



## OMRON Flat Proximity Sensor E2K-F Instruction Manual

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# OMRON

Flat Proximity Sensor  
E2K-F  
CSM\_E2K-F\_DS\_E\_5\_6

### 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.

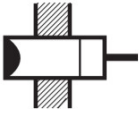


 Be sure to read Safety Precautions on page 3.

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## Ordering Information

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

| Appearance  | Sensing distance (Adjustable range)   |                             | Output configuration | Model/Operation mode |                 |
|---|---|-----------------------------|----------------------|----------------------|-----------------|
| Flat Unshielded<br> |    | 10 m<br>m                   | DC 3-wire NPN        | NO                   | NC              |
|   |  | 10 m<br>m (4<br>o 10<br>mm) |                      | E2K-F10MC1 2M        | E2K-F10MC2 2M   |
|   |   |                             |                      | E2K-F10MC1-A 2M      | E2K-F10MC2-A 2M |

## Ratings and Specifications

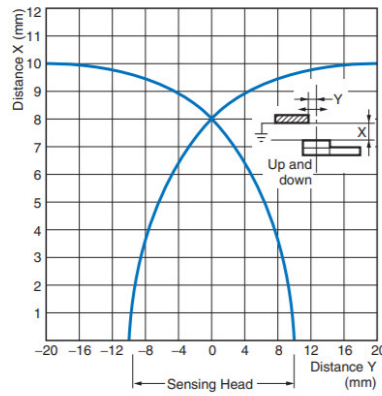
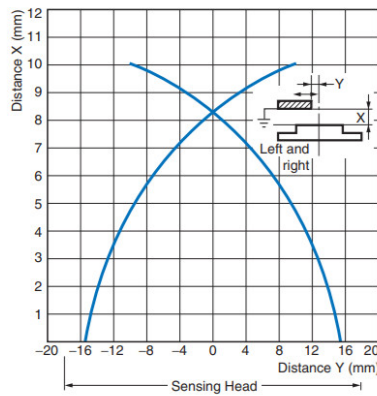
| Item Model                                     |                  | E2K-F10MC -A  | E2K-F10MC ■ |
|--|------------------|---|-------------|
| Sensing distance                               |                  | 10 mm (Sensing distance adjustable range: 4 to 10 mm) | 10 mm ±10%  |
| Set distance                                   |                  | 0 to 7.5 mm •   |             |
| Differential travel                            |                  | 15% max of sensing distance                           |             |
| Detectable object                              |                  | Conductors and dielectrics                            |             |
| Standard sensing object                        |                  | Grounded metal plate: 50 x 50 x 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        |                 | 11 turns   | — |
| Operation mode (with sensing object approaching) |                 | NO (Refer to the timing charts under I/O Circuit Diagrams 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                            |                 | ±15% max of sensing distance at 23°C in the temperature range of -10 to 55°C                 |   |
| Voltage influence                                |                 | ±2.5% max. of sensing distance at rated voltage ±10%   |   |
| Insulation resistance                            |                 | 50 MΩ 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                                      |                 | Adjustment screwdriver, Instruction manual   |   |

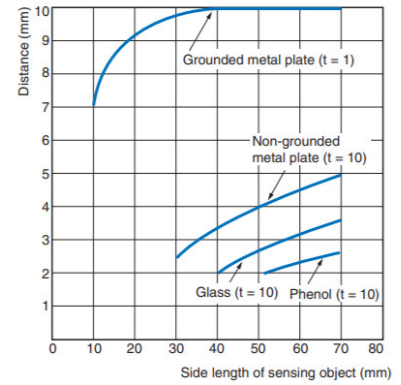
\* The value for the E2K-F10MC-A is when it is adjusted to 10 mm.

## Engineering Data (Reference Value)

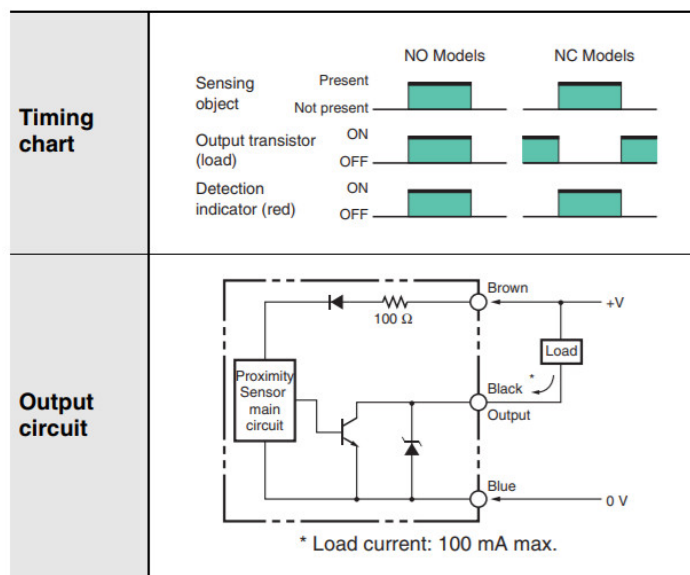
## Sensing Area (Grounded Metal Plate)



## 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 the 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

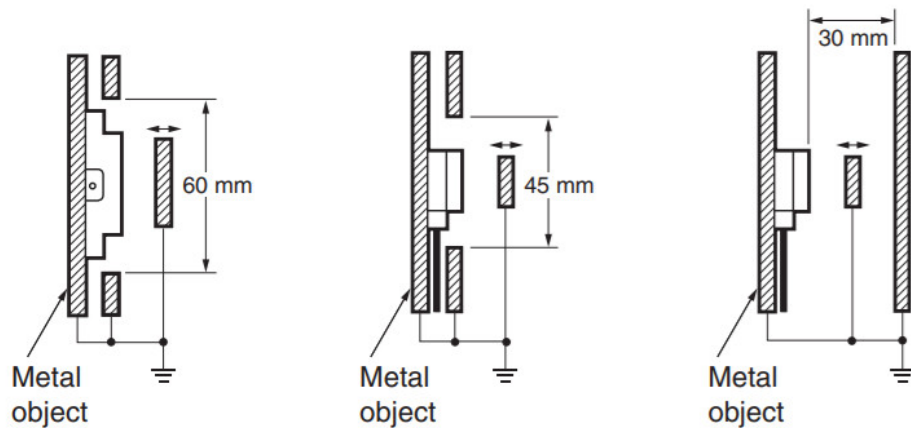
#### Sensing Object Material

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.

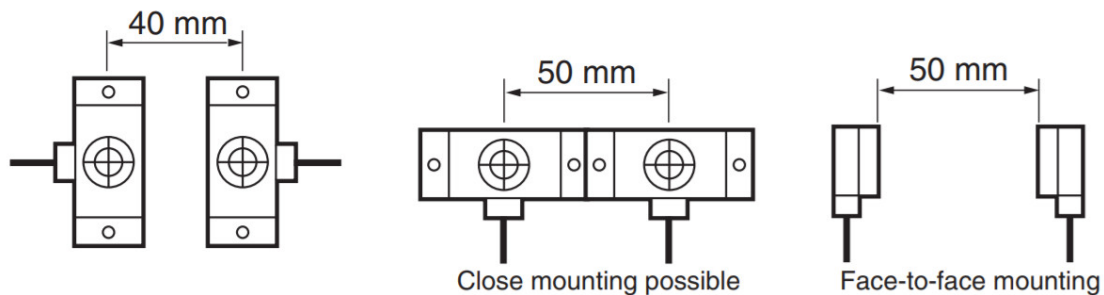
### Influence of Surrounding Metal

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

Use the included screwdriver to adjust the sensitivity. Use of a screwdriver other than the one included may damage the sensitivity adjuster.

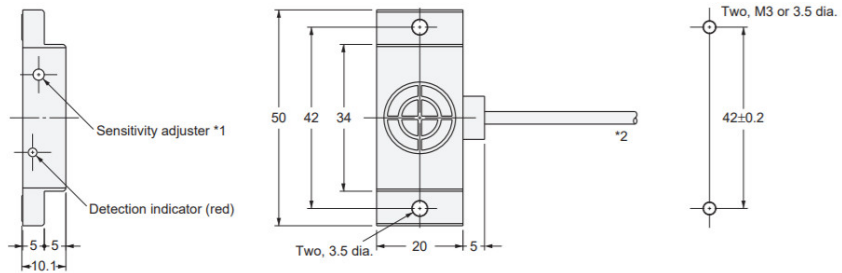
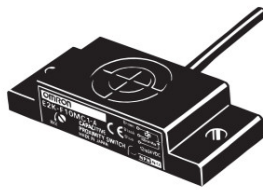
For information on the sensitivity adjustment, refer to Technical Guide for Operation for information for Proximity Sensor.

### Dimensions

(Unit: mm)

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

## E2K-F



\*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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## **Documents / Resources**

|   |   |
|---|---|
|  | <p><a href="#">OMRON Flat Proximity Sensor E2K-F</a> [pdf] Instruction Manual<br/>OMRON, Flat, Proximity, Sensor, E2K-F</p> |
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