

Capacitive Proximity Sensor

E2J

Compact and Ideal for Robot Hands and Various Built-in Applications for LCD, Wafer and Plasma Display Panel (PDP) Detection



* Plasma display panel

Features

Flat head is only 5.5-mm thick.

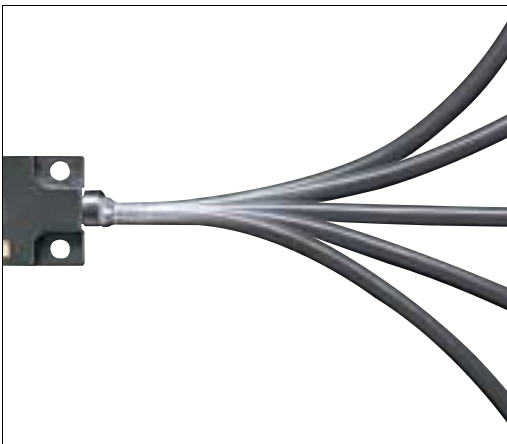
Due to detection electrode construction of using multilayer substrate, the flat head is only 5.5-mm thick. It is the most suitable for installing to robot hands for LCD and PDP. Sensing distance is two kinds of 10 mm and 20 mm. The printed circuit glass board for LCD can be detected at a rate of 50%.

Sensing Indicator of the Sensor Head

Sensing indicator of the Sensor Head clearly visible in the dark. Sensitivity can be adjusted by the adjuster of amplifier side.

**Robot Cable ensures improved flexibility**

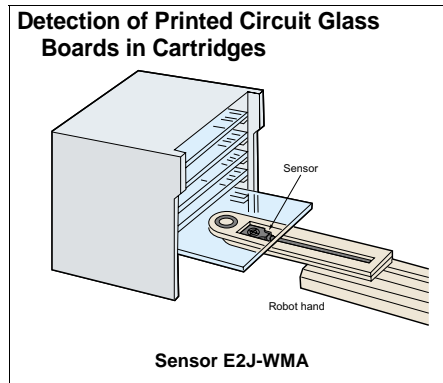
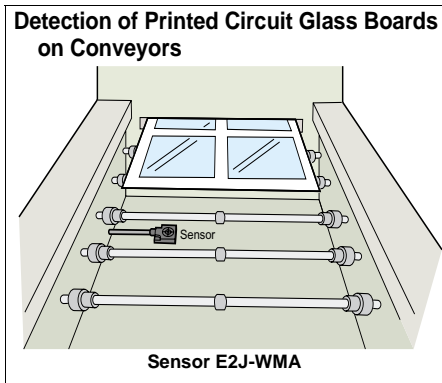
Since the robot cable is adopted between a sensor and amplifier, bending resistance is improved remarkably.

**Easy-to-use connector**

Between a amplifier and sensor can be easily connected by a connector. In addition, maintenance becomes easily.



Application






Ordering Information

Sensors


Sensors

Amplifier Units

Shape	Sensing distance adjustable range	Model	Output specifications	Model
Flat type Unshielded 	 4 to 10mm	E2J-W10MA	DC 3-wire NPN open collector output	E2J-JC4A
	 8 to 20mm	E2J-W20MA		

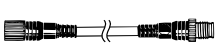
Accessories (Order Separately)

Dust Covers

Shape	Application	Application	Model
	Dust-proof *	E2J-JC4A (For Amplifiers)	XS3Z-13
		E2J-W□MA (For Sensors)	XS3Z-15

* Although the XS3Z Dust Covers protect the E2J from dust, they do not satisfy IP 67. When attaching the Dust Cover, be sure to fully insert the connector into the Dust Cover.

M8-screw-mounting Vibration-proof Robot cable

Shape	Application	Cable conductors	Cable length	Model	Remarks
	For extension	4	1 m	XS3W-M421-401-R	M8 fixed screw type robot cord (vibration resistance) straight/straight type
			2 m	XS3W-M421-402-R	

Rating/performance

Sensors

Item	Model	
	E2J-W10MA	E2J-W20MA
Sensing range	10 mm	20 mm
Sensing distance adjustable range	4 to 10 mm	8 to 20 mm
Differential distance	15% max. of sensing distance	
Sensing object	Conductors and dielectrics	
Standard sensing object	with grounded metal: 50 × 50 × 1t mm	
Response frequency	70 kHz max.	
Indicator lamp	Detection indicator (red LED)	
Ambient temperature	Operating: -10°C to 55°C (with no icing)	
Ambient humidity	Operating/Storage: 35% to 95%RH (with no condensation)	
Vibration resistance	Malfunction: 10 to 500 Hz, 2.0-mm double amplitude or 150 m/s ² (approx. 15G) for 2 hrs each in X, Y, and Z directions	
Shock resistance	500 m/s ² for 3 times each in X, Y, and Z directions	
Protective structure	IEC 60529 IP66	
Connection method	Connector Extension Models (robot cord) (standard length: 1 m)	
Weight (Packed state)	Approx. 30 g	Approx. 40 g
Material	Heat-resistant ABS resin	

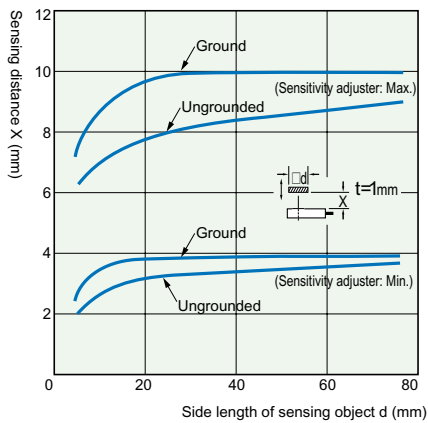
Amplifier Units

Item	Model	
	E2J-JC4A	
Power supply voltage	12 to 24 VDC, ripple (p-p): 10% max.	
Current consumption	30 mA max.	
Control output	Switching capacity	NPN open collector 100 mA max. (30 VDC max.)
	Residual voltage	1 V max.
Indicator lamp	Operation indicator (orange) Power indicator (green)	
Number of sensitivity adjuster rotations	Eight rotations, with indicator	
Protective circuits	Protection for load short circuit, surge voltage, reverse polarity	
Ambient temperature	Operating: -10°C to 55°C (with no icing)	
Ambient humidity	Operating/Storage: 35% to 85%RH (with no condensation)	
Temperature influence (Sensor Head and Amplifier Unit)	±25% max. of sensing distance at 23°C in temperature range of 0°C to 40°C	
Voltage influence	1% max. of sensing distance within a range of 80% to 120% of the rated power supply voltage.	
Insulation resistance	50 MΩ min. (at 500 VDC) between current carry parts and case	
Dielectric strength	1000 VAC 50/60 Hz for 1 min between current carrying part and case	
Vibration resistance	Malfunction: 10 to 150 Hz, 1.5 mm double amplitude or 150 m/s ² (approx. 15G) for 2 hrs each in X, Y, and Z directions	
Shock resistance	300 m/s ² , 3 times each in X, Y, and Z directions	
Protective structure	IEC 60529 IP50	
Connection method	Pre-wired models (standard length: 2 m)	
Weight (Packed state)	Approx. 60 g	
Material	Case	ABS
Accessories	Mounting bracket, instruction manual	

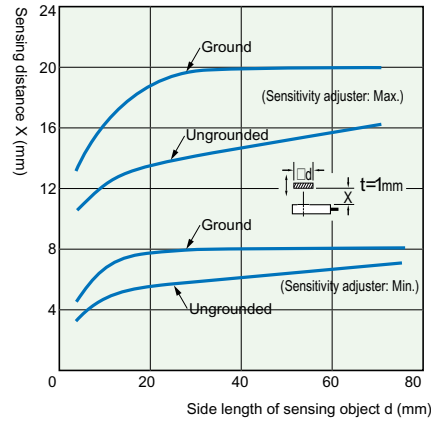
Characteristic data (typical)

Sensing Distance vs. Sensing Object (Iron)

E2J-W10MA

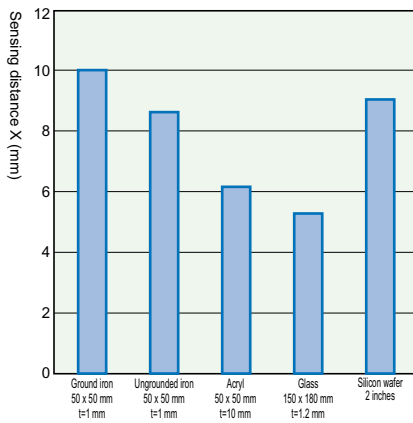


E2J-W20MA

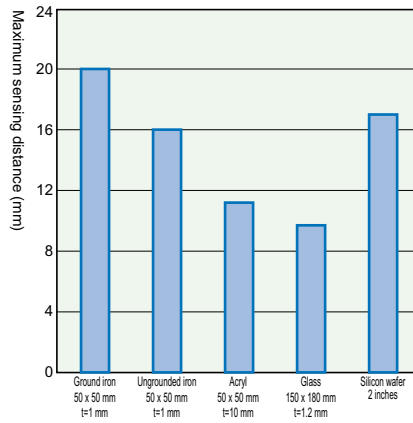


Sensing Distance Change by Sensing Object (Typical)

E2J-W10MA



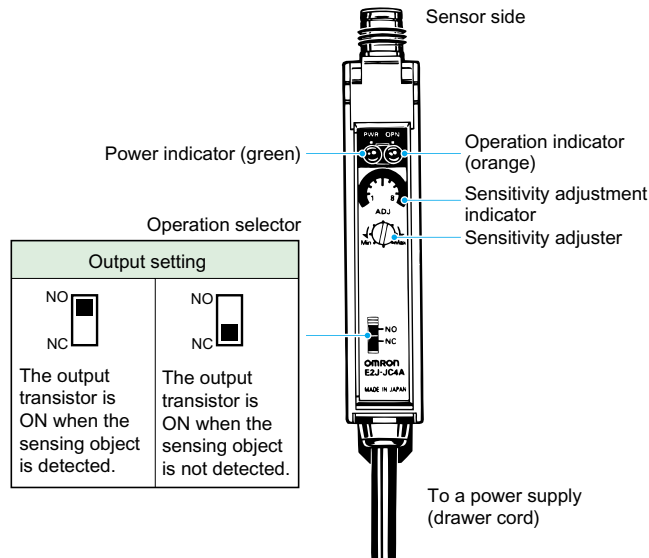
E2J-W20MA



Output Circuit Diagram

Operating status	Model	Timing chart	Output circuit
NO	E2J-W10MA E2J-W20MA + E2J-JC4A	<p>Sensing object: Yes (ON), No (OFF)</p> <p>Output transistor: ON (ON), OFF (OFF)</p> <p>Sensor Head sensing indicator (red): ON (ON), OFF (OFF)</p> <p>Amplifier Unit operation indicator (orange): ON (ON), OFF (OFF)</p>	
		<p>Sensing object: Yes (ON), No (OFF)</p> <p>Output transistor: ON (ON), OFF (OFF)</p> <p>Sensor Head sensing indicator (red): ON (ON), OFF (OFF)</p> <p>Amplifier Unit operation indicator (orange): ON (ON), OFF (OFF)</p>	

Nomenclature (amplifier)



Operation

Operation

Please adjust in order of 1, 2, and 3.

Sequence	Detection state	Adjustment (Sensitivity adjuster)
①		Obtain the sensing distance X from the set distance S divided by 0.75. Determine S so that X will be less than the maximum sensing distance.
②		Locate the Sensor so that the distance between the Sensor and sensing object is X. Turn the sensitivity adjuster clockwise until the red sensing indicator of the Sensor Head is lit.
③		Return the Sensor to the previous position so that the distance between the Sensor and sensing object is S. Secure the position of the Sensor to complete the sensitivity adjustment.

Note: 1. After completing sensitivity adjustment, mount the provided cover on the Amplifier Unit to prevent mis-operation.
2. The maximum sensing distance will drop depending on the dimen-

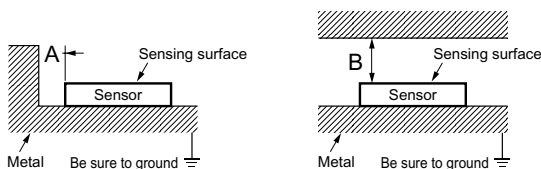
Precautions

Correct Use

Design

Effects of Surrounding Metal

Provide a minimum distance as shown in the table below between the Sensor and the surrounding metal.

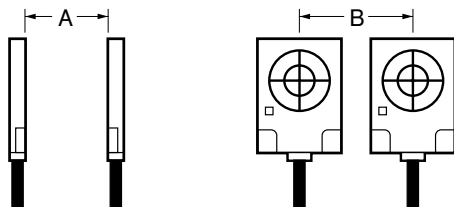


Effects of Surrounding Metal (Unit: mm)

Model	Length	A	B
E2J-W10MA		10	20
E2J-W20MA		20	40

Mutual Interference

When two or more Sensors are mounted face-to-face or side-by-side, keep them separated at the following distance or greater.



Mutual Interference (Unit: mm)

Model	Length	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.

Effects of Static Electricity

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

Mounting

Be sure that the tightening torque does not exceed 0.54N•m.

Cord

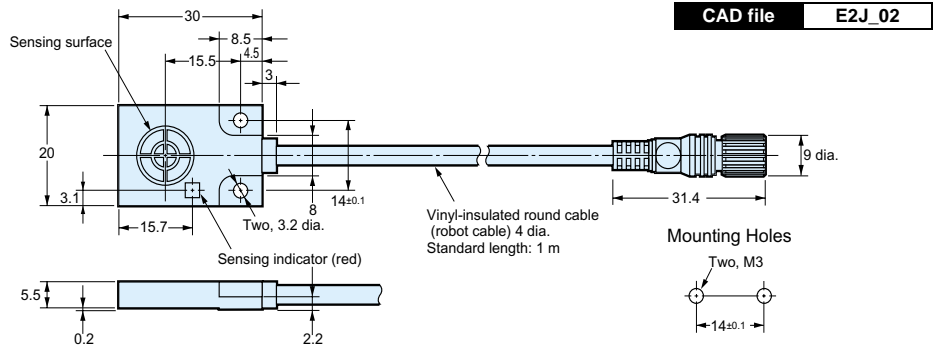
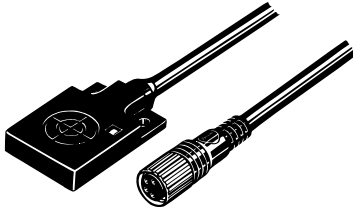
Be sure that the bending radius of the cord is more than 5 mm. Use the XS3W-M421-40□-R with connectors (M8-screw-mounting type) as the extension cord. The maximum cord length is 3 m (extension section: 2 m).

Dimensions (Unit: mm)

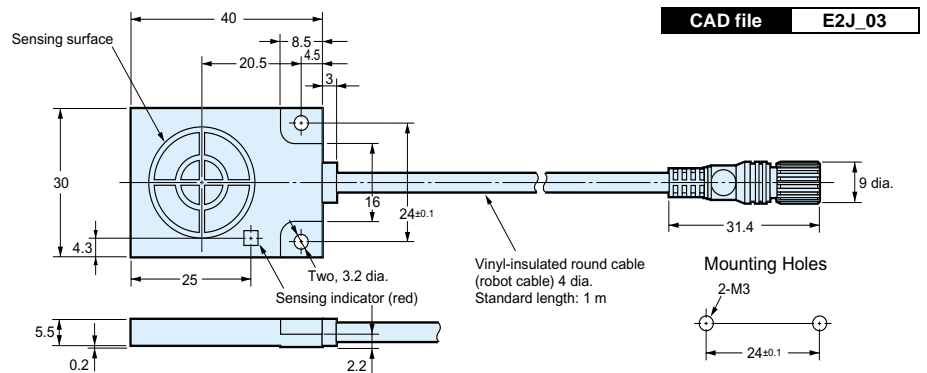
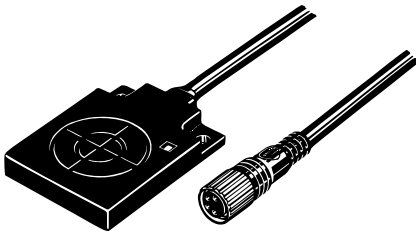
Sensors

Sensors

E2J-W10MA

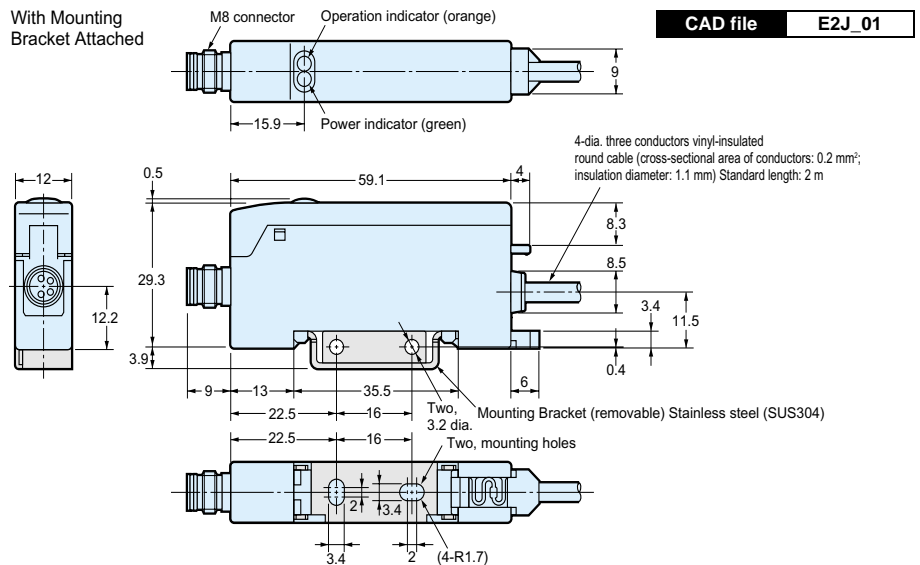
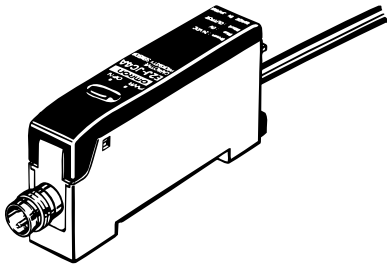


E2J-W20MA



Amplifier Units

E2J-JC4A



Accessories (Order Separately)

Dust Covers

Material: Red polyvinyl chloride

XS3Z-13 (For Amplifier: E2J-JC4A)

XS3Z-15 (For Sensor: E2J-W□MA)

