

## Cylindrical Inductive Sensor for Explosive Environments

**E2AX**

- ATEX certification Group II category 3D (94/9/EG Appendix VIII)
- Typically for explosive areas zone 22 with non leading dust construction based on EN50014 and EN50281-1-1/2



## Ordering Information

DC 3-wire models (NO + NC: DC 4-wire) \*1

| Size |              | Sensing distance | Connec-tion   | Body material | Thread length (overall length) | Output confi-guration | Operation mode NO  | Operation mode NC  | Operation mode NO + NC |
|------|--------------|------------------|---------------|---------------|--------------------------------|-----------------------|--------------------|--------------------|------------------------|
| M12  | Shielded     | 4.0 mm           | M12 connector | Brass*2       | 34 (48)                        | PNP                   | E2AX-M12KS04-M1-B1 | E2AX-M12KS04-M1-B2 | E2AX-M12KS04-M1-B3     |
|      |              |                  |               |               |                                | NPN                   | E2AX-M12KS04-M1-C1 | E2AX-M12KS04-M1-C2 | E2AX-M12KS04-M1-C3     |
|      |              |                  |               |               | 56 (70)                        | PNP                   | E2AX-M12LS04-M1-B1 | E2AX-M12LS04-M1-B2 | E2AX-M12LS04-M1-B3     |
|      |              |                  |               |               |                                | NPN                   | E2AX-M12LS04-M1-C1 | E2AX-M12LS04-M1-C2 | E2AX-M12LS04-M1-C3     |
|      | Non-shielded | 8.0 mm           | M12 connector | Brass*2       | 34 (48)                        | PNP                   | E2AX-M12KN08-M1-B1 | E2AX-M12KN08-M1-B2 | E2AX-M12KN08-M1-B3     |
|      |              |                  |               |               |                                | NPN                   | E2AX-M12KN08-M1-C1 | E2AX-M12KN08-M1-C2 | E2AX-M12KN08-M1-C3     |
|      |              |                  |               |               | 56 (70)                        | PNP                   | E2AX-M12LN08-M1-B1 | E2AX-M12LN08-M1-B2 | E2AX-M12LN08-M1-B3     |
|      |              |                  |               |               |                                | NPN                   | E2AX-M12LN08-M1-C1 | E2AX-M12LN08-M1-C2 | E2AX-M12LN08-M1-C3     |
| M18  | Shielded     | 8.0 mm           | M12 connector | Brass*2       | 39 (53)                        | PNP                   | E2AX-M18KS08-M1-B1 | E2AX-M18KS08-M1-B2 | E2AX-M18KS08-M1-B3     |
|      |              |                  |               |               |                                | NPN                   | E2AX-M18KS08-M1-C1 | E2AX-M18KS08-M1-C2 | E2AX-M18KS08-M1-C3     |
|      |              |                  |               |               | 61 (75)                        | PNP                   | E2AX-M18LS08-M1-B1 | E2AX-M18LS08-M1-B2 | E2AX-M18LS08-M1-B3     |
|      |              |                  |               |               |                                | NPN                   | E2AX-M18LS08-M1-C1 | E2AX-M18LS08-M1-C2 | E2AX-M18LS08-M1-C3     |
|      | Non-shielded | 16.0 mm          | M12 connector | Brass*2       | 39 (53)                        | PNP                   | E2AX-M18KN16-M1-B1 | E2AX-M18KN16-M1-B2 | E2AX-M18KN16-M1-B3     |
|      |              |                  |               |               |                                | NPN                   | E2AX-M18KN16-M1-C1 | E2AX-M18KN16-M1-C2 | E2AX-M18KN16-M1-C3     |
|      |              |                  |               |               | 61 (75)                        | PNP                   | E2AX-M18LN16-M1-B1 | E2AX-M18LN16-M1-B2 | E2AX-M18LN16-M1-B3     |
|      |              |                  |               |               |                                | NPN                   | E2AX-M18LN16-M1-C1 | E2AX-M18LN16-M1-C2 | E2AX-M18LN16-M1-C3     |
| M30  | Shielded     | 15.0 mm          | M12 connector | Brass*2       | 44 (58)                        | PNP                   | E2AX-M30KS15-M1-B1 | E2AX-M30KS15-M1-B2 | E2AX-M30KS15-M1-B3     |
|      |              |                  |               |               |                                | NPN                   | E2AX-M30KS15-M1-C1 | E2AX-M30KS15-M1-C2 | E2AX-M30KS15-M1-C3     |
|      |              |                  |               |               | 66 (80)                        | PNP                   | E2AX-M30LS15-M1-B1 | E2AX-M30LS15-M1-B2 | E2AX-M30LS15-M1-B3     |
|      |              |                  |               |               |                                | NPN                   | E2AX-M30LS15-M1-C1 | E2AX-M30LS15-M1-C2 | E2AX-M30LS15-M1-C3     |
|      | Non-shielded | 20.0 mm          | M12 connector | Brass*2       | 44 (58) (See note.)            | PNP                   | E2AX-M30KN20-M1-B1 | E2AX-M30KN20-M1-B2 | E2AX-M30KN20-M1-B3     |
|      |              |                  |               |               |                                | NPN                   | E2AX-M30KN20-M1-C1 | E2AX-M30KN20-M1-C2 | E2AX-M30KN20-M1-C3     |
|      |              | 30.0 mm          |               |               | 66 (80)                        | PNP                   | E2AX-M30LN30-M1-B1 | E2AX-M30LN30-M1-B2 | E2AX-M30LN30-M1-B3     |
|      |              |                  |               |               |                                | NPN                   | E2AX-M30LN30-M1-C1 | E2AX-M30LN30-M1-C2 | E2AX-M30LN30-M1-C3     |

\*1. Please contact your OMRON representative for DC 2-wire models.

\*2. Stainless steel models are also available. Please contact your OMRON representative.

**Note:** M30 non-shielded models with double sensing distance and short barrels cannot be mounted due to the necessary separation distance from the surrounding metal. Standard sensing models are thus available.

## Connectivity

The E2A sensors are available with the following connectors:

### Connector models



Standard connectors: M12

-M1

## Model Number Legend

**E2A**                          

1 2 3 4 5 6 7 8 9 10 11 12

**Example:** E2A-M12LS04-M1-B1

E2A-S08KN04-WP-B1 5M

Standard, M12, long barrel, shielded, Sn=4 mm, M12 connector, PNP-NO

Standard, M8 stainless steel, short barrel, non-shielded, Sn=4 mm, pre-wired PVC cable, PNP-NO, cable length=5 m

#### 1. Basic name

E2A

#### 2. Sensing technology

Blank: Standard double distance

3: Triple distance

U: Mobile usage

X: Explosion hazardous environments

#### 3. Housing shape and material

M: Cylindrical, metric threaded, brass

S: Cylindrical, metric threaded, stainless steel

#### 4. Housing size

08: 8 mm

12: 12 mm

18: 18 mm

30: 30 mm

#### 5. Barrel length

K: Standard length

L: Long body

#### 6. Shield

S: Shielded

N: Non-shielded

#### 7. Sensing distance

Numeral: Sensing distance: e.g. 02=2 mm, 16=16 mm

#### 8. Kind of connection

M1: M12 connector (4 pin) \*

M3: M8 connector (4 pin)

M5: M8 connector (3 pin)

#### 9. Power source and output

B: DC, 3-wire, PNP open collector

C: DC, 3-wire, NPN open collector

D: DC, 2-wire

E: DC, 3-wire, NPN voltage output

F: DC, 3-wire, PNP voltage output

#### 10. Operation mode

1: Normally open (NO)

2: Normally closed (NC)

3: Antivalent (NO+NC)

#### 11. Specials (e.g., cable material, oscillating frequency)

#### 12. Cable length

Blank: Connector type

Numeral: Cable length

Note: \*In case of DC 2-wire models the M12 connector identifier is '-M1G'

## Specifications

## DC 3-wire Models / DC 4-wire (NO+NC)

| Size                                             |                            | M12                                                                                                                                                                |                                                                                      |
|--------------------------------------------------|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Type                                             |                            | Shielded                                                                                                                                                           | Non-shielded                                                                         |
| Item                                             |                            | E2AX-M12□S04-□□-B□<br>E2AX-M12□S04-□□-C□<br>E2AX-S12□S04-□□-B□<br>E2AX-S12□S04-□□-C□                                                                               | E2AX-M12□N08-□□-B□<br>E2AX-M12□N08-□□-C□<br>E2AX-S12□N08-□□-B□<br>E2AX-S12□N08-□□-C□ |
| Sensing distance                                 |                            | 4 mm ± 10%                                                                                                                                                         | 8 mm ± 10%                                                                           |
| Setting distance                                 |                            | 0 to 3.2 mm                                                                                                                                                        | 0 to 6.4 mm                                                                          |
| Differential travel                              |                            | 10% max. of sensing distance                                                                                                                                       |                                                                                      |
| Target                                           |                            | Ferrous metal (The sensing distance decreases with non-ferrous metal.)                                                                                             |                                                                                      |
| Standard target (mild steel ST37)                |                            | 12×12×1 mm                                                                                                                                                         | 24×24×1 mm                                                                           |
| Response frequency (See note 1.)                 |                            | 1,000 Hz                                                                                                                                                           | 800 Hz                                                                               |
| Power supply voltage (operating voltage range)   |                            | 12 to 24 VDC. Ripple (p-p): 10% max. (10 to 32 VDC)                                                                                                                |                                                                                      |
| Current consumption (DC 3-wire)                  |                            | 10 mA max.                                                                                                                                                         |                                                                                      |
| Output type                                      |                            | -B models: PNP open collector<br>-C models: NPN open collector                                                                                                     |                                                                                      |
| Control output                                   | Load current (See note 2.) | 200 mA max. (32 VDC max.)                                                                                                                                          |                                                                                      |
|                                                  | Residual voltage           | 2 V max. (under load current of 200 mA with cable length of 2 m)                                                                                                   |                                                                                      |
| Indicator                                        |                            | Operation indicator (Yellow LED)                                                                                                                                   |                                                                                      |
| Operation mode (with sensing object approaching) |                            | -B1/-C1 models: NO<br>-B2/-C2 models: NC<br>-B3/-C3 models: NO+NC<br>For details, refer to the timing charts.                                                      |                                                                                      |
| Protection circuit                               |                            | Output reverse polarity protection, Power source circuit reverse polarity protection, Surge suppressor, Short-circuit protection                                   |                                                                                      |
| Ambient air temperature                          |                            | Operating: -40°C to 70°C, Storage: -40°C to 85°C (with no icing or condensation)                                                                                   |                                                                                      |
| Temperature influence (See note 2.)              |                            | ±10% max. of sensing distance at 23°C within temperature range of -25°C to 70°C<br>±15% max. of sensing distance at 23°C within temperature range of -40°C to 70°C |                                                                                      |
| Ambient humidity                                 |                            | Operating: 35% to 95%, Storage: 35% to 95%                                                                                                                         |                                                                                      |
| Voltage influence                                |                            | ±1% max. of sensing distance in rated voltage range ±15%                                                                                                           |                                                                                      |
| Insulation resistance                            |                            | 50 MΩ min. (at 500 VDC) between current carry parts and case                                                                                                       |                                                                                      |
| Dielectric strength                              |                            | 1,000 VAC at 50/60 Hz for 1 min between current carry parts and case                                                                                               |                                                                                      |
| Vibration resistance                             |                            | 10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y and Z directions                                                                                     |                                                                                      |
| Shock resistance                                 |                            | 1,000 m/s <sup>2</sup> , 10 times each in X, Y and Z directions                                                                                                    |                                                                                      |
| Standard and listings (See note 3.)              |                            | IP65<br>EMC after EN60947-5-2<br>ATEX after EN50014<br>EN50281-1-1/2                                                                                               |                                                                                      |
| Connection method                                |                            | Please see chapter 'Connectivity' for details on M12 connectors.                                                                                                   |                                                                                      |
| Weight (packaged)                                | Connector model            | Approx. 35 g                                                                                                                                                       |                                                                                      |
| Material                                         | Case                       | Brass-nickel plated or stainless steel                                                                                                                             |                                                                                      |
|                                                  | Sensing surface            | PBT                                                                                                                                                                |                                                                                      |
|                                                  | Clamping nut               | Brass-nickel plated for brass models stainless steel for steel models                                                                                              |                                                                                      |

**Note 1.** The response frequency is an average value. Measurement conditions are as follows: standard target, a distance of twice the standard target distance between targets, and a setting distance of half the sensing distance.

**2.** When using any model at an ambient temperature between -40°C and -25°C and a power voltage between 30 and 32 VDC, use a load current of 100 mA max.,

**3.** For USA and Canada: Use class 2 circuit only.

DC 3-wire Models / DC 4-wire (NO+NC)

| Size                                             |                            | M18                                                                                                                                                                |                    | M30                |                    |                    |
|--------------------------------------------------|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|--------------------|
| Type                                             |                            | Shielded                                                                                                                                                           | Non-shielded       | Shielded           | Non-shielded       | Non-shielded       |
| Item                                             |                            | E2AX-M18□S08-M1-B□                                                                                                                                                 | E2AX-M18□N16-M1-B□ | E2AX-M30□S15-M1-B□ | E2AX-M30KN20-M1-B□ | E2AX-M30LN30-M1-B□ |
|                                                  |                            | E2AX-M18□S08-M1-C□                                                                                                                                                 | E2AX-M18□N16-M1-C□ | E2AX-M30□S15-M1-C□ | E2AX-M30KN20-M1-C□ | E2AX-M30LN30-M1-C□ |
|                                                  |                            | E2AX-S18□S08-M1-B□                                                                                                                                                 | E2AX-S18□N16-M1-B□ | E2AX-S30□S15-M1-B□ | E2AX-S30KN20-M1-B□ | E2AX-S30LN30-M1-B□ |
|                                                  |                            | E2AX-S18□S08-M1-C□                                                                                                                                                 | E2AX-S18□N16-M1-C□ | E2AX-S30□S15-M1-C□ | E2AX-S30KN20-M1-C□ | E2AX-S30LN30-M1-C□ |
| Sensing distance                                 |                            | 8 mm±10%                                                                                                                                                           | 16 mm±10%          | 15 mm±10%          | 20 mm±10%          | 30 mm±10%          |
| Setting distance                                 |                            | 0 to 6.4 mm                                                                                                                                                        | 0 to 12.8 mm       | 0 to 12 mm         | 0 to 16 mm         | 0 to 24 mm         |
| Differential travel                              |                            | 10% max. of sensing distance                                                                                                                                       |                    |                    |                    |                    |
| Target                                           |                            | Ferrous metal (The sensing distance decreases with non-ferrous metal.)                                                                                             |                    |                    |                    |                    |
| Standard target (mild steel ST37)                |                            | 24×24×1 mm                                                                                                                                                         | 48×48×1 mm         | 45×45×1 mm         | 60×60×1 mm         | 90×90×1 mm         |
| Response frequency (See note 1.)                 |                            | 500 Hz                                                                                                                                                             | 400 Hz             | 250 Hz             | 100 Hz             | 100 Hz             |
| Power supply voltage (operating voltage range)   |                            | 12 to 24 VDC. Ripple (p-p): 10% max. (10 to 32 VDC)                                                                                                                |                    |                    |                    |                    |
| Current consumption (DC 3-wire)                  |                            | 10 mA max.                                                                                                                                                         |                    |                    |                    |                    |
| Output type                                      |                            | -B models: PNP open collector<br>-C models: NPN open collector                                                                                                     |                    |                    |                    |                    |
| Control output                                   | Load current (See note 2.) | 200 mA max. (32 VDC max.)                                                                                                                                          |                    |                    |                    |                    |
|                                                  | Residual voltage           | 2 V max. (under load current of 200 mA with cable length of 2 m)                                                                                                   |                    |                    |                    |                    |
| Indicator                                        |                            | Operation indicator (Yellow LED)                                                                                                                                   |                    |                    |                    |                    |
| Operation mode (with sensing object approaching) |                            | -B1/-C1 models: NO<br>-B2/-C2 models: NC<br>-B3/-C3 models: NO+NC<br>For details, refer to the timing charts.                                                      |                    |                    |                    |                    |
| Protection circuit                               |                            | Output reverse polarity protection, Power source circuit reverse polarity protection, Surge suppressor, Short-circuit protection                                   |                    |                    |                    |                    |
| Ambient air temperature                          |                            | Operating: -40°C to 70°C, Storage: -40°C to 85°C (with no icing or condensation)                                                                                   |                    |                    |                    |                    |
| Temperature influence (See note 2.)              |                            | ±10% max. of sensing distance at 23°C within temperature range of -25°C to 70°C<br>±15% max. of sensing distance at 23°C within temperature range of -40°C to 70°C |                    |                    |                    |                    |
| Ambient humidity                                 |                            | Operating: 35% to 95%, Storage: 35% to 95%                                                                                                                         |                    |                    |                    |                    |
| Voltage influence                                |                            | ±1% max. of sensing distance in rated voltage range ±15%                                                                                                           |                    |                    |                    |                    |
| Insulation resistance                            |                            | 50 MΩ min. (at 500 VDC) between current carry parts and case                                                                                                       |                    |                    |                    |                    |
| Dielectric strength                              |                            | 1,000 VAC at 50/60 Hz for 1 min between current carry parts and case                                                                                               |                    |                    |                    |                    |
| Vibration resistance                             |                            | 10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y and Z directions                                                                                     |                    |                    |                    |                    |
| Shock resistance                                 |                            | 1,000 m/s <sup>2</sup> , 10 times each in X, Y and Z directions                                                                                                    |                    |                    |                    |                    |
| Standard and listings (See note 3.)              |                            | IP65<br>EMC after EN60947-5-2<br>ATEX after EN50014<br>EN50281-1-1/2                                                                                               |                    |                    |                    |                    |
| Connection method                                |                            | Please see chapter 'Connectivity' for details on M12 connectors.                                                                                                   |                    |                    |                    |                    |
| Weight (pak-kaged)                               | Connector model            | Approx. 70 g                                                                                                                                                       |                    | Approx. 200 g      | Approx. 200 g      | Approx. 260 g      |
| Material                                         | Case                       | Brass-nickel plated or stainless steel                                                                                                                             |                    |                    |                    |                    |
|                                                  | Sensing surface            | PBT                                                                                                                                                                |                    |                    |                    |                    |
|                                                  | Clamping nut               | brass-nickel plated for brass models stainless steel for steel models                                                                                              |                    |                    |                    |                    |

**Note 1.** The response frequency is an average value. Measurement conditions are as follows: standard target, a distance of twice the standard target distance between targets, and a setting distance of half the sensing distance.

**2.** When using any model at an ambient temperature between -40°C and -25°C and a power voltage between 30 and 32 VDC, use a load current of 100 mA max.

**3.** For USA and Canada: Use class 2 circuit only.

## DC 2-wire Models

| Size                                              |                               | M12                                                                                                                                                                |                                    |
|---------------------------------------------------|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| Type                                              |                               | Shielded                                                                                                                                                           | Non-shielded                       |
| Item                                              |                               | E2AX-M12□S04-D□<br>E2AX-S12□S04-D□                                                                                                                                 | E2AX-M12□N08-D□<br>E2AX-S12□N08-D□ |
| Sensing distance                                  |                               | 4 mm ± 10%                                                                                                                                                         | 8 mm ± 10%                         |
| Setting distance                                  |                               | 0 to 3.2 mm                                                                                                                                                        | 0 to 6.4 mm                        |
| Differential travel                               |                               | 10% max. of sensing distance                                                                                                                                       |                                    |
| Target                                            |                               | Ferrous metal (The sensing distance decreases with non-ferrous metal.)                                                                                             |                                    |
| Standard target                                   |                               | 12×12×1 mm                                                                                                                                                         | 24×24×1 mm                         |
| Response frequency (See note 1.)                  |                               | 1,000 Hz                                                                                                                                                           | 800 Hz                             |
| Power supply voltage<br>(operating voltage range) |                               | 12 to 24 VDC. Ripple (p-p): 10% max.<br>(10 to 32 VDC)                                                                                                             |                                    |
| Leakage current                                   |                               | 0.8 mA max.                                                                                                                                                        |                                    |
| Output type                                       |                               | DC 2 wire type                                                                                                                                                     |                                    |
| Control<br>output                                 | Load current<br>(See note 2.) | 3 to 100 mA                                                                                                                                                        |                                    |
|                                                   | Residual voltage              | 3 V max. (under load current of 100 mA with cable length of 2 m)                                                                                                   |                                    |
| Indicator (see timing chart)                      |                               | NO type: Operation indicator (Yellow), Setting indicator (Red)<br>NC type: Operation indicator (Yellow)                                                            |                                    |
| Operation mode                                    |                               | -D1 models: NO<br>-D2 models: NC                                                                                                                                   |                                    |
| Protection circuit                                |                               | Surge suppressor, Short circuit protection                                                                                                                         |                                    |
| Ambient temperature                               |                               | Operating: -40°C to 70°C, Storage: -40°C to 85°C (with no icing or condensation)                                                                                   |                                    |
| Temperature influence                             |                               | ±10% max. of sensing distance at 23°C within temperature range of -25°C to 70°C<br>±15% max. of sensing distance at 23°C within temperature range of -40°C to 70°C |                                    |
| Ambient humidity                                  |                               | Operating: 35% to 95%, Storage: 35% to 95%                                                                                                                         |                                    |
| Voltage influence                                 |                               | ±1% max. of sensing distance in rated voltage range ±15%                                                                                                           |                                    |
| Insulation resistance                             |                               | 50 MΩ min. (at 500 VDC) between current carry parts and case                                                                                                       |                                    |
| Dielectric strength                               |                               | 1,000 VAC at 50/60 Hz for 1 min between current carry parts and case                                                                                               |                                    |
| Vibration resistance                              |                               | 10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y and Z directions                                                                                     |                                    |
| Shock resistance                                  |                               | 1,000 m/s <sup>2</sup> , 10 times each in X, Y and Z directions                                                                                                    |                                    |
| Standard and listings (See note 3.)               |                               | IP65<br>EMC after EN60947-5-2<br>ATEX after EN50014<br>EN50281-1-1/2                                                                                               |                                    |
| Connection method                                 |                               | Please see chapter 'Connectivity' for details on different cable materials and lengths and M8 or M12 connectors.                                                   |                                    |
| Weight<br>(packaged)                              | Pre-wired model               | Approx. 85 g                                                                                                                                                       |                                    |
|                                                   | Connector model               | Approx. 35 g                                                                                                                                                       |                                    |
| Material                                          | Case                          | Brass-nickel plated or stainless steel                                                                                                                             |                                    |
|                                                   | Sensing surface               | PBT                                                                                                                                                                |                                    |
|                                                   | Clamping nut                  | Brass-nickel plated for brass models stainless steel for steel models                                                                                              |                                    |

**Note 1.** The response frequency is an average value. Measurement conditions are as follows: standard target, a distance of twice the standard target distance between targets, and a setting distance of half the sensing distance.

**2.** When using any model at an ambient temperature between -40°C and -25°C and a power voltage between 30 and 32 VDC, use a load current of 50 mA max.

**3.** For USA and Canada: Use class 2 circuit only.

# DC 2-wire Models

| Size                                |                                                   | M18                                                                                                                                                                |                                                                        | M30                                |                                                                          |                                                 |
|-------------------------------------|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------|--------------------------------------------------------------------------|-------------------------------------------------|
| Type                                |                                                   | Shielded                                                                                                                                                           | Non-shielded                                                           | Shielded                           | Non-shielded                                                             |                                                 |
| Item                                |                                                   | E2AX-M18□S08-D□<br>E2AX-S18□S08-D□                                                                                                                                 | E2AX-M18□N16-D□<br>E2AX-S18□N16-D□                                     | E2AX-M30□S15-D□<br>E2AX-S30□S15-D□ | E2AX-M30□N30-D□<br>E2AX-M30□N20-D□<br>E2AX-S30□N30-D□<br>E2AX-S30□N20-D□ |                                                 |
|                                     | Sensing distance                                  |                                                                                                                                                                    | 8 mm ± 10%                                                             | 16 mm ± 10%                        | 15 mm ± 10%                                                              | Short body: 20 m ± 10%<br>Long body: 30 m± 10%  |
|                                     | Setting distance                                  |                                                                                                                                                                    | 0 to 6.4 mm                                                            | 0 to 12.8 mm                       | 0 to 12 mm                                                               | Short body: 0 to 16 mm<br>Long body: 0 to 24 mm |
|                                     | Differential travel                               |                                                                                                                                                                    | 10% max. of sensing distance                                           |                                    |                                                                          |                                                 |
|                                     | Target                                            |                                                                                                                                                                    | Ferrous metal (The sensing distance decreases with non-ferrous metal.) |                                    |                                                                          |                                                 |
|                                     | Standard target                                   |                                                                                                                                                                    | 24x24x1 mm                                                             | 48x48x1 mm                         | 45x45x1 mm                                                               | Short body: 60x60x1 mm<br>Long body: 90x90x1mm  |
|                                     | Response frequency (See note 1.)                  |                                                                                                                                                                    | 500 Hz                                                                 | 400 Hz                             | 250 Hz                                                                   | 100 Hz                                          |
|                                     | Power supply voltage<br>(operating voltage range) |                                                                                                                                                                    | 12 to 24 VDC. Ripple (p-p): 10% max.<br>(10 to 32 VDC)                 |                                    |                                                                          |                                                 |
|                                     | Leakage current                                   |                                                                                                                                                                    | 0.8 mA max.                                                            |                                    |                                                                          |                                                 |
|                                     | Output type                                       |                                                                                                                                                                    | DC 2 wire type                                                         |                                    |                                                                          |                                                 |
|                                     | Control output                                    | Load current<br>(See note 2.)                                                                                                                                      | 3 to 100 mA                                                            |                                    |                                                                          |                                                 |
| Residual voltage                    |                                                   | 3 V max. (under load current of 100 mA with cable length of 2 m)                                                                                                   |                                                                        |                                    |                                                                          |                                                 |
| Indicator (see timing chart)        |                                                   | NO type: Operation indicator (Yellow), Setting indicator (Red)<br>NC type: Operation indicator (Yellow)                                                            |                                                                        |                                    |                                                                          |                                                 |
| Operation mode                      |                                                   | -D1 models: NO<br>-D2 models: NC                                                                                                                                   |                                                                        |                                    |                                                                          |                                                 |
| Protection circuit                  |                                                   | Surget suppressor, Short circuit protection                                                                                                                        |                                                                        |                                    |                                                                          |                                                 |
| Ambient temperature                 |                                                   | Operating: −40°C to 70°C, Storage: −40°C to 85°C (with no icing or condensation)                                                                                   |                                                                        |                                    |                                                                          |                                                 |
| Temperature influence               |                                                   | ±10% max. of sensing distance at 23°C within temperature range of −25°C to 70°C<br>±15% max. of sensing distance at 23°C within temperature range of −40°C to 70°C |                                                                        |                                    |                                                                          |                                                 |
| Ambient humidity                    |                                                   | Operating: 35% to 95%, Storage: 35% to 95%                                                                                                                         |                                                                        |                                    |                                                                          |                                                 |
| Voltage influence                   |                                                   | ±1% max. of sensing distance in rated voltage range ±15%                                                                                                           |                                                                        |                                    |                                                                          |                                                 |
| Insulation resistance               |                                                   | 50 MΩ min. (at 500 VDC) between current carry parts and case                                                                                                       |                                                                        |                                    |                                                                          |                                                 |
| Dielectric strength                 |                                                   | 1,000 VAC at 50/60 Hz for 1 min between current carry parts and case                                                                                               |                                                                        |                                    |                                                                          |                                                 |
| Vibration resistance                |                                                   | 10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y and Z directions                                                                                     |                                                                        |                                    |                                                                          |                                                 |
| Shock resistance                    |                                                   | 500 m/s <sup>2</sup> , 10 times each in X, Y and Z directions                                                                                                      |                                                                        |                                    |                                                                          |                                                 |
| Standard and listings (See note 3.) |                                                   | IP65<br>EMC after EN60947-5-2<br>ATEX after EN50014<br>EN50281-1-1/2                                                                                               |                                                                        |                                    |                                                                          |                                                 |
| Connection method                   |                                                   | Please see chapter 'Connectivity' for details on M12 connectors.                                                                                                   |                                                                        |                                    |                                                                          |                                                 |
| Weight (packaged)                   | Connector model                                   | Approx. 70 g                                                                                                                                                       |                                                                        | Approx. 200 g                      | short body: 200 g<br>long body: 260 g                                    |                                                 |
| Material                            | Case                                              | Brass-nickel plated or stainless steel                                                                                                                             |                                                                        |                                    |                                                                          |                                                 |
|                                     | Sensing surface                                   | PBT                                                                                                                                                                |                                                                        |                                    |                                                                          |                                                 |
|                                     | Clamping nut                                      | brass-nickel plated for brass models stainless steel for steel models                                                                                              |                                                                        |                                    |                                                                          |                                                 |

**Note 1.** The response frequency is an average value. Measurement conditions are as follows: standard target, a distance of twice the standard target distance between targets, and a setting distance of half the sensing distance.

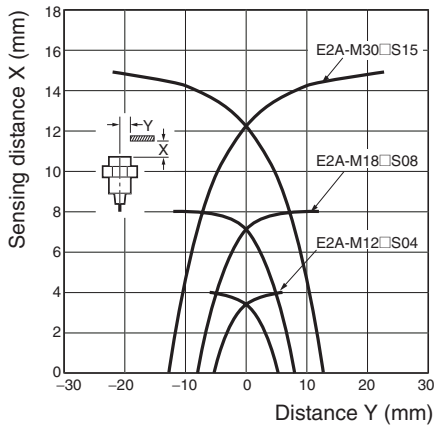
**2.** When using any model at an ambient temperature between -40°C and -25°C and a power voltage between 30 and 32 VDC, use a load current of 50 mA max.

**3.** For USA and Canada: Use class 2 circuit only.

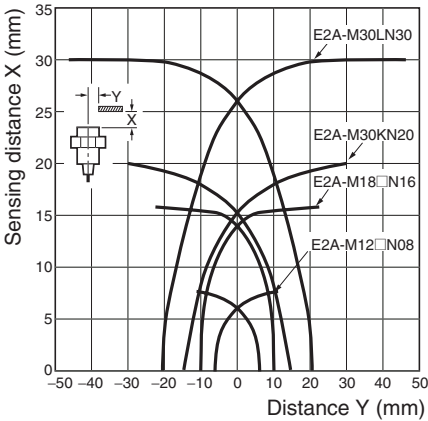
Engineering Data

Operating Range (Typical)

Shielded Models



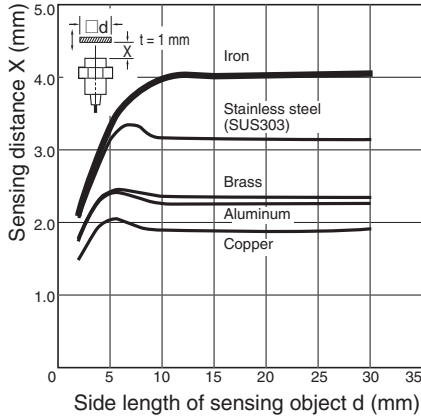
Non-shielded Models



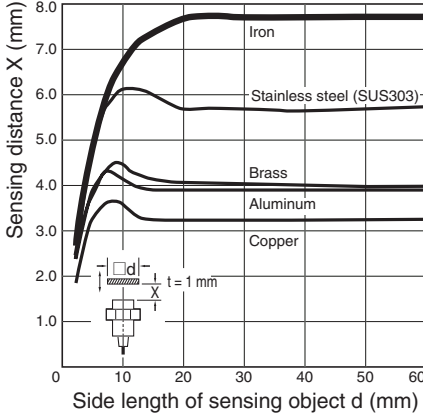
Influence of Sensing Object Size and Materials

Shielded Models

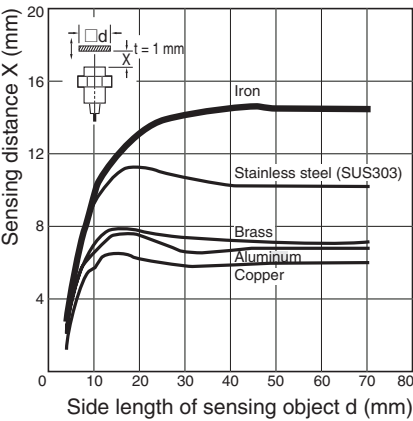
E2AX-M12□S04/ E2A-S12□S04



E2AX-M18□S08/E2A-S18□S08

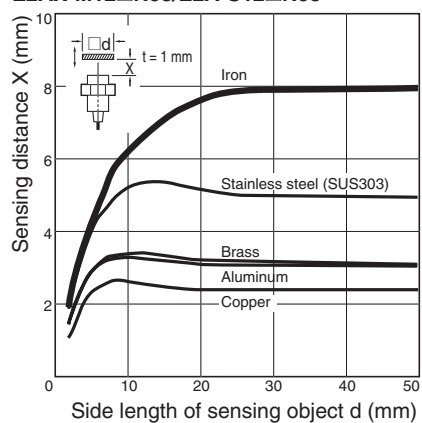


E2AX-M30□S15/ E2A-S30□S15

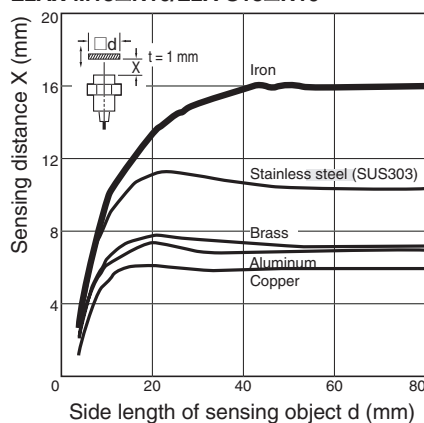


Non-shielded Models

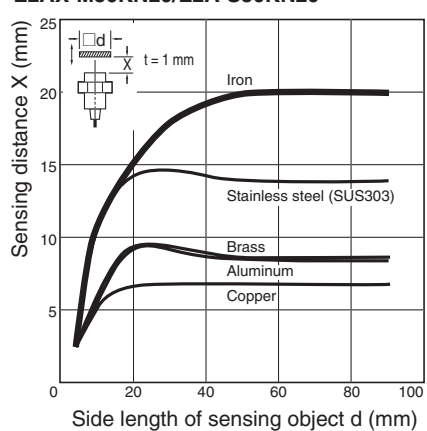
E2AX-M12□N08/E2A-S12□N08



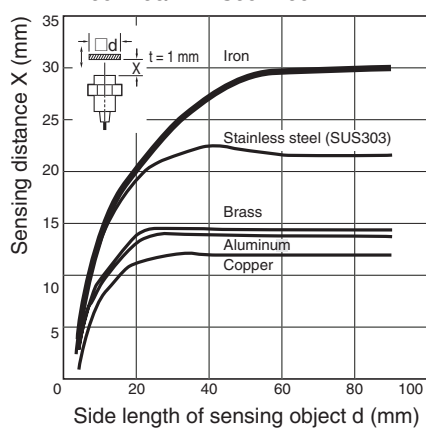
E2AX-M18□N16/E2A-S18□N16



E2AX-M30KN20/E2A-S30KN20



E2AX-M30LN30/E2A-S30LN30



Operation

DC 3-wire models  
PNP Output

| Operation mode | Model       | Timing chart | Output circuit |
|----------------|-------------|--------------|----------------|
| NO             | E2AX-□-□-B1 |              |                |
| NC             | E2AX-□-□-B2 |              |                |
| NO + NC        | E2AX-□-□-B3 |              |                |

# DC 3-wire models

## NPN Output

| Operation mode | Model       | Timing chart                                                                                                                                                                                              | Output circuit                                                                                       |
|----------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| NO             | E2AX-□-□-C1 | <p>Non-sensing zone Sensing zone Proximity Sensor</p> <p>Sensing object</p> <p>(%) 100 0</p> <p>Rated sensing distance</p> <p>ON OFF Yellow indicator</p> <p>ON OFF Control output</p>                    | <p>M12 Connector Pin Arrangement (See note)</p> <p>Note: Pin 2 of the M12 connector is not used.</p> |
| NC             | E2AX-□-□-C2 | <p>Non-sensing zone Sensing zone Proximity Sensor</p> <p>Sensing object</p> <p>(%) 100 0</p> <p>Rated sensing distance</p> <p>ON OFF Yellow indicator</p> <p>ON OFF Control output</p>                    | <p>M12 Connector Pin Arrangement (See note)</p> <p>Note: Pin 4 of the M12 connector is not used.</p> |
| NO + NC        | E2AX-□-□-C3 | <p>Non-sensing zone Sensing zone Proximity Sensor</p> <p>Sensing object</p> <p>(%) 100 0</p> <p>Rated sensing distance</p> <p>ON OFF Yellow indicator</p> <p>ON OFF NO output</p> <p>ON OFF NC output</p> | <p>M12 Connector Pin Arrangement</p>                                                                 |

DC 2-wire models  
Output Circuit Diagrams (Operation)

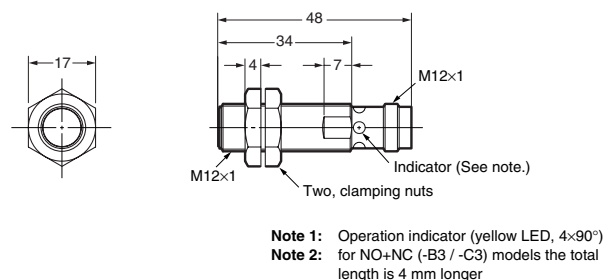
| Operation mode | Model     | Timing chart | Output circuit                                                                      |
|----------------|-----------|--------------|-------------------------------------------------------------------------------------|
| NO             | E2AX-□-D1 |              | <p>Load can be connected to +V or 0V side.</p> <p>M12 Connector Pin Arrangement</p> |
| NC             | E2AX-□-D2 |              | <p>Load can be connected to +V or 0V side.</p> <p>M12 Connector Pin Arrangement</p> |

## Dimensions

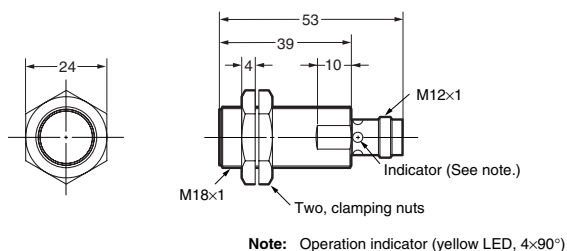
**Note:** All units are in millimeters unless otherwise indicated.

### M12 Connector Models (Shielded)

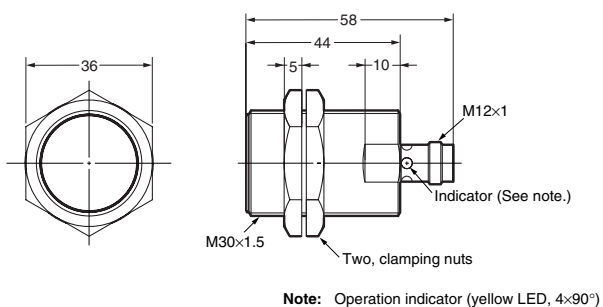
#### E2AX-M12KS04-M1-□□/E2A-S12KS04-M1-□



#### E2AX-M18KS08-M1-□□/E2A-S18KS08-M1-□

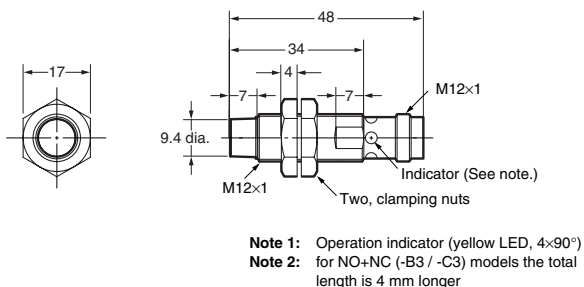


#### E2AX-M30KS15-M1-□□/E2A-S30KS15-M1-□

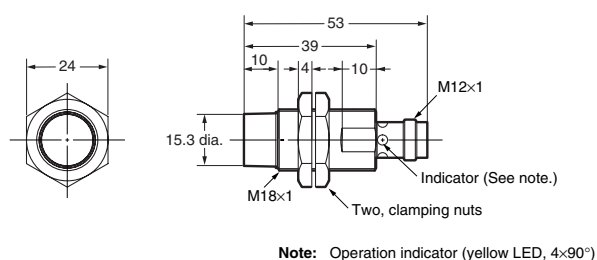


### M12 Connector Models (Non-shielded)

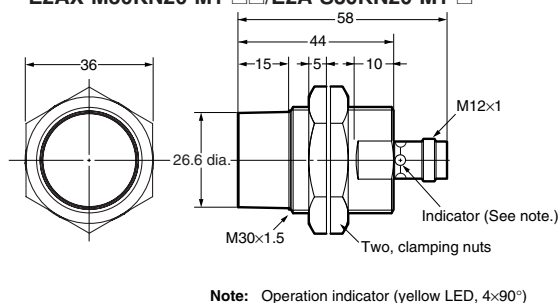
#### E2AX-M12KN08-M1-□□/E2A-S12KN08-M1-□

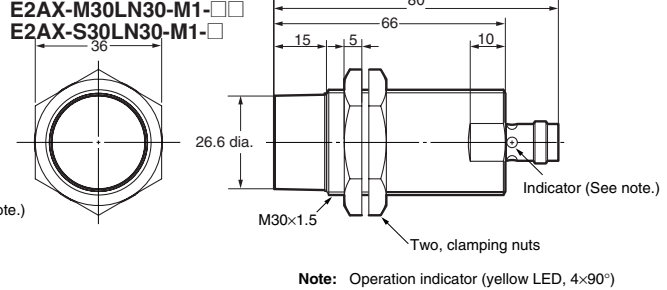
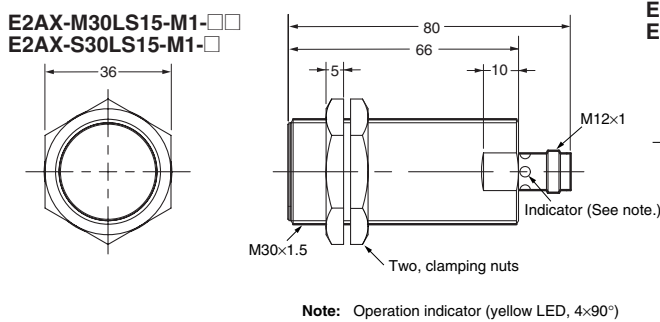
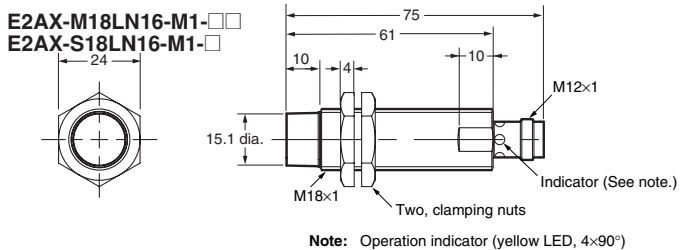
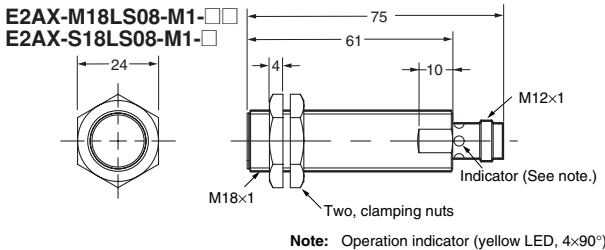
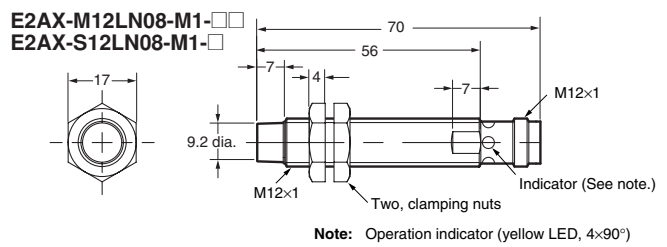
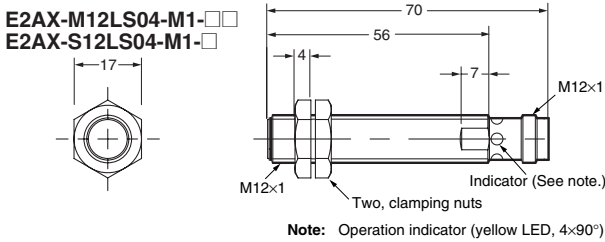


#### E2AX-M18KN16-M1-□□/E2A-S18KN16-M1-□



#### E2AX-M30KN20-M1-□□/E2A-S30KN20-M1-□





Note: Please contact your OMRON sales representative for dimension drawings not listed here.

## Precautions

### Safety Precautions

#### Power Supply

Do not impose an excessive voltage on the E2AX, otherwise it may be damaged. Do not impose AC current (100 to 240 VAC) on any DC model, otherwise it may be damaged.

#### Load Short-circuit

Do not short-circuit the load, or the E2AX may be damaged.

The E2AX's short-circuit protection function will be valid if the polarity of the supply voltage imposed is correct and within the rated voltage range.

### Wiring

Be sure to wire the E2AX and load correctly, otherwise it may be damaged.

#### Connection with No Load

Be sure to insert loads when wiring. Make sure to connect a proper load to the E2AX in operation, otherwise it may damage internal elements.

**Do not expose the product to flammable or explosive gases.**

**Do not disassemble, repair, or modify the product.**

### Correct Use

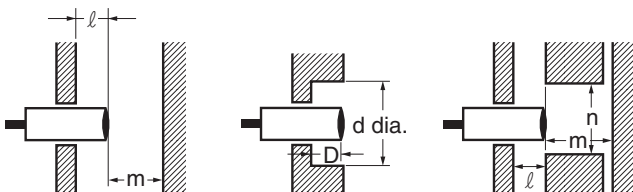
#### Designing

##### Power Reset Time

The Proximity Sensor is ready to operate within 100 ms (160ms for NO+NC -B3 / -C3 types) 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.

##### Effects of Surrounding Metal

When mounting the E2AX within a metal panel, ensure that the clearances given in the following table are maintained.



(Unit: mm)

| Type         | Dimension | M12 | M18                | M30                |             |
|--------------|-----------|-----|--------------------|--------------------|-------------|
|              |           |     |                    | Short barrel       | Long barrel |
| Shielded     | l         | 0   | 0<br>(See note 1.) | 0<br>(See note 2.) |             |
|              | m         | 12  | 24                 | 45                 |             |
|              | d         | --- | 27                 | 45                 |             |
|              | D         | 0   | 1.5                | 4                  |             |
|              | n         | 18  | 27                 | 45                 |             |
| Non-shielded | l         | 15  | 22                 | 30                 | 40          |
|              | m         | 20  | 48                 | 70                 | 90          |
|              | d         | 40  | 70                 | 90                 | 120         |
|              | D         | 15  | 22                 | 30                 | 40          |
|              | n         | 40  | 70                 | 90                 | 120         |

**Note 1.** In the case of using the supplied nuts. If true flush mounting is necessary, apply a free zone of 1.5 mm.

**Note 2.** In the case of using the supplied nuts. If true flush mounting is necessary, apply a free zone of 4 mm.

## Power OFF

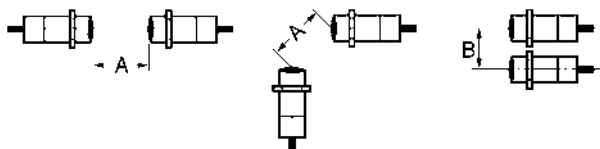
The Proximity Sensor may output a pulse signal when it is turned OFF. Therefore, it is recommended that the load be turned OFF before turning OFF the Proximity Sensor.

## 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.

## 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.



(Unit: mm)

| Type         | Dimension | M12 | M18 | M30          |             |
|--------------|-----------|-----|-----|--------------|-------------|
|              |           |     |     | Short barrel | Long barrel |
| Shielded     | A         | 30  | 60  | 110          |             |
|              | B         | 20  | 35  | 70           |             |
| Non-shielded | A         | 120 | 200 | 300          | 300         |
|              | B         | 100 | 120 | 200          | 300         |

## 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.

## 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-resistivity.

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



| Type | Torque |
|------|--------|
| M12  | 30 Nm  |
| M18  | 70 Nm  |
| M30  | 180 Nm |

## Maintenance and Inspection

Periodically perform the following checks to ensure stable operation of the Proximity Sensor over a long period of time.

1. Check for mounting position, dislocation, looseness, or distortion of the Proximity Sensor and sensing objects.
2. Check for loose wiring and connections, improper contacts, and line breakage.
3. Check for attachment or accumulation of metal powder or dust.
4. Check for abnormal temperature conditions and other environmental conditions.
5. Check for proper lighting of indicators (for models with a set indicator.)

Never disassemble or repair the Sensor.

## Environment

### Water Resistivity

The Proximity Sensors are tested intensively on water resistance, but in order to ensure maximum performance and life expectancy avoid immersion in water and provide protection from rain or snow.

### Operating Environment

Ensure storage and operation of the Proximity Sensor within the given specifications.

### 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.

## <SUITABILITY FOR USE>

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of the products in the customer's application or use of the products.

Take all necessary steps to determine the suitability of the product for the systems, machines, and equipment with which it will be used.

## <CHANGE IN SPECIFICATIONS>

Product specifications and accessories may be changed at any time based on improvements and other reasons. Consult with your OMRON representative at any time to confirm actual specifications of purchased product.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.