

# Capacitive Proximity Sensor E2K-X

## Threaded Cylindrical Capacitive Proximity Sensor

- Detects almost any kind of metallic and nonmetallic objects, including glass, lumber, water, oil, and plastic.
- Three choices of threaded cylinder sizes for easy installation: M12, M18, and M30
- All models equipped with an LED indicator for operation monitoring.
- Fixed sensing distance requires no sensitivity adjustment.

### <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.



## Ordering Information

Shield	Size	Sensing distance	DC 3-Wire Models				AC 2-Wire Models	
			NPN		PNP		NO	NC
			NO	NC	NO	NC		
Unshielded	M12	4 mm	E2K-X4ME1	E2K-X4ME2	E2K-X4MF1	E2K-X4MF2	E2K-X4MY1	E2K-X4MY2
	M18	8 mm	E2K-X8ME1	E2K-X8ME2	E2K-X8MF1	E2K-X8MF2	E2K-X8MY1	E2K-X8MY2
	M30	15 mm	E2K-X15ME1	E2K-X15ME2	E2K-X15MF1	E2K-X15MF2	E2K-X15MY1	E2K-X15MY2

## Specifications

Model	E2K-X4ME(F)□	E2K-X8ME(F)□	E2K-X15ME(F)□	E2K-X4MY□	E2K-X8MY□	E2K-X15MY□
Supply voltage (operating voltage range) (see note 1)	12 to 24 VDC (10 to 30 VDC)			100 to 220 VAC (90 to 250 VAC)		
Current consumption	15 mA			2.2 mA max. (Refer to <i>Engineering Data</i> .)		
Sensing object	Conductors and dielectrics					
Sensing distance	4 mm±10%	8 mm±10%	15 mm±10%	4 mm±10%	8 mm±10%	15 mm±10%
Sensitivity	Fixed					
Differential travel	4% to 20% of sensing distance					
Control output	200 mA			10 to 200 mA		
Response speed	100 Hz			10 Hz		
Indicator	Operation indicator (red)					
Circuit protection	Reverse connection protection, surge absorber			Surge absorber		
Set distance (for standard sensing object) (see note 2)	0 to 2.8 mm with grounded object (50 x 50 x 1 mm)	0 to 5.6 mm with grounded object (50 x 50 x 1 mm)	0 to 10 mm with grounded object (50 x 50 x 1 mm)	0 to 2.8 mm with grounded object (50 x 50 x 1 mm)	0 to 5.6 mm with grounded object (50 x 50 x 1 mm)	0 to 10 mm with grounded object (50 x 50 x 1 mm)
Operating status (with sensing object approaching)	E1 Models: Load ON, low-level output signal E2 Models: Load OFF, high-level output signal			Y1 Models: Load ON		
Ambient temperature	-25°C to 70°C (with no icing)		-10°C to 55°C (with no icing)	-25°C to 70°C (with no icing)		-10°C to 55°C (with no icing)
Ambient humidity	Operating: 35% to 95%					

Model	E2K-X4ME(F)□	E2K-X8ME(F)□	E2K-X15ME(F)□	E2K-X4MY□	E2K-X8MY□	E2K-X15MY□
Temperature influence	±20% max. of sensing distance at 23°C in the temperature range of -25°C to 70°C		±20% max. of sensing distance at 23°C in the temperature range of -10°C to 55°C	±20% max. of sensing distance at 23°C in the temperature range of -25°C to 70°C		±20% max. of sensing distance at 23°C in the temperature range of -10°C to 55°C
Voltage influence	E Models: ±2% max. of sensing distance at a voltage between 80% and 120% of the rated power supply voltage			Y Models: ±2% max. of sensing distance at a voltage between 90% and 110% of the rated power supply voltage		
Residual voltage	E Models: 1.0 V max. under a load current of 200 mA and a cable length of 2 m			Y Models: Refer to <i>Residual Load Voltage (Typical)</i> in the following <i>Engineering Data</i> .		
Insulation resistance	50 MΩ (at 500 VDC) between current carry parts and case					
Dielectric strength	DC Models: 1,000 VAC (50/60 Hz) for 1 min between current carry parts and case AC Models: 2,000 V (50/60 Hz) for 1 min between current carry parts 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	Malfunction: 500 m/s <sup>2</sup> (approx. 50G) 3 times each in X, Y, and Z directions.					
Degree of protection	IEC IP66					
Weight (with 2-m cable)	Approx. 65 g	Approx. 145 g	Approx. 205 g	Approx. 65 g	Approx. 145 g	Approx. 205 g
Material	Case	Heat-resistant ABS resin				
	Sensing surface	Heat-resistant ABS resin				
Clamping nut	Polyacetal resin					

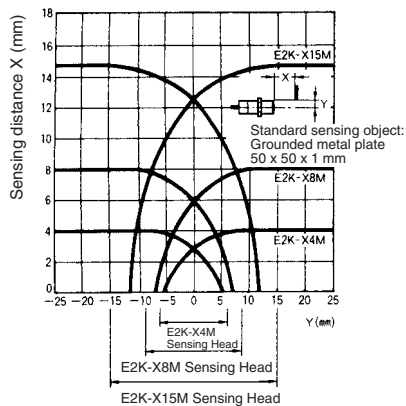
**Note 1.** DC Models (i.e., Sensors with model numbers including the suffix “E”) operate with full-wave rectified power supplies at 24 VDC±20% (mean value).

**2.** The set distances are sensing distances applicable to standard sensing objects. Refer to *Engineering Data* for sensing distances applicable to other types of objects.

## Engineering Data

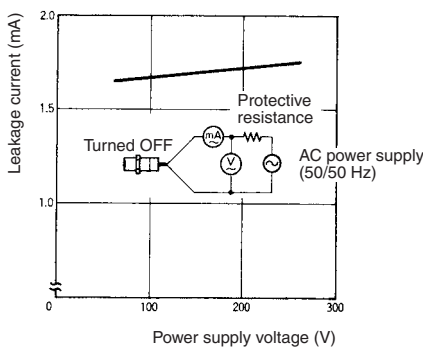
### Sensing Range (Typical)

E2K-X4MY□□, E2K-X8MY□□, E2K-X15MY□□



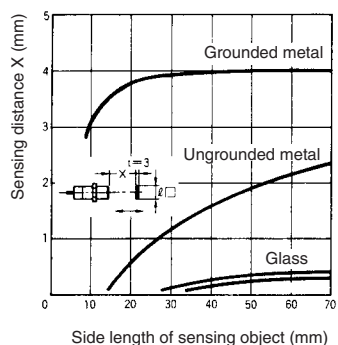
### Leakage Current (Typical)

E2K-X□MY

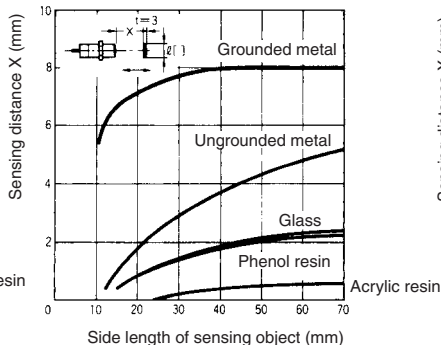


### Sensing Object Size and Material vs. Sensing Distance (Typical)

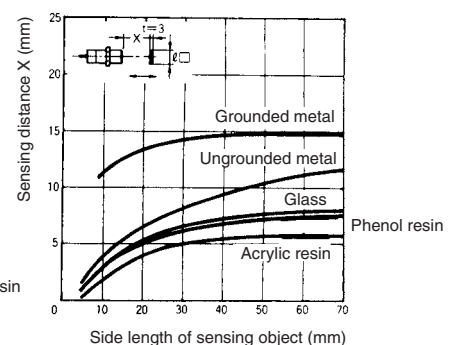
E2K-X4M



E2K-X8M

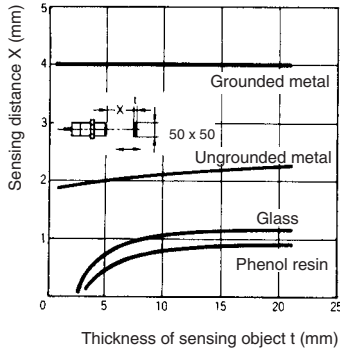


E2K-X15M

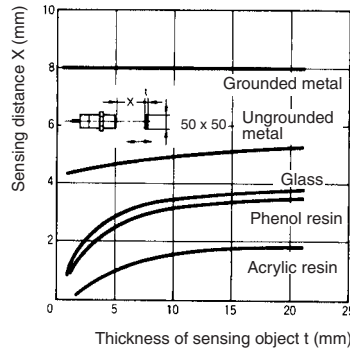


**Sensing Object Thickness and Material vs. Sensing Distance (Typical)**

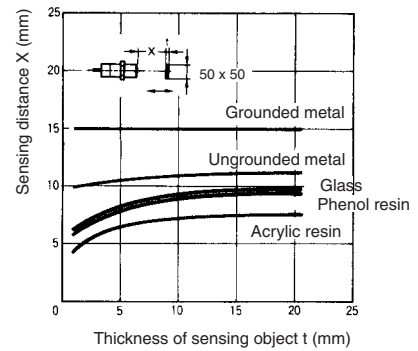
**E2K-X4M**



**E2K-X8M**



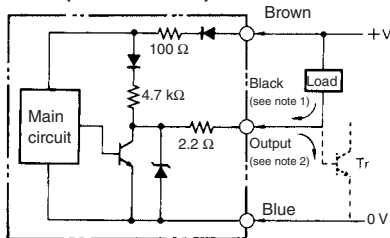
**E2K-X15M**



**Operation**

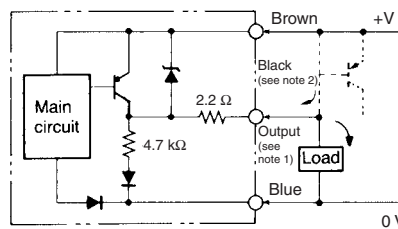
**Output Circuits**

**DC 3-wire Models  
NPN (E2K-X□ME□)**



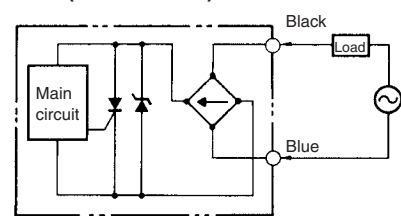
- Note 1. 200 mA max. (load current)
- 2. When a transistor is connected.

**PNP (E2K-X□MF□)**

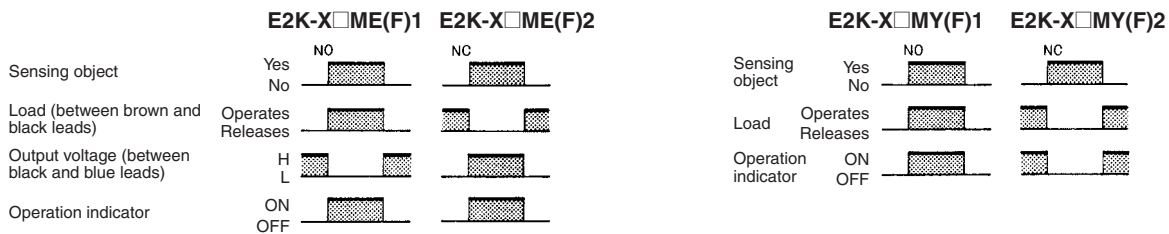


- Note 1. 200 mA max. (load current)
- 2. When a transistor is connected.

**AC 2-wire Models  
NPN (E2K-X□MY□)**

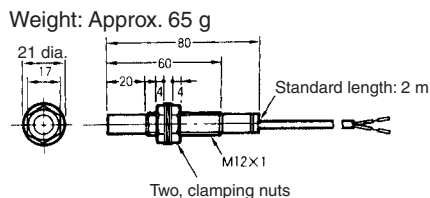


**Timing Charts**



**Dimensions**

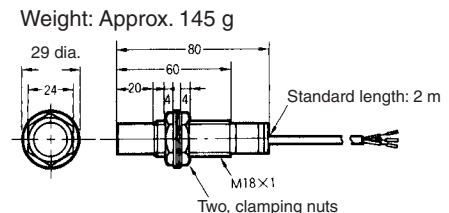
**E2K-X4M□□**



E2K-K-X4ME(F)1 and E2K-X4ME(F)2:  
Oil- and vibration-resistant, vinyl-insulated round cable with three conductors, 4 dia. (0.2 mm<sup>2</sup> x 3); Standard length: 2 m

E2K-K-X4MY1 and E2K-X4MY2:  
Oil- and vibration-resistant, vinyl-insulated round cable with three conductors, 4 dia. (0.2 mm<sup>2</sup> x 2); Standard length: 2 m

**E2K-X8M□□**

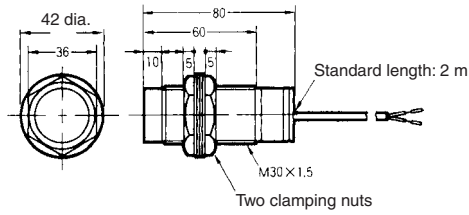


E2K-K-X8ME(F)1 and E2K-X8ME(F)2:  
Oil- and vibration-resistant, vinyl-insulated round cable with three conductors, 6 dia. (0.2 mm<sup>2</sup> x 3); Standard length: 2 m

E2K-K-X8MY1 and E2K-X8MY2:  
Oil- and vibration-resistant, vinyl-insulated round cable with three conductors, 6 dia. (0.2 mm<sup>2</sup> x 2); Standard length: 2 m

**E2K-X15M□□**

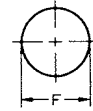
Weight: Approx. 205 g



E2K-K-X15ME(F)1 and E2K-X15ME(F)2:  
Oil- and vibration-resistant, vinyl-insulated round cable with three conductors, 6 dia. (0.2 mm<sup>2</sup> x 3); Standard length: 2 m

E2K-K-X15MY1 and E2K-X15MY2:  
Oil- and vibration-resistant, vinyl-insulated round cable with three conductors, 6 dia. (0.2 mm<sup>2</sup> x 3); Standard length: 2 m

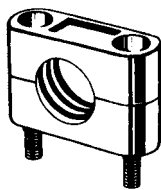
**Mounting Holes**



Model	F (mm)
E2K-X4ME(F)□ E2K-X4MY□	12.5 <sup>+0.5/0</sup> dia.
E2K-X8ME(F)□ E2K-X8MY□	18.5 <sup>+0.5/0</sup> dia.
E2K-X15ME(F)□ E2K-X15MY□	30.5 <sup>+0.5/0</sup> dia.

**Accessories (Order Separately)**

**Y92E-B□**



Plastic Mounting Fixtures are available as options. Select the one suitable for the dimensions of the Sensor.

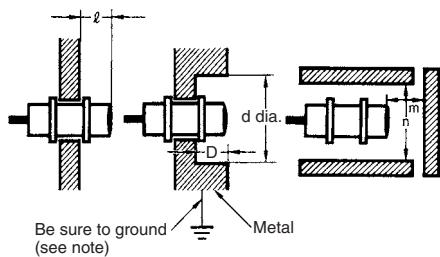
**Precautions**

**WARNING**

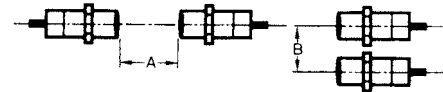
This product is not designed or rated for ensuring safety of persons. Do not use it for such purpose.

**Influence of Surrounding Metals and Mutual Influence**

When mounting a Proximity Sensor flush with a metallic panel, or when installing two or more identical Sensors face-to-face or side-by-side, be sure to provide a minimum distance as shown in the following table. Using the minimum distances in the table will prevent the Sensor from being affected by metallic objects other than the sensing object or will prevent mutual interference between the two Sensors.



**Note:** Always ground the metallic panel or object; otherwise, the Sensor may malfunction.

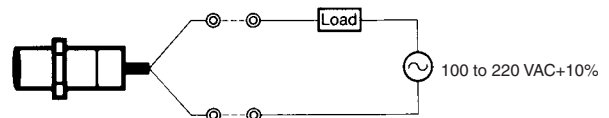


Distance	Model		
	E2K-X4M□□	E2K-X8M□□	E2K-X15M□□
l	20	20	10
d	50	50	50
D	20	20	10
m	8	12	25
n	60	60	60
A	80	150	300
B	70	110	200

**Connection to the Load**

Be sure to connect the Sensor to a power source through a load. Direct connection of a power source may damage the Sensor.

E2K-X4MY□, E2K-X8MY□, E2K-X15MY□









# Warranties and Limitations of Liability

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## ■ WARRANTY

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# Application Considerations

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## ■ SUITABILITY FOR USE

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Take all necessary steps to determine the suitability of the product for the systems, machines, and equipment with which it will be used.

Know and observe all prohibitions of use applicable to this product.

NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

# Disclaimers

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## ■ CHANGE IN SPECIFICATIONS

Product specifications and accessories may be changed at any time based on improvements and other reasons. Consult with your OMRON representative at any time to confirm actual specifications of purchased product.

## ■ DIMENSIONS AND WEIGHTS

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

**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. D017-E1-04

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

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