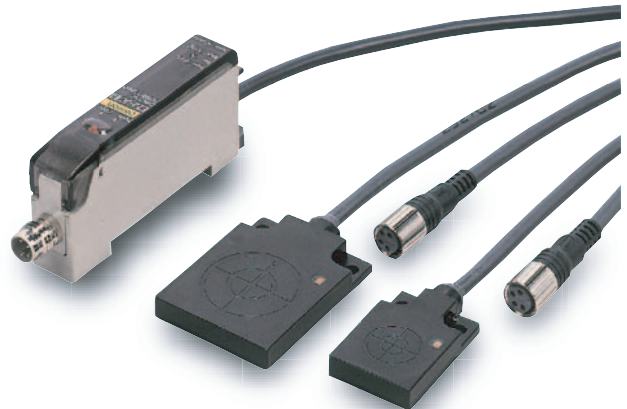



Long Sensing-distance Capacitive Separate Amplifier Proximity Sensor E2J

CSM_E2J_DS_E_5_3

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.

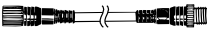
[Refer to *Dimensions* on page 6.]

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 (red)	
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	

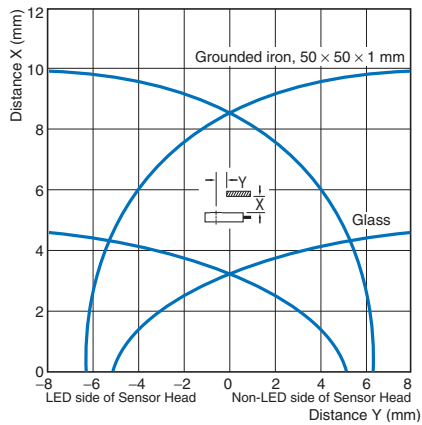
Amplifier Units

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

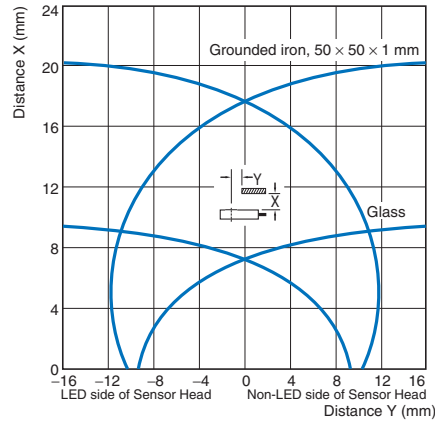
Engineering Data (Reference Value)

Sensing Area

E2J-W10MA

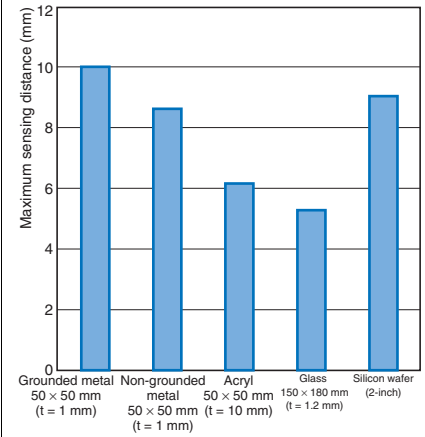


E2J-W20MA



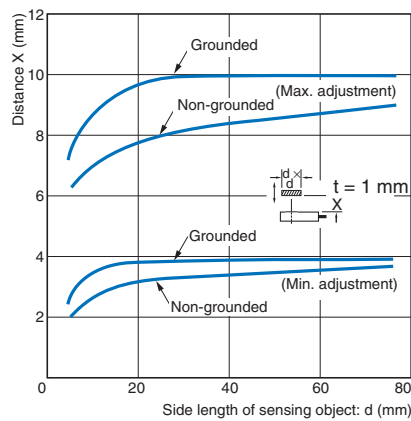
Sensing Distance Change by Sensing Object (Typical)

E2J-W10MA

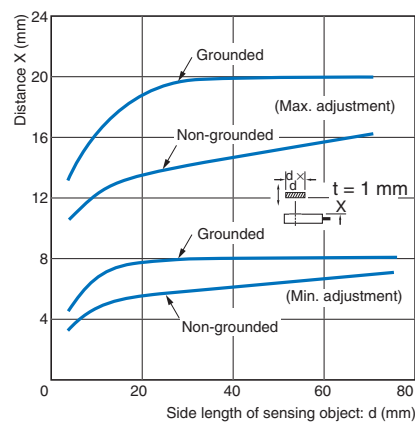


Influence of Sensing Object (Iron)

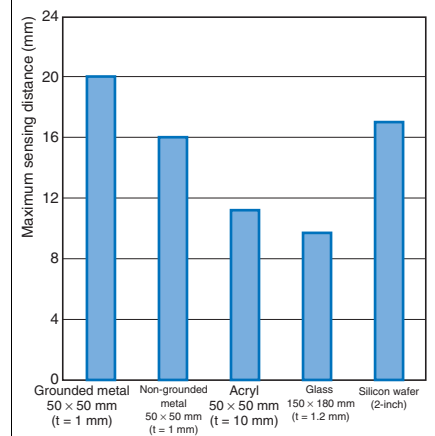
E2J-W10MA



E2J-W20MA

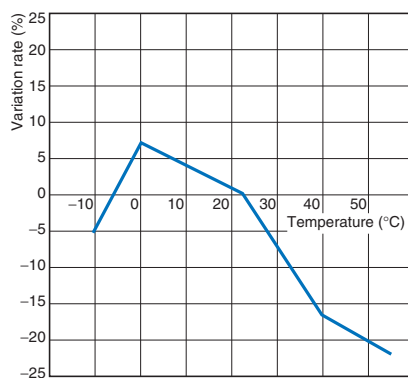


E2J-W20MA

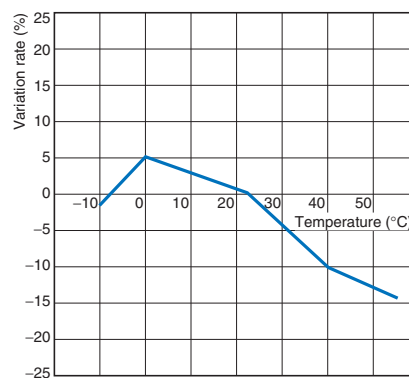


Influence of Ambient Temperature

E2J-W10MA



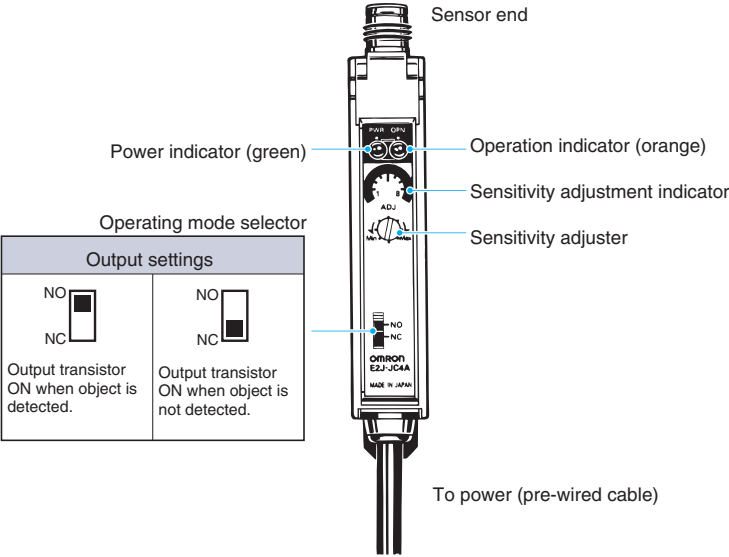
E2J-W20MA



I/O Circuit Diagrams

Operation mode	Model	Timing chart	Output circuit
NO	E2J-W10MA E2J-W20MA + E2J-JC4A	<div><div>Sensing object</div><div>Present</div><div>Not present</div><div>Output transistor</div><div>ON</div><div>OFF</div><div>Sensor detection indicator (red)</div><div>ON</div><div>OFF</div><div>Amplifier Unit operation indicator (orange)</div><div>ON</div><div>OFF</div></div>	
NC		<div><div>Sensing object</div><div>Present</div><div>Not present</div><div>Output transistor</div><div>ON</div><div>OFF</div><div>Sensor detection indicator (red)</div><div>ON</div><div>OFF</div><div>Amplifier Unit operation indicator (orange)</div><div>ON</div><div>OFF</div></div>	

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.



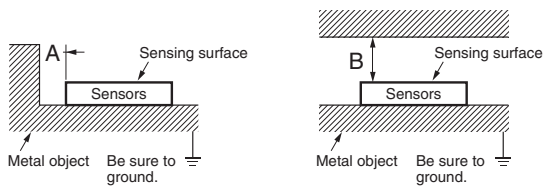
Precautions for Correct Use

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.

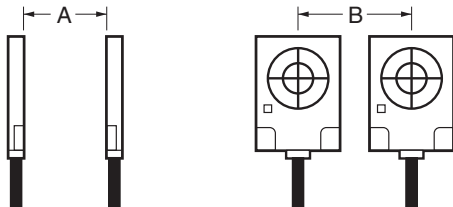


Influence of Surrounding Metal (Unit: mm)

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

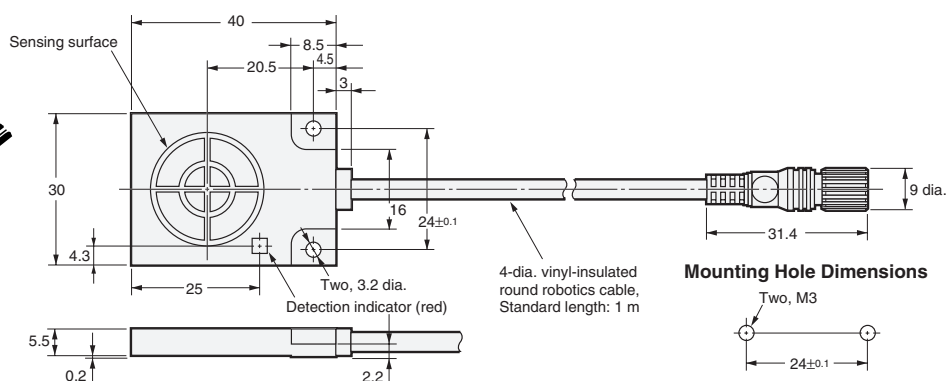
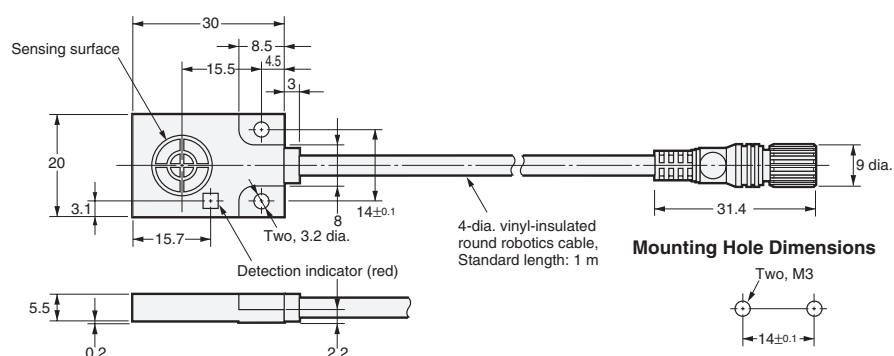
- Be sure that the bending radius of the cable is more than 5 mm.
 - Use the XS3W-M421-40□-R cable with connectors (M8-screw mounting) as the extension cable.
- The maximum cable length is 3 m (extension section: 2 m).

Sensitivity Adjustment

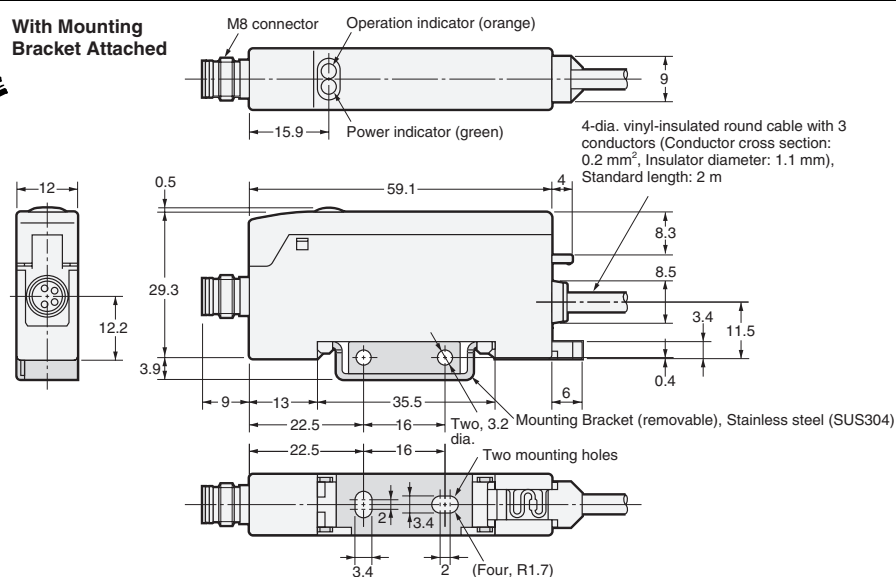
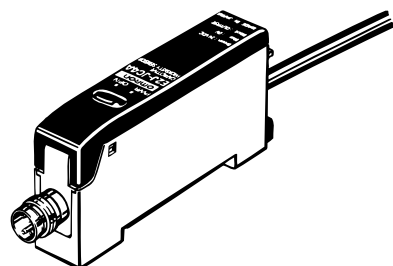
For information on the sensitivity adjustment, refer to *Technical Guide for Operation* for information for Proximity Sensor.

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

Sensors

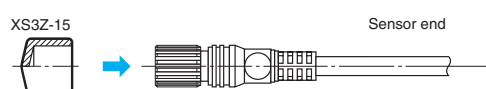
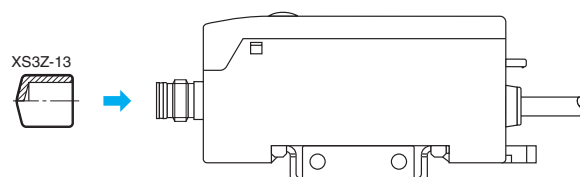


E2J-JC4A



Dust Cover	Material: polyvinyl chloride (red)
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XS3Z-15 (for E2J-W□MA Sensor)



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