions [mm (in.)]		
	A	B	C
M12 x 1	12 (0.47)	93.45 (3.68)	46.08 (1.81)
M18 x 1	18 (0.71)	75.82 (2.99)	53.9 (2.12)
M30 x 1.5	30 (1.18)	86.66 (3.41)	64.31 (2.53)

AC Micro QD Style



Normally Open or Normally Closed



IMPORTANT

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

Thread Size	Dimensions [mm (in.)]		
	A	B	C
M12 x 1	12 (0.47)	90.42 (3.56)	46.99 (1.85)
M18 x 1	18 (0.71)	83.54 (3.29)	61.6 (2.43)
M30 x 1.5	30 (1.18)	86 (3.39)	64.31 (2.53)

871C 2-wire AC Plastic Barrel Tubular Sensors



871C Cable Style
18 mm and 30 mm Diameter

Specifications

Attribute	18 mm Diameter	30 mm Diameter
Load current	≤ 180 mA	≤ 300 mA
Inrush current (one cycle)	≤ 1 A	≤ 3 A
Leakage current	≤ 1.7 mA	
Operating voltage	24...250V AC	
Voltage drop	≤ 11V	
Hysteresis	≤ 20% typical	
Protection type	Transient noise	
Certifications	CE Marked for all applicable directives and UKCA Marked for all applicable regulations	
Enclosure type rating	NEMA 1, 2, 3, 4, 4X, 12, 13; IP67 (IEC529)	
Housing material	Plastic face and threaded barrel	
Connection type	Cable: 2 m (6.5 ft) length, 2-conductor PVC	
Status indicator	Red: Output energized	
Operating temperature	-25...+55 °C (-13...+131 °F)	
Shock	30 g (1.06 oz), 11 ms	
Vibration	55 Hz, 1 mm (0.039 in.) amplitude, 3 planes	

Correction Factors

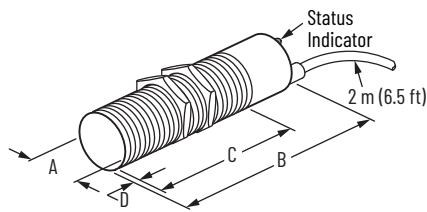
Target Material	Correction Factors
Steel	1.0
Stainless steel	0.7...0.8
Brass	0.4...0.5
Aluminum	0.3...0.4
Copper	0.3...0.4

Product Selection

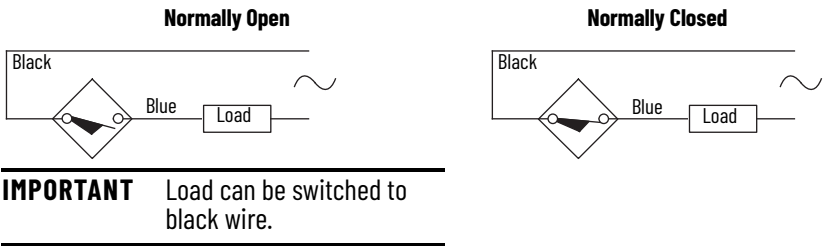
Barrel Diameter [mm (in.)]	Nominal Sensing Distance [mm (in.)]	Shielded	Output Configuration	Switching Frequency [Hz]	Cat. No.
					Cable Style
18 (0.71)	5 (0.2)	Yes	N.O.	8	871C-C5S18
			N.C.		871C-D5S18
	8 (0.31)	No	N.O.		871C-C8R18
			N.C.		871C-D8R18
30 (1.18)	10 (0.39)	Yes	N.O.		871C-C10S30
			N.O.		871C-C15R30
	15 (0.59)	No	N.O.		871C-D15R30
			N.C.		871C-D15R30

Approximate Dimensions

Cable Style



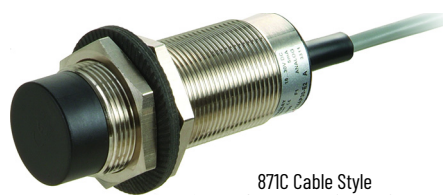
Wiring Diagrams



Thread Size	Shielded	Dimensions [mm (in.)]			
		A	B	C	D
M18 x 1	Yes	18 (0.71)	81 (3.19)	61 (2.4)	2 (0.08)
	No ⁽¹⁾				
M30 x 1.5	Yes	30 (1.18)			
	No ⁽¹⁾				

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

871C Analog Output, 3-wire DC Tubular Sensors



871C Cable Style
12 mm, 18 mm, and 30 mm Diameter

Specifications

Attribute	12 mm Diameter	18 mm Diameter	30 mm Diameter
Analog output	0...10V sourcing		
Load current	5 mA		
Operating voltage	18...30V DC		
Repeatability	≤ 1%		
Ripple	10%		
Slew speed	1.0 V/ms	0.7 V/ms	0.1 V/ms
Δ Output/Δ distance	0.25 mm/V	0.375 mm/V	0.875 mm/V
Linearity tolerance	6.25%		
Temperature drift	±0.3V		
Protection type	Transient noise, reverse polarity, short circuit, and overload		
Certifications	CE Marked for all applicable directives and UKCA Marked for all applicable regulations		
Enclosure type rating	NEMA 1, 2, 3, 4, 12, 13; IP67 (IEC529)		
Housing material	Nickel-plated brass barrel, plastic face (PBT)		
Connection type	Cable: 2 m (6.5 ft) length, 3-conductor PVC		
Status indicator	None		
Operating temperature	-25...+70 °C (-13...+158 °F)		
Shock	30 g (1.06 oz), 11 ms		
Vibration	55 Hz, 1 mm 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

Product Selection

Barrel Diameter [mm (in.)]	Linear Sensing Distance [mm (in.)]	Shielded	Output Configuration		Switching Frequency [Hz]	Cat. No.
						Cable Style
12 (0.47)	0.5...2.5 (0.02...0.1)	Yes	Analog voltage	PNP	100	871C-D3AP12-E2
18 (0.71)	1...4 (0.04...0.16)	Yes			100	871C-D4AP18-E2
30 (1.18)	1...9 (0.04...0.35)	Yes			400	871C-D9AP30-E2
	7...14 (0.27...0.55)	No			30	871C-D14AP30-E2

871C 2-wire NAMUR Intrinsically Safe, Cable Style Tubular Sensors



871C NAMUR Cable Style
8 mm, 12 mm, 18 mm, and 30 mm Diameter



871C NAMUR Micro Quick Disconnect Style
8 mm, 12 mm, 18 mm, and 30 mm Diameter

Specifications

Attribute	8 mm, 12 mm, 18 mm, and 30 mm Diameter
Output type	NAMUR (conforms to DIN 19 234)
Load current, nominal	< 1 mA (target present), > 3 mA (target absent)
Operating voltage	5...15V DC (8.2V DC nom., Ri = 1 k Ω , DIN 19 234)
Ripple	5%
Repeatability	< 10%
Hysteresis	10% typical
Protection type (realized in amplifier)	Reverse polarity, false pulse, transient noise, short circuit, and overload
Certifications	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 Certified - 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; CE Marked for all applicable directives and UKCA Marked for all applicable regulations
Enclosure type rating	NEMA 4, IP67 (IEC529)
Housing material	Nickel-plated brass barrel, plastic face
Connection type	- Cable: 2 m (6.5 ft) length, 2-conductor 22 AWG PVC - Quick disconnect: 4-pin micro style
Status indicator	None
Operating temperature	-25...+60 °C (-13...+140 °F)
Shock	30 g (1.06 oz), 11 ms
Vibration	55 Hz, 1 mm amplitude, 3 plane

Entity Parameters

Sensor			Barrier
V_{max}	16V	$\geq$	V_t
I_{max}	60 mA	$\geq$	I_t
C_l	150 nF	$\leq$	C_a
L_l	200 μ H	$\leq$	L_a

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



ATTENTION: You must adhere to operating parameters.

Product Selection

Barrel Diameter [mm (in.)]	Nominal Sensing Distance [mm (in.)]	Shielded	Output Configuration	Switching Frequency [Hz]	Cat. No.	
					Cable Style	Micro QD Style
8 (0.31)	1 (0.03)	Yes	NAMUR (conforms to DIN 19 234)	2000	871C-DH1M8-A2	871C-DH1M8-D4
	2 (0.08)	No		1000	871C-DH2M8-A2	871C-DH2M8-D4
12 (0.47)	2 (0.08)	Yes		2000	871C-DH2M12-A2	871C-DH2M12-D4
	4 (0.16)	No		1000	871C-DH4M12-A2	871C-DH4M12-D4
18 (0.71)	5 (0.2)	Yes		1000	871C-DH5M18-A2	871C-DH5M18-D4
	8 (0.31)	No		500	871C-DH8M18-A2	871C-DH8M18-D4
30 (1.18)	10 (0.39)	Yes		500	871C-DH10M30-A2	871C-DH10M30-D4
	15 (0.59)	No		300	871C-DH15M30-A2	871C-DH15M30-D4
Recommended cordset: 2 m (6.5 ft) 4-pin DC micro (straight)						889D-F4AC-2

IMPORTANT

The sensor output conforms to NAMUR specification (DIN 19 234) when used with Cat. No. 937TH-DISAR-DC2, 937TS-DISAR-KD2, 937TS-DISAR-KF2, or 937TH-DISAT-DC Intrinsically Safe Output Switch Amplifier. Installation must be in accordance with the National Electrical Code, ANSI/ISA RP12.6, or per other regulations by the authority having jurisdiction over the installation site as appropriate.

871C 3-wire DC Mini Tubular Sensors



871C NAMUR Cable Style
8 mm, 12 mm, 18 mm, and 30 mm



871C NAMUR Micro Quick Disconnect Style
8 mm, 12 mm, 18 mm, and 30 mm



871C NAMUR Micro Quick Disconnect Style
8 mm, 12 mm, 18 mm, and 30 mm



871C NAMUR Micro Quick Disconnect Style
8 mm, 12 mm, 18 mm, and 30 mm



871C NAMUR Micro Quick Disconnect Style
8 mm, 12 mm, 18 mm, and 30 mm



Specifications

Attribute	3 mm Smooth Barrel and 4 mm Threaded Barrel	4 mm Smooth Barrel and 5 mm Threaded Barrel
Environmental		
Operating environment	NEMA 1, 2, 3, 4, 12, 13 IP67 (IEC 529)	
Operating temperature	-25...+70 °C (-13...+158 °F)	
Vibration	55 Hz, 1 mm amplitude, 3 planes	
Shock	30 g (1.06 oz), 11 ms	
Electrical		
Load current	≤ 100 mA	< 200 mA
Leakage current	≤ 0.1 mA	
Operating voltage	10...30V DC	
Voltage drop	≤ 2V	
Repeatability	≤ 5%	
Hysteresis	10% typical	
Protection type	False pulse, transient noise, reverse polarity, and short circuit	
IO-Link (Enabled on Normally Open, PNP Models Only)		
Protocol	IO-Link V1.0	
Interface type	IO-Link	
Mode	COM 2 (38.4 kBd)	
Cycle time 1	10.4 ms, minimum	
SIO (standard I/O)	Supported (pin 4 for either IO-Link or standard I/O)	
Mechanical		
Housing material	Small threaded or smooth stainless steel barrel, polyester face	
Status indicator	Yellow: Output energized	
Status indicator (IO-Link mode)	Steady yellow: Sensor in IO-Link mode	
Connection type	Pico™ QD (M8), 2 m (6.6 ft) cable, Pico with lead	

Correction Factors

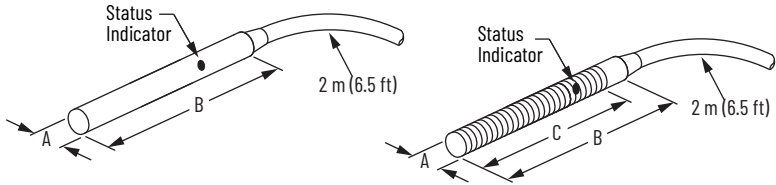
Sensor Type/ Target Material	3 mm Diameter Smooth		4 mm Diameter Smooth or Threaded		5 mm Diameter Smooth or Threaded	
	0.6 mm Sr	1.0 mm Sr	0.8 mm Sr	1.5 mm Sr	1 mm Sr	1.5 mm Sr
Steel	1	1	1	1	1	1
Copper	0.5	0.45	0.45	0.4	0.45	0.4
Aluminum	0.55	0.5	0.5	0.4	0.5	0.4
Brass	0.65	0.6	0.55	0.5	0.55	0.5
Stainless steel 304	0.8	0.8	0.8	0.75	0.8	0.75

Product Selection

Barrel Diameter [mm (in.)]	Barrel Type [mm (in.)]	Nominal Sensing Distance [mm (in.)]	Shielded	Output Configuration		Switching Frequency [Hz]	Cat. No.		
							Cable Style	Pico QD Style	Pico with Lead Style
3 (0.12)	Smooth	0.6 (0.02)	Yes	N.O.	NPN	5000	871C-DM1NN3-E2	—	871C-DM1NN3-AP3
					PNP		871C-DM1NP3-E2	—	871C-DM1NP3-AP3
		1 (0.04)			NPN	3000	871C-MM1NN3-E2	—	871C-MM1NN3-AP3
					PNP		871C-MM1NP3-E2	—	871C-MM1NP3-AP3
4 (0.16)	Threaded	0.8 (0.03)			NPN	5000	871C-D1NN4-E2	—	871C-D1NN4-AP3
					PNP		871C-D1NP4-E2	—	871C-D1NP4-AP3
		1 (0.04)			NPN	3000	871C-M1NN4-E2	—	871C-M1NN4-AP3
					PNP		871C-M1NP4-E2	—	871C-M1NP4-AP3
	Smooth	0.8 (0.03)			NPN	5000	871C-DM1NN4-E2	871C-DM1NN4-P3	—
					PNP		871C-DM1NP4-E2	871C-DM1NP4-P3	871C-DM1NP4-AP3
		1.5 (0.06)			NPN	3000	871C-MM2NN4-E2	871C-MM2NN4-P3	—
					PNP		871C-MM2NP4-E2	871C-MM2NP4-P3	—
5 (0.2)	Threaded	1 (0.04)			NPN	5000	871C-D1NN5-E2	871C-D1NN5-P3	—
					PNP		871C-D1NP5-E2	871C-D1NP5-P3	—
		1.5 (0.06)			NPN	3000	871C-M2NN5-E2	871C-M2NN5-P3	—
					PNP		871C-M2NP5-E2	871C-M2NP5-P3	—
Recommended standard QD cordset: -2 = 2 m (6.5 ft)								889P-F3AB-2	

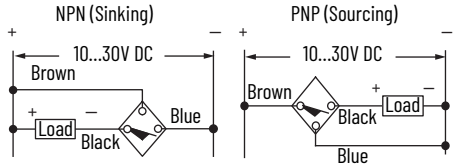
Approximate Dimensions

Cable Style



Wiring Diagrams

Normally Open



Smooth Diameter	Thread Size	Shielded	Dimensions [mm (in.)]		
			A	B	C
3	—	Yes	3 (0.12)	22 (0.87)	—
4	—		4 (0.16)	25 (0.98)	—
4	M4 x 0.5	Yes	4 (0.16)	22 (0.87)	19 (0.75)
5	M5 x 0.5		5 (0.2)	25 (0.98)	20 (0.79)