

Long Distance Cylindrical Proximity Sensor

E2A3

Extra long distance for increased protection and sensing performance

- triple distance proximity sensors for flush mounting requirements.
- designed and tested for extra long life.



Ordering Information

DC 3-wire Models

| Size | Type | Sensing distance | Connection | Body material | Thread length | Output | Operation mode: NO | Operation mode: NC |
|------|----------|------------------|----------------------|-----------------------------|--------------------|--------------------|-----------------------|-----------------------|
| M8 | Shielded | 3.0mm | Pre-wired | Stainless steel (See note.) | 27 (40) mm | PNP | E2A3-S08KS03-WP-B1 2M | E2A3-S08KS03-WP-B2 2M |
| | | | M12 connector | | 27 (44) mm | NPN | E2A3-S08KS03-WP-C1 2M | E2A3-S08KS03-WP-C2 2M |
| | | | | | | PNP | E2A3-S08KS03-M1-B1 | E2A3-S08KS03-M1-B2 |
| | | | M8 connector (3-pin) | | 27 (40) mm | NPN | E2A3-S08KS03-M1-C1 | E2A3-S08KS03-M1-C2 |
| | | | | | | PNP | E2A3-S08KS03-M5-B1 | E2A3-S08KS03-M5-B2 |
| | | | NPN | | E2A3-S08KS03-M5-C1 | E2A3-S08KS03-M5-C2 | | |
| M12 | Shielded | 6.0mm | Pre-wired | Brass | 34 (50) mm | PNP | E2A3-M12KS06-WP-B1 2M | E2A3-M12KS06-WP-B2 2M |
| | | | M12 connector | | 34 (49) mm | NPN | E2A3-M12KS06-WP-C1 2M | E2A3-M12KS06-WP-C2 2M |
| | | | | | | PNP | E2A3-M12KS06-M1-B1 | E2A3-M12KS06-M1-B2 |
| | | | NPN | | E2A3-M12KS06-M1-C1 | E2A3-M12KS06-M1-C2 | | |
| M18 | Shielded | 11.0mm | Pre-wired | Brass | 39 (60) mm | PNP | E2A3-M18KS11-WP-B1 2M | E2A3-M18KS11-WP-B2 2M |
| | | | M12 connector | | 39 (54) mm | NPN | E2A3-M18KS11-WP-C1 2M | E2A3-M18KS11-WP-C2 2M |
| | | | | | | PNP | E2A3-M18KS11-M1-B1 | E2A3-M18KS11-M1-B2 |
| | | | NPN | | E2A3-M18KS11-M1-C1 | E2A3-M18KS11-M1-C2 | | |
| M30 | Shielded | 20.0mm | Pre-wired | Brass | 44 (65) mm | PNP | E2A3-M30KS20-WP-B1 2M | E2A3-M30KS20-WP-B2 2M |
| | | | M12 connector | | 44 (59) mm | NPN | E2A3-M30KS20-WP-C1 2M | E2A3-M30KS20-WP-C2 2M |
| | | | | | | PNP | E2A3-M30KS20-M1-B1 | E2A3-M30KS20-M1-B2 |
| | | | NPN | | E2A3-M30KS20-M1-C1 | E2A3-M30KS20-M1-C2 | | |

Note: Material specifications for stainless steel housing case: 1.4305 (W.-No.), SUS303 (AISI), 2346 (SS).

Connectivity

E2A3 Sensors are available with the following connectors and cable materials:

Pre-wired Models



Standard cable lengths are 2 m and 5 m.
For other cable lengths, please contact your OMRON representative.

Standard cable material: PVC (4-mm dia.) -WP

Model Number Legend

E2A 1-2-3-4-5-6-7-8-9-10-11-12

Example: E2A3-M12KS06-M1-B1 Triple distance, M12, standard barrel, shielded, Sn = 6 mm, M12 connector, PNP-NO
 E2A3-S08KS03-WP-B1 2M Triple distance, M8 stainless steel, standard barrel, shielded, Sn = 3 mm, pre-wired PVC cable, PNP-NO, cable length = 2 m

1. Basic name

E2A

2. Sensing technology

Blank: Standard double distance
 3: Triple distance

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., 03 = 3 mm, 11 = 11 mm

Connector Models



Standard connectors: M12, M8 (3-pin) -M1, -M5

8. Kind of connection

WP: Pre-wired, PVC, 4-mm dia.
 M1: M12 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

10. Operation mode

1: Normally open (NO)
 2: Normally closed (NC)

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

12. Cable length

Blank: Connector Model
 Numeral: Cable length

Specifications

DC 3-wire Models

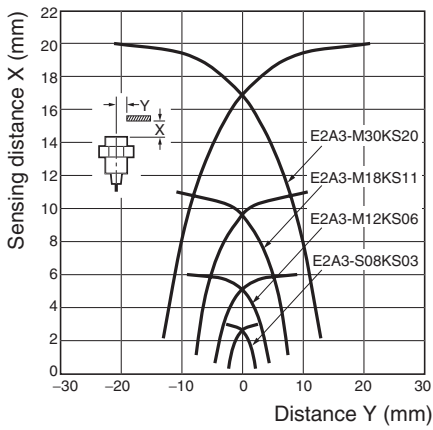
| Size | | M8 | M12 | M18 | M30 |
|--|------------------------------|---|--|--|--|
| Type | | Shielded | Shielded | Shielded | Shielded |
| Item | | E2A3-S08KS03-□□-B□ E2A3-S08KS03-□□-C□ | E2A3-M12KS06-□□-B□ E2A3-M12KS06-□□-C□ | E2A3-M18KS11-□□-B□ E2A3-M18KS11-□□-C□ | E2A3-M30KS20-□□-B□ E2A3-M30KS20-□□-C□ |
| Sensing distance | | 3 mm ± 10% | 6 mm ± 10% | 11 mm ± 10% | 20 mm ± 10% |
| Setting distance | Ambient temp. of -25 to 70°C | 0 to 2.1 mm | 0 to 4.2 mm | 0 to 7.7 mm | 0 to 14 mm |
| | Ambient temp. of -10 to 60°C | 0 to 2.4 mm | 0 to 4.8 mm | 0 to 8.8 mm | 0 to 16 mm |
| Differential travel | | 20% max. of sensing distance | | | |
| Target | | Ferrous metal (The sensing distance decreases with non-ferrous metal.) | | | |
| Standard sensing object | | 9 × 9 × 1 mm | 18 × 18 × 1 mm | 33 × 33 × 1 mm | 60 × 60 × 1 mm |
| Response frequency (See note 1.) | | 700 Hz | 350 Hz | 250 Hz | 80 Hz |
| Power supply voltage (operating voltage range) | | 12 to 24 VDC. Ripple (p-p): 10% max. (10 to 32 VDC) | | | |
| Current consumption | | 10 mA max. | | | |
| Output type | | -B models: PNP open collector -C models: NPN open collector | | | |
| Control output | Load current | 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 | | -B1/-C1 models: NO -B2/-C2 models: NC For details, refer to the timing charts. | | | |
| Protection circuits | | Power source circuit reverse polarity protection, Surge suppressor, Short-circuit protection | Output reverse polarity protection, Power source circuit reverse polarity protection, Surge suppressor, Short-circuit protection | | |
| Ambient air temperature | | Operating: -25°C to 70°C, Storage: -25°C to 70°C | | | |
| Temperature influence | | ±20% max. of sensing distance at 23°C within temperature range of -25°C to 70°C -10% to +20% of sensing distance at 23°C within temperature range of -10°C to 60°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-carrying parts and case | | | |
| Dielectric strength | | 1,000 VAC at 50/60 Hz for 1 min between current-carrying 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 ² , 10 times each in X, Y, and Z directions | 1,000 m/s ² , 10 times each in X, Y and Z directions | | |
| Standards and listings (See note 2.) | | IP67 after IEC 60529 IP69K after DIN 40050 EMC after EN60947-5-2 | | | |
| Connection method | | -WP models: Pre-wired Models (4-mm dia. PVC cable with length of 2 m) -M1 models: M12 4-pin Connector Models -M5 models: M8 3-pin Connector Models | | | |
| Weight (packed state) | Pre-wired Models | Approx. 65 g | Approx. 85 g | Approx. 160 g | Approx. 280 g |
| | Connector Models | M12 Connector Models: Approx. 20 g | Approx. 35 g | Approx. 70 g | Approx. 200 g |
| Material | Case | Stainless steel | Brass-nickel plated | | |
| | Sensing surface | PBT | | | |
| | Cable | PVC | | | |
| | Clamping nut | Stainless steel | Brass-nickel plated | | |

Note 1. The response frequency is an average value. Measurement conditions are as follows: standard sensing object, a distance of twice the standard sensing object length between sensing objects, and a set distance of half the sensing distance.

2. For USA and Canada: use class 2 circuit only.

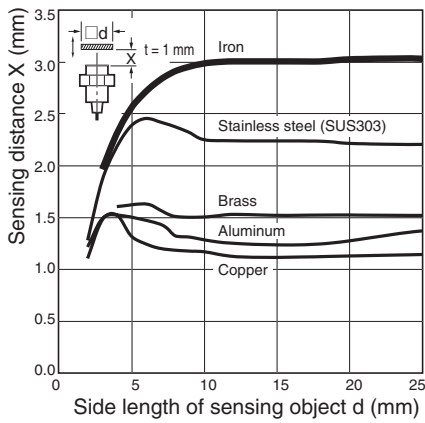
Engineering Data

Operating Range (Typical)

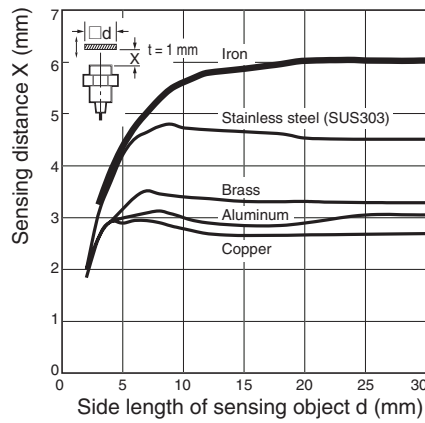


Influence of Sensing Object Size and Materials

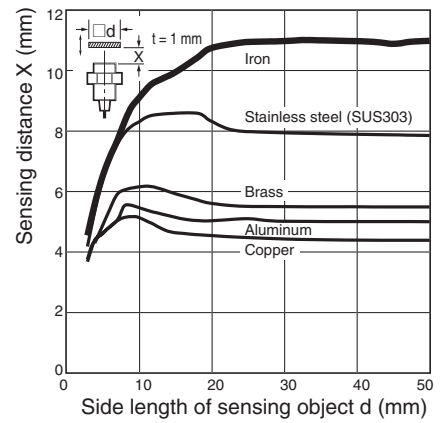
E2A3-S08KS03



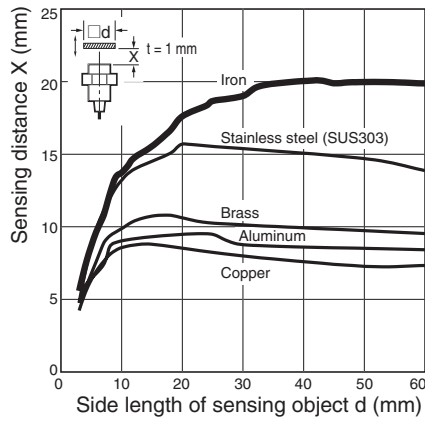
E2A3-M12KS06



E2A3-M18KS11



E2A3-M30KS20



Operation

DC 3-wire Models

PNP Output

| Operation mode | Model | Timing chart | Output circuit |
|----------------|---------------------|--|--|
| NO | E2A3-□-□- B1 | <p>Non-sensing area Sensing area Proximity Sensor</p> <p>Sensing object</p> <p>(%) 100 0</p> <p>Rated sensing distance</p> <p>ON Yellow indicator</p> <p>OFF</p> <p>ON Control output</p> <p>OFF</p> | <p>Brown ① +V</p> <p>Proximity Sensor main circuits</p> <p>(See note 1.)</p> <p>Black ④</p> <p>Load</p> <p>Blue ③ 0 V</p> <p>Note 1: With M8 Size Models, there is no output reverse polarity protection diode.</p> <p>M12 Connector Pin Arrangement (See note 2.) M8 Connector (3-pin) Pin Arrangement</p> <p>Note 2: Terminal 2 of the M12 connector is not used.</p> |
| NC | E2A3-□-□- B2 | <p>Non-sensing area Sensing area Proximity Sensor</p> <p>Sensing object</p> <p>(%) 100 0</p> <p>Rated sensing distance</p> <p>ON Yellow indicator</p> <p>OFF</p> <p>ON Control output</p> <p>OFF</p> | <p>Brown ① +V</p> <p>Proximity Sensor main circuits</p> <p>(See note 1.)</p> <p>Black ② (M8 connector: ④)</p> <p>Load</p> <p>Blue ③ 0 V</p> <p>Note 1: With M8 Size Models, there is no output reverse polarity protection diode.</p> <p>M12 Connector Pin Arrangement (See note 2.) M8 Connector (3-pin) Pin Arrangement</p> <p>Note 2: Terminal 4 of the M12 connector is not used.</p> |

DC 3-wire Models

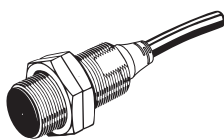
NPN Output

| Operation mode | Model | Timing chart | Output circuit |
|----------------|-------------|--|--|
| NO | E2A3-□-□-C1 | <p>Non-sensing area Sensing area Proximity Sensor</p> <p>Sensing object</p> <p>(%) 100 0</p> <p>Rated sensing distance</p> <p>ON Yellow indicator</p> <p>OFF</p> <p>ON Control output</p> <p>OFF</p> | <p>Proximity Sensor main circuits</p> <p>(See note 1.)</p> <p>Brown ① +V</p> <p>Black ④ Load</p> <p>Blue ③ 0 V</p> <p>Note 1: With M8 Size Models, there is no output reverse polarity protection diode.</p> <p>M12 Connector Pin Arrangement (See note 2.)</p> <p>M8 Connector (3-pin) Pin Arrangement</p> <p>Note 2: Terminal 2 of the M12 connector is not used.</p> |
| NC | E2A3-□-□-C2 | <p>Non-sensing area Sensing area Proximity Sensor</p> <p>Sensing object</p> <p>(%) 100 0</p> <p>Rated sensing distance</p> <p>ON Yellow indicator</p> <p>OFF</p> <p>ON Control output</p> <p>OFF</p> | <p>Proximity Sensor main circuits</p> <p>(See note 1.)</p> <p>Brown ① +V</p> <p>Black ② Load</p> <p>Blue ③ 0 V</p> <p>(M8 connector: ④)</p> <p>Note 1: With M8 Size Models, there is no output reverse polarity protection diode.</p> <p>M12 Connector Pin Arrangement (See note 2.)</p> <p>M8 Connector (3-pin) Pin Arrangement</p> <p>Note 2: Terminal 4 of the M12 connector is not used.</p> |

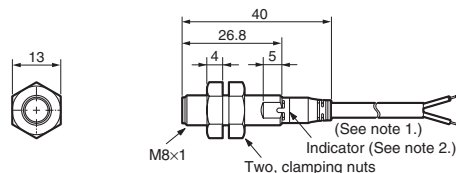
Dimensions

Note: All units are in millimeters unless otherwise indicated.

Pre-wired Models

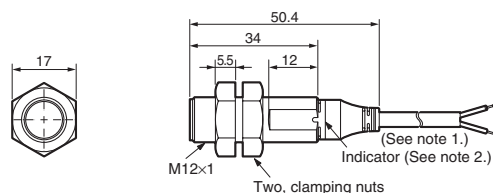


E2A3-S08KS03-WP-□□



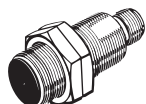
Note 1. 4-dia. vinyl-insulated round cable with 3 conductors (Conductor cross section: 0.3 mm²; Insulator diameter: 1.3 mm), Standard length: 2 m
2. Operation indicator (yellow)

E2A3-M12KS06-WP-□□

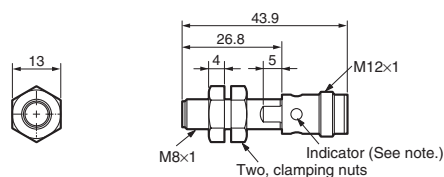


Note 1. 4-dia. vinyl-insulated round cable with 3 conductors (Conductor cross section: 0.3 mm²; Insulator diameter: 1.3 mm), Standard length: 2 m
2. Operation indicator (yellow)

M12 Connector Models

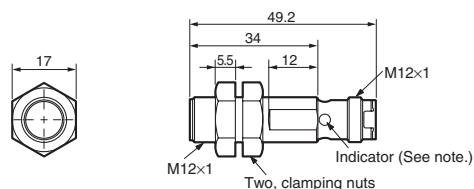


E2A3-S08KS03-M1-□□



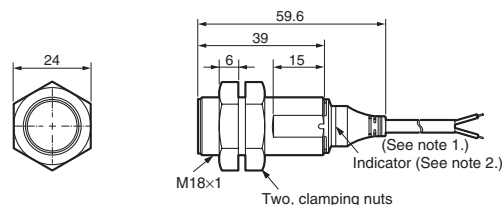
Note: Operation indicator (yellow LED, 4×90°)

E2A3-M12KS06-M1-□□



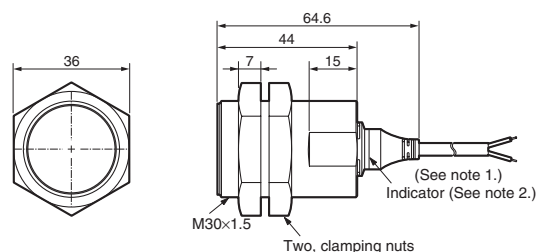
Note: Operation indicator (yellow LED, 4×90°)

E2A3-M18KS11-WP-□□



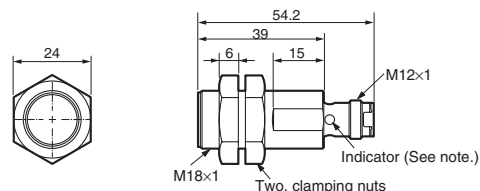
Note 1. 4-dia. vinyl-insulated round cable with 3 conductors (Conductor cross section: 0.3 mm²; Insulator diameter: 1.3 mm), Standard length: 2 m
2. Operation indicator (yellow)

E2A3-M30KS20-WP-□□



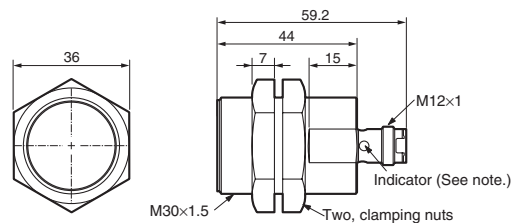
Note 1. 4-dia. vinyl-insulated round cable with 3 conductors (Conductor cross section: 0.3 mm²; Insulator diameter: 1.3 mm), Standard length: 2 m
2. Operation indicator (yellow)

E2A3-M18KS11-M1-□□



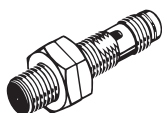
Note: Operation indicator (yellow LED, 4×90°)

E2A3-M30KS20-M1-□□

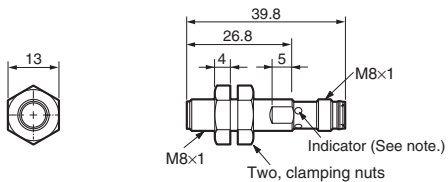


Note: Operation indicator (yellow LED, 4×90°)

M8 Connector Models

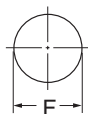


E2A3-S08KS03-M5-□□



Note: Operation indicator (yellow LED, 4×90°)

Mounting Hole Cutout Dimensions



| External diameter of Proximity Sensor | Dimension F (mm) |
|---------------------------------------|---|
| M8 | 8.5 dia. $\begin{smallmatrix} +0.5 \\ 0 \end{smallmatrix}$ |
| M12 | 12.5 dia. $\begin{smallmatrix} +0.5 \\ 0 \end{smallmatrix}$ |
| M18 | 18.5 dia. $\begin{smallmatrix} +0.5 \\ 0 \end{smallmatrix}$ |
| M30 | 30.5 dia. $\begin{smallmatrix} +0.5 \\ 0 \end{smallmatrix}$ |

Safety Precautions

Precautions for Safe Use

⚠ WARNING

This product is not designed or rated for ensuring safety of persons.
Do not it for such purposes.



Power Supply

Do not impose an excessive voltage on the E2A3, 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 E2A3 may be damaged.

The E2A3's short-circuit protection function will be valid if the polarity of the supply voltage is correct and within the rated voltage range.

Wiring

Be sure to wire the E2A3 and load correctly, otherwise it may be damaged.

Connection with No Load

Be sure to insert a load when wiring. Make sure to connect a proper load to the E2A3 during 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.

Precautions for Correct Use

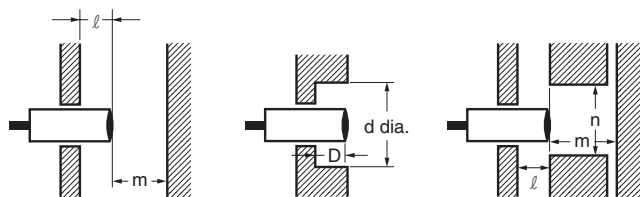
Designing

Power Reset Time

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

Effects of Surrounding Metal

When mounting the E2A3 within a metal panel, ensure that the clearances given in the following tables are maintained.



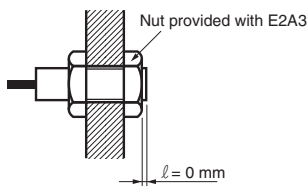
(Unit: mm)

| Model | Dimension Material of surrounding metal | M8 | | M12 | |
|---------------|--|---------------|-------------------|---------------|-------------------|
| | | Ferrous metal | Non-ferrous metal | Ferrous metal | Non-ferrous metal |
| E2A3 Shielded | l | 0.5 (*) | 2 (*) | 2 (*) | 1 (*) |
| | m | 9 | | 18 | |
| | d | 24 | | 36 | |
| | D | 0.5 | 2 | 2 | 1 |
| | n | 24 | | 36 | |

(Unit: mm)

| Model | Dimension Material of surrounding metal | M18 | | M30 | |
|---------------|--|---------------|-------------------|---------------|-------------------|
| | | Ferrous metal | Non-ferrous metal | Ferrous metal | Non-ferrous metal |
| E2A3 Shielded | l | 4 (*) | 2.5 (*) | 6 (*) | 4 (*) |
| | m | 33 | | 60 | |
| | d | 54 | | 90 | |
| | D | 4 | 2.5 | 6 | 4 |
| | n | 54 | | 90 | |

* Using the nuts provided with the E2A3 allows mounting in the way shown below.



Power OFF

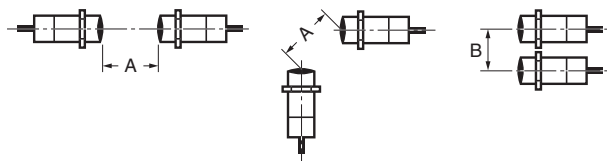
The Proximity Sensor may output a pulse signal when it is turned OFF. Therefore, it is recommended that the load be turned OFF before turning OFF the Proximity Sensor.

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 | M8 | M12 | M18 | M30 |
|----------|-----------|----|-----|-----|-----|
| Shielded | A | 25 | 35 | 70 | 110 |
| | B | 20 | 25 | 45 | 70 |

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.

Cable Extension

The standard cable length is less than 200 m.

The tractive force is 50 N.

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.

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



| Type | | Torque |
|------|-----------------------|---------|
| M8 | Stainless Steel Model | 9 N·m |
| | Brass Model | --- |
| M12 | | 20 N·m |
| M18 | | 60 N·m |
| M30 | | 150 N·m |

<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.

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 attempt to disassemble or repair the Sensor.

Environment

Water Resistivity

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

Operating Environment

Store and operate the Proximity Sensor only 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. Connect the load to the Proximity Sensor through a relay.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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