

Long-distance Detection of Both Ferrous of Non-ferrous Metals

- Same sensing distance for non-ferrous metals, such as aluminum and brass, and ferrous metals.
- Maximum sensing distance of 10 mm.



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

Ordering Information

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

| Appearance | | Sensing distance | | | Output configuration | | Model | |
|------------|-----|------------------|--|--|----------------------|--|----------------|---------------|
| | | | | | | | Operation mode | |
| | | | | | | | NO | NC |
| Shielded | M12 | 2 mm | | | DC 3-wire NPN | | E2EV-X2C1 2M | E2EV-X2C2 2M |
| | M18 | 5 mm | | | | | E2EV-X5C1 2M | E2EV-X5C2 2M |
| | M30 | 10 mm | | | | | E2EV-X10C1 2M | E2EV-X10C2 2M |

Accessories (Order Separately)

[Mounting Brackets](#)

[Protective Covers](#)

[Sputter Protective Covers](#)

Refer to Y92□ for details.

Ratings and Specifications

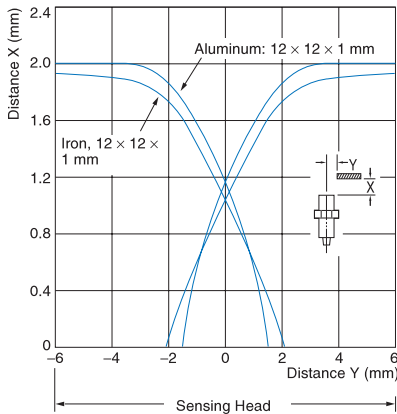
| Model | | E2EV-X2C1 E2EV-X2C2 | E2EV-X5C1 E2EV-X5C2 | E2EV-X10C1 E2EV-X10C2 |
|---|------------------|---|--------------------------|--------------------------|
| Item | | | | |
| Sensing distance | | 2mm ±10% | 5 mm ±10% | 10 mm ±10% |
| Set distance | | 0 to 1.4 mm | 0 to 3.5 mm | 0 to 7 mm |
| Differential travel | | 10% max. of sensing distance | | |
| Detectable object | | Ferrous metal and non-ferrous metal | | |
| Standard sensing object | | Aluminum: 12 × 12 × 1 mm | Aluminum: 18 × 18 × 1 mm | Aluminum: 30 × 30 × 1 mm |
| Response frequency * | | 150 Hz | 70 Hz | |
| Power supply voltage (operating voltage range) | | 12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max. | | |
| Current consumption | | 15 mA max. | | |
| Control output | Load current | NPN open-collector output, 100 mA max. (at 30 VDC) | | |
| | Residual voltage | 2 V max. (Load current: 100 mA, Cable length: 2 m) | | |
| Indicators | | Detection indicator (red) | | |
| Operation mode (with sens- ing object approaching) | | C1 Models: NO Refer to the timing charts under <i>I/O Circuit Diagrams</i> on page 4 for details. C2 Models: NC | | |
| Protection circuits | | Reverse polarity protection, Load short-circuit protection, Surge suppressor | | |
| Ambient temperature range | | Operating/Storage: –10 to 55°C (with no icing or condensation) | | |
| Ambient humidity range | | Operating/Storage: 35% to 95% (with no condensation) | | |
| Temperature influence | | ±20% max. of sensing distance at 23°C in the temperature range of –10 to 55°C | | |
| Voltage influence | | ±2.5% max. of sensing distance at rated voltage in the rated voltage ±15% range | | |
| Insulation resistance | | 50 MΩ min. (at 500 VDC) between current-carrying parts and case | | |
| Dielectric strength | | 1,000 VAC, 50/60 Hz for 1 minute 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: 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 (Standard cable length: 2 m) | | |
| Weight (packed state) | | Approx. 120 g | Approx. 140 g | Approx. 190 g |
| Materials | Case | Nickel-plated brass | | |
| | Sensing surface | Heat-resistant ABS | | |
| | Clamping nuts | Nickel-plated brass | | |
| | Toothed washer | Zinc-plated iron | | |
| 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 for the DC switching section of half the sensing distance.

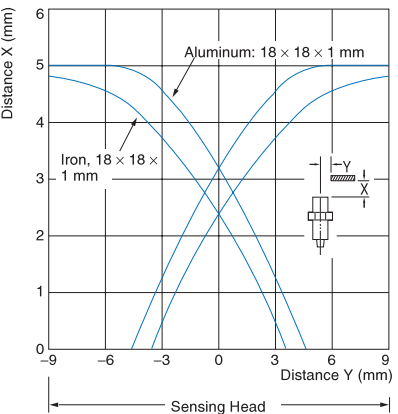
Engineering Data (Typical)

Sensing Area (Note: Other non-ferrous metal, such as stainless steel, copper, and brass, have the same characteristics.)

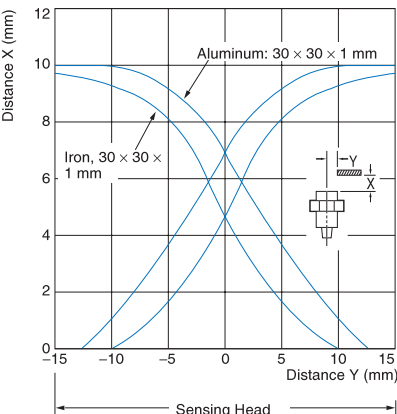
E2EV-X2C



E2EV-X5C

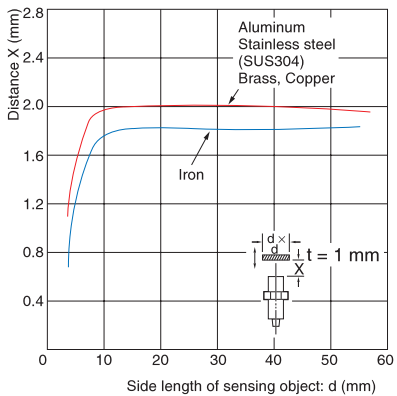


E2EV-X10C

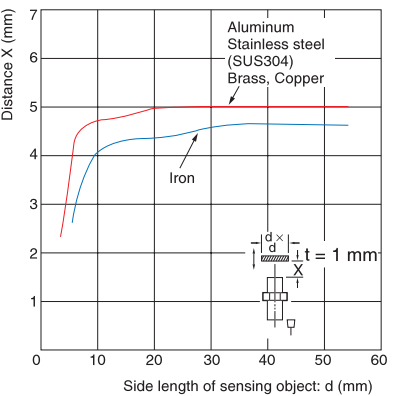


Influence of Sensing Object Size and Material

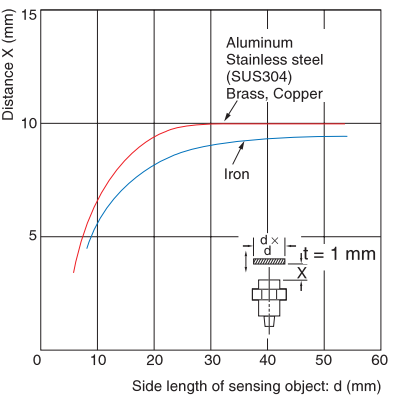
E2EV-X2C



E2EV-X5C

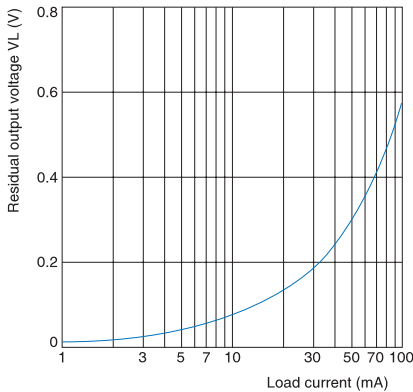


E2EV-X10C



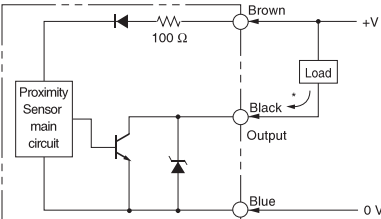
Residual Output Voltage

E2EV



I/O Circuit Diagrams

DC 3-Wire Models

| Operation mode | Model | Timing chart | Output circuit |
|----------------|--------------------------------------|---|--|
| NO | E2EV-X2C1 E2EV-X5C1 E2EV-X10C1 | <div><div>Sensing object</div><div>Present</div><div>Not present</div><div>Output transistor (load)</div><div>ON</div><div>OFF</div><div>Detection indicator (red)</div><div>ON</div><div>OFF</div></div> |  <p>*Load current: 100 mA max.</p> |
| | | | |
| NC | E2EV-X2C2 E2EV-X5C2 E2EV-X10C2 | <div><div>Sensing object</div><div>Present</div><div>Not present</div><div>Output transistor (load)</div><div>ON</div><div>OFF</div><div>Detection indicator (red)</div><div>ON</div><div>OFF</div></div> | |
| | | | |

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.



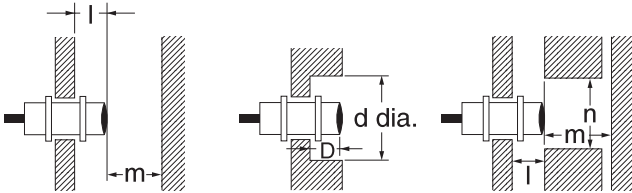
Precautions for Correct Use

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)

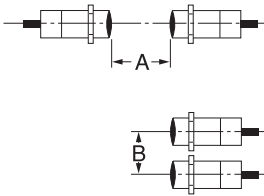
| Model | Item | l | d | D | m | n |
|------------|------|---|----|---|----|----|
| E2EV-X2C□ | | | 12 | | 8 | 18 |
| E2EV-X5C□ | | 0 | 18 | 0 | 20 | 27 |
| E2EV-X10C□ | | | 30 | | 40 | 45 |

Mutual Interference

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

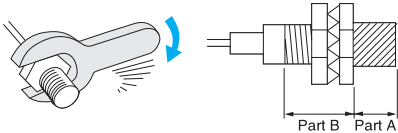
Mutual Interference (Unit: mm)

| Model | Item | A | B |
|------------|------|-----|----|
| E2EV-X2C□ | | 30 | 20 |
| E2EV-X5C□ | | 50 | 35 |
| E2EV-X10C□ | | 100 | 70 |



● Mounting

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



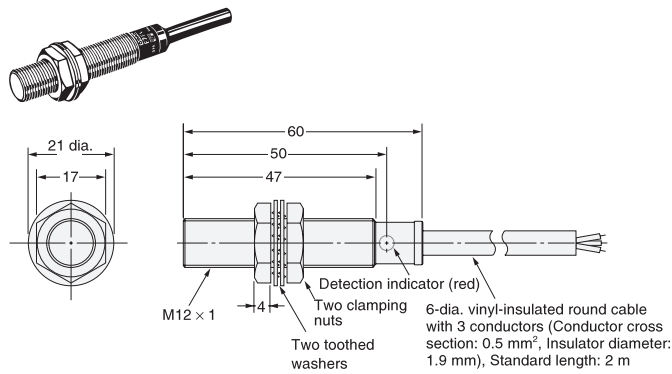
Note: 1. The allowable tightening strength depends on the distance from the edge of the head, as shown in the following table. (A is the distance from the edge of the head. B includes the nut on the head side. If the edge of the nut is in part A, the tightening torque for part A applies instead.)
2. The following strength assume washers are being used.

| Tightening Torque | Part A | | Part B |
|-------------------|----------------|---------|---------|
| | Dimension (mm) | Torque | Torque |
| E2EV-X2C□ | 17 | 5.9 N·m | 9.8 N·m |
| E2EV-X5C□ | 22 | 15 N·m | 49 N·m |
| E2EV-X10C□ | 26 | 39 N·m | 78 N·m |

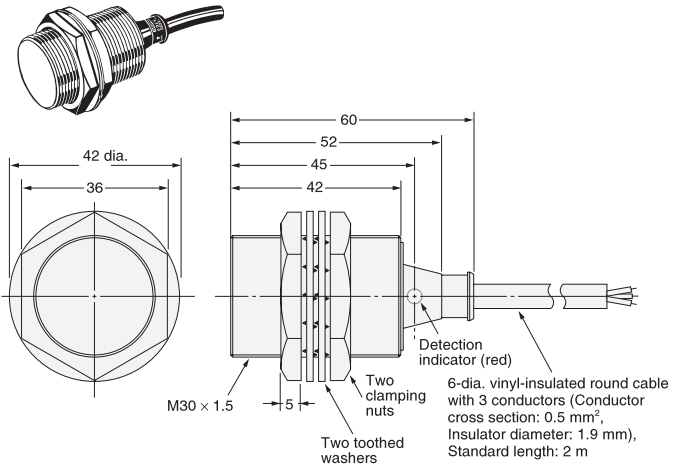
Dimensions

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

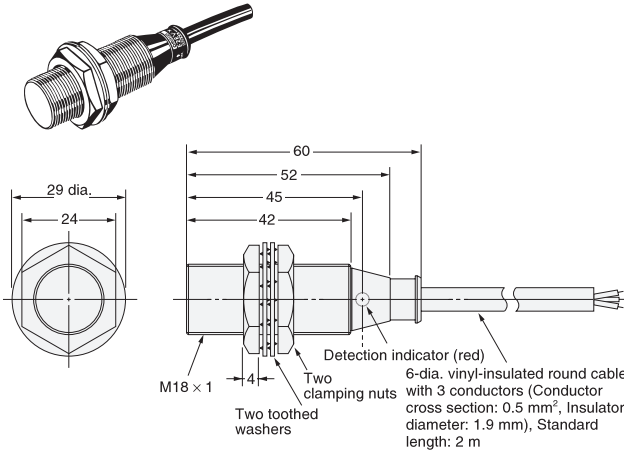
E2EV-X2C



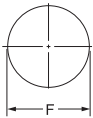
E2EV-X10C



E2EV-X5C



Mounting Hole Dimensions



| Model | F (mm) |
|-----------|--|
| E2EV-X2C | 12.5 ^{+0.5} ₀ dia. |
| E2EV-X5C | 18.5 ^{+0.5} ₀ dia. |
| E2EV-X10C | 30.5 ^{+0.5} ₀ dia. |

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