

Chemical Resistant Inductive Proximity Sensor

E2FQ

*Fluoro plastic housing for
highest chemical and
detergent resistance*



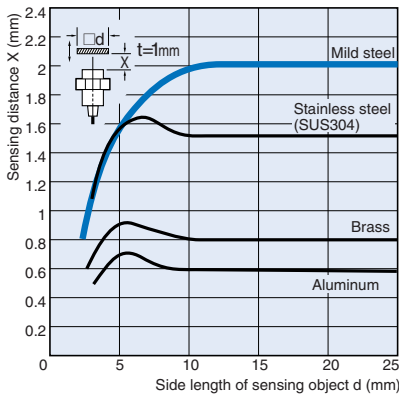
Ordering Information

Shape		Sensing distance	DC 3-wire models			DC 2-wire models	
			PNP (NO)	NPN (NO)	Response frequency	NO	Response frequency
	M12	2mm	E2FQ-X2F1	E2FQ-X2E1	1.5 kHz	E2FQ-X2D1	800 Hz
	M18	5mm	E2FQ-X5F1	E2FQ-X5E1	600 Hz	E2FQ-X5D1	500 Hz
	M30	10mm	E2FQ-X10F1	E2FQ-X10E1	400 Hz	E2FQ-X10D1	300 Hz

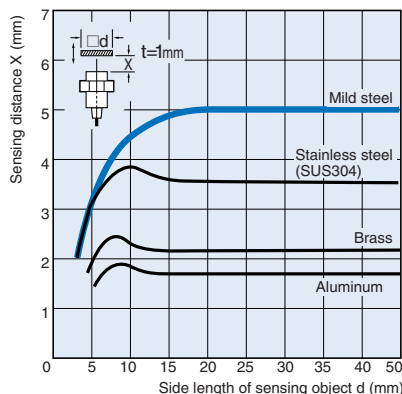
Characteristic data (typical)

Sensing Distance vs. Sensing Object

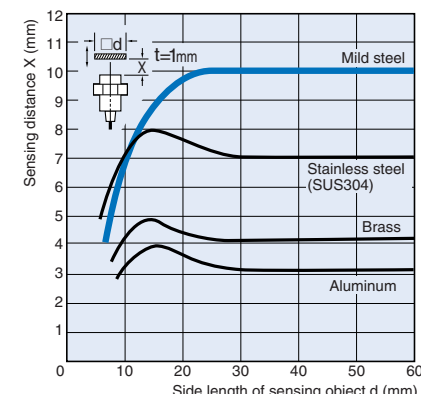
E2FQ-X2



E2FQ-X5



E2FQ-X10



Rating/Performance

Item		Model	E2FQ-X2□	E2FQ-X5□	E2FQ-X10□
Sensing distance			2 mm ±10%	5 mm ±10%	10 mm ±10%
Setting distance			0 to 1.6 mm	0 to 4 mm	0 to 8 mm
Differential distance			E1, F1 models: 10% max. of sensing distance		
Sensing object			Ferrous metal (Sensitivity lowers with non-ferrous metals)		
Standard sensing object (mild steel)			12 x 12 x 1 mm	18 x 18 x 1 mm	30 x 30 x 1 mm
Response frequency*1			E1, F1 models: 1.5 kHz D1 models: 800 Hz	E1, F1 models: 600 Hz, D1 models: 500 Hz	E1, F1 models: 400 Hz, D1 models: 300 Hz
Power supply (Operating voltage range)			E1, F1 models: 12 to 24 VDC, ripple (p-p) : 10% max., (10 to 30 VDC) D1 models: 12 to 24 VDC, ripple (p-p) : 20% max., (10 to 36 VDC)		
Current consumption			E1, F1 models: 17 mA max.		
Leakage current			D1 models: 0.8 mA max.		
Control output	Switching capacity	E1, F1 models: 200 mA max., D1 models: 5 to 100 mA DC			
	Residual voltage	E1, F1 models: 2 V max. (load current: 200 mA with cable length: 2 m) D1 models: 3.0 V max. (under load current of 100 mA with cable length of 2 m)			
Indicator lamp			E models: operation indicator (red) D models: operation indicator (green for stable detection, red for detection close to threshold)		
Operating status (with sensing object approaching)			Normally open (NO)		
Protective circuits			E1, F1 models: Protection for reverse polarity, load short circuit, surge voltage		
Ambient temperature			Operating/Storage: -25°C to 70°C (with no icing or condensation)		
Ambient humidity			Operating/Storage: 35% to 95%RH (with no condensation)		
Temperature influence			10% max. of sensing distance at 23°C within temperature range of -25°C to 70°C		
Voltage influence			E1, F1 models: ±2.5% max. of sensing distance within rated voltage range ±15%		
Insulation resistance			50 MW min. (at 500 VDC) between energized parts and case		
Dielectric strength			E1, F1, D1 models: 1,000 VAC 50/60 Hz for 1 min between energized parts and case		
Vibration resistance			Destruction: 10 to 55 Hz, 1.5 mm double amplitude for 2 hours each in X, Y, and Z directions		
Shock resistance			Destruction: 500 m/s ² for 10 times each in X, Y, and Z directions	Destruction: 1,000 m/s ² for 10 times each in X, Y, and Z directions	
Protective structure			IEC60529 IP67		
Connection method			Pre-wired models (standard length: 2 m)		
Weight (Packed state)			Approx. 70 g	Approx. 130 g	Approx. 170 g
Material	Case	Fluoro plastic			
	Sensing surface				
Accessories			Instruction manual		

*1. The response frequencies are average values measured on condition that the distance between each sensing object is twice as large as the size of the sensing object and the sensing distance set is half of the maximum sensing distance.

Output Circuit Diagram

Operating status	Output specifications	Model	Timing chart	Output circuit
NO	PNP	E2FQ-X□F1	Sensing object: Yes (ON), No (OFF) Load (between black and blue leads): Operates (ON), Releases (OFF) Output voltage (between black and blue leads): H (ON), L (OFF) Operation indicator: ON (ON), OFF (OFF)	
	NPN	E2FQ-X□E1	Sensing object: Yes (ON), No (OFF) Load (between black and blue leads): Operates (ON), Releases (OFF) Output voltage (between black and blue leads): H (ON), L (OFF) Operation indicator: ON (ON), OFF (OFF)	
	DC 2-wire	E2FQ-X□D1	Sensing object: Yes (ON), No (OFF) Load: Operates (ON), Releases (OFF) Operation indicator: ON (ON), OFF (OFF)	

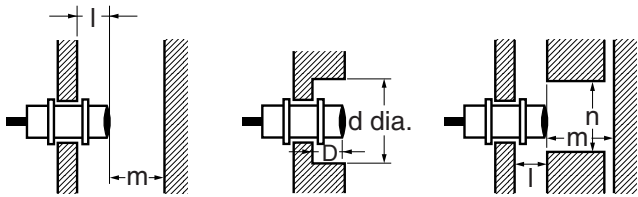
Precautions

Correct Use

Design

Effects of Surrounding Metal

Provide a minimum distance between the Sensor and the surrounding metal as shown in the table below.



Effects of Surrounding Metal

(Unit: mm)

Model	Item	l	d	D	m	n
E2FQ-X2□	0	0	12	0	8	18
E2FQ-X5□			18		20	27
E2FQ-X10□			30		40	45

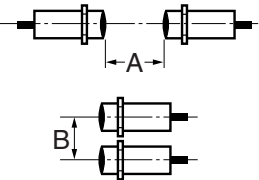
Mutual Interference

If more than one Proximity Sensor is installed face to face or in parallel, ensure that the distances between two Units adjacent to each other are the same as or larger than the corresponding values shown in the following table.

Mutual Interference

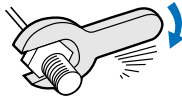
(Unit: mm)

Model	Item	A	B
E2FQ-X2□		30	20
E2FQ-X5□		50	35
E2FQ-X10□		100	70



Installation

Do not tighten the nut with excessive force. A washer must be used with the nut.



Note: The table below shows the value of tightening torques when using toothed washers.

Model	Torque	Tensile strength (torque)
E2FQ-X2□	2 Nm	0.98 Nm
E2FQ-X5□		
E2FQ-X10□		

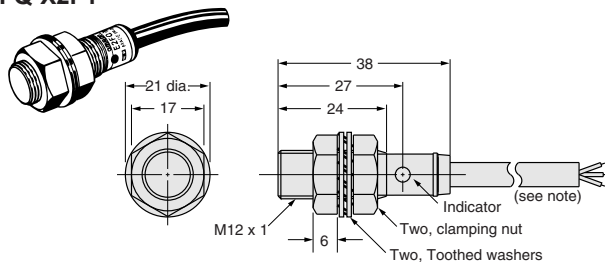
Others

Chemical resistance

Dimensions (Unit: mm)

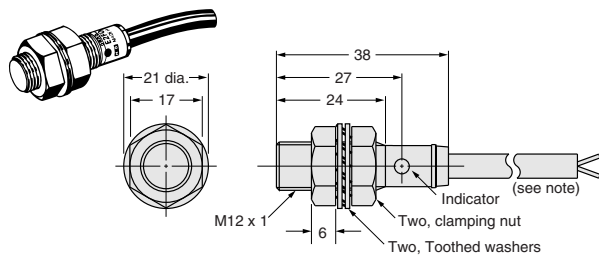
E2FQ-X2E1

E2FQ-X2F1



Note:
Oil-resistant, vibration-resistant, and fire-retardant
vinyl-insulated round cord, 6 dia. x 3 cores,
standard length: 2 m
The cord can be extended in an independent conduit
for 200 m maximum.

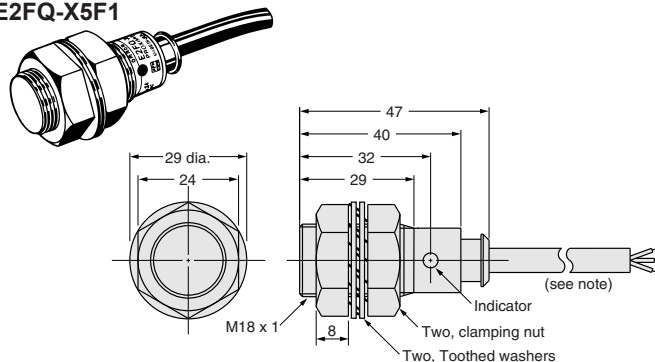
E2FQ-X2D1



Note:
Oil-resistant, vibration-resistant, and fire-retardant
vinyl-insulated round cord, 6 dia. x 2 cores,
standard length: 2 m
The cord can be extended in an independent conduit
for 200 m maximum.

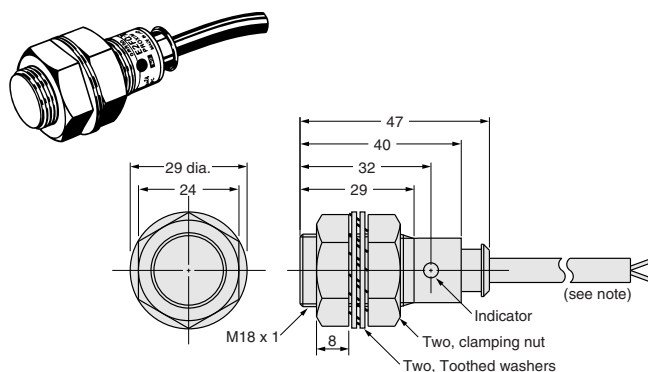
E2FQ-X5E1

E2FQ-X5F1



Note:
Oil-resistant, vibration-resistant, and fire-retardant
vinyl-insulated round cord, 6 dia. x 3 cores,
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for 200 m maximum.

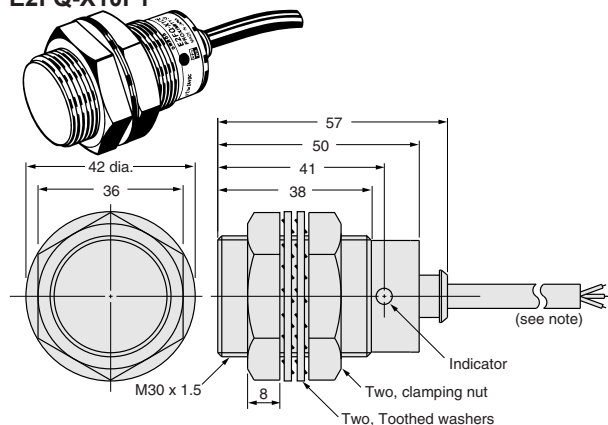
E2FQ-X5D1



Note:
Oil-resistant, vibration-resistant, and fire-retardant
vinyl-insulated round cord, 6 dia. x 2 cores,
standard length: 2 m
The cord can be extended in an independent conduit
for 200 m maximum.

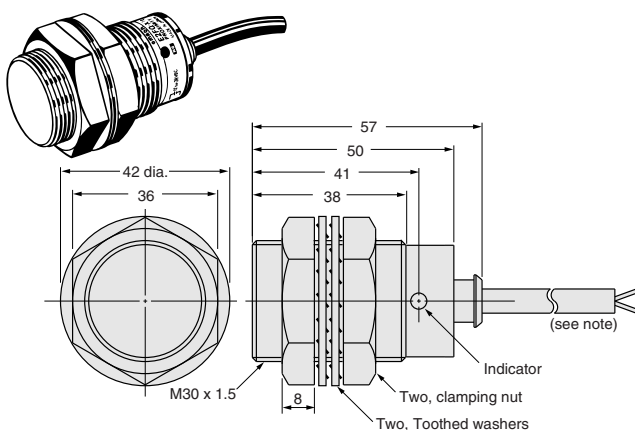
E2FQ-X10E1

E2FQ-X10F1



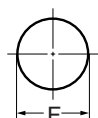
Note:
Oil-resistant, vibration-resistant, and fire-retardant vinyl-insulated
round cord, 6 dia. x 3 cores, standard length: 2 m
The cord can be extended in an independent conduit for 200 m maximum.

E2FQ-X10D1



Note:
Oil-resistant, vibration-resistant, and fire-retardant vinyl-insulated
round cord, 6 dia. x 2 cores, standard length: 2 m
The cord can be extended in an independent conduit for 200 m maximum.

Mounting Holes



Model	F (mm)
E2FQ-X2□	12.5 mm dia. ^{+0.5} ₀
E2FQ-X5□	18.5 mm dia. ^{+0.5} ₀
E2FQ-X10□	30.5 mm dia. ^{+0.5} ₀

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