

## Inductive Proximity Sensor with Chemical-resistant Fluororesin Case

- Housing and mounting are made of Fluororesin resistant to chemicals.
- Maximum sensing distance: 10 mm.



Be sure to read *Safety Precautions* on page 5.

Note: The cable is made of vinyl chloride and requires separate protection.

For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

### Ordering Information

**Sensors** [Refer to *Dimensions* on page 6.]

Appearance	Sensing distance	Output configuration	Operation mode	Model
Shielded 	 2 mm	DC 2-wire	NO	E2FQ-X2D1 2M
		DC 3-wire, NPN		E2FQ-X2E1 2M
	 5 mm	DC 2-wire		E2FQ-X5D1 2M
		DC 3-wire, NPN		E2FQ-X5E1 2M
		AC 2-wire		E2FQ-X5Y1 2M
	 10 mm	DC 2-wire		E2FQ-X10D1 2M
		DC 3-wire, NPN		E2FQ-X10E1 2M
		AC 2-wire		E2FQ-X10Y1 2M

## Ratings and Specifications

Model		E2FQ-X2E1 E2FQ-X2D1	E2FQ-X5E1 E2FQ-X5D1, E2FQ-X5Y1	E2FQ-X10E1 E2FQ-X10D1, E2FQ-X10Y1	
<b>Item</b>					
<b>Sensing distance</b>		2 mm ±10%	5 mm ±10%	10 mm ±10%	
<b>Set distance</b>		0 to 1.6 mm	0 to 4 mm	0 to 8 mm	
<b>Differential travel</b>		E1/Y1 Models: 10% max. of sensing distance, D1 Models: 20% max. of sensing distance			
<b>Detectable object</b>		Ferrous metal (The sensing distance decreases with non-ferrous metal. Refer to <i>Engineering Data</i> on page 3.)			
<b>Standard sensing object</b>		Iron, 12 × 12 × 1 mm	Iron, 18 × 18 × 1 mm	Iron, 30 × 30 × 1 mm	
<b>Response frequency *</b>		E1 Models: 1.5 kHz D1 Models: 800 Hz	E1 Models: 600 Hz D1 Models: 500 Hz Y1 Models: 25 Hz	E1 Models: 400 Hz D1 Models: 300 Hz	
<b>Power supply voltage (operating voltage range)</b>		E1 Models: 12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max. Y1 Models: 24 to 240 VAC (20 to 264 VAC), 50/60 Hz D1 Models: 12 to 24 VDC (10 to 36 VDC), ripple (p-p): 20% max.			
<b>Current consumption</b>		E1 Models: 17 mA max.			
<b>Leakage current</b>		D1 Models: 0.8 mA max., Y1 Models: 1.7 mA max. (at 200 VAC)			
<b>Control output</b>	<b>Load current</b>	E1 Models: 200 mA max., D1 Models: 5 to 100 mA, Y1 Models: 5 to 300 mA			
	<b>Residual voltage</b>	E1 Models: 2 V max. (Load current: 200 mA, Cable length: 2 m) Y1 Models: Refer to <i>Engineering Data</i> on page 3. D1 Models: 3 V max. (Load current: 100 mA, Cable length: 2 m)			
<b>Indicators</b>		E Models: Detection indicator (red), Y Models: Operation indicator (red), D Models: Operation indicator (red), Setting indicator (green) (NO only)			
<b>Operation mode (with sensing object approaching)</b>		E1/D1/Y1 Models: NO (Refer to the timing charts under <i>I/O Circuit Diagrams</i> on page 5 for details.)			
<b>Protection circuits</b>		E1 Models: Load short-circuit protection, Reverse polarity protection, Surge suppressor, D1/Y1 Models: Surge suppressor			
<b>Ambient temperature range</b>		Operating/Storage: -25 to 70°C (with no icing or condensation)			
<b>Ambient humidity range</b>		Operating/Storage: 35% to 95% (with no condensation)			
<b>Temperature influence</b>		±10% max. of sensing distance at 23°C in the temperature range of -25 to 70°C			
<b>Voltage influence</b>		E1 Models: ±2.5% max. of sensing distance at rated voltage in the rated voltage ±15% range D1 Models: ±2.5% max. of sensing distance at rated voltage in the rated voltage ±20% range Y1 Models: ±1% max. of sensing distance at rated voltage in the rated voltage ±10% range			
<b>Insulation resistance</b>		50 MΩ min. (at 500 VDC) between current-carrying parts and case			
<b>Dielectric strength</b>		E1/D1 Models: 1,000 VAC, 50/60 Hz for 1 min between current-carrying parts and case Y Models: 4,000 VAC, 50/60 Hz for 1 min between current-carrying parts and case			
<b>Vibration resistance</b>		Destruction: 10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions			
<b>Shock resistance</b>		Destruction: 500 m/s <sup>2</sup> 10 times each in X, Y, and Z directions	Destruction: 1,000 m/s <sup>2</sup> 10 times each in X, Y, and Z directions		
<b>Degree of protection</b>		IEC 60529 IP67, in-house standards: oil-resistant			
<b>Connection method</b>		Pre-wired Models (Cable length: 2 m)			
<b>Weight (packed state)</b>		Approx. 70 g	Approx. 130 g	Approx. 170 g	
<b>Materials</b>	<b>Case</b>	Fluororesin			
	<b>Sensing surface</b>				
	<b>Clamping nuts</b>				
	<b>Toothed washer</b>				Zinc-plated iron
	<b>Cable</b>				Vinyl chloride
<b>Accessories</b>		Instruction manual			

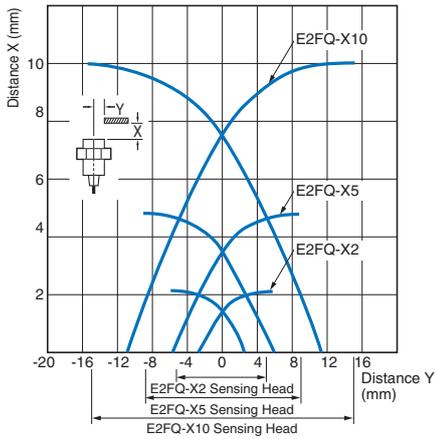
\* The response frequency is an average value.

Measurement conditions are as follows: standard sensing object, a distance of twice the standard sensing object, and a set distance of half the sensing distance.

# Engineering Data (Reference Value)

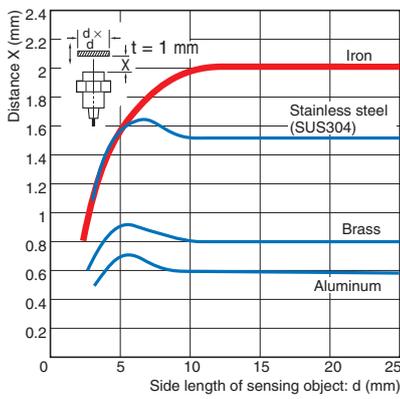
## Sensing Area

### E2FQ-X□

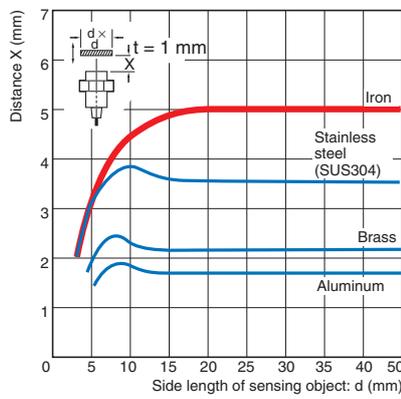


## Influence of Sensing Object Size and Material

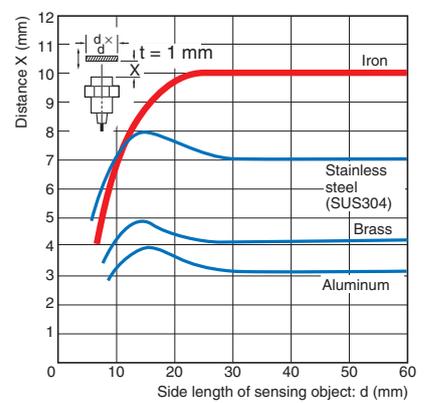
### E2FQ-X2□



### E2FQ-X5□

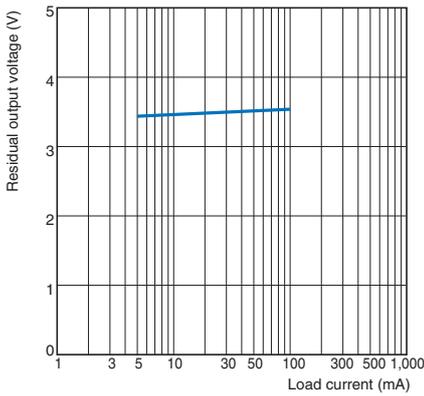


### E2FQ-X10□

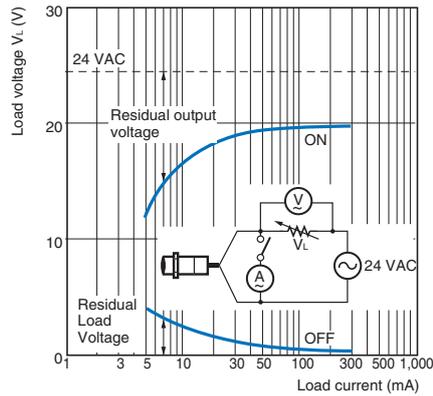


## Residual Output Voltage

### E2FQ-X□

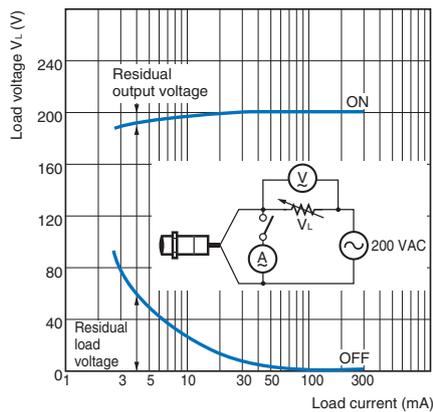
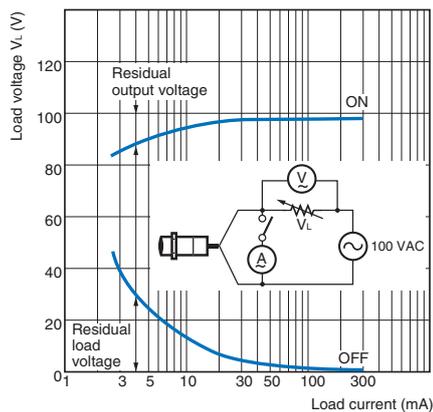


### E2FQ-X□Y1 at 24 VAC



E2FQ-X□Y1 at 100 VAC

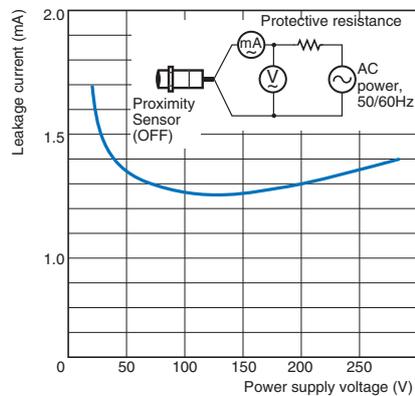
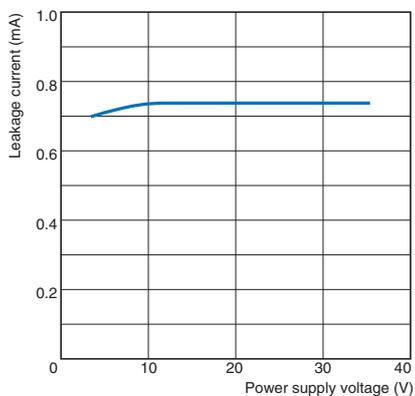
E2FQ-X□Y1 at 200 VAC



Leakage Current

E2FQ-X□D

E2FQ-X□Y



## I/O Circuit Diagrams

Operation mode	Output configuration	Model	Timing chart	Output circuit
NO	NPN	E2FQ-X2E1 E2FQ-X5E1 E2FQ-X10E1		<p>*1. 200 mA max. (load current). *2. When a transistor is connected.</p>
	DC 2-wire	E2FQ-X2D1 E2FQ-X5D1 E2FQ-X10D1		<p>Note: The load can be connected to either the +V or 0 V side.</p>
	AC 2-wire	E2FQ-X5Y1 E2FQ-X10Y1		

## Safety Precautions

Refer to *Warranty and Limitations of Liability*.

### ⚠ WARNING

This product is not designed or rated for ensuring safety of persons either directly or indirectly. Do not use it for such purposes.



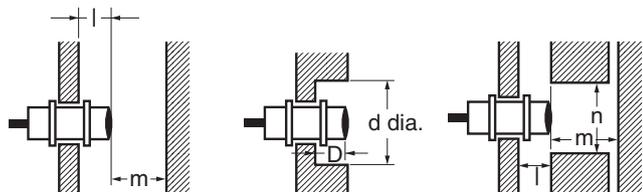
### Precautions for Correct Use

Do not use this product under ambient conditions that exceed the ratings.

#### ● Design

##### Influence of Surrounding Metal

When mounting the Sensor within a metal panel, ensure that the clearances given in the following table are maintained. Failure to maintain these distances may cause deterioration in the performance of the Sensor.



##### Influence of Surrounding Metal

(Unit: mm)

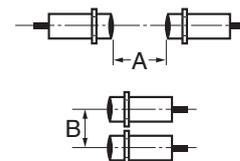
Model	Item	l	d	D	m	n
E2FQ-X2□	0		12	0	8	18
E2FQ-X5□			18		20	27
E2FQ-X10□			30		40	45

##### Mutual Interference

When installing two or more Sensors face-to-face or side-by-side, ensure that the minimum distances given in the following table are maintained.

Mutual Interference (Unit: mm)

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



##### Mounting

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



Note: The following torque assume washers are being used.

Model	Torque
E2FQ-X2□	0.98 N·m
E2FQ-X5□	2 N·m
E2FQ-X10□	

##### Miscellaneous

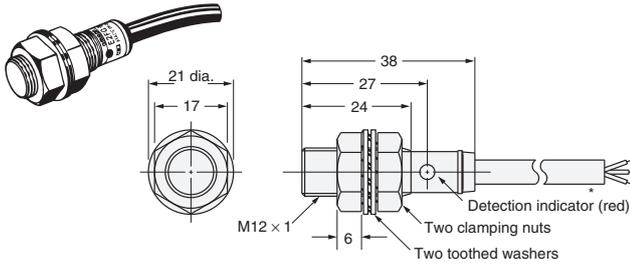
##### Chemical Resistance

Refer to *Chemical Resistance* for details.

Dimensions

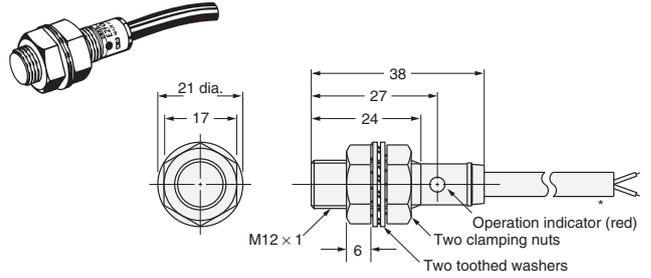
Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.

E2FQ-X2E1



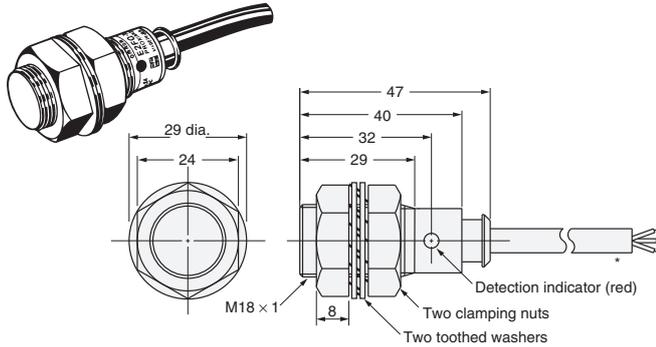
\* 6-dia. vinyl-insulated round cable with 3 conductors (Flame resistant, Conductor cross section: 0.5 mm<sup>2</sup>, Insulator diameter: 1.9 mm), Standard length: 2 m  
The cable can be extended up to 200 m (separate metal conduit).

E2FQ-X2D1



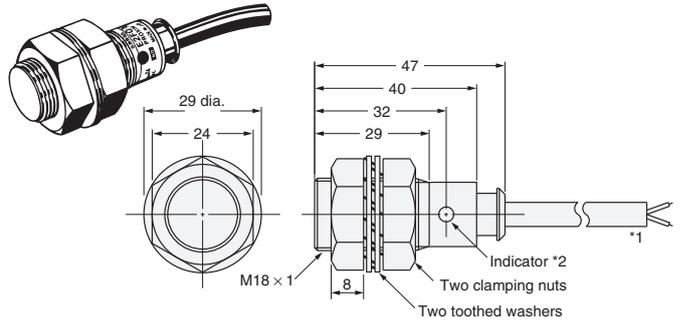
\* 6-dia. vinyl-insulated round cable with 2 conductors (Flame resistant, Conductor cross section: 0.5 mm<sup>2</sup>, Insulator diameter: 1.9 mm), Standard length: 2 m  
The cable can be extended up to 200 m (separate metal conduit).

E2FQ-X5E1



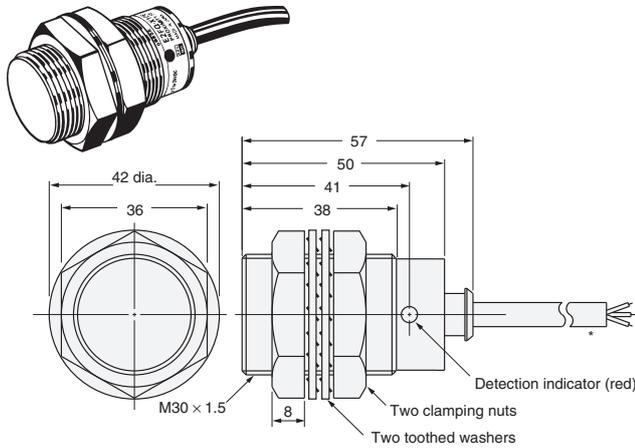
\* 6-dia. vinyl-insulated round cable with 3 conductors (Flame resistant, Conductor cross section: 0.5 mm<sup>2</sup>, Insulator diameter: 1.9 mm), Standard length: 2 m  
The cable can be extended up to 200 m (separate metal conduit).

E2FQ-X5D1  
E2FQ-X5Y1



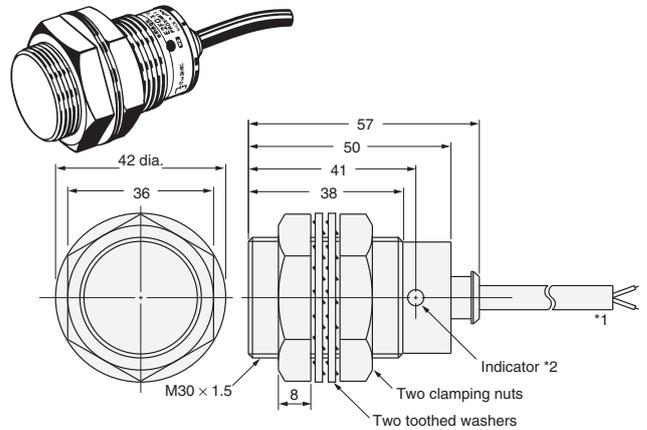
\*1. 6-dia. vinyl-insulated round cable with 2 conductors (Flame-resistant, Conductor cross section: 0.5 mm<sup>2</sup>, Insulator diameter: 1.9 mm), Standard length: 2 m  
The cable can be extended up to 200 m (separate metal conduit).  
\*2. D1: Operation indicator (red) and Setting indicator (green)  
Y1: Operation indicator (red)

E2FQ-X10E1



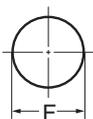
\* 6-dia. vinyl-insulated round cable with 3 conductors (Flame resistant, Conductor cross section: 0.5 mm<sup>2</sup>, Insulator diameter: 1.9 mm), Standard length: 2 m  
The cable can be extended up to 200 m (separate metal conduit).

E2FQ-X10D1  
E2FQ-X10Y1



\*1. 6-dia. vinyl-insulated round cable with 2 conductors (Flame-resistant, Conductor cross section: 0.5 mm<sup>2</sup>, Insulator diameter: 1.9 mm), Standard length: 2 m  
The cable can be extended up to 200 m (separate metal conduit).  
\*2. D1: Operation indicator (red) and Setting indicator (green)  
Y1: Operation indicator (red)

Mounting Hole Dimensions



Model	F (mm)
E2FQ-X2□	12.5 <sup>+0.5</sup> <sub>0</sub> dia.
E2FQ-X5□	18.5 <sup>+0.5</sup> <sub>0</sub> dia.
E2FQ-X10□	30.5 <sup>+0.5</sup> <sub>0</sub> dia.

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