

# Flat Proximity Sensor

# E2K-F

CSM\_E2K-F\_DS\_E\_5\_3

## Flat Capacitive Sensor with a Thickness of Only 10 mm



- Flat Sensor with excellent space efficiency.  
(Model with built-in Amplifier is only 10 mm thick.)
- Direct mounting onto a metallic surface is possible.






For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

 Be sure to read *Safety Precautions* on page 3.

## Ordering Information

**Sensors** [Refer to *Dimensions* on page 4.]

Appearance	Sensing distance	Output configuration	Model/Operation mode	
			NO	NC
Flat Unshielded 	 10 mm	DC 3-wire NPN	<b>E2K-F10MC1 2M</b>	<b>E2K-F10MC2 2M</b>
	 10 mm [4 to 10 mm *]		<b>E2K-F10MC1-A 2M</b>	<b>E2K-F10MC2-A 2M</b>

\* Adjustable range

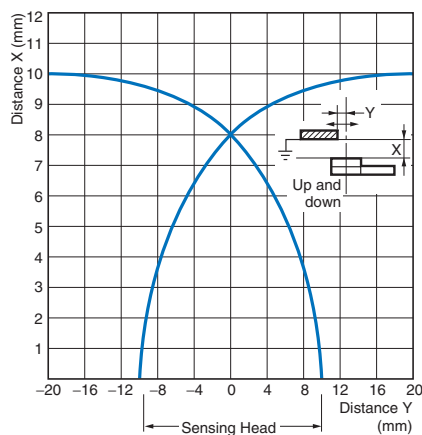
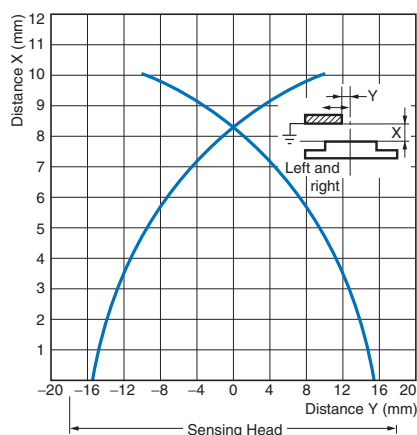
## Ratings and Specifications

Item		Model	E2K-F10MC□-A	E2K-F10MC□
Sensing distance			10 mm (Sensing distance adjustable range: 4 to 10 mm)	10 mm $\pm 10\%$
Set distance			0 to 7.5 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			100 Hz	
Power supply voltage (operating voltage range)			12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.	
Current consumption			10 mA max. at 24 VDC	
Control output	Load current		NPN open collector, 100 mA max. (at 30 VDC)	
	Residual voltage		1.5 V max. (Load current: 100 mA, Cable length: 2 m)	
Indicators			Detection indicator (red)	
Number of turns of sensitivity adjustment			12 turns	—
Operation mode (with sensing object approaching)			NO (Refer to the timing charts under <i>I/O Circuit Diagrams</i> on page 3 for details.)	
Protection circuits			Reverse polarity protection, Surge suppressor	
Ambient temperature range			Operating/Storage: $-10$ to $55^{\circ}\text{C}$ (with no icing or condensation)	
Ambient humidity range			Operating/Storage: 35% to 95%	Operating/Storage: 35% to 95%
Temperature influence			$\pm 15\%$ max. of sensing distance at $23^{\circ}\text{C}$ in the temperature range of $-10$ to $55^{\circ}\text{C}$	
Voltage influence			$\pm 2.5\%$ max. of sensing distance at rated voltage at rated voltage $\pm 10\%$	
Insulation resistance			50 M $\Omega$ min. (at 500 VDC) between current-carrying parts and case	
Dielectric strength			500 VAC, 50/60 Hz for 1 min between current-carrying parts and case	
Vibration resistance			Destruction: 10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions	
Shock resistance			Destruction: 500 m/s <sup>2</sup> 3 times each in X, Y, and Z directions	
Degree of protection			IP64 (IEC)	IP66 (IEC)
Connection method			Pre-wired Models (Standard cable length: 2 m)	
Weight (packed state)			Approx. 35 g	
Materials	Case		Heat-resistant ABS	
	Sensing surface			
Accessories			Instruction manual	

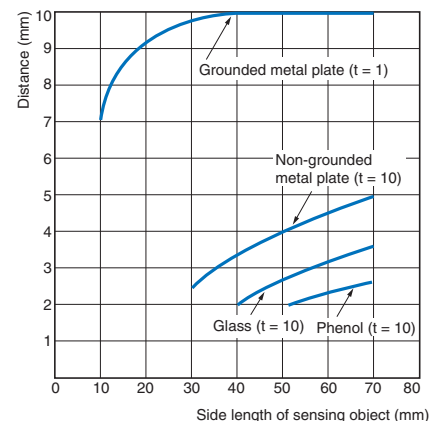
\* The value for the E2K-F10MC□-A is when it is adjusted to 10 mm.

## Engineering Data (Reference Value)

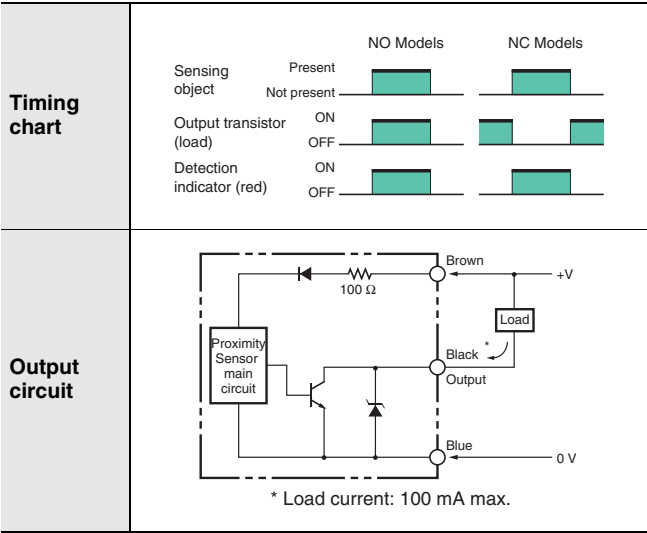
### Sensing Area (Grounded Metal Plate)



### Influence of Sensing Object Size and Material



I/O Circuit Diagrams



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.

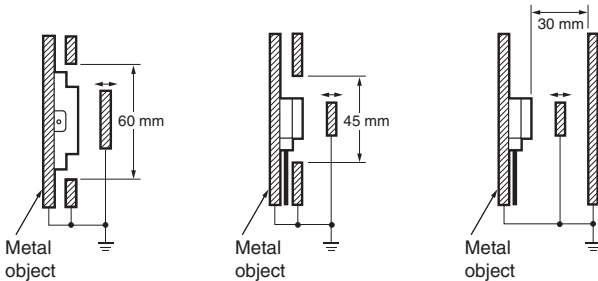
● Design

**Sensing Object Material**

The E2K-F can detect almost any type of object. The sensing distance of the E2K-F, however, will vary with the electrical characteristics of the object, such as the conductance and inductance of the object, and the water content and capacity of the object. The maximum sensing distance of the E2K-F will be obtained if the object is made of grounded metal. There are objects that cannot be detected indirectly. Therefore, be sure to test the E2K-F in a trial operation with the objects before using the E2K-F in actual applications.

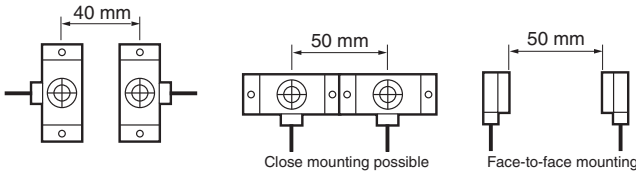
**Influence of Surrounding Metal**

Separate the E2K-F from surrounding metal as shown below.



**Mutual Interference**

When mounting more than one E2K-F face-to-face or side-by-side, separate them as shown below.



**Effects of a High-frequency Electromagnetic Field**

The E2K-F may malfunction if there is an ultrasonic washer, high-frequency generator, transceiver, portable telephone, or inverter nearby. For major measures, refer to *Noise of Warranty and Limitations of Liability* for Photoelectric Sensors.

● Wiring

The characteristics of the E2K-F will not change if the cable is extended. Extending the cable, however, will result in a voltage drop, so do not extend the length past 200 m.

● Mounting

**Sensitivity Adjustment**

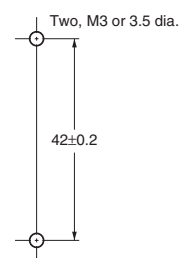
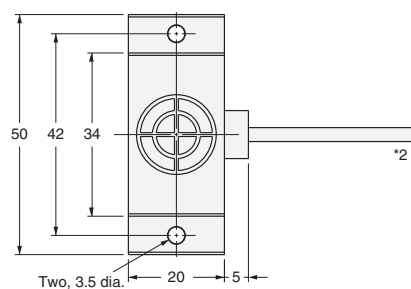
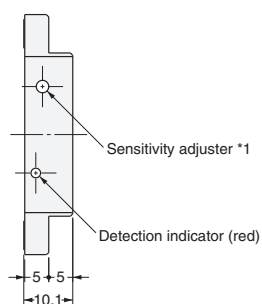
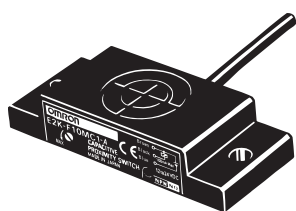
For information on the sensitivity adjustment, refer to *Technical Guide for Operation* for information for Proximity Sensor.

## Dimensions

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

### E2K-F

#### Mounting Hole Dimensions



\*1. Only the E2K-F10MC□-A has a sensitivity adjuster.

\*2. 2.9-dia. vinyl-insulated round cable  
(Conductor cross section: 0.14 mm<sup>2</sup>,  
Insulator diameter: 0.9 mm), Standard length: 2 m.

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