


Flat Capacitive Sensor with Separate Amplifier Ideal for Mounting on Robot Hands.

- Flat head is only 5.5-mm thick.
- Robotics cable ensures improved flexibility.
- Operation indicator on the Sensor.
- Easy-to-use connector.






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

Ordering Information

Sensors

[Refer to *Dimensions* on page 6.]

| Appearance | Sensing distance (variable) | Model |
|--|---|---------------------|
|  Flat, Unshielded |  10 mm (4 to 10 mm) | E2J-W10MA 1M |
| |  20 mm (8 to 20 mm) | E2J-W20MA 1M |


Amplifier Units

| Output configuration | Model |
|---|--------------------|
| DC 3-wire NPN Open-collector output | E2J-JC4A 2M |

Accessories (Order Separately)

Dust Covers A Dust Cover is not provided with the Sensor or Amplifier. Order a Dust Cover separately if required.

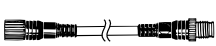
[Refer to *Dimensions* on page 6.]

| Appearance | Application | Application | Model |
|---|-------------------|-------------------------|----------------|
|  | Dust protection * | E2J-JC4A Amplifier Unit | XS3Z-13 |
| | | E2J-W□MA Sensor | XS3Z-15 |

* These dust covers are for protection against dust. They do not satisfy IP67. When attaching the Dust Cover, be sure to fully insert the connector into the Dust Cover.

Sensor I/O Connectors with Cables A Connector is not provided with the Sensor. Order a Connector separately if required.

[Refer to *XS3*.]

| Appearance | Application | Cable conductors | Cable length | Model | Remarks |
|---|---------------------|------------------|--------------|------------------------|--|
|  | For cable extension | 4 conductors | 1 m | XS3W-M421-401-R | M8-screw-mounting cables Robotics cables (vibration resistant) Straight/Straight Model |
| | | | 2 m | XS3W-M421-402-R | |

Note: Refer to *Introduction to Sensor I/O Connectors/Sensor Controllers* for details.

Ratings and Specifications

Sensors

| Item | Model | |
|--|---|--------------------|
| | E2J-W10MA | E2J-W20MA |
| Sensing distance | 10 mm | 20 mm |
| Sensing distance adjustable range | 4 to 10 mm | 8 to 20 mm |
| Differential travel | 15% max. of sensing distance | |
| Detectable object | Conductors and dielectrics | |
| Standard sensing object | Grounded metal plate: 50 × 50 × 1 mm | |
| Response frequency | 70 Hz min. | |
| Indicators | Detection indicator (yellow) | |
| Ambient temperature range | Operating/Storage: -10 to 55°C (with no icing or condensation) | |
| Ambient humidity range | Operating/Storage: 35% to 85% (with no condensation) | |
| Vibration resistance | Destruction: 10 to 500 Hz, 2-mm double amplitude or 150 m/s ² for 2 hours each in X, Y, and Z directions | |
| Shock resistance | Destruction: 500 m/s ² 3 times each in X, Y, and Z directions | |
| Degree of protection | IP66 (IEC) | |
| Connection method | Pre-wired Connector Models (Robotics cable, Standard cable length: 1m) | |
| Weight (packed state) | Approx. 30 g | Approx. 40 g |
| Materials | Case | Heat-resistant ABS |

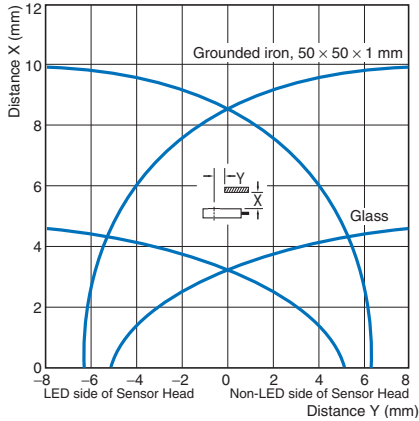
Amplifier Units

| Item | Model |
|--|---|
| | E2J-JC4A |
| Power supply voltage | 24 VDC ±20%, ripple (p-p): 10% max. |
| Current consumption | 30 mA max. |
| Control output | Load current NPN open-collector output, 100 mA max. (30 VDC max.) |
| | Residual voltage 1 V max. |
| Indicators | Operation indicator (orange) Power indicator (green) |
| Number of turns of sensitivity adjustment | 8 turns with an indicator |
| Protection circuits | Load short-circuit protection, Surge suppressor, Reverse polarity protection |
| Ambient temperature range | Operating/Storage: -10 to 55°C (with no icing or condensation) |
| Ambient humidity range | Operating/Storage: 35% to 85% (with no condensation) |
| Temperature influence (Sensor with Amplifier) | ±25% max. of sensing distance at 23°C in the temperature range of 0 to 40°C |
| Voltage influence | ±1% max. of sensing distance at the rated voltage in the ±20% rated voltage range |
| Insulation resistance | 50 MΩ min. (at 500 VDC) between current-carrying parts and case |
| Dielectric strength | 1,000 VAC, 50/60 Hz for 1 min between current-carrying parts and case |
| Vibration resistance | Destruction: 10 to 150 Hz, 1.5-mm double amplitude or 100 m/s ² for 2 hours each in X, Y, and Z directions |
| Shock resistance | Destruction: 300 m/s ² 3 times each in X, Y, and Z directions |
| Degree of protection | IP50 (IEC) |
| Connection method | Pre-wired Models (Standard cable length: 2 m) |
| Weight (packed state) | Approx. 60 g |
| Materials | Case ABS |
| Accessories | Mounting Bracket, Instruction manual |

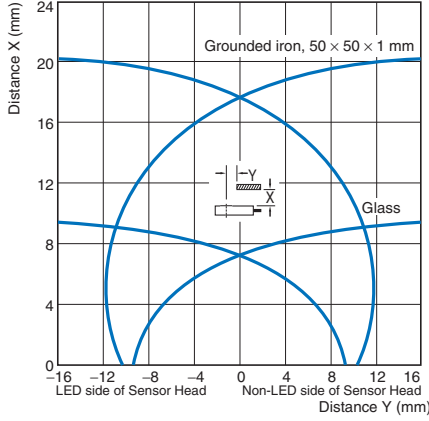
Engineering Data (Reference Value)

Sensing Area

E2J-W10MA

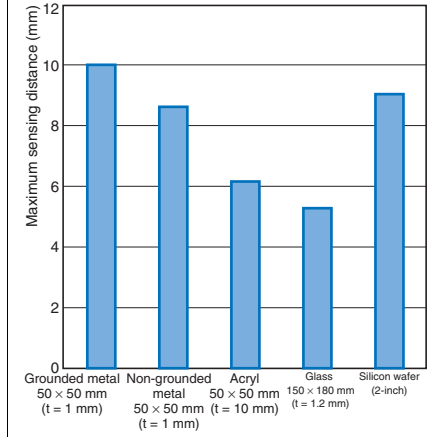


E2J-W20MA



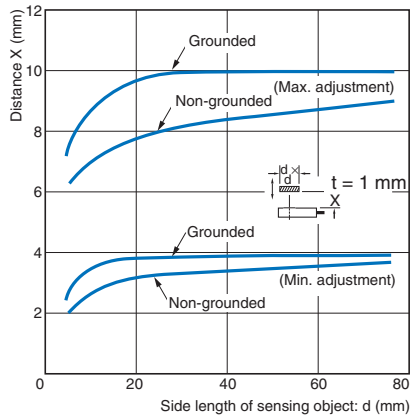
Sensing Distance Change by Sensing Object (Typical)

E2J-W10MA

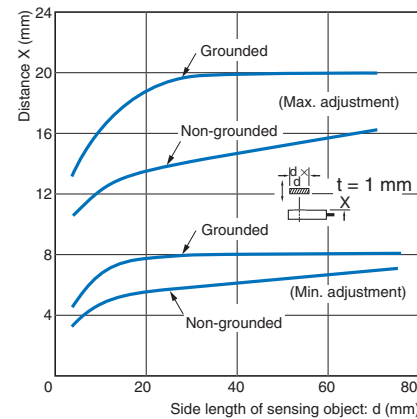


Influence of Sensing Object (Iron)

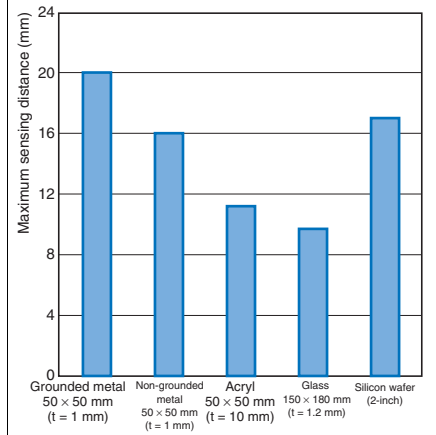
E2J-W10MA



E2J-W20MA

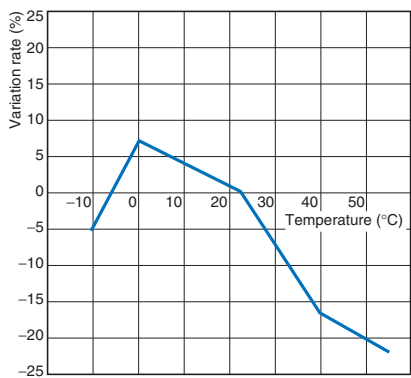


E2J-W20MA

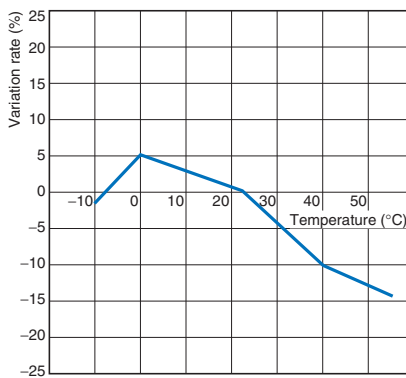


Influence of Ambient Temperature

E2J-W10MA



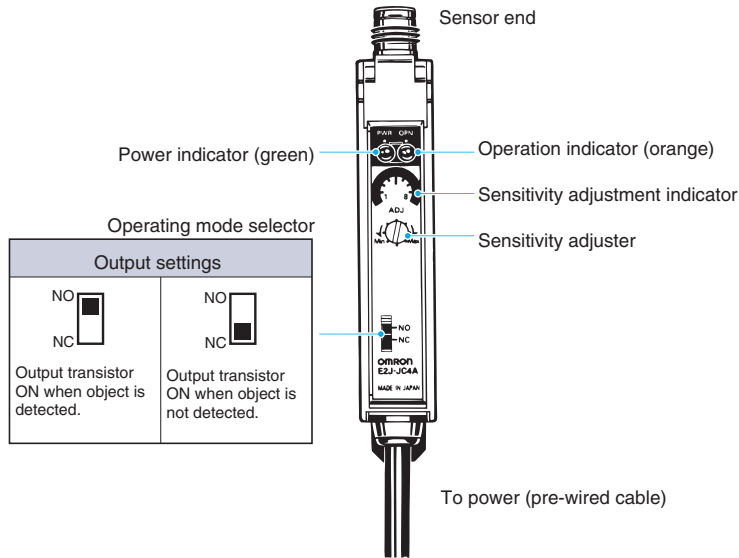
E2J-W20MA



I/O Circuit Diagrams

| Operation mode | Model | Timing chart | Output circuit |
|----------------|---|--|----------------|
| NO | E2J-W10MA E2J-W20MA + E2J-JC4A | Sensing object Present Not present Output transistor ON OFF Sensor detection indicator (yellow) ON OFF Amplifier Unit operation indicator (orange) ON OFF | |
| | | Sensing object Present Not present Output transistor ON OFF Sensor detection indicator (yellow) ON OFF Amplifier Unit operation indicator (orange) ON OFF | |

Amplifier Unit Nomenclature



Safety Precautions

Refer to *Warranty and Limitations of Liability*.

⚠ WARNING

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



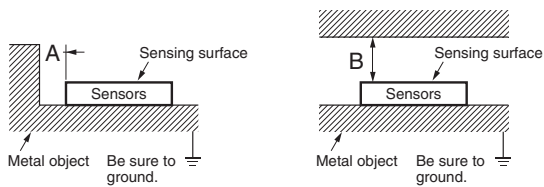
Precautions for Correct Use

Do not use this product under ambient conditions that exceed the ratings.

● **Design**

Influence of Surrounding Metal

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

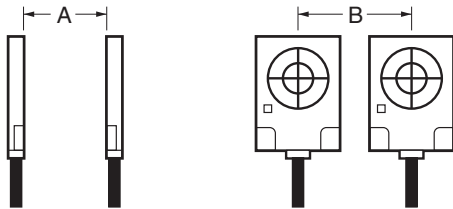


Influence of Surrounding Metal (Unit: mm)

| Model | Dimension | A | B |
|-----------|-----------|----|----|
| E2J-W10MA | | 10 | 20 |
| E2J-W20MA | | 20 | 40 |

Mutual Interference

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



Mutual Interference (Unit: mm)

| Model | Dimension | A | B |
|-----------|-----------|----|----|
| E2J-W10MA | | 20 | 30 |
| E2J-W20MA | | 70 | 50 |

● **Mounting**

Handling

- Do not use the Sensor outdoors.
- Do not wire the Sensor alongside a high-tension or power line.
- Do not use portable telephones or transceivers near the Sensor. Be sure to ground the Mounting Brackets.
- Do not use the Sensor in an environment where it will be exposed to chemicals, particularly chemical solutions or oxidizing acids.

Influence of Static Electricity

Be sure to discharge static electricity before detecting objects that are greatly affected by static electricity.

Mounting the Sensor

The maximum tightening torque that should be applied is 0.54 N·m.

Cable between Sensor and Amplifier Unit

- Be sure that the bending radius of the cable is more than 5 mm.
 - Use the XS3W-M421-40□-R cable with connectors (M8-screw mounting) as the extension cable.
- The maximum cable length is 3 m (extension section: 2 m).

Sensitivity Adjustment

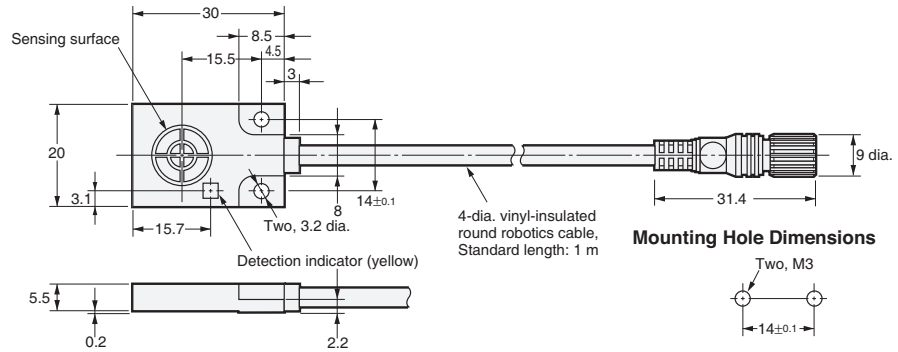
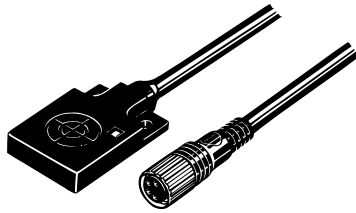
For information on the sensitivity adjustment, refer to *Technical Guide for Operation for information for Proximity Sensor*.

Dimensions

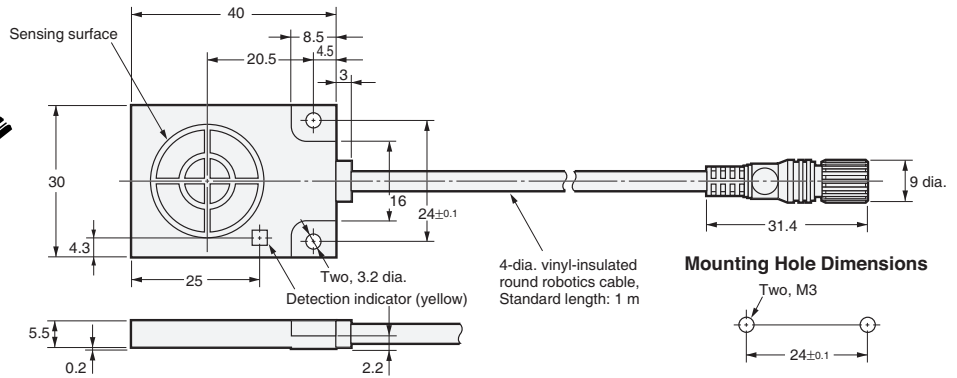
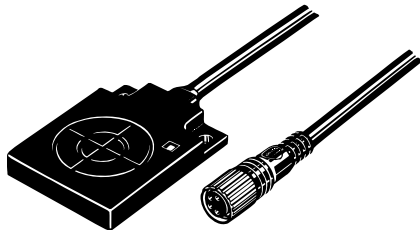
Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.

Main Units
Sensors

E2J-W10MA

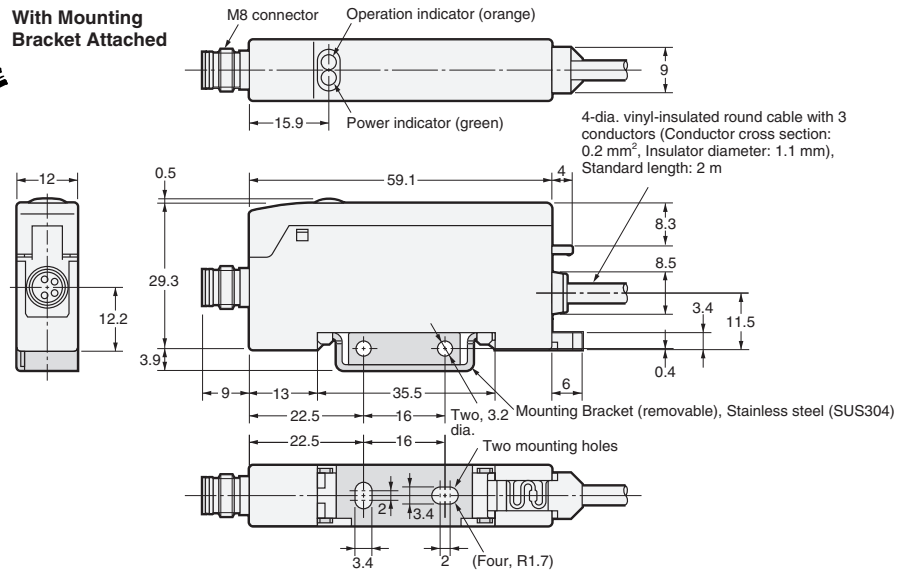
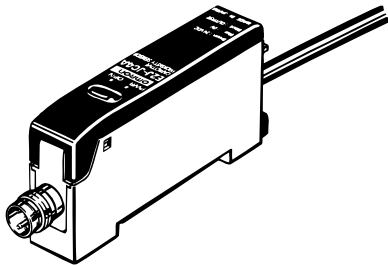


E2J-W20MA



Amplifier Units

E2J-JC4A



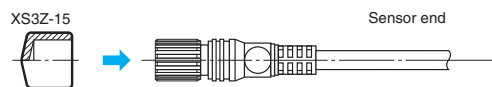
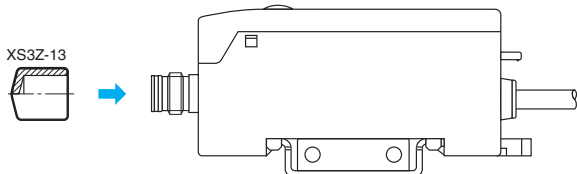
Accessories (Order Separately)

Dust Cover

Material: polyvinyl chloride (red)

XS3Z-13 (for E2J-JC4A Amplifier Unit)

XS3Z-15 (for E2J-W□MA Sensor)



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