

## 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.



 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	E2K-F10MC1 2M	E2K-F10MC2 2M
		4 to 10 mm		E2K-F10MC1-A 2M	E2K-F10MC2-A 2M

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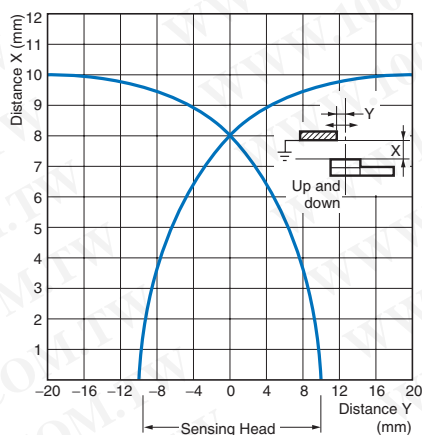
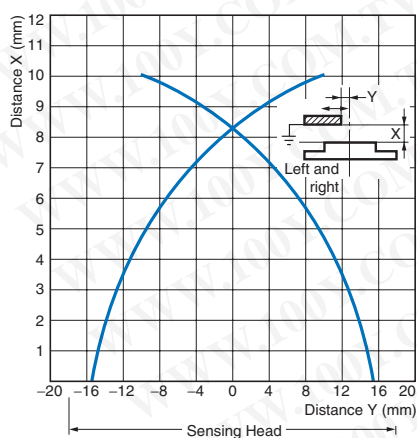
## Ratings and Specifications

Item	Model	E2K-F10MC□-A	E2K-F10MC□
Sensing distance		4 to 10 mm (adjustable with 12-turn adjuster)	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 $\times$ 50 $\times$ 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)	
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	

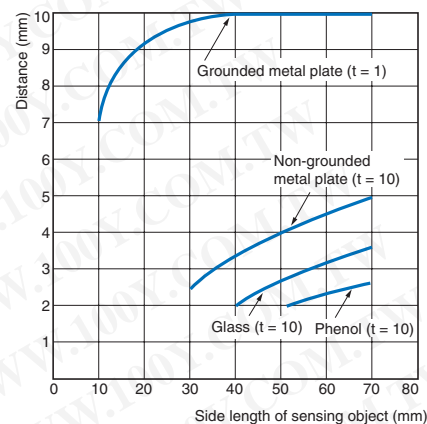
\* The value for the E2K-F10MC□-A is when it is adjusted to 10 mm.

## Engineering Data (Typical)

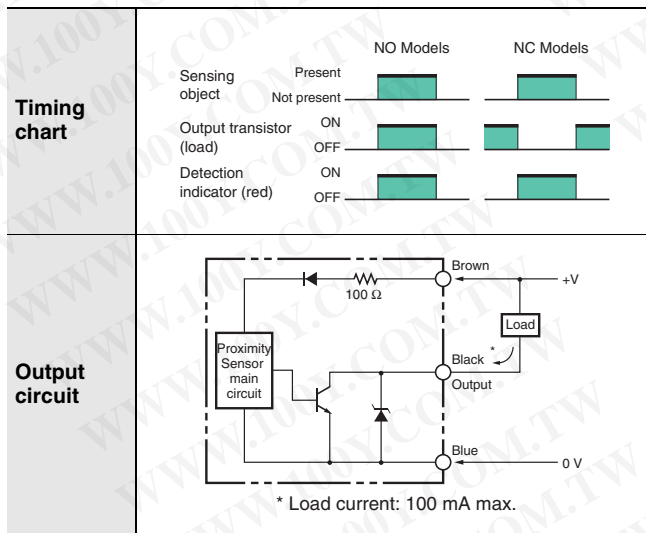
### Sensing Area (Grounded Metal Plate)



### 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.

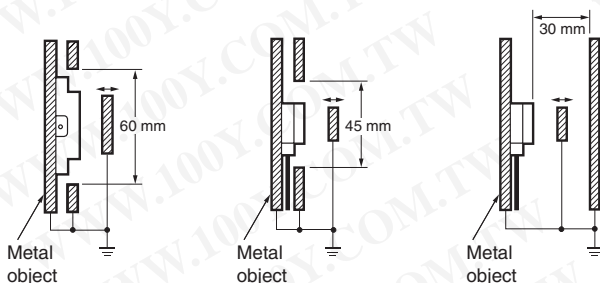
● **Design**

**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.

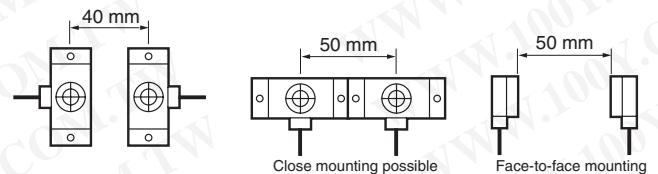
**Influence of Surrounding Metal**

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.

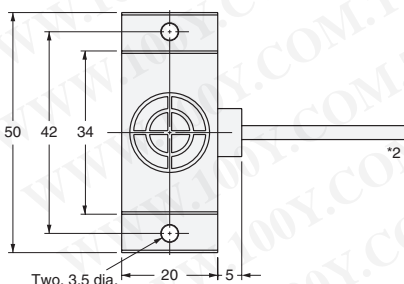
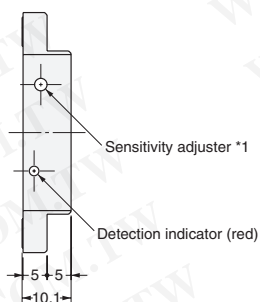
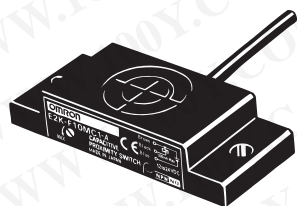
# E2K-F

(Unit: mm)

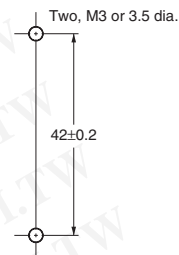
## Dimensions

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.



## Read and Understand This Catalog

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

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- Systems, machines, and equipment that could present a risk to life or property.

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### DIMENSIONS AND WEIGHTS

Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.

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