


Chemical Resistant Inductive Proximity Sensor

E2FQ

Fluoro plastic housing for increased chemical and detergent resistance



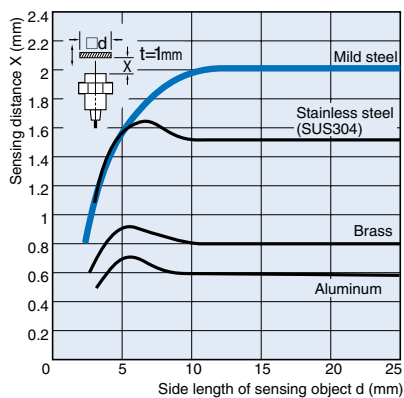
Ordering Information

Shape	Sensing distance	DC 3-wire models			DC 2-wire models		AC 2-wire models	
		PNP (NO)	NPN (NO)	Response frequency	NO	Response frequency	NO	Response frequency
 Shielded	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	E2FQ-X5Y1	25 Hz
	M30 10mm	E2FQ-X10F1	E2FQ-X10E1	400 Hz	E2FQ-X10D1	300 Hz	E2FQX10Y1	

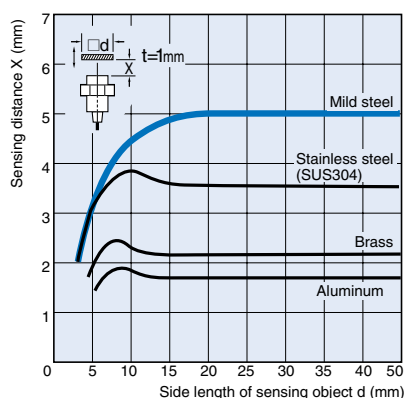
Characteristic data (typical)

Sensing Distance vs. Sensing Object

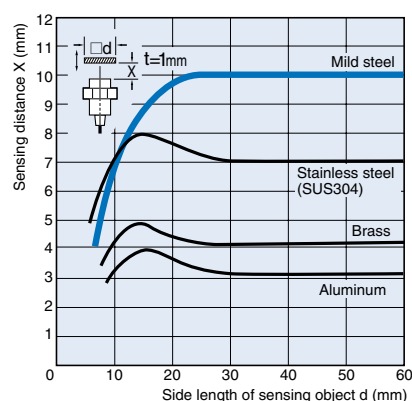
E2FQ-X2



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, Y1 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
			Y1 models: 25 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., Y models: 5 to 300 mA		
Control output	Switching capacity	E1, F1 models: 200 mA max., D1 models: 5 to 100 mA DC, Y models: 5 to 300 mA		
	Residual voltage	E1, F1 models: 2 V max. (load current: 200 mA with cable length: 2 m) Y models: Refer to the Specifications. D1 models: 4.0 V max. (under load current of 100 mA with cable length of 2 m)		
Indicator lamp		E,D models: detection indicator (red), Y models: operation indicator (red)		
Operating status (with sensing object approaching)		E1, F1 models, D1 models and Y1 models: 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 M 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 for DC switching 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	<p>Sensing object: Yes (High), No (Low)</p> <p>Load (between black and blue leads): Operates (High), Releases (Low)</p> <p>Output voltage (between black and blue leads): H, L</p> <p>Operation indicator: ON, OFF</p>	
	NPN	E2FQ-X□E1	<p>Sensing object: Yes (High), No (Low)</p> <p>Load (between black and blue leads): Operates (High), Releases (Low)</p> <p>Output voltage (between black and blue leads): H, L</p> <p>Operation indicator: ON, OFF</p>	<p>Note: 1. 200 mA max.(load current) 2. When a transistor is connected</p>
	DC 2-wire	E2FQ-X□D1	<p>Sensing object: Yes (High), No (Low)</p> <p>Load: Operates (High), Releases (Low)</p> <p>Operation indicator: ON, OFF</p>	<p>Note: The load can be connected to either the +V or the 0-V line.</p>
	AC 2-wire Models	E2FQ-X□Y1	<p>Sensing object: Yes (High), No (Low)</p> <p>Load: Operates (High), Releases (Low)</p> <p>Operation indicator: ON, OFF</p>	

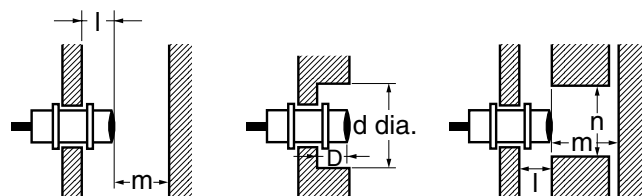
Precautions

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)

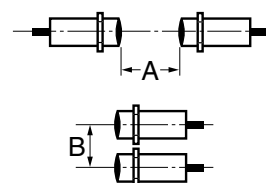
Model	Item	l	d	D	m	n
E2FQ-X2□	0	0	12	0	8	18
E2FQ-X5□			18		20	27
E2FQ-X10□			30		40	45

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 corre-

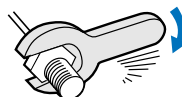
sponding values shown in the following table.

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.

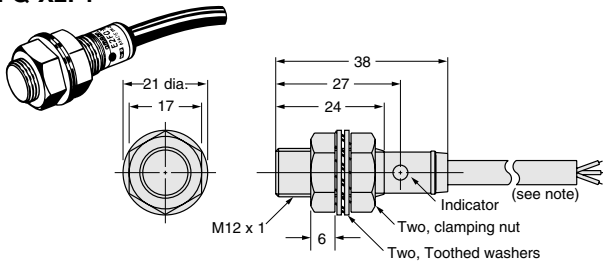
Model	Torque	Tensile strength (torque)
E2FQ-X2□		0.98 Nm
E2FQ-X5□		2 Nm
E2FQ-X10□		

Others

Chemical resistance

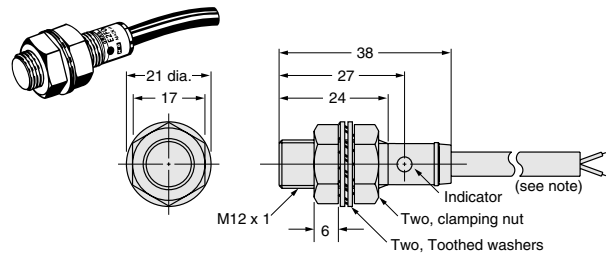
Dimensions (Unit: mm)

E2FQ-X2E1
E2FQ-X2F1



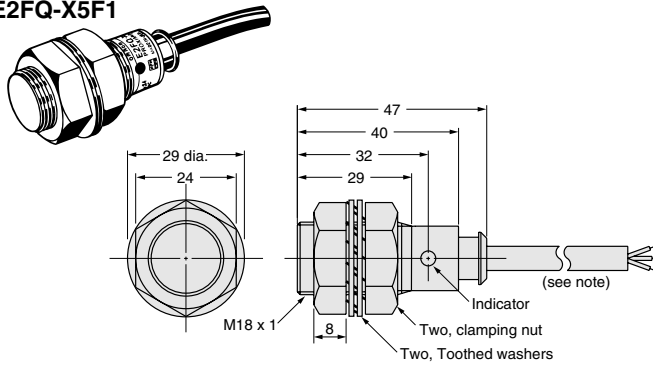
Note:
Oil-resistant, vibration-resistant, and fire-retardant vinyl-insulated round cord, 6 dia. x 3 cores, standard length: 2 m
The cord can be extended in an independent conduit for 200 m maximum.

E2FQ-X2D1



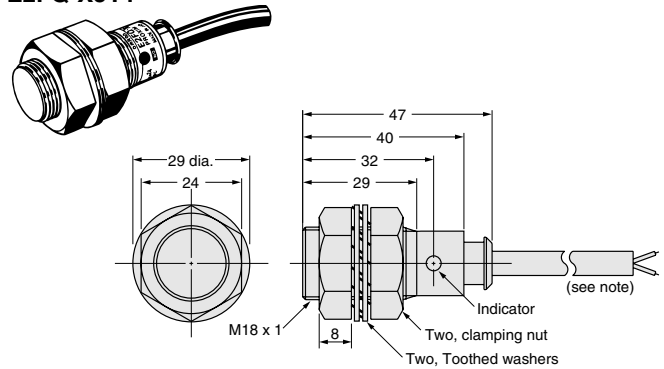
Note:
Oil-resistant, vibration-resistant, and fire-retardant vinyl-insulated round cord, 6 dia. x 2 cores, standard length: 2 m
The cord can be extended in an independent conduit for 200 m maximum.

E2FQ-X5E1
E2FQ-X5F1



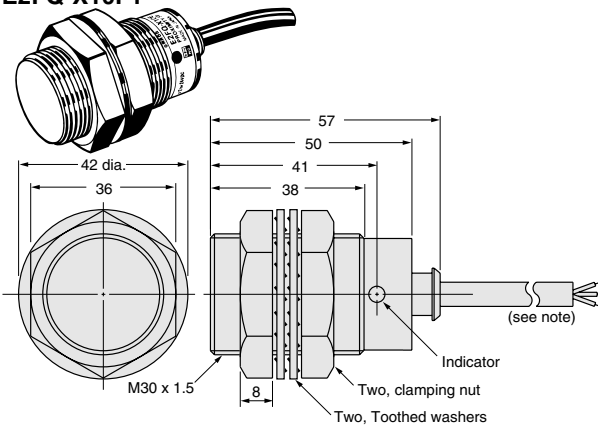
Note:
Oil-resistant, vibration-resistant, and fire-retardant vinyl-insulated round cord, 6 dia. x 3 cores, standard length: 2 m
The cord can be extended in an independent conduit for 200 m maximum.

E2FQ-X5D1
E2FQ-X5Y1



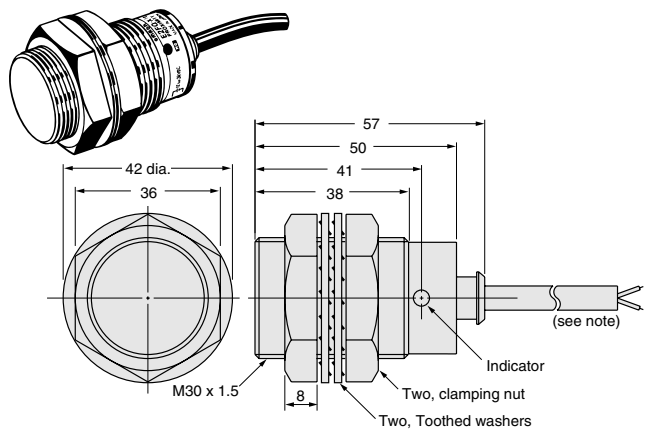
Note:
Oil-resistant, vibration-resistant, and fire-retardant vinyl-insulated round cord, 6 dia. x 2 cores, standard length: 2 m
The cord can be extended in an independent conduit for 200 m maximum.

E2FQ-X10E1
E2FQ-X10F1



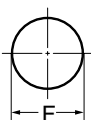
Note:
Oil-resistant, vibration-resistant, and fire-retardant vinyl-insulated round cord, 6 dia. x 3 cores, standard length: 2 m
The cord can be extended in an independent conduit for 200 m maximum.

E2FQ-X10D1
E2FQ-X10Y1



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

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.