

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  | M12 | 2 mm | | DC 2-wire | NO | E2FQ-X2D1 2M |
| | | | | DC 3-wire, NPN | | E2FQ-X2E1 2M |
| | M18 | 5 mm | | DC 2-wire | | E2FQ-X5D1 2M |
| | | | | DC 3-wire, NPN | | E2FQ-X5E1 2M |
| | | | | AC 2-wire | | E2FQ-X5Y1 2M |
| | M30 | 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 | |
|---|-------------------------|--|---|--|------------------|
| Item | | | | | |
| Sensing distance | | 2 mm ±10% | 5 mm ±10% | 10 mm ±10% | |
| Set distance | | 0 to 1.6 mm | 0 to 4 mm | 0 to 8 mm | |
| Differential travel | | E1/Y1 Models: 10% max. of sensing distance, D1 Models: 20% max. of sensing distance | | | |
| Detectable object | | Ferrous metal (The sensing distance decreases with non-ferrous metal. Refer to <i>Engineering Data</i> on page 3.) | | | |
| Standard sensing object | | Iron, 12 × 12 × 1 mm | Iron, 18 × 18 × 1 mm | Iron, 30 × 30 × 1 mm | |
| Response frequency * | | 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 | |
| Power supply voltage (operating voltage range) | | 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. | | | |
| Current consumption | | E1 Models: 17 mA max. | | | |
| Leakage current | | D1 Models: 0.8 mA max., Y1 Models: 1.7 mA max. (at 200 VAC) | | | |
| Control output | Load current | E1 Models: 200 mA max., D1 Models: 5 to 100 mA, Y1 Models: 5 to 300 mA | | | |
| | Residual voltage | 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) | | | |
| Indicators | | E Models: Detection indicator (red), Y Models: Operation indicator (red), D Models: Operation indicator (red), Setting indicator (green) (NO only) | | | |
| Operation mode (with sensing object approaching) | | E1/D1/Y1 Models: NO (Refer to the timing charts under <i>I/O Circuit Diagrams</i> on page 5 for details.) | | | |
| Protection circuits | | E1 Models: Load short-circuit protection, Reverse polarity protection, Surge suppressor, D1/Y1 Models: Surge suppressor | | | |
| Ambient temperature range | | Operating/Storage: -25 to 70°C (with no icing or condensation) | | | |
| Ambient humidity range | | Operating/Storage: 35% to 95% (with no condensation) | | | |
| Temperature influence | | ±10% max. of sensing distance at 23°C in the temperature range of -25 to 70°C | | | |
| Voltage influence | | 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 | | | |
| Insulation resistance | | 50 MΩ min. (at 500 VDC) between current-carrying parts and case | | | |
| Dielectric strength | | 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 | | | |
| 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 10 times each in X, Y, and Z directions | Destruction: 1,000 m/s ² 10 times each in X, Y, and Z directions | | |
| Degree of protection | | IEC 60529 IP67, in-house standards: oil-resistant | | | |
| Connection method | | Pre-wired Models (Cable length: 2 m) | | | |
| Weight (packed state) | | Approx. 70 g | Approx. 130 g | Approx. 170 g | |
| Materials | Case | Fluororesin | | | |
| | Sensing surface | | | | |
| | Clamping nuts | | | | |
| | Toothed washer | | | | Zinc-plated iron |
| | Cable | | | | Vinyl chloride |
| Accessories | | Instruction manual | | | |

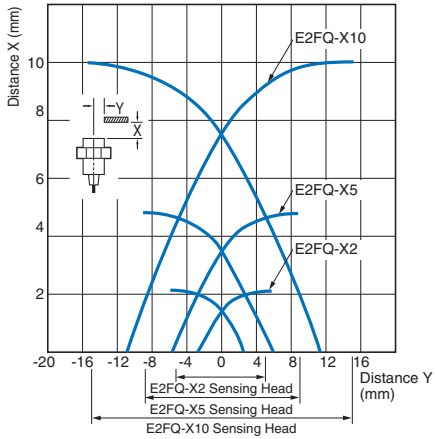
* The response frequency is an average value.

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)

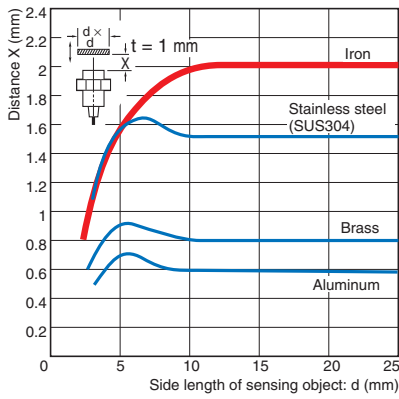
Sensing Area

E2FQ-X□

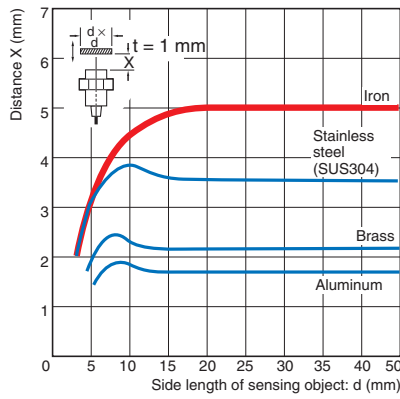


Influence of Sensing Object Size and Material

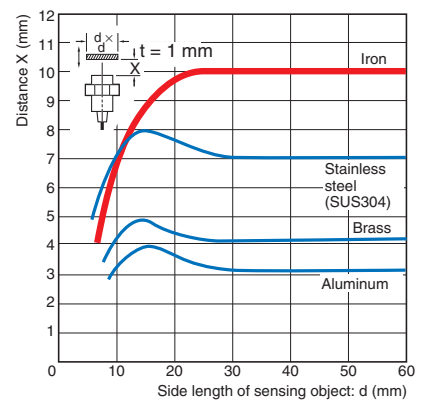
E2FQ-X2□



E2FQ-X5□

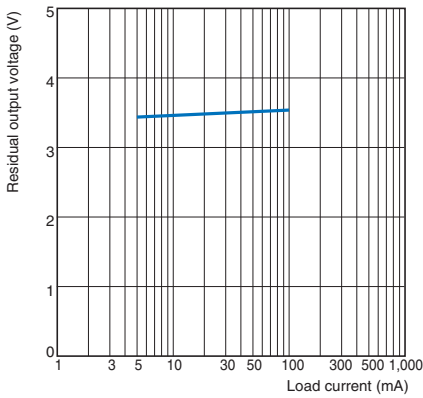


E2FQ-X10□

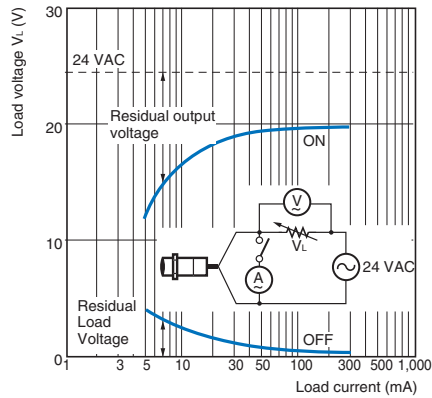


Residual Output Voltage

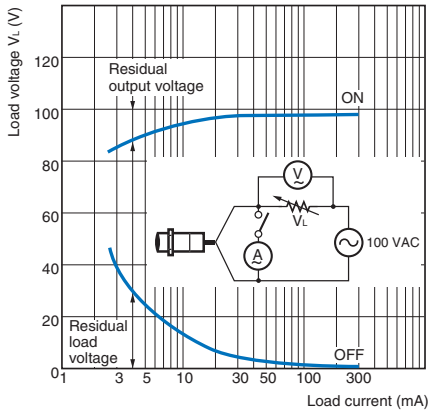
E2FQ-X□



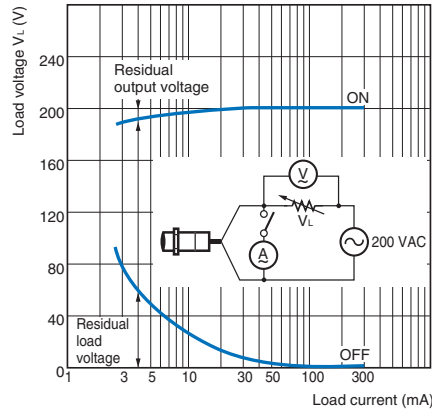
E2FQ-X□Y1 at 24 VAC



E2FQ-X□Y1 at 100 VAC

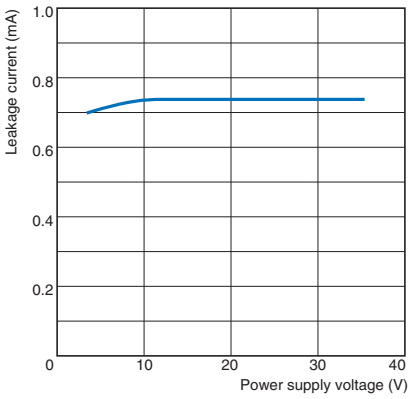


E2FQ-X□Y1 at 200 VAC

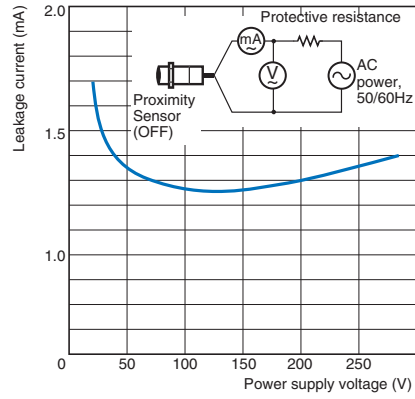


Leakage Current

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>Sensing object Present (High), Not present (Low)</p> <p>Load (between brown and black leads) Operate (High), Reset (Low)</p> <p>Output voltage (between black and blue leads) H, L</p> <p>Detection indicator (red) ON, OFF</p> | <p>*1. 200 mA max. (load current). *2. When a transistor is connected.</p> |
| | DC 2-wire | E2FQ-X2D1 E2FQ-X5D1 E2FQ-X10D1 | <p>Non-sensing area, Unstable sensing area, Stable sensing area</p> <p>Sensing object (%) 100, 80, 0</p> <p>Rated sensing distance</p> <p>Setting indicator (green) ON, OFF</p> <p>Operation indicator (red) ON, OFF</p> <p>Control output ON, OFF</p> | <p>Note: The load can be connected to either the +V or 0 V side.</p> |
| | AC 2-wire | E2FQ-X5Y1 E2FQ-X10Y1 | <p>Sensing object Present (High), Not present (Low)</p> <p>Load Operate (High), Reset (Low)</p> <p>Operation indicator (red) ON, OFF</p> | |

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.



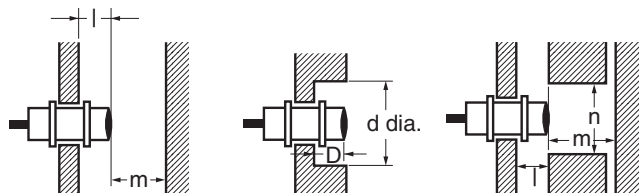
Precautions for Correct Use

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)

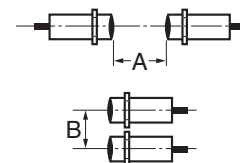
| Model | Item | l | d | D | m | n |
|-----------|------|---|----|---|----|----|
| E2FQ-X2□ | 0 | | 12 | 0 | 8 | 18 |
| E2FQ-X5□ | | | 18 | | 20 | 27 |
| E2FQ-X10□ | | | 30 | | 40 | 45 |

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

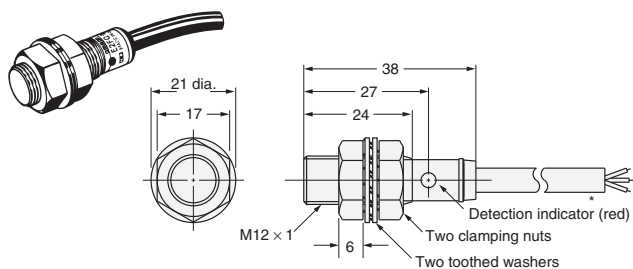
Chemical Resistance

Refer to *Chemical Resistance* for details.

Dimensions

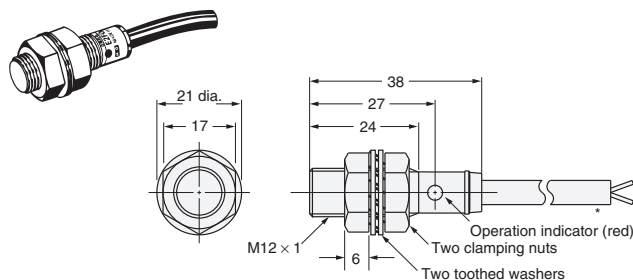
Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.

E2FQ-X2E1



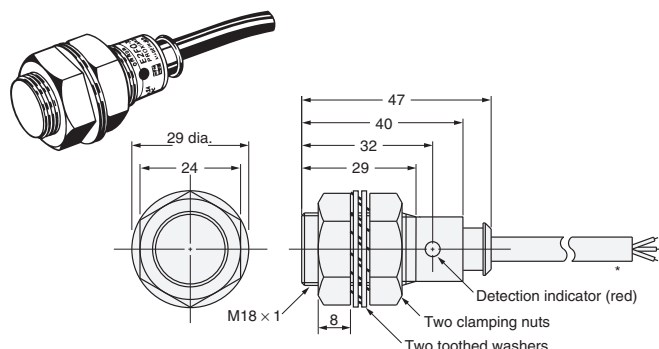
* 6-dia. vinyl-insulated round cable with 3 conductors (Flame resistant, Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m
The cable can be extended up to 200 m (separate metal conduit).

E2FQ-X2D1



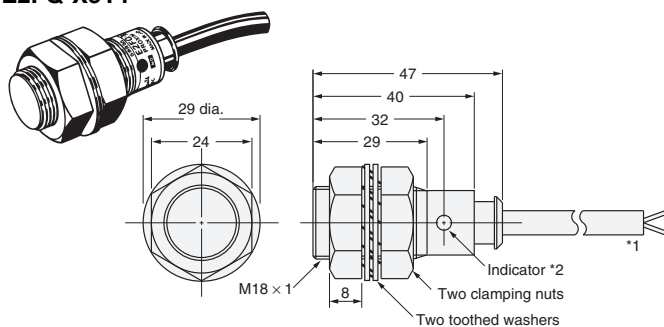
* 6-dia. vinyl-insulated round cable with 2 conductors (Flame resistant, Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m
The cable can be extended up to 200 m (separate metal conduit).

E2FQ-X5E1



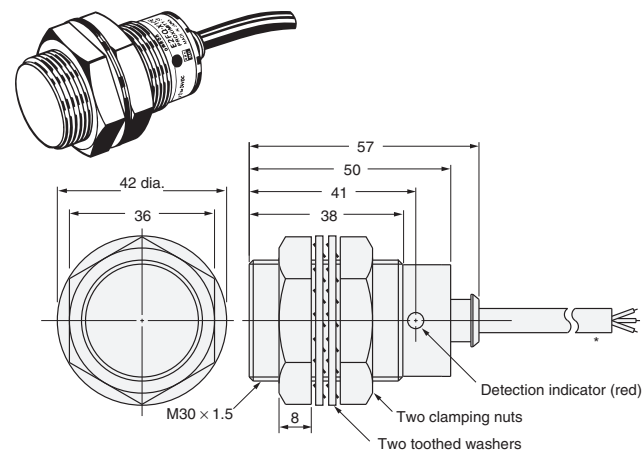
* 6-dia. vinyl-insulated round cable with 3 conductors (Flame resistant, Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m
The cable can be extended up to 200 m (separate metal conduit).

E2FQ-X5D1
E2FQ-X5Y1



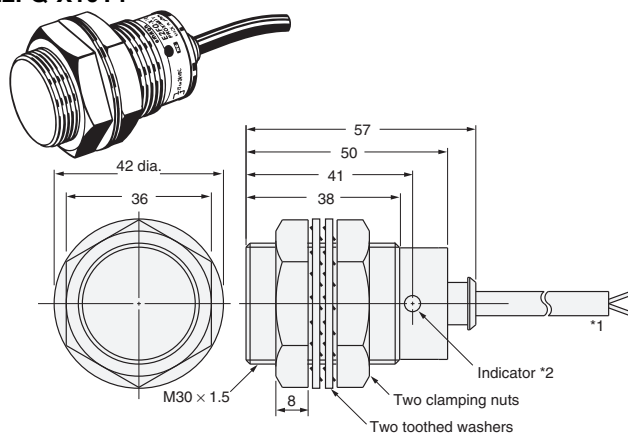
*1. 6-dia. vinyl-insulated round cable with 2 conductors (Flame-resistant, Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m
The cable can be extended up to 200 m (separate metal conduit).
*2. D1: Operation indicator (red) and Setting indicator (green)
Y1: Operation indicator (red)

E2FQ-X10E1



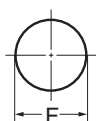
* 6-dia. vinyl-insulated round cable with 3 conductors (Flame resistant, Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m
The cable can be extended up to 200 m (separate metal conduit).

E2FQ-X10D1
E2FQ-X10Y1



*1. 6-dia. vinyl-insulated round cable with 2 conductors (Flame-resistant, Conductor cross section: 0.5 mm², 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 ^{+0.5} ₀ dia. |
| E2FQ-X5□ | 18.5 ^{+0.5} ₀ dia. |
| E2FQ-X10□ | 30.5 ^{+0.5} ₀ dia. |

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2017.7

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