

## 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<br>Unshielded  | 10 mm            | DC 3-wire<br>NPN     | E2K-F10MC1 2M        | E2K-F10MC2 2M   |
|                                                                                                       | 4 to 10 mm       |                      | E2K-F10MC1-A 2M      | E2K-F10MC2-A 2M |

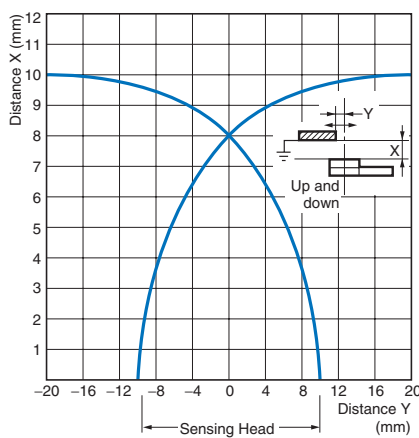
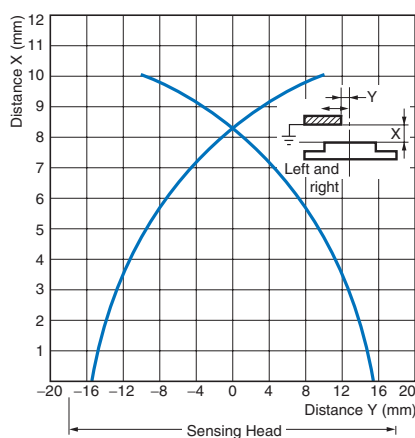
## Ratings and Specifications

| 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 × 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)                                                                    |                               |
| 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°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°C in the temperature range of -10 to 55°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                                                                           |                               |

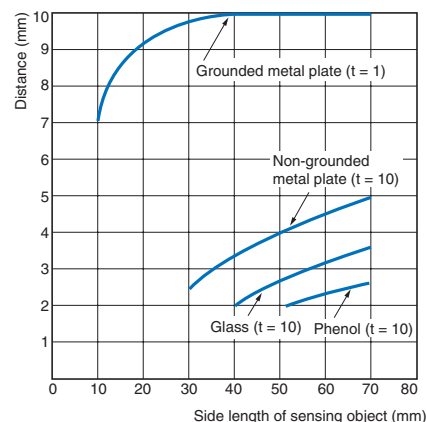
\* The value for the E2K-F10MC□-A is when it is adjusted to 10 mm.

## Engineering Data (Typical)

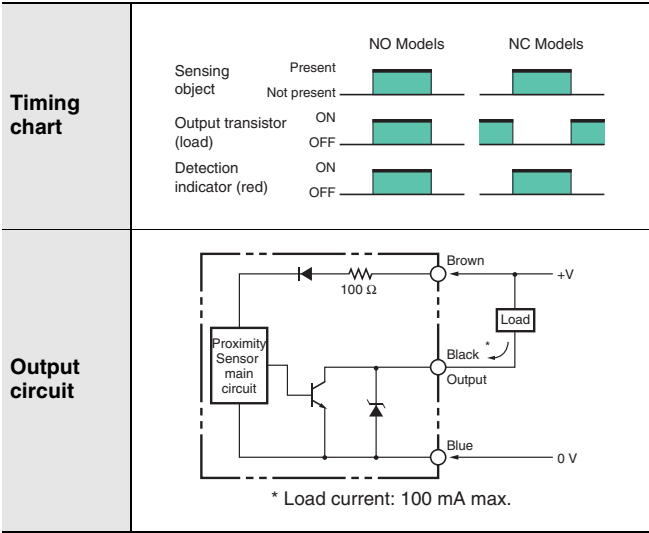
### Sensing Area (Grounded Metal Plate)



### 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.

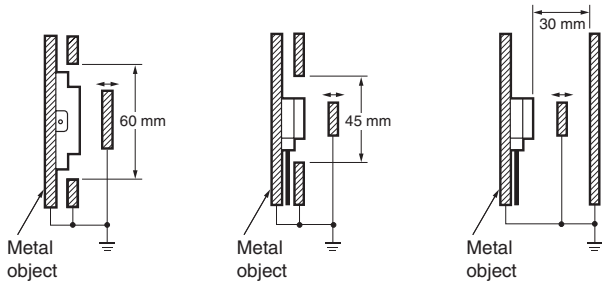
● Design

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.

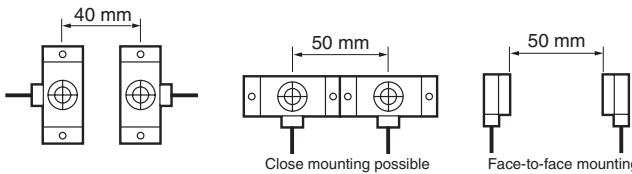
Influence of Surrounding Metal

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.

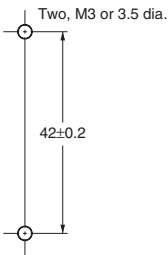
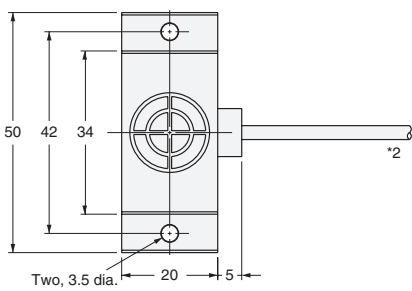
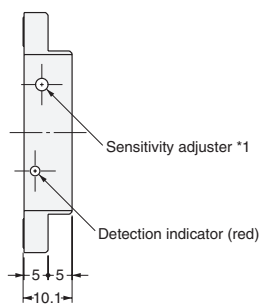
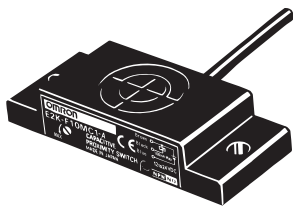
● Wiring

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.

Dimensions

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

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