

## Short Barrel Inductive Prox

## E2E 2-WIRE DC

Reduce Wiring to Control Devices with  
Short-Barrel 2-Wire DC  
Prox Sensors

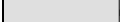
- Thick nickel-plated brass barrel has wrench flats for easy installation
- Solid potted internal circuitry withstands shocks and water washdown to IP67
- High visibility indicator
- Choose prewired or connector models



## Ordering Information

WHEN ORDERING, PLEASE NOTE: Omron has added the suffix "-N" to E2E part numbers for ordering purposes only; the suffix "-N" will not appear on the product.

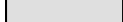
### ■ PREWIRED SENSORS

| Self-diagnostic output function | Type                                                                                              | Size | Sensing distance                                                                          | Part number          |     |
|---------------------------------|---------------------------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------------|----------------------|-----|
|                                 |                                                                                                   |      |                                                                                           | NO (Note.)           | NC  |
| Yes                             | Shielded<br>   | M12  |  3 mm  | <b>E2E-X3D1S-N</b>   | --- |
|                                 |                                                                                                   | M18  |  7 mm  | <b>E2E-X7D1S-N</b>   | --- |
|                                 |                                                                                                   | M30  |  10 mm | <b>E2E-X10D1S-N</b>  | --- |
|                                 | Unshielded<br> | M12  |  8 mm  | <b>E2E-X8MD1S-N</b>  | --- |
|                                 |                                                                                                   | M18  |  14 mm | <b>E2E-X14MD1S-N</b> | --- |
|                                 |                                                                                                   | M30  |  20 mm | <b>E2E-X20MD1S-N</b> | --- |

Note: A different oscillating frequency is available. Add a "5" to the part number (e.g., E2E-X3D15-N-N).

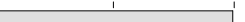
(This table continues on the next page.)

Ordering Information - continued from previous page

| Self-diagnostic output function | Type                                                                                            | Size | Sensing distance                                                                        | Part number      |               |
|---------------------------------|-------------------------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------------|------------------|---------------|
|                                 |                                                                                                 |      |                                                                                         | NO (Notes 1, 2.) | NC            |
| No                              | Shielded<br>   | M8   |  2 mm  | E2E-X2D1-N-N     | E2E-X2D2-N-N  |
|                                 |                                                                                                 | M12  |  3 mm  | E2E-X3D1-N-N     | E2E-X3D2-N-N  |
|                                 |                                                                                                 | M18  |  7 mm  | E2E-X7D1-N-N     | E2E-X7D2-N-N  |
|                                 |                                                                                                 | M30  |  10 mm | E2E-X10D1-N-N    | E2E-X10D2-N-N |
|                                 | Unshielded<br> | M8   |  4 mm  | E2E-X4MD1-N      | E2E-X4MD2-N   |
|                                 |                                                                                                 | M12  |  8 mm  | E2E-X8MD1-N      | E2E-X8MD2-N   |
|                                 |                                                                                                 | M18  |  14 mm | E2E-X14MD1-N     | E2E-X14MD2-N  |
|                                 |                                                                                                 | M30  |  20 mm | E2E-X20MD1-N     | E2E-X20MD2-N  |

Note: 1. A different oscillating frequency is available. Add a "5" to the part number (e.g., E2E-X3D15-N-N).  
 2. E2E sensors with robotic cable are available. Add a "-R" in the part number (e.g., E2E-X3D1-R-N).

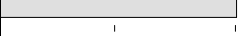
## ■ SENSORS WITH BUILT-IN CONNECTOR

| Connector size    | Self-diagnostic output function | Type                                                                                              | Size | Sensing distance                                                                          | Part number                      |                   |
|-------------------|---------------------------------|---------------------------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------------|----------------------------------|-------------------|
|                   |                                 |                                                                                                   |      |                                                                                           | NO (Pins 1 and 4)                | NC (Pins 1 and 2) |
| M12/Micro Change® | Yes                             | Shielded<br>   | M12  |  3 mm  | E2E-X3D1S-M1-N                   | ---               |
|                   |                                 |                                                                                                   | M18  |  7 mm  | E2E-X7D1S-M1-N                   | ---               |
|                   |                                 |                                                                                                   | M30  |  10 mm | E2E-X10D1S-M1-N                  | ---               |
|                   |                                 | Unshielded<br> | M12  |  8 mm  | E2E-X8MD1S-M1-N                  | ---               |
|                   |                                 |                                                                                                   | M18  |  14 mm | E2E-X14MD1S-M1-N                 | ---               |
|                   |                                 |                                                                                                   | M30  |  20 mm | E2E-X20MD1S-M1-N                 | ---               |
|                   | No                              | Shielded<br>   | M8   |  2 mm  | E2E-X2D1-M1G-N                   | E2E-X2D2-M1G-N    |
|                   |                                 |                                                                                                   | M12  |  3 mm  | E2E-X3D1-M1G-N<br>(See Note 1.)  | E2E-X3D2-M1G-N    |
|                   |                                 |                                                                                                   | M18  |  7 mm  | E2E-X7D1-M1G-N<br>(See Note 1.)  | E2E-X7D2-M1G-N    |
|                   |                                 |                                                                                                   | M30  |  10 mm | E2E-X10D1-M1G-N<br>(See Note 1.) | E2E-X10D2-M1G-N   |

Note: 1. A different oscillating frequency is available. Add a "5" to the part number (e.g., E2E-X3D15-N-N).  
 2. E2E sensors with a "G" in the part number denotes alternate pin arrangement. Refer to the *Connections* section.  
 3. Connector cordsets: For MicroChange® use OMRON Y96E-44□D□; for NanoChange® use Omron XS3F-M42□-40□-R.

(This table continues on the next page.)

Ordering Information - continued from previous page

| Connector size    | Self-diagnostic output function | Type                                                                                            | Size | Sensing distance                                                                        | Part number                              |                         |
|-------------------|---------------------------------|-------------------------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------------|------------------------------------------|-------------------------|
|                   |                                 |                                                                                                 |      |                                                                                         | NO (Pins 1 and 4)                        | NC (Pins 1 and 2)       |
| M12/Micro Change® | No                              |                | M8   |  4 mm  | <b>E2E-X4MD1-M1G-N</b>                   | <b>E2E-X4MD2-M1G-N</b>  |
|                   |                                 |                                                                                                 | M12  |  8 mm  | <b>E2E-X8MD1-M1G-N</b><br>(See Note 1.)  | <b>E2E-X8MD2-M1G-N</b>  |
|                   |                                 |                                                                                                 | M18  |  14 mm | <b>E2E-X14MD1-M1G-N</b><br>(See Note 1.) | <b>E2E-X14MD2-M1G-N</b> |
|                   |                                 |                                                                                                 | M30  |  20 mm | <b>E2E-X20MD1-M1G-N</b><br>(See Note 1.) | <b>E2E-X20MD2-M1G-N</b> |
| M8/Nano Change®   | No                              | Shielded<br>   | M8   |  2 mm  | <b>E2E-X2D1-M3G</b>                      | <b>E2E-X2D2-M3G</b>     |
|                   |                                 | Unshielded<br> |      |  4 mm  | <b>E2E-X4MD1-M3G</b>                     | <b>E2E-X4MD2-M3G</b>    |

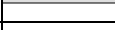
- Note: 1. A different oscillating frequency is available. Add a "5" to the part number (e.g., E2E-X3D15-N-N).
2. E2E sensors with a "G" in the part number denotes alternate pin arrangement. Refer to the *Connections* section.
3. Connector cordsets: For MicroChange® use OMRON Y96E-44□□□; for NanoChange® use Omron XS3F-M42□-40□-R.

## ■ SENSOR WITH PIGTAIL CONNECTOR

| Type                                                                                              | Size | Sensing distance                                                                          | Polarity | Part number              |
|---------------------------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------------|----------|--------------------------|
|                                                                                                   |      |                                                                                           |          | NO                       |
| Shielded<br>    | M12  |  3 mm   | Yes      | <b>E2E-X3D1-M1GJ-N</b>   |
|                                                                                                   |      |                                                                                           | No       | <b>E2E-X3D1-M1J-T-N</b>  |
|                                                                                                   | M18  |  7 mm  | Yes      | <b>E2E-X7D1-M1GJ-N</b>   |
|                                                                                                   |      |                                                                                           | No       | <b>E2E-X7D1-M1J-T-N</b>  |
|                                                                                                   | M30  |  10 mm | Yes      | <b>E2E-X10D1-M1GJ-N</b>  |
|                                                                                                   |      |                                                                                           | No       | <b>E2E-X10D1-M1J-T-N</b> |
| Unshielded<br> | M12  |  8 mm  | Yes      | <b>E2E-X8MD1-M1GJ-N</b>  |
|                                                                                                   | M18  |  14 mm |          | <b>E2E-X14MD1-M1GJ-N</b> |
|                                                                                                   | M30  |  20 mm |          | <b>E2E-X20MD1-M1GJ-N</b> |

- Note: 1. A model with no polarity has a residual voltage of 5 V, which must be taken into consideration together with the interface condition (the PLC's ON voltage, for example) when connecting the proximity sensor to a load.
2. Connector cordsets: Use OMRON Y96E-44□□□.

## ■ SENSOR WITH FOUR-PIN CONNECTOR

| Type                                                                                            | Size | Sensing distance                                                                        | Part number       |                   |
|-------------------------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------------|-------------------|-------------------|
|                                                                                                 |      |                                                                                         | NO (Pins 3 and 4) | NC (Pins 2 and 3) |
| Shielded<br>   | M8   |  2 mm  | E2E-X2D1-M1-N     | E2E-X2D2-M1-N     |
|                                                                                                 | M12  |  3 mm  | E2E-X3D1-M1-N     | E2E-X3D2-M1-N     |
|                                                                                                 | M18  |  7 mm  | E2E-X7D1-M1-N     | E2E-X7D2-M1-N     |
|                                                                                                 | M30  |  10 mm | E2E-X10D1-M1-N    | E2E-X10D2-M1-N    |
| Unshielded<br> | M8   |  4 mm  | E2E-X4MD1-M1-N    | E2E-X4MD2-M1-N    |
|                                                                                                 | M12  |  8 mm  | E2E-X8MD1-M1-N    | E2E-X8MD2-M1-N    |
|                                                                                                 | M18  |  14 mm | E2E-X14MD1-M1-N   | E2E-X14MD2-M1-N   |
|                                                                                                 | M30  |  20 mm | E2E-X20MD1-M1-N   | E2E-X20MD2-M1-N   |

## ■ ACCESSORIES

| Description                                 |                       | Part number                                                |
|---------------------------------------------|-----------------------|------------------------------------------------------------|
| Mounting brackets                           | Fits M8 size sensors  | Y92E-B8                                                    |
|                                             | Fits M12 size sensors | Y92E-B12                                                   |
|                                             | Fits M18 size sensors | Y92E-B18                                                   |
|                                             | Fits M30 size sensors | Y92E-B30                                                   |
| Silicone rubber covers for shielded sensors | Fits M12 size sensors | Y92E-E12-2                                                 |
|                                             | Fits M18 size sensors | Y92E-E18-2                                                 |
|                                             | Fits M30 size sensors | Y92E-E30-2                                                 |
| Connector cordsets                          |                       | See Y96E and XS Connector Cordsets data sheets for details |

Note: Use OMRON Y96E-44□□ cordsets with M12 connector; use XS3F cordsets with M8 connector.

## ■ REPLACEMENT PARTS

| Description                                                       |                       | Part number |
|-------------------------------------------------------------------|-----------------------|-------------|
| Mounting hardware including one pair of metal nuts and one washer | Fits M8 size sensors  | M8-MHWS     |
|                                                                   | Fits M12 size sensors | M12-MHWS    |
|                                                                   | Fits M18 size sensors | M18-MHWS    |
|                                                                   | Fits M30 size sensors | M30-MHWS    |

# Specifications

## ■ RATINGS/CHARACTERISTICS

| Part number                                |              | E2E-X2D□-N                                                                                                                | E2E-X4MD□-N                            | E2E-X3D□-N                                                                                   | E2E-X8MD□-N                            | E2E-X7D□-N                             | E2E-X14MD□-N                           | E2E-X10D□-N                            | E2E-X20MD□-N                           |
|--------------------------------------------|--------------|---------------------------------------------------------------------------------------------------------------------------|----------------------------------------|----------------------------------------------------------------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|
| Size                                       |              | M8                                                                                                                        |                                        | M12                                                                                          |                                        | M18                                    |                                        | M30                                    |                                        |
| Type                                       |              | Shielded                                                                                                                  | Unshielded                             | Shielded                                                                                     | Unshielded                             | Shielded                               | Unshielded                             | Shielded                               | Unshielded                             |
| Sensing distance                           |              | 2 mm (0.08 in) ±10%                                                                                                       | 4 mm (0.16 in) ±10%                    | 3 mm (0.12 in) ±10%                                                                          | 8 mm (0.31 in) ±10%                    | 7 mm (0.28 in) ±10%                    | 14 mm (0.55 in) ±10%                   | 10 mm (0.39 in) ±10%                   | 20 mm (0.79 in) ±10%                   |
| Supply voltage (operating voltage)         |              | 12 to 24 VDC, ripple (p-p): 10% max., (10 to 30 VDC)                                                                      |                                        |                                                                                              |                                        |                                        |                                        |                                        |                                        |
| Leakage current                            |              | 0.8 mA max.                                                                                                               |                                        |                                                                                              |                                        |                                        |                                        |                                        |                                        |
| Sensing object                             |              | Magnetic metals (refer to <i>Engineering Data</i> for non-magnetic metals)                                                |                                        |                                                                                              |                                        |                                        |                                        |                                        |                                        |
| Setting distance                           |              | 0 to 1.6 mm (0 to 0.06 in)                                                                                                | 0 to 3.2 mm (0 to 0.13 in)             | 0 to 2.4 mm (0 to 0.09 in)                                                                   | 0 to 6.4 mm (0 to 0.25 in)             | 0 to 5.6 mm (0 to 0.22 in)             | 0 to 11.2 mm (0 to 0.44 in)            | 0 to 8.0 mm (0 to 0.31 in)             | 0 to 16.0 mm (0 to 0.63 in)            |
| Standard object (mild steel)               |              | 8 x 8 x 1 mm (0.31 x 0.31 x 0.04 in)                                                                                      | 20 x 20 x 1 mm (0.79 x 0.79 x 0.04 in) | 12 x 12 x 1 mm (0.47 x 0.47 x 0.04 in)                                                       | 30 x 30 x 1 mm (1.18 x 1.18 x 0.04 in) | 18 x 18 x 1 mm (0.71 x 0.71 x 0.04 in) | 30 x 30 x 1 mm (1.18 x 1.18 x 0.04 in) | 30 x 30 x 1 mm (1.18 x 1.18 x 0.04 in) | 54 x 54 x 1 mm (2.13 x 2.13 x 0.04 in) |
| Differential travel                        |              | 15% max. of sensing distance                                                                                              |                                        | 10% max. of sensing distance                                                                 |                                        |                                        |                                        |                                        |                                        |
| Response frequency                         |              | 1.5 kHz                                                                                                                   | 1.0 kHz                                | 1.0 kHz                                                                                      | 0.8 kHz                                | 0.5 kHz                                | 0.4 kHz                                | 0.4 kHz                                | 0.1 kHz                                |
| Operation (with target object approaching) |              | D1 models: Load ON<br>D2 models: Load OFF                                                                                 |                                        |                                                                                              |                                        |                                        |                                        |                                        |                                        |
| Control output (switching capacity)        |              | 3 to 100 mA (5 to 100 mA with residual voltage of 5V for -M1J-T models)<br>Diagnostic output: 50 mA for -D1S models       |                                        |                                                                                              |                                        |                                        |                                        |                                        |                                        |
| Diagnostic output delay                    |              | 0.3 to 1 s                                                                                                                |                                        |                                                                                              |                                        |                                        |                                        |                                        |                                        |
| Circuit protection                         |              | Surge absorber, load short-circuit protection (for control and diagnostic output)                                         |                                        |                                                                                              |                                        |                                        |                                        |                                        |                                        |
| Indicator                                  |              | D1 models: Operation indicator (red LED), operation set indicator (green LED)<br>D2 models: Operation indicator (red LED) |                                        |                                                                                              |                                        |                                        |                                        |                                        |                                        |
| Ambient temperature                        |              | Operating: -25°C to 70°C (-13°F to 158°F) with no icing                                                                   |                                        |                                                                                              |                                        |                                        |                                        |                                        |                                        |
| Ambient humidity                           |              | Operating: 35% to 95%                                                                                                     |                                        |                                                                                              |                                        |                                        |                                        |                                        |                                        |
| Temperature influence                      |              | ±15% max. of sensing distance at 23°C in temperature range of -25°C to 70°C (-13°F to 158°F)                              |                                        | ±10% max. of sensing distance at 23°C in temperature range of -25°C to 70°C (-13°F to 158°F) |                                        |                                        |                                        |                                        |                                        |
| Voltage influence                          |              | ±1% max. of sensing distance in rated voltage range ±15%                                                                  |                                        |                                                                                              |                                        |                                        |                                        |                                        |                                        |
| Residual voltage                           |              | 3.0 V max. (under load current of 100 mA with cable length of 2 m)<br>5.0 V min. for -M1J-T models                        |                                        |                                                                                              |                                        |                                        |                                        |                                        |                                        |
| Insulation resistance                      |              | 50 MΩ min. (at 500 VDC) between current carry parts and case                                                              |                                        |                                                                                              |                                        |                                        |                                        |                                        |                                        |
| Dielectric strength                        |              | 1,000 VAC for 1 min between current carry parts and case                                                                  |                                        |                                                                                              |                                        |                                        |                                        |                                        |                                        |
| Vibration resistance                       |              | 10 to 55 Hz, 1.5-mm double amplitude for 10 times each in X, Y, and Z axes                                                |                                        |                                                                                              |                                        |                                        |                                        |                                        |                                        |
| Shock resistance                           |              | 500 m/s <sup>2</sup> (approx. 50G) for 10 times each in X, Y, and Z axes                                                  |                                        | 1,000 m/s <sup>2</sup> (approx. 100G) for 10 times each in X, Y, and Z axes                  |                                        |                                        |                                        |                                        |                                        |
| Enclosure rating                           | IEC          | IP67                                                                                                                      |                                        |                                                                                              |                                        |                                        |                                        |                                        |                                        |
|                                            | NEMA         | 1, 4, 6, 12, 13                                                                                                           |                                        |                                                                                              |                                        |                                        |                                        |                                        |                                        |
| Weight                                     |              | Approx. 45 g                                                                                                              |                                        | Approx. 120 g                                                                                |                                        | Approx. 160 g                          |                                        | Approx. 220 g                          |                                        |
| Material                                   | Body         | Stainless steel                                                                                                           |                                        | Brass                                                                                        |                                        |                                        |                                        |                                        |                                        |
|                                            | Sensing face | PBT                                                                                                                       |                                        |                                                                                              |                                        |                                        |                                        |                                        |                                        |

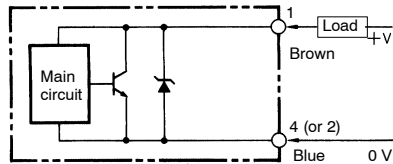
# Operation

## ■ OUTPUT CIRCUITS

### E2E-X□D□-N DC 2-wire Models

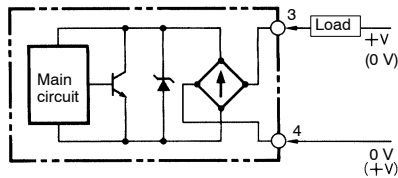
#### E2E-X□D□-N

##### Without Diagnostic Output



#### E2E-X□D1-M1J-T-N

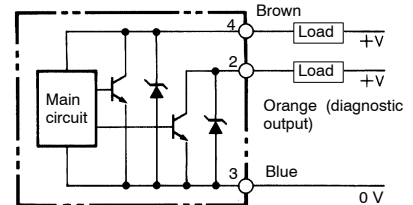
##### No Polarity



- Note:
1. The load can be connected to either the +V or 0-V side.
  2. The E2E-X□D1-M1J-T has no polarity. Therefore, terminals 3 and 4 have no polarity.

#### E2E-X□D1S-N

##### With Diagnostic Output



### Short-Circuit Indication

The LED dims when the load is shorted and the load output immediately turns off and remains off until the short-circuit protection is reset.

### Resetting Short-Circuit Protection

Before the short-circuit protection can be reset, the short must be repaired. We recommend turning the power off before repairing the short. If this approach is taken, no further action is required to reset the short-circuit protection.

If the short must be repaired with power on, the following resetting steps are required:

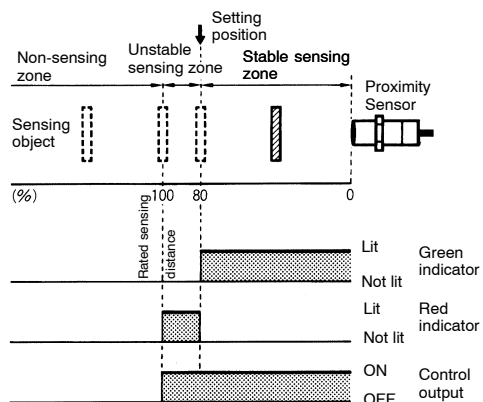
For NO sensors, the target must be removed to reset the short-circuit protection.

For NC sensors, the target must be presented then removed to reset the short-circuit protection.

## OPERATING CHARTS

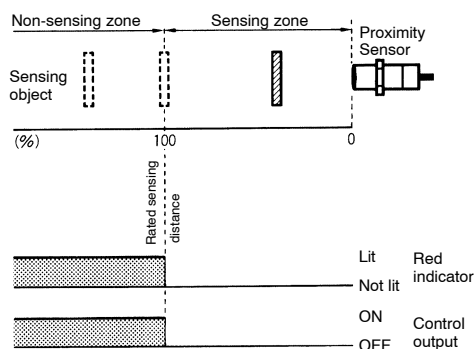
### E2E-X□D1-N

#### NO Type

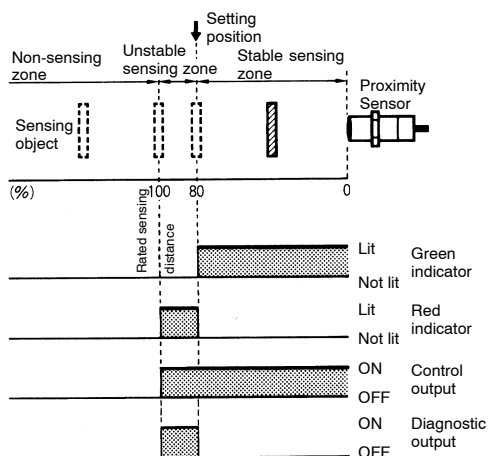


### E2E-X□D2-N

#### NC Type



### E2E-X□D1S-N



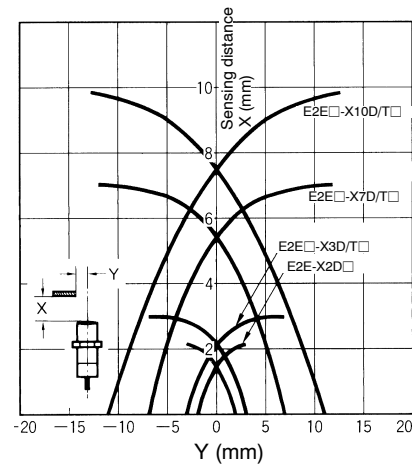
Note: The diagnostic output of the E2E-X□D1S-N is ON when there is a coil burnout or the sensing object is located in the unstable sensing range for 0.3 s or more.

## Engineering Data

## ■ OPERATING RANGE (TYPICAL)

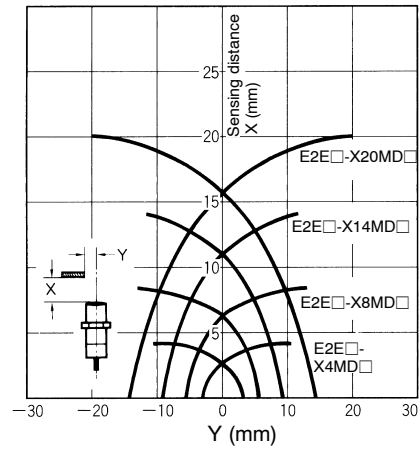
## Shielded Models

## E2E-X□D□-N



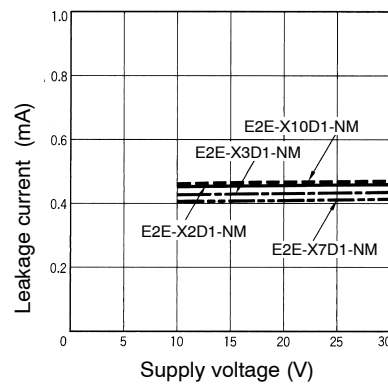
## Unshielded Models

## E2E-X□MD□-N



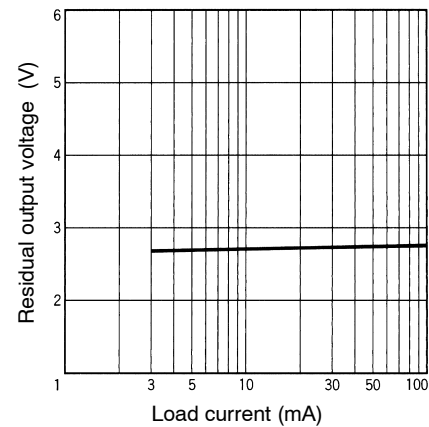
## ■ LEAKAGE CURRENT (TYPICAL)

## E2E-X□D□-N



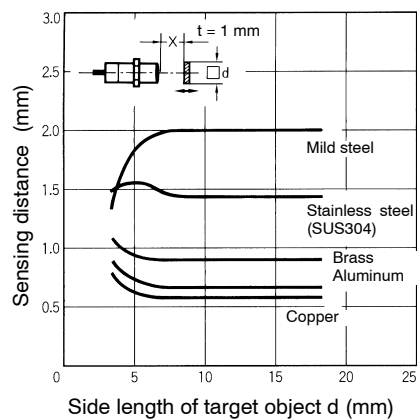
## ■ RESIDUAL OUTPUT VOLTAGE (TYPICAL)

## E2E-X□D□-N

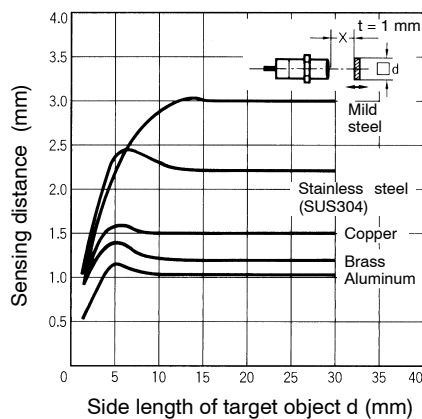


# ■ SENSING DISTANCE VS. SENSING OBJECT (TYPICAL)

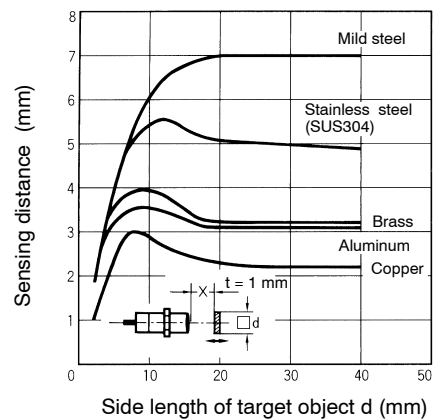
E2E-X2D□-N



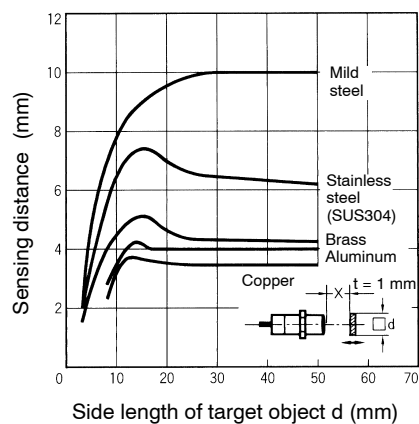
E2E-X3D□-N



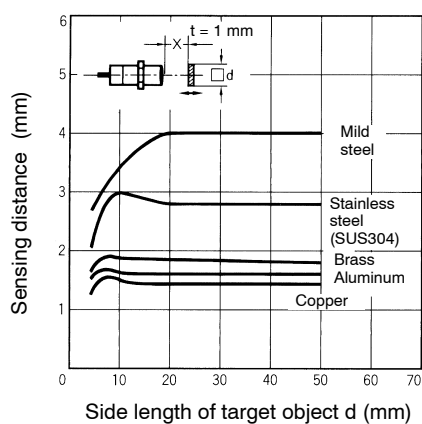
E2E-X7D□-N



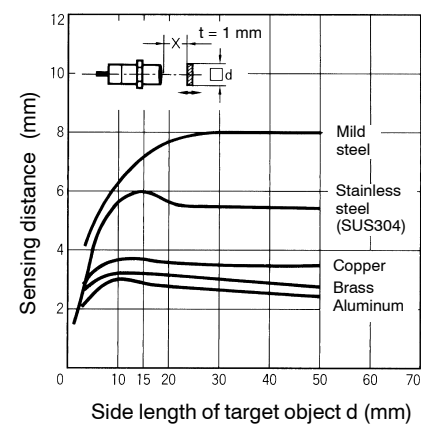
E2E-X10D□-N



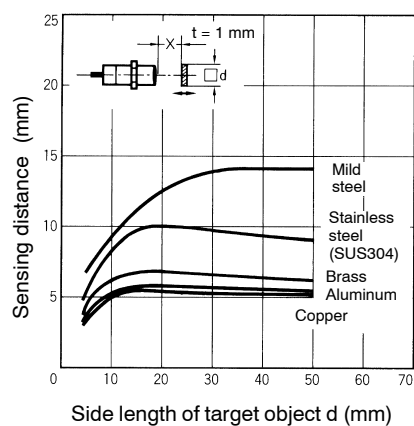
E2E-X4MD□-N



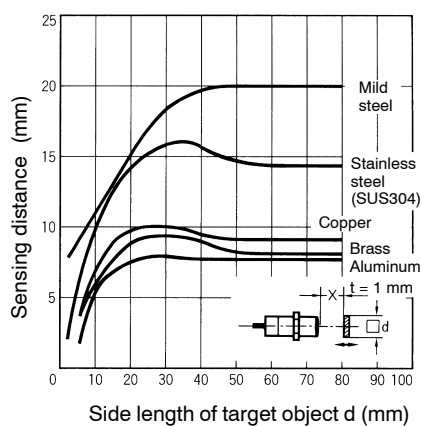
E2E-X8MD□-N



E2E-X14MD□-N



E2E-X20MD□-N

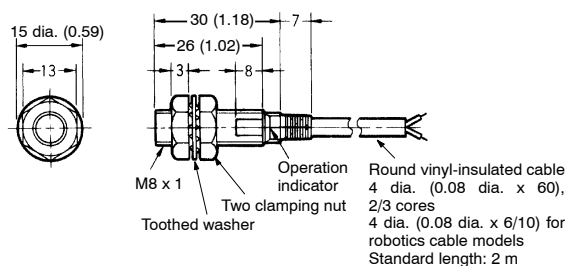
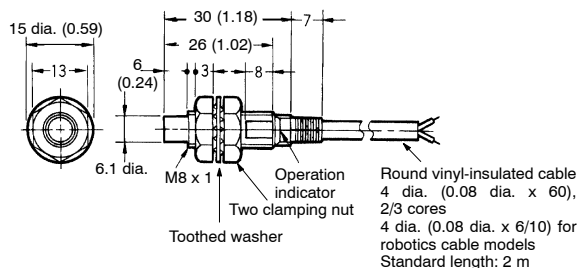
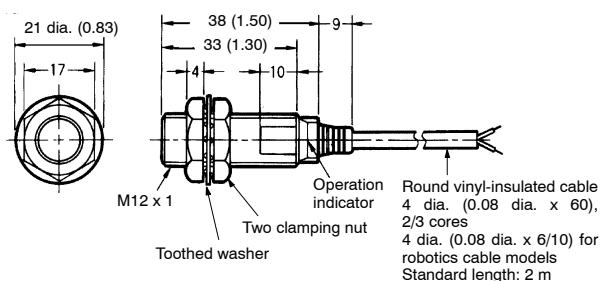
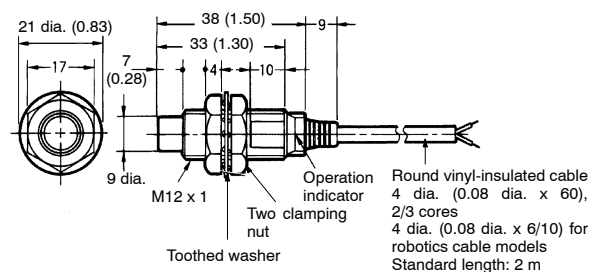
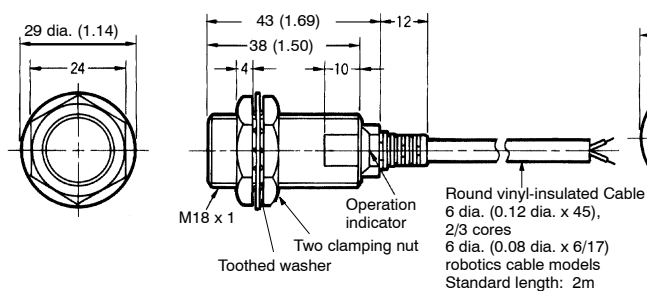
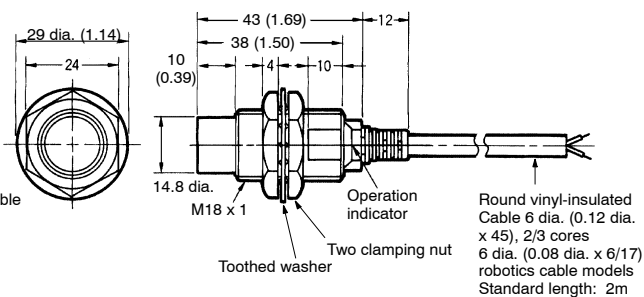


# Dimensions

## ■ DRAWING LOCATOR

| Type                              |            |     | Part number       | Figure number |
|-----------------------------------|------------|-----|-------------------|---------------|
| Pre-wired                         | Shielded   | M8  | E2E-X2D□-N-N      | 1             |
|                                   |            | M12 | E2E-X3D□-N-N      | 3             |
|                                   |            | M18 | E2E-X7D□-N-N      | 5             |
|                                   |            | M30 | E2E-X10D□-N-N     | 7             |
|                                   | Unshielded | M8  | E2E-X4MD□-N       | 2             |
|                                   |            | M12 | E2E-X8MD□-N       | 4             |
|                                   |            | M18 | E2E-X14MD□-N      | 6             |
|                                   |            | M30 | E2E-X20MD□-N      | 8             |
| 4-Pin connector<br>(M12)          | Shielded   | M8  | E2E-X2D□-M1G-N    | 9             |
|                                   |            | M12 | E2E-X3D□-M1G-N    | 11            |
|                                   |            | M18 | E2E-X7D□-M1G-N    | 13            |
|                                   |            | M30 | E2E-X10D□-M1G-N   | 15            |
|                                   | Unshielded | M8  | E2E-X4MD□-M1G-N   | 10            |
|                                   |            | M12 | E2E-X8MD□-M1G-N   | 12            |
|                                   |            | M18 | E2E-X14MD□-M1G-N  | 14            |
|                                   |            | M30 | E2E-X20MD□-M1G-N  | 16            |
| M8 connector                      | Shielded   | M8  | E2E-X2D□-M3G-N    | 17            |
|                                   | Unshielded |     | E2E-X4MD□-M3G-N   | 18            |
| Pigtail connector                 | Shielded   | M12 | E2E-X3D1-M1GJ-N   | 19            |
|                                   |            | M18 | E2E-X7D1-M1GJ-N   | 21            |
|                                   |            | M30 | E2E-X10D1-M1GJ-N  | 23            |
|                                   | Unshielded | M12 | E2E-X8MD1-M1GJ-N  | 20            |
|                                   |            | M18 | E2E-X14MD1-M1GJ-N | 22            |
|                                   |            | M30 | E2E-X20MD1-M1GJ-N | 24            |
| Pigtail connector, no<br>polarity | Shielded   | M12 | E2E-X3D1-M1J-T-N  | 25            |
|                                   |            | M18 | E2E-X7D1-M1J-T-N  | 26            |
|                                   |            | M30 | E2E-X10D1-M1J-T-N | 27            |

Unit: mm (inch)

**Prewired Models  
(Shielded)****Fig. 1: E2E-X2D□-N****Prewired Models  
(Unshielded)****Fig. 2: E2E-X4MD□-N****Fig. 3: E2E-X3D□-N****Fig. 4: E2E-X8MD□-N****Prewired Models  
(Shielded)****Fig. 5: E2E-X7D□-N****Prewired Models  
(Unshielded)****Fig. 6: E2E-X14MD□**

Unit: mm (inch)

Fig. 7: E2E-X10D□-N

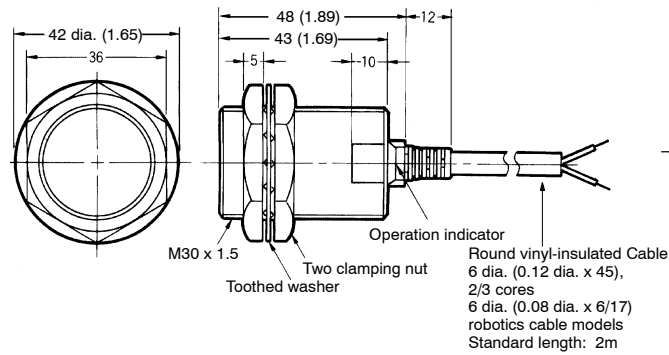


Fig. 8: E2E-X20MD□

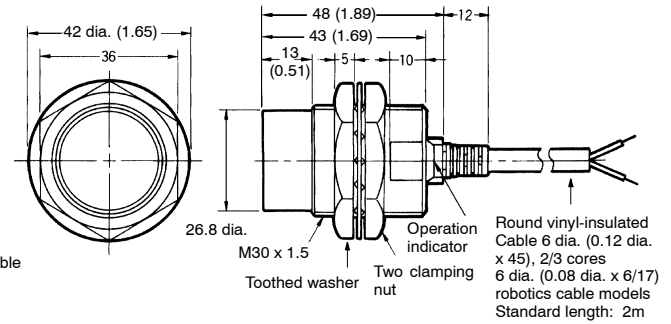
Connector Models  
(Shielded)

Fig. 9: E2E-X2D□-M1G-N

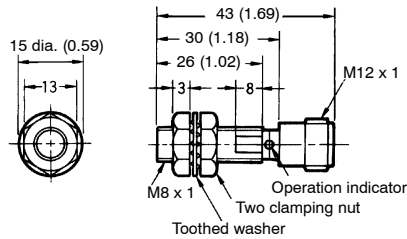


Fig. 10: E2E-X4MD□-M1G-N

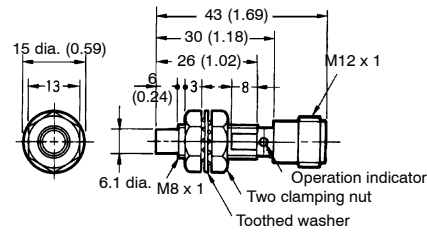


Fig. 11: E2E-X3D□-M1G-N

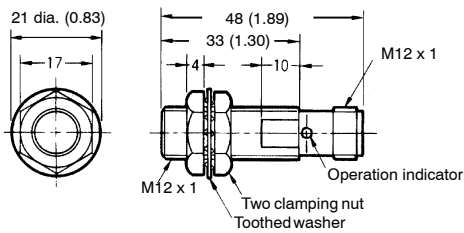
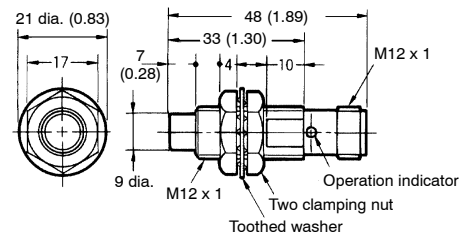


Fig. 12: E2E-X8MD□-M1G-N



### Connector Models (Shielded), continued

Fig. 13 E2E-X7D□-M1G

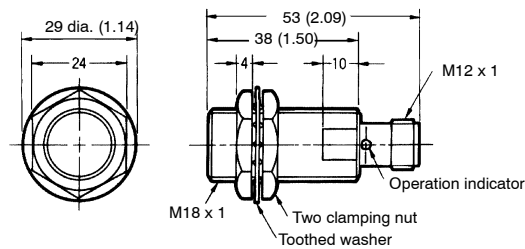
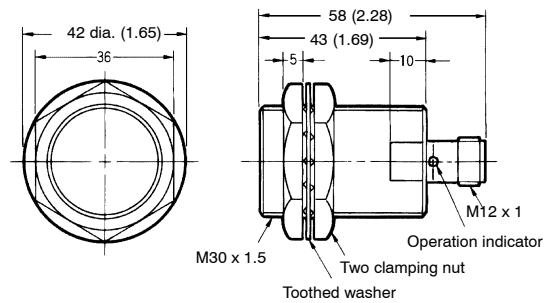


Fig. 15: E2E-X10D□-M1G



### M8 Connector Models (Shielded)

Fig. 17: E2E-X2D□-M3G

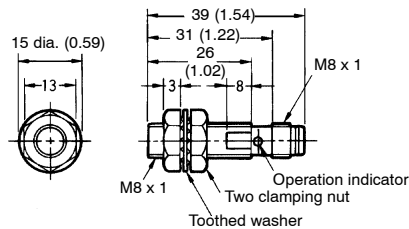


Fig. 14: E2E-X14MD□-M1G

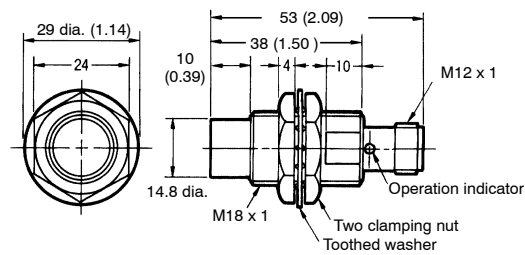
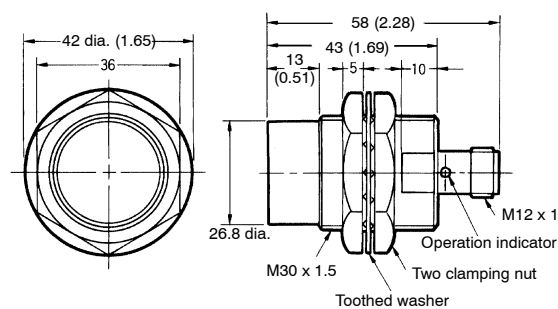
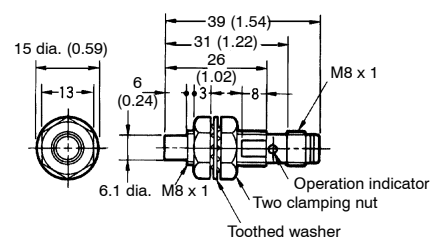


Fig. 16: E2E-X20MD□-M1G



### M8 Connector Models (Unshielded)

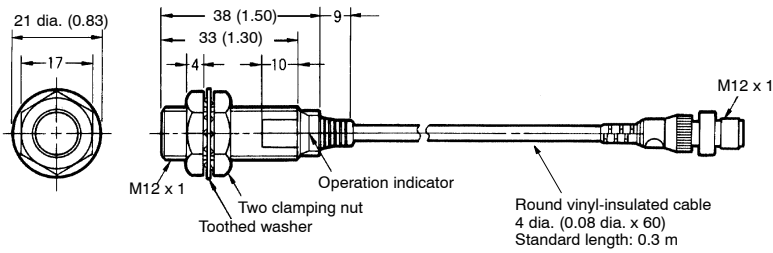
Fig. 18: E2E-X4MD□-M3G



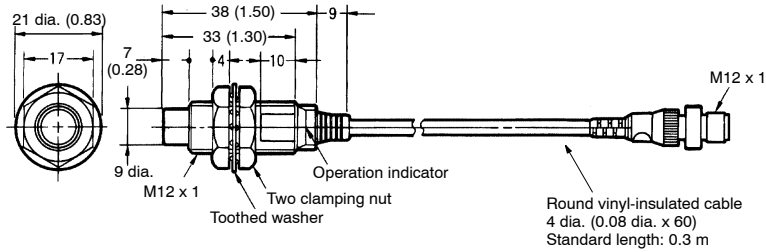
Unit: mm (inch)

## ■ PIGTAIL CONNECTOR

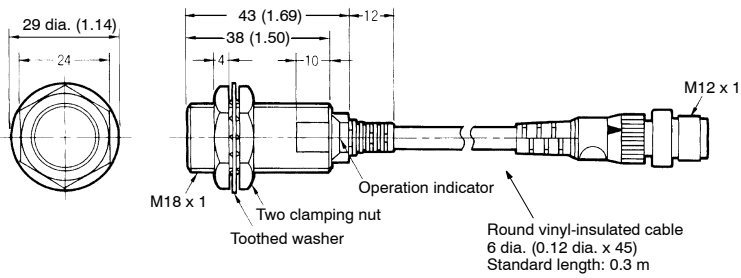
**Fig. 19:** E2E-X3D1-M1GJ-N  
E2E-X3D1-M1J-T-N



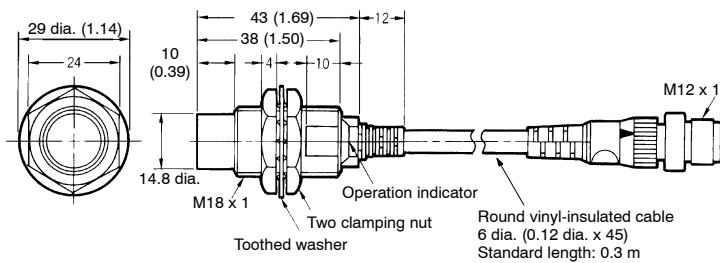
**Fig. 20:** E2E-X8MD1-M1GJ-N



**Fig. 21:** E2E-X7D1-M1GJ-N  
E2E-X7D1-M1J-T-N



**Fig. 22:** E2E-X14MD1-M1GJ-N



Pigtail Connector Models, continued

Fig. 23: E2E-X10D1-M1GJ-N  
E2E-X10D1-M1J-T-N

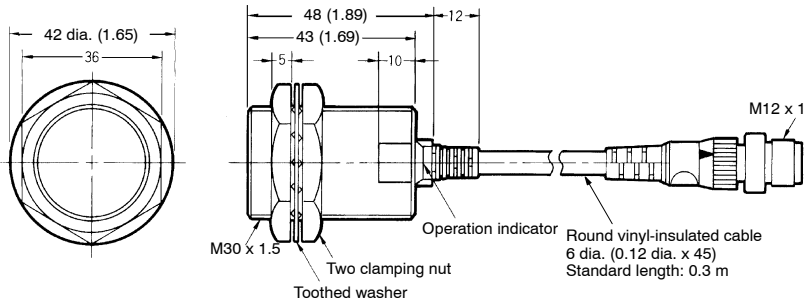
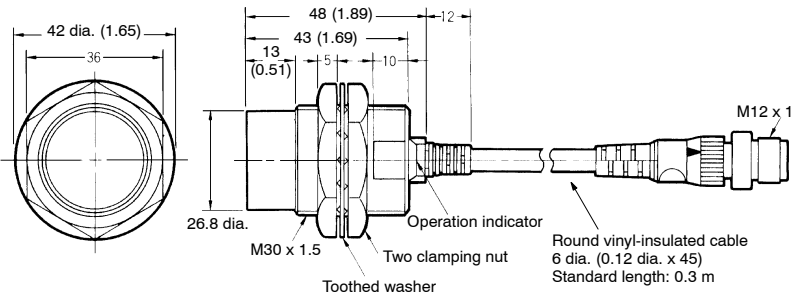
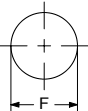


Fig. 24: E2E-X20MD1-M1GJ-N



Mounting Holes



| Dimensions | M8                  | M12                  | M18                  | M30                  |
|------------|---------------------|----------------------|----------------------|----------------------|
| F (mm)     | $8.5^{+0.5}_0$ dia. | $12.5^{+0.5}_0$ dia. | $18.5^{+0.5}_0$ dia. | $30.5^{+0.5}_0$ dia. |

# Connection

## PIN ARRANGEMENTS

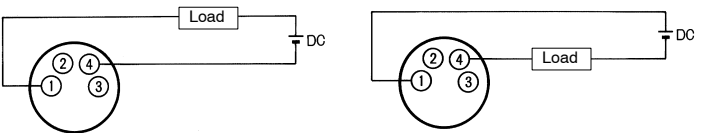
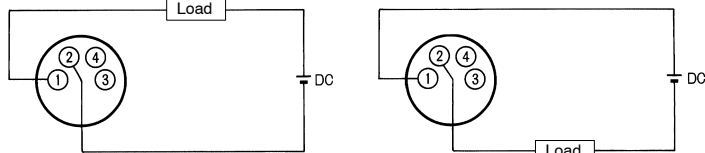
### E2E-X□D□-M□-N DC 2-wire Models

| Connector         | Self-diagnostic output | Output configuration | Applicable models              | Pin arrangement                                                                            |
|-------------------|------------------------|----------------------|--------------------------------|--------------------------------------------------------------------------------------------|
| M12 Micro Change® | No                     | NO                   | E2E-X□D1-M1G□-N<br>(See Note.) | <p>Note: Terminals 2 and 3 are not used.</p>                                               |
|                   |                        |                      | E2E-X□D1-M1J-T-N               | <p>Note: 1. Terminals 1 and 2 are not used.<br/>2. Terminals 3 and 4 have no polarity.</p> |
|                   |                        |                      | E2E-X□D1-M1-N                  | <p>Note: Terminals 1 and 2 are not used.</p>                                               |
|                   |                        |                      | E2E-X□D2-M1G-N<br>(See Note.)  | <p>Note: Terminals 3 and 4 are not used.</p>                                               |
|                   |                        |                      | E2E-X□D2-M1-N                  | <p>Note: Terminals 1 and 4 are not used.</p>                                               |
|                   | Yes                    | NO                   | E2E-X□D1S-M1-N                 | <p>(Control output)</p> <p>Note: Terminal 1 is not used.</p>                               |

Note: Pin arrangements conform to IEC standards.

(This table continues on the next page.)

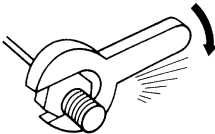
PIN ARRANGEMENT (CONTINUED)

| Connector       | Self-diagnostic output | Output configuration | Applicable models | Pin arrangement                                                                                                             |
|-----------------|------------------------|----------------------|-------------------|-----------------------------------------------------------------------------------------------------------------------------|
| M8 Nano Change® | No                     | NO                   | E2E-X□D1-M3G-N    | <br>Note: Terminals 2 and 3 are not used. |
|                 |                        | NC                   | E2E-X□D2-M3G-N    | <br>Note: Terminals 3 and 4 are not used. |

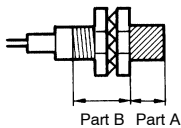
Precautions

MOUNTING

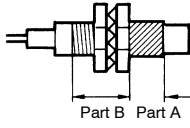
Do not tighten the nut with excessive force. A washer must be used with the nut.



Shielded Model



Unshielded Model

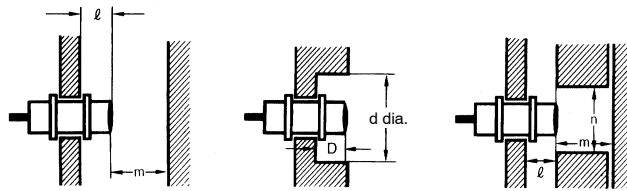


Note: The table above right shows the tightening torques for part A and part B nuts. In the previous examples, the nut is on the sensor head side (part B) and hence the tightening torque for part B applies. If this nut is in part A, the tightening torque for part A applies instead.

| Type |            | Part A                     |                          | Part B                     |
|------|------------|----------------------------|--------------------------|----------------------------|
|      |            | Length                     | Torque                   | Torque                     |
| M8   | Shielded   | 9 mm                       | 9 N • m<br>(90 kgf • cm) | 12 N • m<br>(120 kgf • cm) |
|      | Unshielded | 3 mm                       |                          |                            |
| M12  |            | 30 N • m (310 kgf • cm)    |                          |                            |
| M18  |            | 70 N • m (710 kgf • cm)    |                          |                            |
| M30  |            | 180 N • m (1,800 kgf • cm) |                          |                            |

## ■ EFFECTS OF SURROUNDING METAL

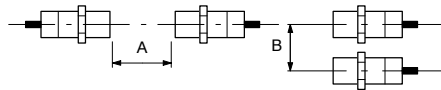
When mounting the E2E within a metal panel, ensure that the clearances given in the following table are maintained. Failure to maintain these distances may cause deterioration in the performance of the sensor.



| Type                    |            | Dimension | M8     | M12   | M18   | M30   |
|-------------------------|------------|-----------|--------|-------|-------|-------|
| E2E-X□D□-N<br>DC 2-wire | Shielded   | $\ell$    | 0 mm   | 0 mm  | 0 mm  | 0 mm  |
|                         |            | d         | 8 mm   | 12 mm | 18 mm | 30 mm |
|                         |            | D         | 0 mm   | 0 mm  | 0 mm  | 0 mm  |
|                         |            | m         | 4.5 mm | 8 mm  | 20 mm | 40 mm |
|                         |            | n         | 12 mm  | 18 mm | 27 mm | 45 mm |
|                         | Unshielded | $\ell$    | 12 mm  | 15 mm | 22 mm | 30 mm |
|                         |            | d         | 24 mm  | 40 mm | 70 mm | 90 mm |
|                         |            | D         | 12 mm  | 15 mm | 22 mm | 30 mm |
|                         |            | m         | 8 mm   | 20 mm | 40 mm | 70 mm |
|                         |            | n         | 24 mm  | 40 mm | 70 mm | 90 mm |

## ■ 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.



| Type                    |            | Dimension | M8    | M12         | M18          | M30          |
|-------------------------|------------|-----------|-------|-------------|--------------|--------------|
| E2E-X□D□-N<br>DC 2-wire | Shielded   | A         | 20 mm | 30 (20) mm  | 50 (30) mm   | 100 (50) mm  |
|                         |            | B         | 15 mm | 20 (12) mm  | 35 (18) mm   | 70 (35) mm   |
|                         | Unshielded | A         | 80 mm | 120 (60) mm | 200 (100) mm | 300 (100) mm |
|                         |            | B         | 60 mm | 100 (50) mm | 110 (60) mm  | 200 (100) mm |

Note: The figures in parentheses refer to Sensors operating at different frequencies.

## ■ INSTALLATION

### Power Reset Time

The Proximity Sensor is ready to operate within 100 ms after power is supplied. If power supplies are connected to the Proximity Sensor and load respectively, be sure to supply power to the Proximity Sensor before supplying power to the load.

### Power OFF

The Proximity Sensor may output a pulse signal when it is turned off. Therefore, it is recommended to turn off the load before turning off the Proximity Sensor.

### Power Supply Transformer

When using a DC power supply, make sure that the DC power supply has an insulated transformer. Do not use a DC power supply with an auto-transformer.

### Sensing Object

Metal Coating:

The sensing distances of the Proximity Sensor vary with the metal coating on sensing objects.

## ■ WIRING

### High-tension Lines

#### Wiring through Metal Conduit

If there is a power or high-tension line near the cable of the Proximity Sensor, wire the cable through an independent metal conduit to prevent against Proximity Sensor damage or malfunctioning.

## ■ CONNECTING LOAD TO DC 2-WIRE SENSOR

Refer to the following before using AC or DC 2-wire Proximity Sensors.

### Surge Protection

Although the Proximity Sensor has a surge absorption circuit, if there is any machine that has a large surge current (e.g., a motor or welding machine) near the Proximity Sensor, connect a surge absorber to the machine.

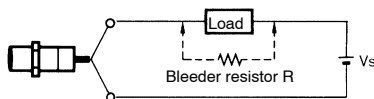
### Leakage Current

When it is OFF, the Proximity Sensor has leakage current. Refer to Leakage Current Characteristics. In this case, the load is imposed with a small voltage and the load may not be reset. Before using the Proximity Sensor, make sure that this voltage is less than the load reset voltage.

### Countermeasures Against Leakage Current

#### DC 2-wire Models

Connect a bleeder resistor as the bypass for the leakage current so that the current flowing into the load will be less than the load reset current.



### Cable Traction Force

Do not pull cable with the traction forces exceeding the following.

| Diameter       | Traction force |
|----------------|----------------|
| 4 mm dia. max. | 30 N max.      |
| 4 mm dia. min. | 50 N max.      |

## ■ MOUNTING

The Proximity Sensor must not be subjected to excessive shock with a hammer when it is installed, otherwise the Proximity Sensor may be damaged or lose its water-resistance.

## ■ ENVIRONMENT

### Water Resistance

Do not use the Proximity Sensor underwater, outdoors, or in the rain.

### Operating Environment

Use the Proximity Sensor within its operating ambient temperature range and do not use the Proximity Sensor outdoors, in order to maintain its reliability and life expectancy. Although the Proximity Sensor is water resistant, a cover to protect the Proximity Sensor from water or water soluble machining oil is recommended to maintain its reliability and life expectancy. Do not use the Proximity Sensor in an environment with chemical gas (e.g., strong alkaline or acid gasses including nitric, chromic, and concentrated sulfuric acid gasses).

Refer to the following to calculate the bleeder resistance and the allowable power of the bleeder resistor.

$$R \leq V_S / (i_R - i_{OFF}) \text{ (k}\Omega\text{)}$$

$$P > V_S^2 / R \text{ (mW)}$$

P: The allowable power of the bleeder resistor. (The actual power capacity of the bleeder resistor must be at least a few times as large as the allowable power of the bleeder resistor.)

$i_R$ : Leakage current of Sensors (mA)

$i_{OFF}$ : Release current of load (mA)

The following resistors are recommended.

12 VDC (supply voltage): A resistor with a resistance of 15 k $\Omega$  maximum and an allowable power of 450 mW minimum  
24 VDC (supply voltage): A resistor with a resistance of 30 k $\Omega$  maximum and an allowable power of 0.1 W minimum

### Inrush Current

A load that has a large inrush current (e.g., a lamp or motor) will damage the Proximity Sensor, in which case connect the load to the Proximity Sensor through a relay.

**NOTE: DIMENSIONS SHOWN ARE IN MILLIMETERS. To convert millimeters to inches divide by 25.4.**

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