

## Capacitive Proximity Sensor

## E2K-F

### Low-profiled Capacitive Proximity Sensor with Mounting Flexibility

- Flat, built-in amplifier model offers excellent space efficiency, with 10-mm sensing distance.
- Detects almost any kind of object, be it metallic or non-metallic (water, oil, glass, plastic, etc.).
- Direct mounting onto a metallic surface is possible.
- LED operation indicator

### Ordering Information

Shield	Sensing distance	DC 3-wire models		Response frequency
		NPN		
		NO	NC	
Unshielded	10 mm	E2K-F10MC1	E2K-F10MC2	100 Hz



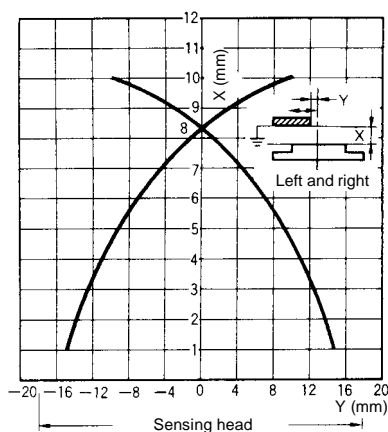
## Specifications

Model		E2K-F10MC1, E2K-F10MC2
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)
Sensing object		Conductors and dielectrics
Sensing distance		0 to 7.5 mm (with grounded metal: 50 x 50 x 1 mm)
Differential travel		15% max. of sensing distance
Indicator		Operation indicator (red)
Circuit protection		Reverse connection protection, surge absorber
Response frequency		100 Hz
Operating status (with sensing object approaching)		Load ON
Control output		NPN open collector, 100 mA max. at 30 VDC
Ambient temperature		Operating: -10°C to 55°C (with no icing)
Ambient humidity		Operating: 35% to 95%
Temperature influence		±15% max. of sensing distance at 23°C in the temperature range of -10°C and 55°C
Voltage influence		±2.5% max. of sensing distance at a voltage between 90% and 110% of the rated power supply voltage
Residual voltage		1.5 V max. with a load current of 100 mA and a cord length of 2 m
Insulation resistance		50 MΩ (at 500 VDC) between the case and current carry parts
Dielectric strength		500 VAC (50/60 Hz) for 1 min between the case and current carry parts
Vibration resistance		Malfunction: 10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions
Shock resistance		Malfunction: 500 m/s <sup>2</sup> (approx. 50G) 3 times each in X, Y, and Z directions.
Enclosure ratings		IEC IP66
Weight (with 2-m cord)		Approx. 35 g
Material	Case	Heat-resistant ABS resin
	Sensing surface	Heat-resistant ABS resin

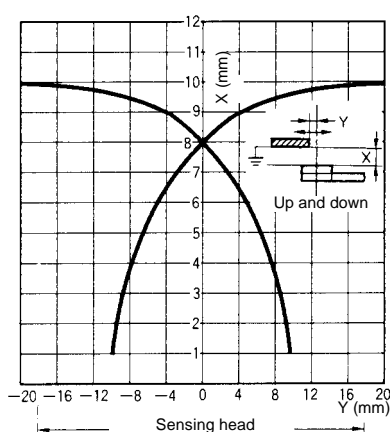


# Engineering Data

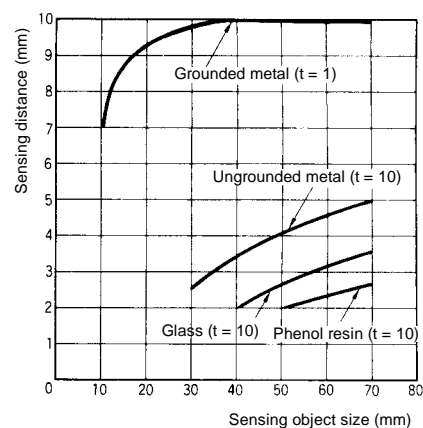
## Operating Range (Typical)



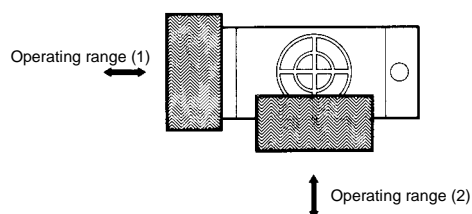
## Operating Range



## Sensing Object Size and Material vs. Sensing Distance (Typical)



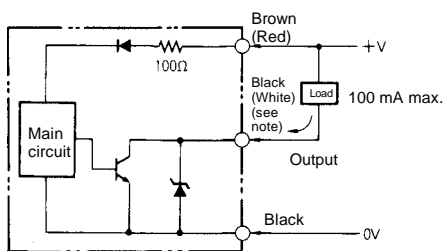
## Moving Direction of Object



# Operation

**Note:** The lead wire colors of the E2K-F have been changed in compliance with the latest Japanese Industrial Standards. Colors in parentheses are previous ones.

## Output Circuit



**Note:** A maximum load current is 100 mA.

## Operating Chart

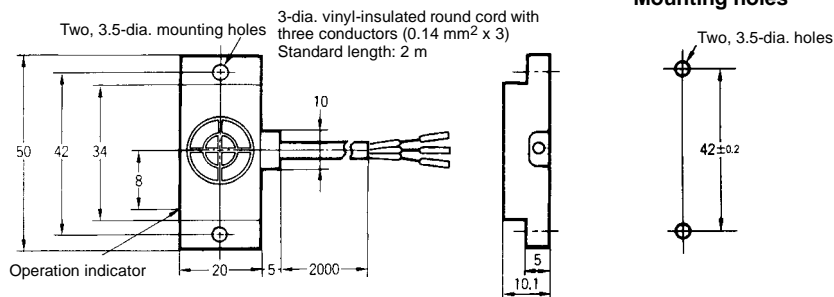
	E2K-10MC1 (NO)	E2K-10MC2 (NC)
Sensing object	Yes	No
Output transistor (Load)	ON	OFF
Operation indicator (LED)	ON	OFF



# Dimensions

## E2K-F

Weight: Approx. 35 g



# Precautions

## 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 available 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.

## Wiring

The characteristics of the E2K-F will not change when the cord is extended. While considering voltage drops that may be caused by the cord extended, be sure that the total cord length is no more than 200 m.

## Effects of a High-frequency Electromagnetic Field

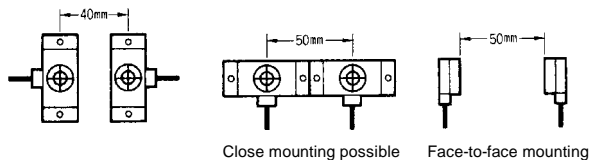
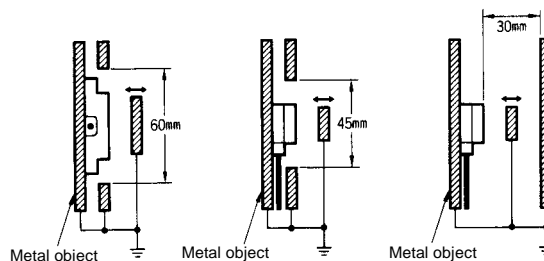
The E2K-F may malfunction if there is an ultrasonic washer, high-frequency generator, transceiver, or inverter nearby.

## Mutual Interference

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

## Effects of Ambient Metal

Separate the E2K-F from ambient metals as shown below.



**ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.**

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. D18-E1-2

In the interest of product improvement, specifications are subject to change without notice.

## OMRON Corporation

Systems Components Division H.Q.  
28th Fl., Crystal Tower Bldg.  
1-2-27, Shiromi, Chuo-ku,  
Osaka 540 Japan  
Phone: 06-949-6012 Fax: 06-949-6021

Printed in Japan  
0897-1M (0697) a