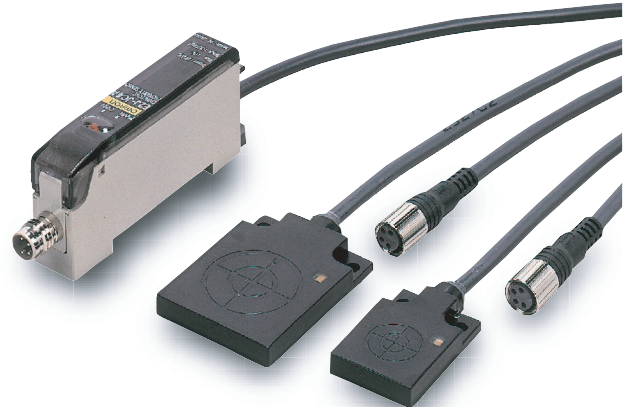


# Long Sensing-distance Capacitive Separate Amplifier Proximity Sensor E2J


CSM\_E2J\_DS\_E\_3\_1

## Compact and Ideal for Robot Hands. Especially Effective in Detecting LCDs, Wafers, and PDPs.\*

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







\* Plasma Display Panel (for wall-mounted TVs)

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

## Ordering Information


### Sensors

[Refer to *Dimensions* on page 6.]

Appearance	Sensing distance (variable)	Model	Amplifier Units	Output configuration	Model
	 10 mm (4 to 10 mm)	E2J-W10MA 1M		DC 3-wire NPN Open-collector output	E2J-JC4A 2M
	 20 mm (8 to 20 mm)	E2J-W20MA 1M			

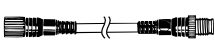
### Accessories (Order Separately)

**Dust Covers** [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 [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* for details.

## Ratings and Specifications

### Sensors

Item	Model	
	E2J-W10MA	E2J-W20MA
<b>Sensing distance</b>	10 mm	20 mm
<b>Sensing area</b>	4 to 10 mm	8 to 20 mm
<b>Differential travel</b>	15% max. of sensing distance	
<b>Detectable object</b>	Conductors and dielectrics	
<b>Standard sensing object</b>	Grounded metal plate: 50 × 50 × 1 mm	
<b>Response frequency</b>	70 Hz min.	
<b>Indicators</b>	Detection indicator (red)	
<b>Ambient temperature range</b>	Operating/Storage: -10 to 55°C (with no icing or condensation)	
<b>Ambient humidity range</b>	Operating/Storage: 35% to 95% (with no condensation)	
<b>Vibration resistance</b>	Destruction: 10 to 500 Hz, 2-mm double amplitude or 150 m/s <sup>2</sup> for 2 hours each in X, Y, and Z directions	
<b>Shock resistance</b>	Destruction: 500 m/s <sup>2</sup> 3 times each in X, Y, and Z directions	
<b>Degree of protection</b>	IP66 (IEC)	
<b>Connection method</b>	Pre-wired Connector Models (Robotics cable, Standard cable length: 1m)	
<b>Weight (packed state)</b>	Approx. 30 g	Approx. 40 g
<b>Materials</b>	<b>Case</b> Heat-resistant ABS	

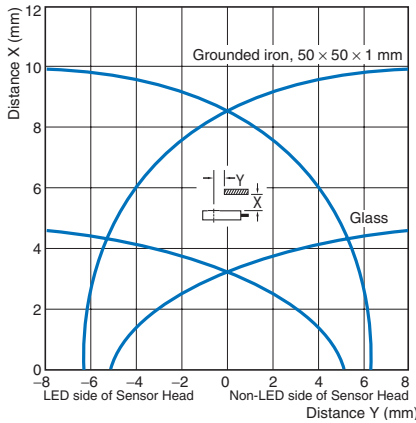
### Amplifier Units

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

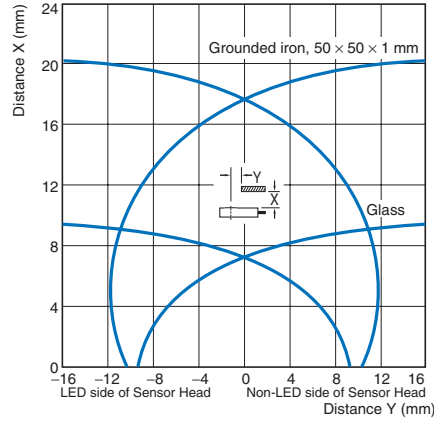
Engineering Data (Typical)

Sensing Area

E2J-W10MA

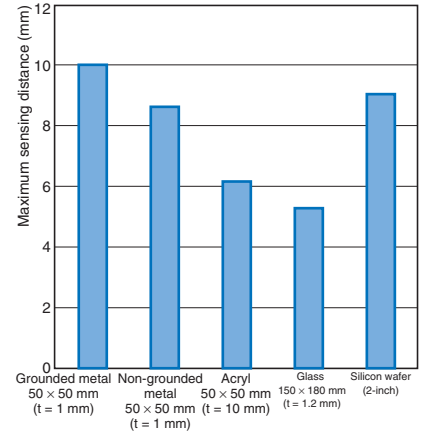


E2J-W20MA



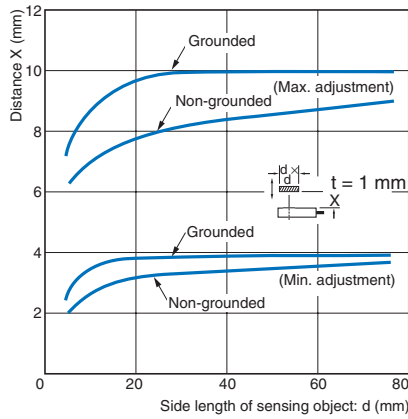
Sensing Distance Change by Sensing Object (Typical)

E2J-W10MA

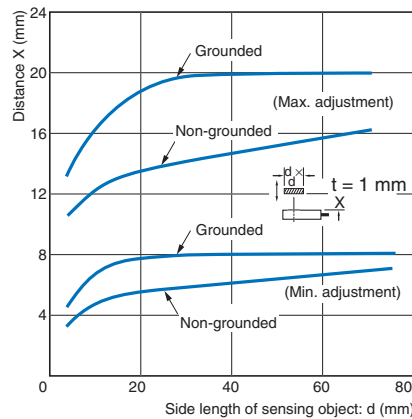


Influence of Sensing Object (Iron)

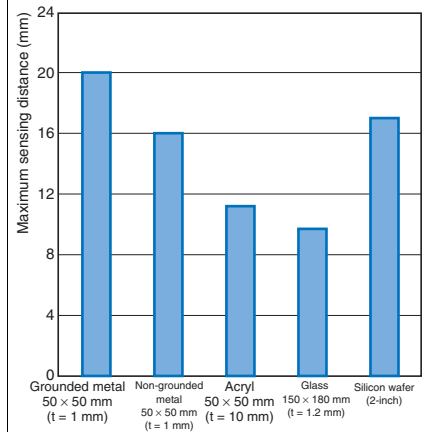
E2J-W10MA



E2J-W20MA

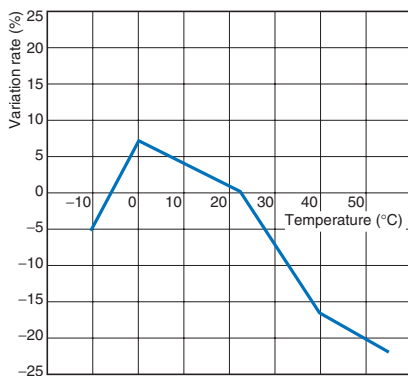


E2J-W20MA

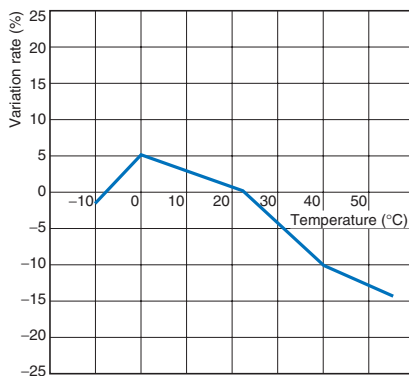


Influence of Ambient Temperature

E2J-W10MA



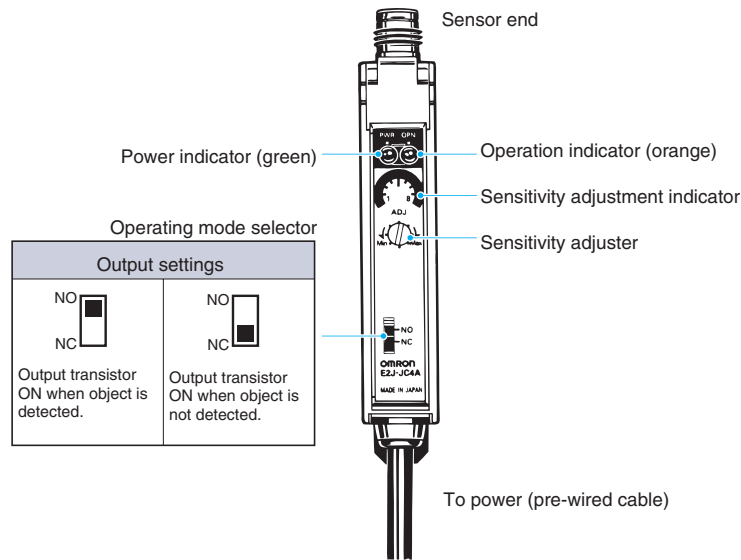
E2J-W20MA



## 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 (red) ON OFF Amplifier Unit operation indicator (orange) ON OFF	
		Sensing object Present Not present Output transistor ON OFF Sensor detection indicator (red) 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.



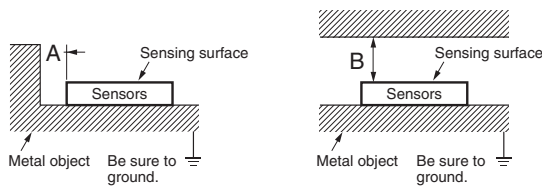
**Precautions for Correct Use**

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.

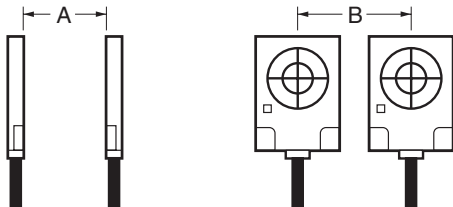


**Influence of Surrounding Metal** (Unit: mm)

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).



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2008.11

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