

## Proximity Sensor with a Long Screw Length



- Increased tightening strength. Cable protectors provided as a standard feature.
- Increased indicator visibility. A milled section for wrench grip on all models.



Be sure to read *Safety Precautions* on page 9.

## Ordering Information

### Sensors

#### DC 2-Wire Models

| Appearance                                                                                        |     | Sensing distance |  | Model            |                |
|---------------------------------------------------------------------------------------------------|-----|------------------|--|------------------|----------------|
|                                                                                                   |     |                  |  | Operation mode   |                |
|                                                                                                   |     |                  |  | NO               | NC             |
| Shielded<br>   | M12 | 3 mm             |  | E2E2-X3D1 2M *   | E2E2-X3D2 2M   |
|                                                                                                   | M18 | 7 mm             |  | E2E2-X7D1 2M *   | E2E2-X7D2 2M   |
|                                                                                                   | M30 | 10 mm            |  | E2E2-X10D1 2M *  | E2E2-X10D2 2M  |
| Unshielded<br> | M12 | 8 mm             |  | E2E2-X8MD1 2M *  | E2E2-X8MD2 2M  |
|                                                                                                   | M18 | 14 mm            |  | E2E2-X14MD1 2M * | E2E2-X14MD2 2M |
|                                                                                                   | M30 | 20 mm            |  | E2E2-X20MD1 2M * | E2E2-X20MD2 2M |

\* Models with different frequencies are also available. The model numbers are E2E2-X□D15 (example: E2E2-X3D15).

#### DC 3-Wire Models

| Appearance                                                                                        |     | Sensing distance |  | Model          |                |
|---------------------------------------------------------------------------------------------------|-----|------------------|--|----------------|----------------|
|                                                                                                   |     |                  |  | Operation mode |                |
|                                                                                                   |     |                  |  | NO             | NC             |
| Shielded<br>   | M12 | 2 mm             |  | E2E2-X2C1 2M   | E2E2-X2C2 2M   |
|                                                                                                   | M18 | 5 mm             |  | E2E2-X5C1 2M   | E2E2-X5C2 2M   |
|                                                                                                   | M30 | 10 mm            |  | E2E2-X10C1 2M  | E2E2-X10C2 2M  |
| Unshielded<br> | M12 | 5 mm             |  | E2E2-X5MC1 2M  | E2E2-X5MC2 2M  |
|                                                                                                   | M18 | 10 mm            |  | E2E2-X10MC1 2M | E2E2-X10MC2 2M |
|                                                                                                   | M30 | 18 mm            |  | E2E2-X18MC1 2M | E2E2-X18MC2 2M |

#### AC 2-Wire Models

| Appearance                                                                                        |     | Sensing distance |  | Model          |                |
|---------------------------------------------------------------------------------------------------|-----|------------------|--|----------------|----------------|
|                                                                                                   |     |                  |  | Operation mode |                |
|                                                                                                   |     |                  |  | NO             | NC             |
| Shielded<br>   | M12 | 2 mm             |  | E2E2-X2Y1 2M   | E2E2-X2Y2 2M   |
|                                                                                                   | M18 | 5 mm             |  | E2E2-X5Y1 2M   | E2E2-X5Y2 2M   |
|                                                                                                   | M30 | 10 mm            |  | E2E2-X10Y1 2M  | E2E2-X10Y2 2M  |
| Unshielded<br> | M12 | 5 mm             |  | E2E2-X5MY1 2M  | E2E2-X5MY2 2M  |
|                                                                                                   | M18 | 10 mm            |  | E2E2-X10MY1 2M | E2E2-X10MY2 2M |
|                                                                                                   | M30 | 18 mm            |  | E2E2-X18MY1 2M | E2E2-X18MY2 2M |

## Accessories (Order Separately)

Mounting Brackets

Protective Covers

Sputter Protective Covers

## Ratings and Specifications

### E2E2-X□D□ DC 2-Wire Models

| Size<br>Shielding<br>Model                               |                       | M12                                                                                                                   |                         | M18                     |                         | M30                     |                         |
|----------------------------------------------------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
|                                                          |                       | Shielded                                                                                                              | Unshielded              | Shielded                | Unshielded              | Shielded                | Unshielded              |
| Item                                                     |                       | E2E2-X3D□                                                                                                             | E2E2-X8MD□              | E2E2-X7D□               | E2E2-X14MD□             | E2E2-X10D□              | E2E2-X20MD□             |
| Sensing distance                                         |                       | 3 mm±10%                                                                                                              | 8 mm±10%                | 7 mm±10%                | 14 mm±10%               | 10 mm±10%               | 20 mm±10%               |
| Set distance *1                                          |                       | 0 to 2.4 mm                                                                                                           | 0 to 6.4 mm             | 0 to 5.6 mm             | 0 to 11.2 mm            | 0 to 8 mm               | 0 to 16 mm              |
| Differential travel                                      |                       | 10% max. of sensing distance                                                                                          |                         |                         |                         |                         |                         |
| Sensing object                                           |                       | Ferrous metal (The sensing distance decreases with non-ferrous metal. Refer to <i>Engineering Data</i> on page 5.)    |                         |                         |                         |                         |                         |
| Standard sensing object                                  |                       | Iron,<br>12 × 12 × 1 mm                                                                                               | Iron,<br>30 × 30 × 1 mm | Iron,<br>18 × 18 × 1 mm | Iron,<br>30 × 30 × 1 mm | Iron,<br>30 × 30 × 1 mm | Iron,<br>54 × 54 × 1 mm |
| Response frequency *2                                    |                       | 1 kHz                                                                                                                 | 800 Hz                  | 500 Hz                  | 400 Hz                  |                         | 100 Hz                  |
| Power supply voltage<br>(operating voltage range)        |                       | 12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.                                                                   |                         |                         |                         |                         |                         |
| Leakage current                                          |                       | 0.8 mA max.                                                                                                           |                         |                         |                         |                         |                         |
| Control<br>output                                        | Switching<br>capacity | 3 to 100 mA                                                                                                           |                         |                         |                         |                         |                         |
|                                                          | Residual voltage      | 3 V max. (Load current: 100 mA, Cable length: 2 m)                                                                    |                         |                         |                         |                         |                         |
| Indicators                                               |                       | D1 Models: Operation indicator (red) and setting indicator (green)<br>D2 Models: Operation indicator (red)            |                         |                         |                         |                         |                         |
| Operation mode<br>(with sensing object ap-<br>proaching) |                       | D1 Models: NO    Refer to the timing charts under <i>I/O Circuit Diagrams</i> on page 8 for details.<br>D2 Models: NC |                         |                         |                         |                         |                         |
| Protection circuits                                      |                       | Surge absorber, Load short-circuit protection                                                                         |                         |                         |                         |                         |                         |
| Ambient temperature                                      |                       | Operating/Storage: –25 to 70°C (with no icing or condensation)                                                        |                         |                         |                         |                         |                         |
| Ambient humidity                                         |                       | 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                                        |                       | ±1% 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                                      |                       | 1000 VAC, 50/60 Hz for 1 minute between current-carrying parts and case                                               |                         |                         |                         |                         |                         |
| Vibration resistance<br>(destruction)                    |                       | 10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions                                       |                         |                         |                         |                         |                         |
| Shock resistance<br>(destruction)                        |                       | 1,000 m/s <sup>2</sup> 10 times each in X, Y, and Z directions                                                        |                         |                         |                         |                         |                         |
| Degree of protection                                     |                       | IEC IP67, in-house standard for oil resistance                                                                        |                         |                         |                         |                         |                         |
| Connection method                                        |                       | Pre-wired Models (Standard cable length: 2 m)                                                                         |                         |                         |                         |                         |                         |
| Weight (packed state)                                    |                       | Approx. 65 g                                                                                                          |                         | Approx. 150 g           |                         | Approx. 210 g           |                         |
| Materi-<br>als                                           | Case                  | Brass                                                                                                                 |                         |                         |                         |                         |                         |
|                                                          | Sensing surface       | PBT                                                                                                                   |                         |                         |                         |                         |                         |
|                                                          | Clamping nuts         | Nickel-plated brass                                                                                                   |                         |                         |                         |                         |                         |
|                                                          | Toothed washer        | Zinc-plated iron                                                                                                      |                         |                         |                         |                         |                         |
| Accessories                                              |                       | Instruction sheet                                                                                                     |                         |                         |                         |                         |                         |

\*1. Use the E2E2 within the range in which the setting indicator (green LED) is ON (except D2 Models).

\*2. 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.

## E2E2-X□C□ DC 3-Wire Models

| Size<br>Shielding                                 |                  | M12                                                                                                                                                            |                         | M18                     |                         | M30                     |                         |
|---------------------------------------------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
|                                                   |                  | Shielded                                                                                                                                                       | Unshielded              | Shielded                | Unshielded              | Shielded                | Unshielded              |
| Item                                              | Model            | E2E2-X2C□                                                                                                                                                      | E2E2-X5MC□              | E2E2-X5C□               | E2E2-X10MC□             | E2E2-X10C□              | E2E2-X18MC□             |
| Sensing distance                                  |                  | 2 mm±10%                                                                                                                                                       | 5 mm±10%                | 5 mm±10%                | 10 mm±10%               | 10 mm±10%               | 18 mm±10%               |
| Set distance                                      |                  | 0 to 1.6 mm                                                                                                                                                    | 0 to 4 mm               | 0 to 4 mm               | 0 to 8 mm               | 0 to 8 mm               | 0 to 14 mm              |
| Differential travel                               |                  | 10% max. of sensing distance                                                                                                                                   |                         |                         |                         |                         |                         |
| Sensing object                                    |                  | Ferrous metal (The sensing distance decreases with non-ferrous metal. Refer to <i>Engineering Data</i> on page 5.)                                             |                         |                         |                         |                         |                         |
| Standard sensing object                           |                  | Iron,<br>12 × 12 × 1 mm                                                                                                                                        | Iron,<br>15 × 15 × 1 mm | Iron,<br>18 × 18 × 1 mm | Iron,<br>30 × 30 × 1 mm | Iron,<br>30 × 30 × 1 mm | Iron,<br>54 × 54 × 1 mm |
| Response frequency *1                             |                  | 1.5 kHz                                                                                                                                                        | 400 Hz                  | 600 Hz                  | 200 Hz                  | 400 Hz                  | 100 Hz                  |
| Power supply voltage (operating voltage range) *2 |                  | 12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.                                                                                                            |                         |                         |                         |                         |                         |
| Leakage current                                   |                  | 13 mA max.                                                                                                                                                     |                         |                         |                         |                         |                         |
| Control output                                    | Load current     | NPN open-collector output, 200 mA max. (30 VDC max.)                                                                                                           |                         |                         |                         |                         |                         |
|                                                   | Residual voltage | 2 V max. (Load current: 200 mA, Cable length: 2 m)                                                                                                             |                         |                         |                         |                         |                         |
| Indicators                                        |                  | Operation indicator (red)                                                                                                                                      |                         |                         |                         |                         |                         |
| Operation mode (with sensing object approaching)  |                  | C1 Models: NO    Refer to the timing charts under <i>I/O Circuit Diagrams</i> on page 8 for details.<br>C2 Models: NC                                          |                         |                         |                         |                         |                         |
| Protection circuits                               |                  | Reverse polarity protection, Surge absorber, Load short-circuit protection                                                                                     |                         |                         |                         |                         |                         |
| Ambient temperature                               |                  | Operating/Storage: −40 to 85°C (with no icing or condensation)                                                                                                 |                         |                         |                         |                         |                         |
| Ambient humidity                                  |                  | Operating/Storage: 35% to 95% (with no condensation)                                                                                                           |                         |                         |                         |                         |                         |
| Temperature influence                             |                  | ±15% max. of sensing distance at 23°C in the temperature range of −40 to 85°C<br>±10% max. of sensing distance at 23°C in the temperature range of −25 to 70°C |                         |                         |                         |                         |                         |
| Voltage influence                                 |                  | ±1% 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 carry 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/s² 10 times each in X, Y, and Z directions                                                                                                             |                         |                         |                         |                         |                         |
| Degree of protection                              |                  | IEC IP67, in-house standard for oil resistance                                                                                                                 |                         |                         |                         |                         |                         |
| Connection method                                 |                  | Pre-wired Models (Standard cable length: 2 m) and Connector Models                                                                                             |                         |                         |                         |                         |                         |
| Weight (packed state)                             |                  | Approx. 75 g                                                                                                                                                   |                         | Approx. 160 g           |                         | Approx. 220 g           |                         |
| Materials                                         | Case             | Brass                                                                                                                                                          |                         |                         |                         |                         |                         |
|                                                   | Sensing surface  | PBT                                                                                                                                                            |                         |                         |                         |                         |                         |
|                                                   | Clamping nuts    | Nickel-plated brass                                                                                                                                            |                         |                         |                         |                         |                         |
|                                                   | Toothed washer   | Zinc-plated iron                                                                                                                                               |                         |                         |                         |                         |                         |
| Accessories                                       |                  | Instruction sheet                                                                                                                                              |                         |                         |                         |                         |                         |

\*1. 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.

\*2. A full-wave rectification power supply of 24 VDC ±20% (average value) can be used.

## E2E2-X□Y□ AC 2-Wire Models

| Size<br>Shielding<br>Model                        |                  | M12                                                                                                                                                             |                         | M18                     |                         | M30                     |                         |
|---------------------------------------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
|                                                   |                  | Shielded                                                                                                                                                        | Unshielded              | Shielded                | Unshielded              | Shielded                | Unshielded              |
| Item                                              |                  | E2E2-X2Y□                                                                                                                                                       | E2E2-X5MY□              | E2E2-X5Y□               | E2E2-X10MY□             | E2E2-X10Y□              | E2E2-X18MY□             |
| Sensing distance                                  |                  | 2 mm±10%                                                                                                                                                        | 5 mm±10%                | 5 mm±10%                | 10 mm±10%               | 10 mm±10%               | 18 mm±10%               |
| Set distance                                      |                  | 0 to 1.6 mm                                                                                                                                                     | 0 to 4 mm               | 0 to 4 mm               | 0 to 8 mm               | 0 to 8 mm               | 0 to 14 mm              |
| Differential travel                               |                  | 10% max. of sensing distance                                                                                                                                    |                         |                         |                         |                         |                         |
| Sensing object                                    |                  | Ferrous metal (The sensing distance decreases with non-ferrous metal. Refer to <i>Engineering Data</i> on page 5.)                                              |                         |                         |                         |                         |                         |
| Standard sensing object                           |                  | Iron,<br>12 × 12 × 1 mm                                                                                                                                         | Iron,<br>15 × 15 × 1 mm | Iron,<br>18 × 18 × 1 mm | Iron,<br>30 × 30 × 1 mm | Iron,<br>30 × 30 × 1 mm | Iron,<br>54 × 54 × 1 mm |
| Response frequency                                |                  | 25 Hz                                                                                                                                                           |                         |                         |                         |                         |                         |
| Power supply voltage (operating voltage range) *1 |                  | 24 to 240 VAC (20 to 264 VAC), 50/60 Hz                                                                                                                         |                         |                         |                         |                         |                         |
| Leakage current                                   |                  | 1.7 mA max.                                                                                                                                                     |                         |                         |                         |                         |                         |
| Control output                                    | Load current *2  | 5 to 200 mA                                                                                                                                                     |                         | 5 to 300 mA             |                         |                         |                         |
|                                                   | Residual voltage | Refer to <i>Engineering Data</i> on page 5.                                                                                                                     |                         |                         |                         |                         |                         |
| Indicators                                        |                  | Operation indicator (red)                                                                                                                                       |                         |                         |                         |                         |                         |
| Operation mode (with sensing object approaching)  |                  | Y1 Models: NO    Refer to the timing charts under <i>I/O Circuit Diagrams</i> on page 8 for details.<br>Y2 Models: NC                                           |                         |                         |                         |                         |                         |
| Ambient temperature *1, 2                         |                  | Operating/Storage: −40 to 85°C (with no icing or condensation)                                                                                                  |                         |                         |                         |                         |                         |
| Ambient humidity                                  |                  | Operating/Storage: 35% to 95% (with no condensation)                                                                                                            |                         |                         |                         |                         |                         |
| Temperature influence                             |                  | ±15% max. of sensing distance at 23°C in the temperature range of −40 to 85°C,<br>±10% max. of sensing distance at 23°C in the temperature range of −25 to 70°C |                         |                         |                         |                         |                         |
| Voltage influence                                 |                  | ±1% 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                               |                  | 4,000 VAC, 50/60 Hz for 1 minute between current carry 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/s² 10 times each in X, Y, and Z directions                                                                                                              |                         |                         |                         |                         |                         |
| Degree of protection                              |                  | IEC IP67, in-house standard for oil resistance                                                                                                                  |                         |                         |                         |                         |                         |
| Connection method                                 |                  | Pre-wired Models (Standard cable length: 2 m) and Connector Models                                                                                              |                         |                         |                         |                         |                         |
| Weight (packed state)                             |                  | Approx. 65 g                                                                                                                                                    |                         | Approx. 150 g           |                         | Approx. 210 g           |                         |
| Materials                                         | Case             | Brass                                                                                                                                                           |                         |                         |                         |                         |                         |
|                                                   | Sensing surface  | PBT                                                                                                                                                             |                         |                         |                         |                         |                         |
|                                                   | Clamping nuts    | Nickel-plated brass                                                                                                                                             |                         |                         |                         |                         |                         |
|                                                   | Toothed washer   | Zinc-plated iron                                                                                                                                                |                         |                         |                         |                         |                         |
| Accessories                                       |                  | Instruction sheet                                                                                                                                               |                         |                         |                         |                         |                         |

\*1. When supplying 24 VAC to any of the above models, make sure that the operating ambient temperature range is at least –25°C to 85°C.

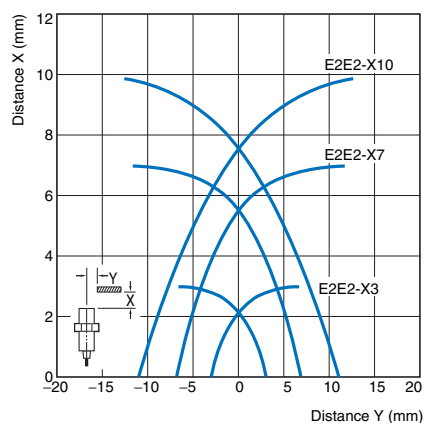
\*2. When using an M18 or M30 Connector Model at an ambient temperature between 70 and 85°C, make sure that the Sensor has a control output (load current) of 5 to 200 mA max.

## Engineering Data (Reference Value)

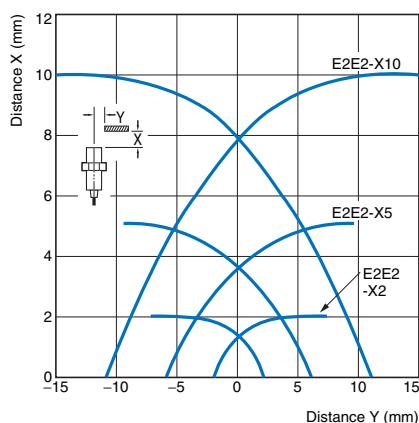
### Sensing Area

#### Shielded Models

##### E2E2-X□D□

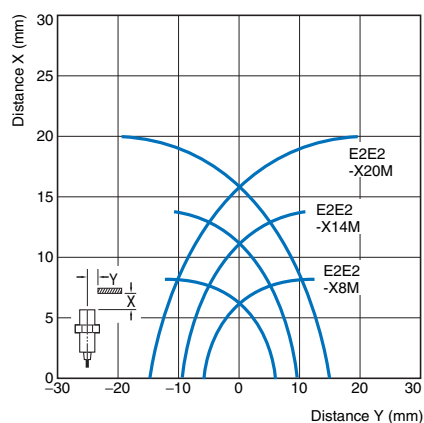


##### E2E2-X□C□/-X□Y□

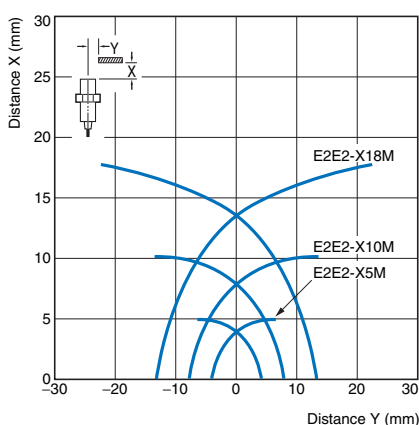


#### Unshielded Models

##### E2E2-X□MD□

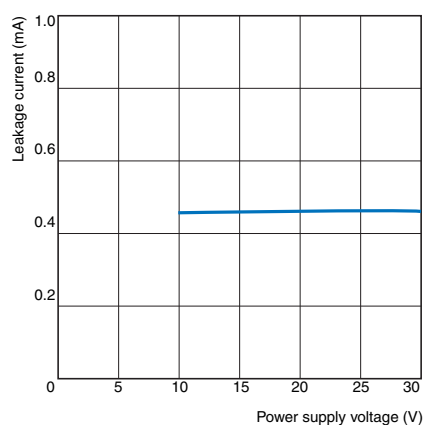


##### E2E2-X□MC□/-X□MY□

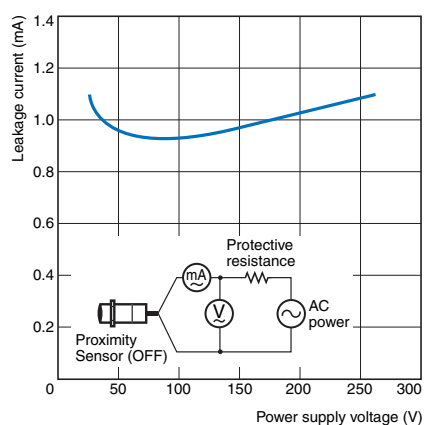


### Leakage Current

#### E2E2-X□D□

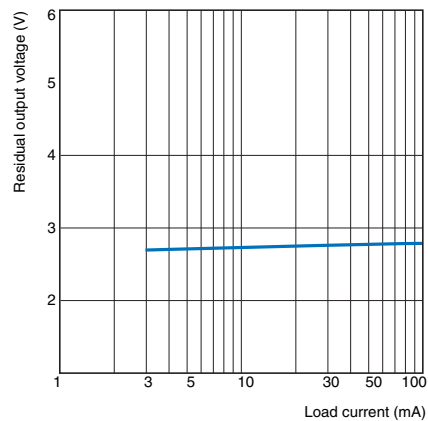


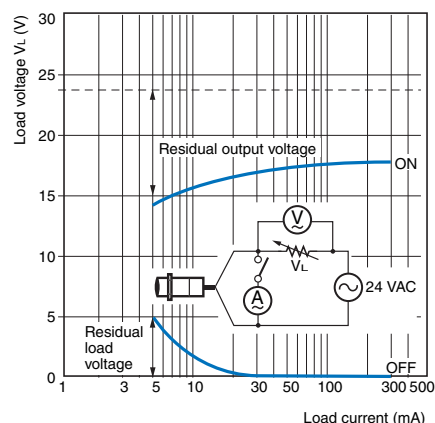
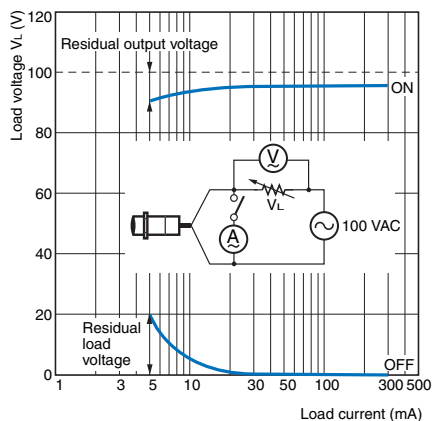
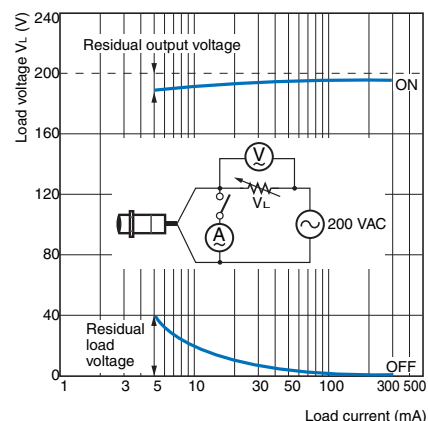
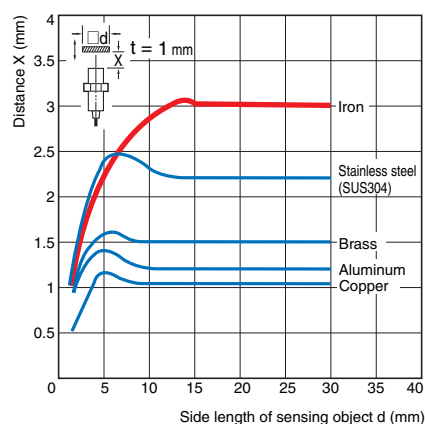
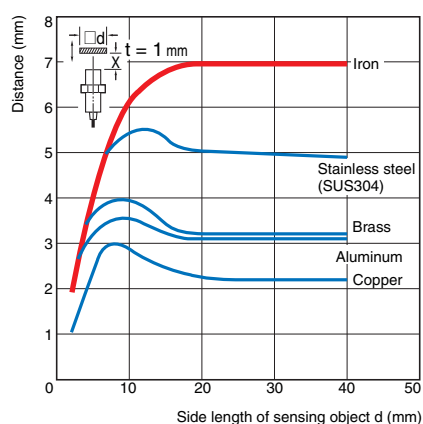
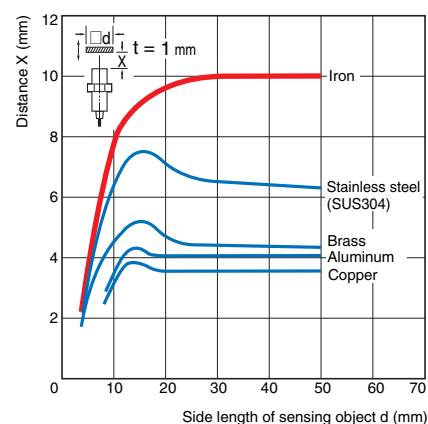
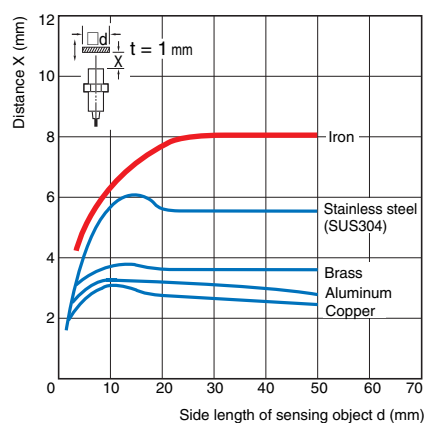
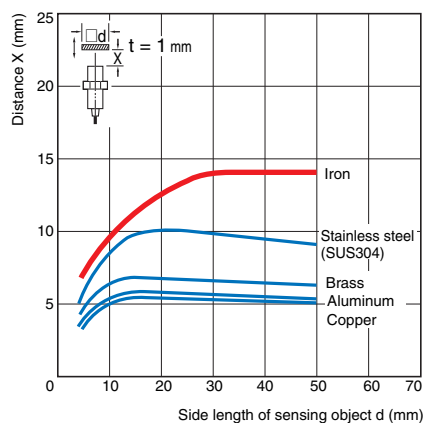
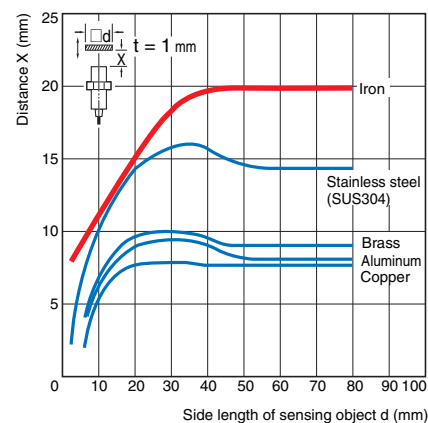
#### E2E2-X□Y□

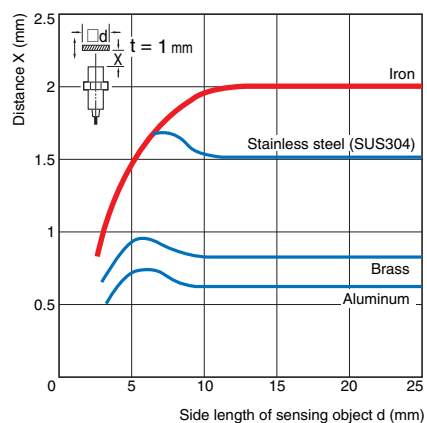
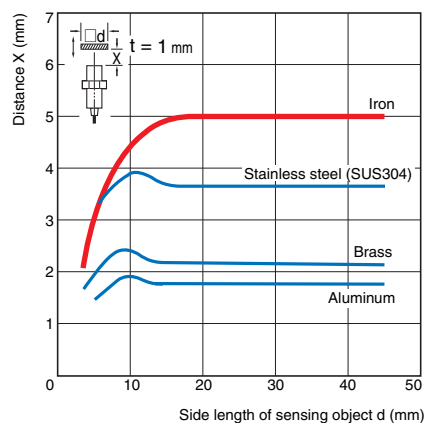
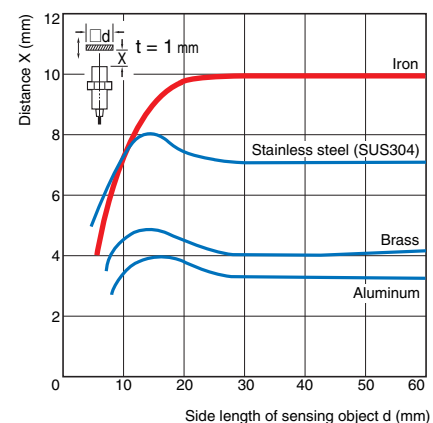
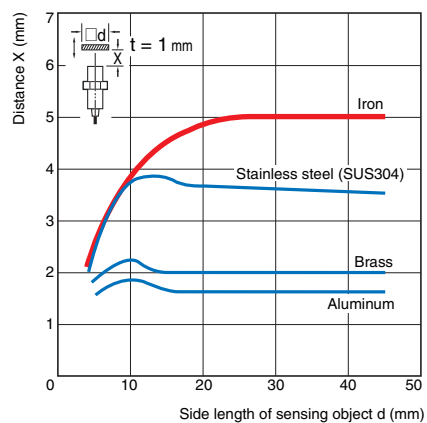
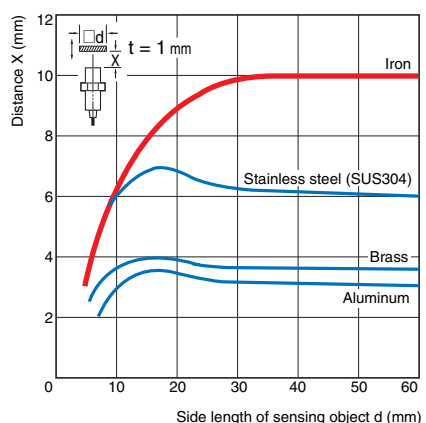
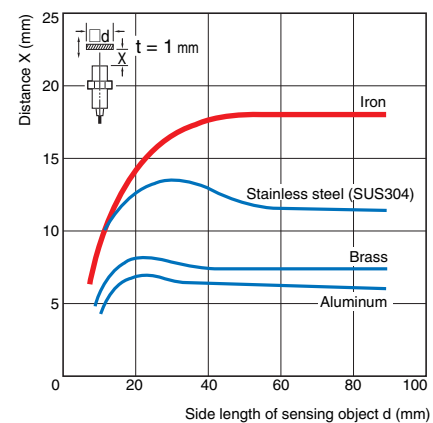


### Residual Output Voltage

#### E2E2-X□D□



**E2E2-X□Y□****at 24 VAC****E2E2-X□Y□****at 100 VAC****E2E2-X□Y□****at 200 VAC****Influence of Sensing Object Size and Material****E2E2-X3D□****E2E2-X7D□****E2E2-X10D□****E2E2-X8MD□****E2E2-X14MD□****E2E2-X20MD□**

**E2E2-X2C□/-X2Y□****E2E2-X5C□/-X5Y□****E2E2-X10C□/-X10Y□****E2E2-X5MC□/-X5MY□****E2E2-X10MC□/-X10MY□****E2E2-X18MC□/-X18MY□**

## I/O Circuit Diagrams

### DC 2-Wire Models

| Operation mode | Model                                                                            | Timing Charts                                                                                                                                                                                                                                                                                             | Output circuit                                                       |
|----------------|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|
| NO             | E2E2-X3D1<br>E2E2-X7D1<br>E2E2-X10D1<br>E2E2-X8MD1<br>E2E2-X14MD1<br>E2E2-X20MD1 | <p>Non-sensing area    Unstable sensing area    Stable sensing area</p> <p>Sensing object</p> <p>(%)    100    80    0</p> <p>Rated sensing distance</p> <p>Proximity Sensor</p> <p>ON Setting indicator<br/>OFF (green)</p> <p>ON Operation indicator (red)<br/>OFF</p> <p>ON Control output<br/>OFF</p> | <p>Note: The load can be connected to either the +V or 0 V side.</p> |
|                | E2E2-X3D2<br>E2E2-X7D2<br>E2E2-X10D2<br>E2E2-X8MD2<br>E2E2-X14MD2<br>E2E2-X20MD2 | <p>Non-sensing area    Stable sensing area</p> <p>Sensing object</p> <p>(%)    100    0</p> <p>Rated sensing distance</p> <p>Proximity Sensor</p> <p>ON Operation indicator (red)<br/>OFF</p> <p>ON Control output<br/>OFF</p>                                                                            |                                                                      |

### DC 3-Wire Models

| Operation mode | Model                                                                            | Timing Charts                                                                                                                    | Output circuit |
|----------------|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|----------------|
| NO             | E2E2-X2C1<br>E2E2-X5C1<br>E2E2-X10C1<br>E2E2-X5MC1<br>E2E2-X10MC1<br>E2E2-X18MC1 | <p>Sensing object    Present    Not present</p> <p>Operation indicator (red)    ON    OFF</p> <p>Control output    ON    OFF</p> |                |
|                | E2E2-X2C2<br>E2E2-X5C2<br>E2E2-X10C2<br>E2E2-X5MC2<br>E2E2-X10MC2<br>E2E2-X18MC2 | <p>Sensing object    Present    Not present</p> <p>Operation indicator (red)    ON    OFF</p> <p>Control output    ON    OFF</p> |                |



## AC 2-Wire Models

| Operation mode | Model       | Timing Charts                                                                                                     | Output circuit |
|----------------|-------------|-------------------------------------------------------------------------------------------------------------------|----------------|
| NO             | E2E2-X2Y1   | Sensing object    Present<br>Not present<br>Operation indicator (red)    ON<br>OFF<br>Control output    ON<br>OFF |                |
|                | E2E2-X5Y1   |                                                                                                                   |                |
|                | E2E2-X10Y1  |                                                                                                                   |                |
|                | E2E2-X5MY1  |                                                                                                                   |                |
|                | E2E2-X10MY1 |                                                                                                                   |                |
|                | E2E2-X18MY1 |                                                                                                                   |                |
| NC             | E2E2-X2Y2   | Sensing object    Present<br>Not present<br>Operation indicator (red)    ON<br>OFF<br>Control output    ON<br>OFF |                |
|                | E2E2-X5Y2   |                                                                                                                   |                |
|                | E2E2-X10Y2  |                                                                                                                   |                |
|                | E2E2-X5MY2  |                                                                                                                   |                |
|                | E2E2-X10MY2 |                                                                                                                   |                |
|                | E2E2-X18MY2 |                                                                                                                   |                |

## Safety Precautions

**⚠ WARNING**

This product is not designed or rated for ensuring safety of persons either directly or indirectly.



Do not use it for such purposes.

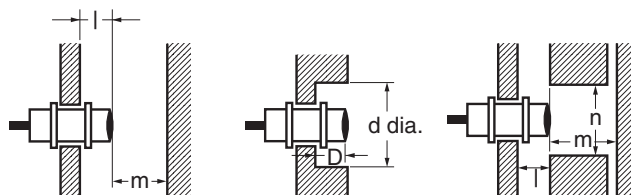
**Precautions for Correct Use**

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.

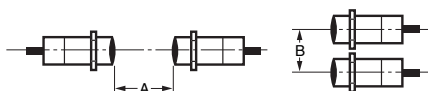


(Unit: mm)

| Model                                                          |            | Item | M12 | M18 | M30 |
|----------------------------------------------------------------|------------|------|-----|-----|-----|
| DC 2-Wire Models<br>E2E2-X□D□                                  | Shielded   | l    | 0   | 0   | 0   |
|                                                                |            | d    | 12  | 18  | 30  |
|                                                                |            | D    | 0   | 0   | 0   |
|                                                                |            | m    | 8   | 20  | 40  |
|                                                                |            | n    | 18  | 27  | 45  |
|                                                                | Unshielded | l    | 15  | 22  | 30  |
|                                                                |            | d    | 40  | 70  | 90  |
|                                                                |            | D    | 15  | 22  | 30  |
|                                                                |            | m    | 20  | 40  | 70  |
|                                                                |            | n    | 40  | 70  | 90  |
| DC 3-Wire Models<br>E2E2-X□C□<br>AC 2-Wire Models<br>E2E2-X□Y□ | Shielded   | l    | 0   | 0   | 0   |
|                                                                |            | d    | 12  | 18  | 30  |
|                                                                |            | D    | 0   | 0   | 0   |
|                                                                |            | m    | 8   | 20  | 40  |
|                                                                |            | n    | 18  | 27  | 45  |
|                                                                | Unshielded | l    | 15  | 22  | 30  |
|                                                                |            | d    | 40  | 55  | 90  |
|                                                                |            | D    | 15  | 22  | 30  |
|                                                                |            | m    | 20  | 40  | 70  |
|                                                                |            | n    | 36  | 54  | 90  |

### 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 | M12         | M18          | M30          |
|----------------------------------------------------------------|------------|------|-------------|--------------|--------------|
| DC 2-Wire Models<br>E2E2-X□D□                                  | Shielded   | A    | 30<br>(20)  | 50<br>(30)   | 100<br>(50)  |
|                                                                |            | B    | 20<br>(12)  | 35<br>(18)   | 70<br>(35)   |
|                                                                | Unshielded | A    | 120<br>(60) | 200<br>(100) | 300<br>(100) |
|                                                                |            | B    | 100<br>(50) | 110<br>(60)  | 200<br>(100) |
| DC 3-Wire Models<br>E2E2-X□C□<br>AC 2-Wire Models<br>E2E2-X□Y□ | Shielded   | A    | 30          | 50           | 100          |
|                                                                |            | B    | 20          | 35           | 70           |
|                                                                | Unshielded | A    | 120         | 200          | 300          |
|                                                                |            | B    | 100         | 110          | 200          |

Note: Values in parentheses apply to Sensors operating at different frequencies.

### ● Mounting



### tening Torque

Do not tighten the nut with excessive force.

A washer must be used with the nut.

The following strengths assume washers are being used.

| Model | Torque  |
|-------|---------|
| M12   | 30 N·m  |
| M18   | 70 N·m  |
| M30   | 180 N·m |

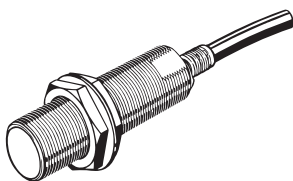
### Relationship between Sizes and Models

|     | Size       | Model       |
|-----|------------|-------------|
| M12 | Shielded   | E2E2-X3D□   |
|     |            | E2E2-X2C□   |
|     |            | E2E2-X2Y□   |
|     | Unshielded | E2E2-X8MD□  |
|     |            | E2E2-X5MC□  |
|     |            | E2E2-X5MY□  |
| M18 | Shielded   | E2E2-X7D□   |
|     |            | E2E2-X5C□   |
|     |            | E2E2-X5Y□   |
|     | Unshielded | E2E2-X14MD□ |
|     |            | E2E2-X10MC□ |
|     |            | E2E2-X10MY□ |
| M30 | Shielded   | E2E2-X10D□  |
|     |            | E2E2-X10C□  |
|     |            | E2E2-X10Y□  |
|     | Unshielded | E2E2-X20MD□ |
|     |            | E2E2-X18MC□ |
|     |            | E2E2-X18MY□ |

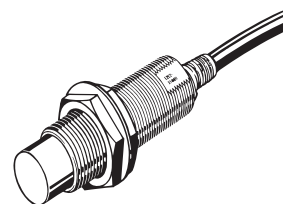
## Dimensions

Unless otherwise specified, the tolerance class IT16 is used for dimensions in this data sheet.

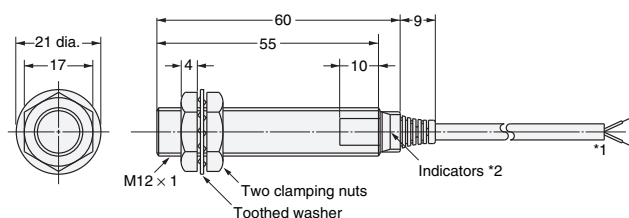
### Shielded



### Unshielded

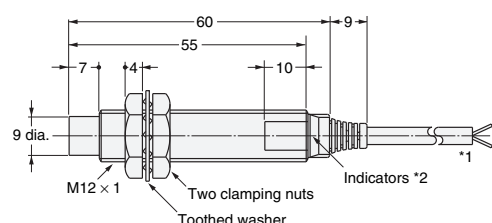


#### E2E2-X3D□/E2E2-X2C□/E2E2-X2Y□



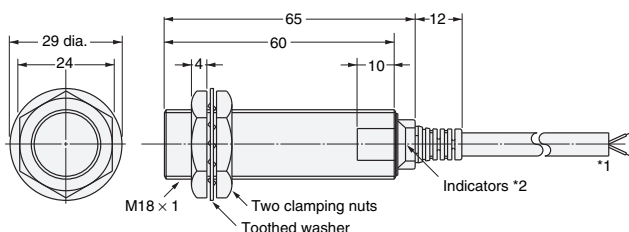
- \*1. 4-dia. vinyl-insulated round cable with 2 conductors  
(Conductor cross section: 0.3 mm<sup>2</sup>, Insulator diameter: 1.3 mm),  
Standard length: 2 m  
4-dia. vinyl-insulated round cable with 3 conductors  
(Conductor cross section: 0.3 mm<sup>2</sup>, Insulator diameter: 1.3 mm),  
Standard length: 2 m  
The cable can be extended to up to 200 m (Separate metal conduit.)  
\*2. D Models: Operation indicator (red) and setting indicator (green),  
C/Y Models: Operation indicator (red)

#### E2E2-X8MD□/E2E2-X5MC□/E2E2-X5MY□



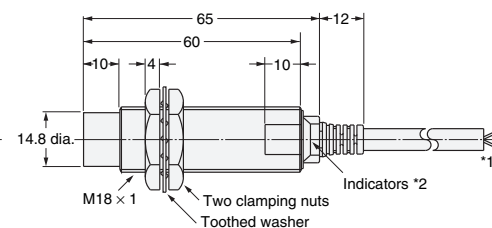
- \*1. 4-dia. vinyl-insulated round cable with 2 conductors  
(Conductor cross section: 0.3 mm<sup>2</sup>, Insulator diameter: 1.3 mm),  
Standard length: 2 m  
4-dia. vinyl-insulated round cable with 3 conductors  
(Conductor cross section: 0.3 mm<sup>2</sup>, Insulator diameter: 1.3 mm),  
Standard length: 2 m  
The cable can be extended to up to 200 m (Separate metal conduit.)  
\*2. D Models: Operation indicator (red) and setting indicator (green),  
C/Y Models: Operation indicator (red)

#### E2E2-X7D□/E2E2-X5C□/E2E2-X5Y□



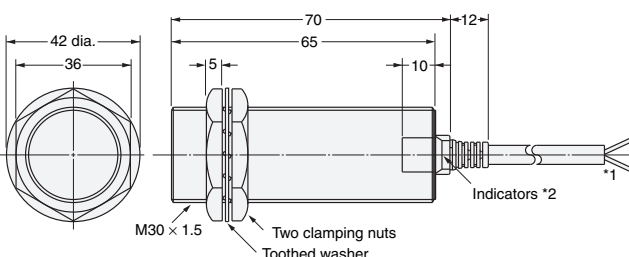
- \*1. 6-dia. vinyl-insulated round cable with 2 conductors  
(Conductor cross section: 0.5 mm<sup>2</sup>, Insulator diameter: 1.9 mm),  
Standard length: 2 m  
6-dia. vinyl-insulated round cable with 3 conductors  
(Conductor cross section: 0.5 mm<sup>2</sup>, Insulator diameter: 1.9 mm),  
Standard length: 2 m  
The cable can be extended to up to 200 m (Separate metal conduit.)  
\*2. D Models: Operation indicator (red) and setting indicator (green),  
C/Y Models: Operation indicator (red)

#### E2E2-X14MD□/E2E2-X10MC□/E2E2-X10MY□



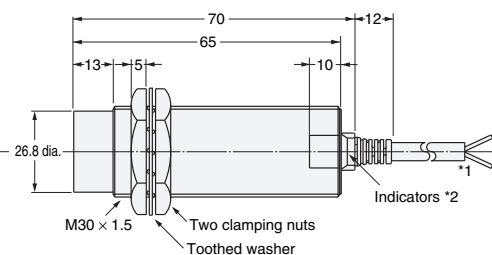
- \*1. 6-dia. vinyl-insulated round cable with 2 conductors  
(Conductor cross section: 0.5 mm<sup>2</sup>, Insulator diameter: 1.9 mm),  
Standard length: 2 m  
6-dia. vinyl-insulated round cable with 3 conductors  
(Conductor cross section: 0.5 mm<sup>2</sup>, Insulator diameter: 1.9 mm),  
Standard length: 2 m  
The cable can be extended to up to 200 m (Separate metal conduit.)  
\*2. D Models: Operation indicator (red) and setting indicator (green),  
C/Y Models: Operation indicator (red)

#### E2E2-X10D□/E2E2-X10C□/E2E2-X10Y□



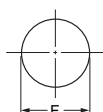
- \*1. 6-dia. vinyl-insulated round cable with 2 conductors  
(Conductor cross section: 0.5 mm<sup>2</sup>, Insulator diameter: 1.9 mm),  
Standard length: 2 m  
6-dia. vinyl-insulated round cable with 3 conductors  
(Conductor cross section: 0.5 mm<sup>2</sup>, Insulator diameter: 1.9 mm),  
Standard length: 2 m  
The cable can be extended to up to 200 m (Separate metal conduit.)  
\*2. D Models: Operation indicator (red) and setting indicator (green),  
C/Y Models: Operation indicator (red)

#### E2E2-X20MD□/E2E2-X18MC□/E2E2-X18MY□



- \*1. 6-dia. vinyl-insulated round cable with 2 conductors  
(Conductor cross section: 0.5 mm<sup>2</sup>, Insulator diameter: 1.9 mm),  
Standard length: 2 m  
6-dia. vinyl-insulated round cable with 3 conductors  
(Conductor cross section: 0.5 mm<sup>2</sup>, Insulator diameter: 1.9 mm),  
Standard length: 2 m  
The cable can be extended to up to 200 m (Separate metal conduit.)  
\*2. D Models: Operation indicator (red) and setting indicator (green),  
C/Y Models: Operation indicator (red)

### Mounting Hole Dimensions



| Dimension | M12                                    | M18                                    | M30                                    |
|-----------|----------------------------------------|----------------------------------------|----------------------------------------|
| F (mm)    | 12.5 <sup>+0.5</sup> <sub>0</sub> dia. | 18.5 <sup>+0.5</sup> <sub>0</sub> dia. | 30.5 <sup>+0.5</sup> <sub>0</sub> dia. |

- Note 1. Two clamping nuts and one toothed washer are provided with each Sensors.  
2. The model number is laser-marked on the cable section and milled section.

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