871C 2-wire AC Full Featured Tubular Sensors

Plastic Face/Threaded Nickel-plated Brass Barrel

871C AC Cable Style
18 mm and 30 mm

871C AC Mini Quick-disconnect Style
12 mm, 18 mm, and 30 mm

871C AC Micro Quick-disconnect Style
12 mm, 18 mm, and 30 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	
Voltage Drop	≤10V @ 5…200 mA	≤10V @ 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, and CE Marked for all applicable directives	
Enclosure Type Rating	NEMA 1, 2, 3, 3R, 4, 4X, 6, 6P, 12, 13; IP67 (IEC529)	
Housing Material	Nickel plated brass barrel	
Connection Type	• Cable: 2 m (6.5 ft) length, 2-conductor PVC • Quick-disconnect: 3-pin 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

871C 2-wire AC Plastic Barrel Tubular Sensors

Plastic Face/Threaded

871C AC Cable Style
18 mm and 30 mm

Specifications

Attribute	18 mm	30 mm
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	
Enclosure Type Rating	NEMA 1, 2, 3, 4, 4X, 12, 13; IP67 (IEC529)	
Housing Material	Plastic 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

871C Analog Output, 3-wire DC Tubular Sensors

Plastic Face/Nickel-plated Brass Barrel

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

Specifications

Attribute	12 mm	18 mm	30 mm
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		
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

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

Nickel-plated Brass Barrel, Plastic Face

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

Specifications

Attribute	8 mm, 12 mm, 18 mm, and 30 mm
Output Type	NAMUR (conforms to DIN 19 234)
Load Current, Nom.	<1 mA (target present), >3 mA (target absent)
Operating Voltage	5…15V DC (8.2V DC nom., Ri = 1 kohm, DIN 19 234)
Ripple	5%
Repeatability	<10%
Hysteresis	10% typical
Protection Type	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
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

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

Entity Parameters

Sensor			Barrier
V_{max}	16V	≥	V_t
I_{max}	60 mA	≥	I_t
C_I	150 $_n$F	≤	C_a
L_I	200 µH	≤	L_a

IMPORTANT Operating parameters must be adhered to.

871C 3-wire DC Mini Tubular Sensors

Plastic Face/Small Threaded or Smooth Stainless Steel Barrel 3 mm, 4 mm, and 5 mm

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

IO-Link

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 SIO)	
Mechanical		
Housing Material	Stainless steel barrel, polyester face	
Status Indicator	Yellow: Output energized	
Status Indicator (IO-Link Mode)	Solid 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

Switching Frequency

Barrel Diameter [mm (in.)]	Nominal Sensing Distance [mm (in.)]	Switching Frequency [Hz]
3	0.6 (0.02)	5000
	1 (0.04)	3000
4	0.8 (0.03)	5000
	1 (0.04)	3000
	1.5 (0.06)	3000
5	1 (0.04)	5000
	1.5 (0.06)	3000

871C 3-wire DC Extended Temperature Tubular Sensors

Plastic Face/Threaded Nickel-plated Brass Barrel

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

871C DC Micro Quick-disconnect Style
12 mm, 18 mm, and 30 mm

Specifications

Attribute	12 mm, 18 mm, and 30 mm
Load Current	1…200 mA
Leakage Current	≤10 µA
Operating Voltage	10…30V DC
Voltage Drop	≤2.4V
Repeatability	≤10%
Hysteresis	≤15% typical
Protection Type	False pulse, transient noise, reverse polarity, short circuit, and overload
Certifications	CE Marked for all applicable directives
Enclosure Type Rating	NEMA 1, 2, 3, 4, 12, 13; IP67 (IEC529)
Housing Material	Nickel-plated brass barrel
Connection Type	• Cable: 2 m (6.5 ft) length, 3-conductor PUR • Quick-disconnect: 4-pin micro style
Status Indicator	Orange: Output Energized
Operating Temperature	-40…+100 °C (-40…+212 °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
Brass	0.5
Aluminum	0.45
Copper	0.4

871T 3-wire DC Stainless Steel Barrel Tubular Sensors

Plastic Face/Threaded

871C DC Cable Style
12 mm and 18 mm

871C DC Mini Quick-disconnect Style
18 mm

Specifications

Attribute	12 mm	18 mm
Load Current	≤300 mA	≤400 mA
Leakage Current	≤10 µA	
Operating Voltage	10…30V DC	
Voltage Drop	≤1V	
Repeatability	≤10%	
Hysteresis	≤10% typical	
Protection Type	False pulse, transient noise, reverse polarity, short circuit, and overload	
Certifications	UL Listed, CSA Certified, and CE Marked for all applicable directives	
Enclosure Type Rating	NEMA 1, 2, 3, 4, 12 and 13; IP67 (IEC529)	
Housing Material	Stainless Steel 303 barrel	
Connections	• Cable: 3 m (10 ft) length, 3-conductor PVC • Quick-disconnect: 4-pin mini style	
Status Indicator	Red: output energized	
Operating Temperature	-40…+70 °C (-40…+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