

871TM 3-wire DC Short Barrel Tubular Sensors

Stainless Steel Face/Threaded Stainless Steel Barrel



871TM DC Cable Style
12 mm, 18 mm, and 30 mm



871TM DC Mini Quick Disconnect Style
12 mm, 18 mm, and 30 mm



871TM DC Micro Quick Disconnect Style
12 mm, 18 mm, and 30 mm

Specifications

Attribute	12 mm, 18 mm, and 30 mm
Load Current	≤200 mA
Capacitive Load	≤1 μF
Leakage Current	≤10 μA
Operating Voltage	10...30V DC
Voltage Drop	≤1V DC at 200 mA
Repeatability	≤10% at constant temperature
Hysteresis	10% typical
Protection Type	False pulse, transient noise, reverse polarity, short circuit (trigger at 340 mA typical), overload
Certifications	UL Listed, CSA Certified, and CE Marked for all applicable directives
Enclosure Type Rating	NEMA 1, 2, 3, 3R, 4, 4X, 6, 6P, 12, 13 IP67 (IEC529) all models; 1200 psi (8270 kPa) washdown; ToughLink™ and micro connector versions are also rated IP69K (IEC 529)
Housing Material	Stainless steel face and barrel
Connection Type	<ul style="list-style-type: none"> Cable: 2 m (6.5 ft) 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
Indicator Status Indicators	<ul style="list-style-type: none"> Red: Output Energized Green: Power/Short Circuit (flashing)—18 mm models only
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	0.9...1.0
Brass	0.3...0.5
Aluminum	0.1...0.4
Aluminum (≤0.02 Thick)	0.9...1.1
Copper	0.1...0.2

871TM 3-wire DC Weld-field Immune Tubular Sensors

Stainless Steel Face/Threaded Stainless Steel Barrel



871TM DC Pico Quick-disconnection Style
8 mm



871TM DC Micro Quick Disconnect Style
12 mm



871TM DC Micro
18 mm

Specifications

Attribute	8 mm, 12 mm, and 18 mm
Load Current	≤ 200 mA
Leakage Current	≤ 0.1 mA
Operating Voltage	10...30V DC
Voltage Drop	≤ 2V DC at 200 mA
Repeatability	≤ 5% at constant temperature, maximum sensing range
Hysteresis	15% typical
Protection Type	False pulse, transient noise, reverse polarity, short circuit (trigger at 340 mA typical), overload
Certifications	c-UL-us Listed and CE Marked for all applicable directives
Enclosure Type Rating	8/12/18 mm: IP68/IP69K
Housing Material	Stainless steel face and barrel, resistant to weld splatter
Connection Type	Quick-disconnect: 4-pin micro style, 3-pin pico style
Indicator Status Indicators	Yellow: Output energized/360° visibility flashing status indicator indicates target that is located between 80...100% of rated sensing distance
Operating Temperature	-25...+85 °C (-13...+185 °F)
Shock	30 g (1.06 oz), 11 ms
Vibration	55 Hz, 1 mm amplitude, 3 planes
Weld-Field Immunity	≤ 40 mT

Correction Factors

Target Material	Barrel Size and Sensing Range		
	M8	M12	M18
	3 mm	6 mm	10 mm
Steel			1.00
Copper ¹	1.00	0.85	1.15
Aluminum	1.00	1.00	1.40
Brass	1.30	1.30	1.50
Stainless Steel ¹ 1 mm/2 mm	0.4/0.70	0.5/0.90	0.1/0.6

871TM 3-wire DC Long-range Sensing Tubular Sensors

Stainless Steel Face/Threaded Stainless Steel Barrel



871TM Pico Quick-disconnection Style
8 mm



871TM DC Micro Quick-disconnect Style
12 mm



871TM DC Cable Style
18 mm



871TM DC Micro Quick-disconnect Style
30 mm

Specifications

Attribute	8 mm, 12 mm, 18 mm, and 30 mm
Load Current	≤ 200 mA
Capacitive Load	≤ 1 mF
Leakage Current	≤ 0.1 mA
Operating Voltage	10...30V DC
Voltage Drop	≤ 2V DC at 200 mA
Repeatability	≤ 5% at constant temperature
Hysteresis	10% typical
Protection Type	False pulse, transient noise, reverse polarity, short circuit (trigger at 340 mA typical), overload
Certifications	c-UL-us Listed and CE Marked for all applicable directives
Enclosure Type Rating	<ul style="list-style-type: none"> 12/18/30 mm: IP68/IP69K 8 mm quick-disconnect models: IP67 8 mm cable models: IP68
Housing Material	Stainless steel face and barrel
Connection Type	<ul style="list-style-type: none"> Cable: 2 m (6.5 ft) length Quick-disconnect: 4-pin micro style, 3-pin pico style
Status Indicators	Yellow: Output energized/360° status indicator visibility, flashing status indicator indicates target that is located between 80...100% of rated sensing distance
Operating Temperature	-25...+70 °C (-13...+158 °F)
Shock	30 g (1.06 oz), 11 ms
Vibration	55 Hz, 1 mm amplitude, 3 planes
IO-Link (enabled on normally open, PNP models only)	
Protocol	IO-Link V1.0
Interface-type	IO-Link
Mode	COM2 (38.4 kBd)
Cycle Time	8 ms minimum
SIO (Standard I/O)	Supported (pin 4 for either IO-Link or SIO)

Switching Frequency

Barrel Diameter [mm]	Switching Frequency [Hz]
8	700
12	400
18	200
30	80

871TM 3-wire DC Ferrous or Nonferrous Selective Tubular Sensors

Stainless Steel Face/Threaded Stainless Steel Barrel



871TM DC Micro Quick-disconnection Style
12 mm, 18 mm, and 30 mm



871TM DC ToughLink Cable Style
12 mm, 18 mm, and 30 mm



871TM DC Mini Quick-disconnect Style
12 mm, 18 mm, and 30 mm



871TM DC Micro Cable Style
12 mm, 18 mm, and 30 mm

Specifications

Attribute	12 mm, 18 mm, and 30 mm
Load Current	≤200 mA
Capacitive Load	≤1 μF
Leakage Current	≤10 μA
Operating Voltage	10...30V DC
Voltage Drop	≤1V DC at 200 mA
Repeatability	≤10% at constant temperature
Hysteresis	10% typical
Protection Type	False pulse, transient noise, reverse polarity, short circuit (trigger at 340 mA typical), overload
Certifications	UL Listed, CSA Certified, and CE Marked for all applicable directives
Enclosure Type Rating	NEMA 1, 2, 3, 3R, 4, 4X, 6, 6P, 12, 13; IP67 (IEC529) all models; 1200 psi (8270 kPa) washdown; ToughLink and micro connector versions are also rated IP69K (IEC 529)
Housing Material	Stainless steel face and barrel
Connection Type	<ul style="list-style-type: none"> Cable: 2 m (6.5 ft) 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
Indicator Status Indicators	<ul style="list-style-type: none"> Red: Output energized Green: Power/short circuit (flashing)—18 mm models only
Operating Temperature	-25...+70 °C (-13...+158 °F)
Shock	30 g (1.05 oz), 11 ms
Vibration	55 Hz, 1 mm amplitude, 3 planes

Correction Factors

Target Material	Ferrous Selective	Nonferrous Selective
Steel	1.0	0.0
Stainless Steel	0...1.0 ⁽¹⁾	0...1.0 ⁽¹⁾
Brass	0.0	1.0
Aluminum	0.0	1.0
Aluminum (>0.003 thick)	0.0	1.0
Copper	0.0	1.0

(1) Variations due to differences in alloy composition.

871TM 2-wire DC Short Barrel Tubular Sensors

Stainless Steel Face/Threaded Stainless Steel Barrel



871TM DC Cable Style
12 mm, 18 mm, and 30 mm



871TM DC Mini Quick-disconnect Style
12 mm, 18 mm, and 30 mm



871TM DC Micro
12 mm, 18 mm, and 30 mm

Specifications

Attribute	12 mm, 18 mm, and 30 mm
Load Current	≤25 mA
Load Current, Minimum	2 mA
Leakage Current	≤0.9 mA
Operating Voltage	10...30V DC
Voltage Drop	≤8V
Repeatability	10% typical
Hysteresis	10% typical
Protection Type	False pulse, transient noise, reverse polarity, short circuit, overload
Certifications	UL Listed, CSA Certified, and CE Marked for all applicable directives
Enclosure Type Rating	NEMA 1, 2, 3, 3R, 4, 4X, 6, 6P, 12, 13; IP67 (IEC 529) all models; 1200 psi (8270 kPa) washdown; ToughLink and micro connector versions are also rated IP69K (IEC 529)
Housing Material	Stainless steel face and barrel
Connection Type	<ul style="list-style-type: none"> Cable: 2 m (6.5 ft) length, A2 - 2-conductor PVC, C2 - 2-conductor #22 AWG ToughLink, H2 - 2-conductor #18 AWG ToughLink Quick-disconnect: 4-pin mini style, 4-pin micro style
Indicator Status Indicators	Red: Output Energized
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	0.9...1.0
Brass	0.3...0.5
Aluminum	0.1...0.4
Aluminum (≤0.02 Thick)	0.9...1.1
Copper	0.1...0.2

871TM 2-wire AC/DC All Stainless Steel Tubular Sensors

Stainless Steel Face/Threaded Stainless Steel Barrel



871TM AC/DC Cable Style
12 mm, 18 mm, and 30 mm



871TM AC/DC Mini
Quick-disconnect Style
12 mm, 18 mm, and 30 mm



871TM AC/DC Micro Quick-disconnect Style
12 mm, 18 mm, and 30 mm



871TM AC/DC EAC Micro
Quick-disconnect Style
12 mm



871TM AC/DC
ToughLink Cable Style
12 mm, 18 mm, and 20 mm

Specifications

Attribute	12 mm	18 mm and 30 mm
Load Current	5...200 mA	5...250 mA
Inrush Current (one cycle)	≤2 A	≤4 A
Leakage Current	≤1.9 mA @ 120V AC	
Operating Voltage	20...250V AC/DC	
Voltage Drop	≤10V @ 5...200 mA	≤10V @ 5...250 mA
Repeatability	≤10% at constant temperature	
Hysteresis	7% typical	
Protection Type	False pulse, transient noise, short circuit (trigger @ 5 A typical), and overload (trigger @ 260 mA typical)	False pulse, transient noise, short circuit (trigger @ 8 A typical), and overload (trigger @ 320 mA typical)
Certifications	UL Listed, CSA Certified, and CE Marked for all applicable directives, CCC Certified (select models)	
Enclosure Type Rating	NEMA 1, 2, 3, 3R, 4, 4X, 6, 6P, 12, 13; IP67 (IEC 529) all models; 1200 psi (8270 kPa) washdown; ToughLink and micro connector versions are also rated IP69K (IEC 529)	
Housing Material	Stainless steel face and barrel	
Connection Type	<ul style="list-style-type: none"> Cable: 2 m (6.5 ft) 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 	
Indicator Status Indicators	<ul style="list-style-type: none"> Red: Output energized Green: Power Short circuit: Red and green flashing 	
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	0.9...1.0
Brass	0.3...0.5
Aluminum	0.1...0.4
Aluminum (≤0.02 Thick)	0.9...1.1
Copper	0.1...0.2

871TM 2-wire AC/DC PLC Interfacer

Stainless Steel Face/Threaded Short Stainless Steel Barrel



871TM AC/DC Cable Style
12 mm, 18 mm, and 30 mm



871TM AC/DC Mini Quick-disconnect Style
12 mm, 18 mm, and 30 mm



871TM AC/DC Micro Quick-disconnect Style
12 mm, 18 mm, and 30 mm



871TM AC/DC EAC Micro Quick-disconnect Style
12 mm



871TM AC/DC ToughLink Cable Style
12 mm, 18 mm, and 20 mm

Specifications

Attribute	12 mm, 18 mm, and 30 mm
Load Current	2...25 mA
Leakage Current	≤0.9 mA at 24V DC ≤1.7 mA at 20...120V AC/DC ≤2.5 mA at 121...250V AC/DC
Operating Voltage	20...250V AC/DC (standard models) 20...132V AC/DC (high temperature models)
Voltage Drop	≤8V at 25 mA DC ≤10V at 25 mA AC
Repeatability	10% typical
Hysteresis	10% typical
Protection Type	False pulse, transient noise, radio frequency (10V per meter, frequency range 20...1000 MHz) ⁽¹⁾
Certifications	UL Listed, CSA Certified, and CE Marked for all applicable directives CCC Certified (select models)
Enclosure Type Rating	NEMA 1, 2, 3, 3R, 4, 4X, 6, 6P, 12, 13; IP67 (IEC 529) all models; 1200 psi (8270 kPa) washdown; ToughLink and micro connector versions are also rated IP69K (IEC 529)
Housing Material	Stainless steel face and barrel
Connection Type	<ul style="list-style-type: none"> Cable: 2 m (6.5 ft) 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
Indicator Status Indicators	Red: Output Energized
Operating Temperature	-25...+70 °C (-13...+158 °F) (standard models) 0...100 ° (32...212 °) (high temperature models)
Shock	30 g (1.06 oz), 11 ms (standard models) 5 g (0.18 oz), 11 ms (high temperature models)
Vibration	55 Hz, 1 mm amplitude, 3 planes (standard models) 30...120 Hz, 1 mm amplitude, 3 planes (high temperature models)

Correction Factors

Target Material	Correction Factors
Steel	1.0
Stainless Steel	0.8...1.0
Brass	0.4...0.7
Aluminum	0.4...0.7
Copper	0.1...0.2

(1) Radio frequency protection is not available on high temperature models.

871TM 2-wire DC Intrinsically Safe Stainless Steel Face and Barrel



871TM Intrinsically Safe
Cable Style



871TM Intrinsically Safe
Micro Quick-disconnect Style
12 mm, 18 mm, and 30 mm



871TM Intrinsically Safe
ToughLink Cable Style
12 mm

Specifications

Attribute	12 mm, 18 mm, and 30 mm
Outputs	Normally open
Load Current, Max.	25 mA
Load Current, Min.	2 mA
Leakage Current	$t \leq 1.0$ mA
Operating Voltage	10...31.5V DC
Voltage Drop	≤ 8 V DC
Repeatability	10% typical
Hysteresis	10% typical
Protection Type	False pulse, transient noise, reverse polarity, short circuit, overload
Certifications	FM Approved and CSA Certified for: <ul style="list-style-type: none"> Class I, II, III; Divisions 1, 2; Groups A, B, C, D, E, F, G when used with an approved intrinsic safety barrier Class I, II, III; Division 2; Groups A, B, C, D, E, F, G without intrinsic safety barrier UL Listed for use in non-hazardous locations (See control drawing 75001-437 for approval details and wiring diagrams)
Enclosure Type Rating	NEMA 1, 2, 3, 3R, 4, 4X, 6, 6P, 12, 13; IP67 (IEC 529) all models; 1200 psi (8270 kPa) washdown; stainless steel face and barrel; ToughLink and micro connector versions are also rated IP69K (IEC 529)
Connection Type	<ul style="list-style-type: none"> Cable: 2 m (6.5 ft) length, A2 - 2 conductor #22 AWG PVC, C2 - 2 conductor #22 AWG ToughLink, H2 - 2 conductor #18 AWG ToughLink Quick Disconnect: 4-pin micro style
Indicator Status Indicators	Red: Output energized
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 Factor
Steel	1.0
Stainless Steel	0.9...1.0
Brass	0.3...0.5
Aluminum	0.1...0.4
Aluminum (≤ 0.02 Thick)	0.9...1.1
Copper	0.1...0.2

Entity Parameters			
Sensor			Barrier
V_{MAX}	31.5V	\geq	V_t
I_{MAX}	130 mA	\geq	I_t
P_{MAX}	1.25 W	\geq	P_t
C_i	0 μ f	\leq	C_a
L_i	0 mH	\leq	L_{ta}

IMPORTANT Operating parameters must be adhered to.