

Flat Type Capacitive Proximity Sensor

# E2K-F

*Low-profiled Capacitive Proximity Sensor providing Flexible Installation*



Ordering Information

Shape	Sensing distance	Output specifications	Operating status	Model
Flat type Unshielded 	10 mm	DC 3-wire NPN	NO	E2K-F10MC1
	4 to 10 mm		NC	E2K-F10MC2
			NO	E2K-F10MC1-A
	NC		E2K-F10MC2-A	

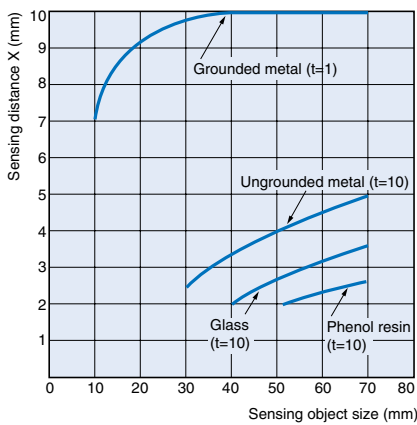
Rating/Performance

Item	E2K-F10MC1 E2K-F10MC2	E2K-F10MC1-A E2K-F10MC2-A
Sensing distance	10 mm ±10%	4 to 10 mm ±10%
Setting distance	0 to 7.5 mm	
Differential distance	15% max. sensing distance	
Sensing object	Conductors and dielectrics	
Standard sensing object	with grounded metal: 50 x 50 x 1 mm	
Response frequency	100 Hz	
Rated supply voltage (operating voltage)	12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.	
Current consumption	10 mA max. (24VDC)	
Control output	Switching capacity	NPN open collector 100 mA max. (under 30 VDC)
	Residual voltage	1.5 V max. (under load current of 100 mA with cable length of 2 m)
Indicator lamp	Detection indicator (red LED)	
Operating status (with sensing object approaching)	NO	
Protective circuits	Reverse connection protection, surge absorber	
Ambient temperature	Operating/Storage: -10°C to 55°C (with no icing or condensation)	
Ambient humidity	Operating/Storage: 35% to 95%RH	
Temperature influence	±15% max. of sensing distance at 23°C within the temperature range of -10°C and 55°C	
Voltage influence	±2.5% max. of sensing distance within a range of ±10% of rated supply voltage	
Insulation resistance	50 M Ω min. (at 500 VDC) between energized parts and case	
Dielectric strength	500 VAC 50/60 Hz for 1 min between energized part and case	
Vibration resistance	Malfunction: 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> for 3 times each in X, Y, and Z directions	
Protective structure	IEC 60529 IP66	IEC 60529 IP64
Connection method	Pre-wired models (standard length: 2 m)	
Weight (Packed state)	Approx. 35 g	
Material	Case	Heat-resistant ABS resin
	Sensing surface	
Accessories	Instruction manual	

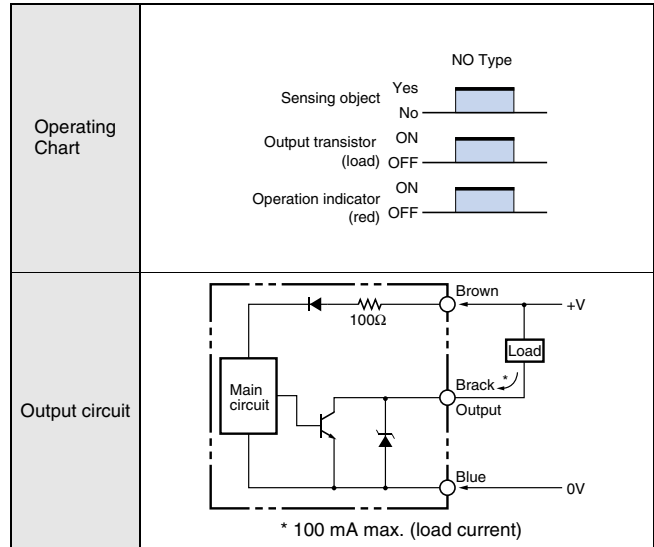
E2K-F

## Characteristic data (typical)

### Sensing Distance vs. Sensing Object



## Output Circuit Diagram



## Precautions

### Correct Use

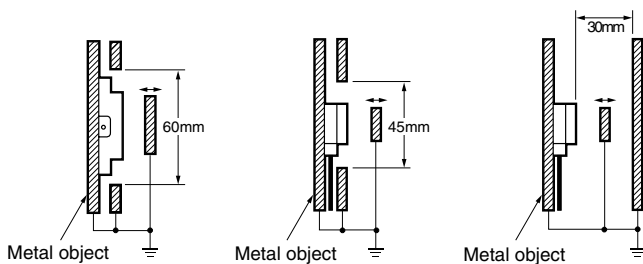
#### Design

#### Sensing Object Material

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

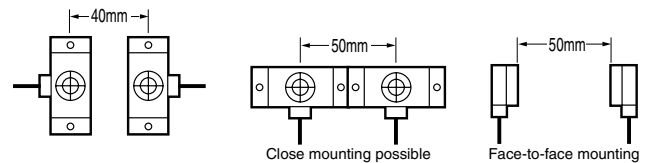
#### Effects of Surrounding Metal

Separate E2K-F from ambient metals as shown below.



#### Mutual Interference

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



#### Effect of High-frequency Electro-magnetic Field

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

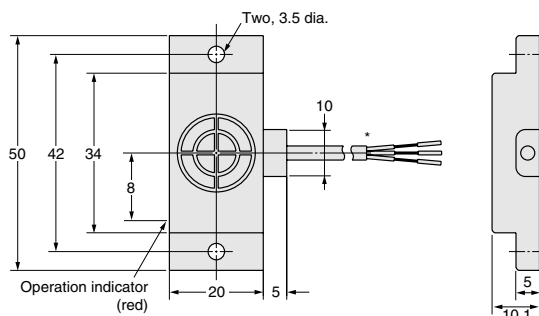
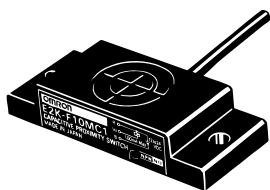
For a typical measure, refer to the "Noise" with Common precautions of a photoelectric sensor in Rear B-page.

#### Wiring Considerations

The characteristics of E2K-F will not change if the cord is extended. Keep in mind that voltage drops may occur due to the cord extension, thus, ensure that the total cord length does not exceed 200 m.

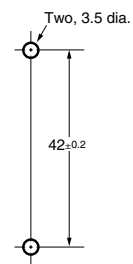
Dimensions (Unit: mm)

E2K-F



\* 2.9-dia. three conductors vinyl-insulated round cable  
 (cross-sectional area of conductors: 0.14 mm<sup>2</sup>;  
 insulation diameter: 0.9 mm)  
 Standard length: 2 m

Mounting Holes



ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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