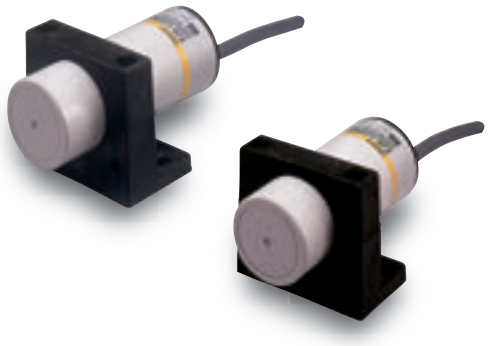
Long-distance type

E2K-C

CSM_E2K-C_DS_E_6_3

Long-distance Capacitive Sensor with Adjustable Sensitivity

- CE Marking for DC 3-wire models and AC/DC 2-wire models.
- Noise-resistant models are also available for environments with strong noise.

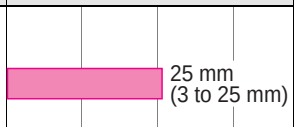
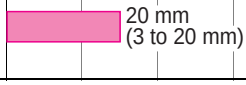


For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

Be sure to read *Safety Precautions* on page 7.

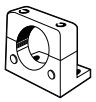
Ordering Information

Sensors [Refer to *Dimensions* on page 8.]

Appearance		Sensing distance (Adjustable range)	Model		
			Output configuration	Operation mode	
				NO	NC
Standard Models	Unshielded  34 dia.	 25 mm (3 to 25 mm)	DC 3-wire, NPN	**E2K-C25ME1 2M**	**E2K-C25ME2 2M**
			DC 3-wire, PNP	**E2K-C25MF1 2M**	**E2K-C25MF2 2M**
			AC 2-wire	**E2K-C25MY1 2M**	**E2K-C25MY2 2M**
Noise-resistant Models		 20 mm (3 to 20 mm)	DC 3-wire, NPN	**E2K-C20MC1 2M**	**E2K-C20MC2 2M**
			AC/DC 2-wire	**E2K-C20MT1 2M**	**E2K-C20MT2 2M**

Accessories (Order Separately)

Mounting Brackets **A Mounting Bracket is provided.**
[Refer to *Dimensions* on page 8.]

Appearance	Model	Quantity	Remarks
	**Y92E-A34**	1	Provided with the product.

Ratings and Specifications

Standard Models

Item	Model	E2K-C25M□1	E2K-C25M□2	E2K-C25MY1	E2K-C25MY2
Sensing distance *		25 mm			
Sensing distance adjustable range		3 to 25 mm			
Detectable object		Conductors and dielectrics			
Standard sensing object		Grounded metal plate: 50 × 50 × 1 mm			
Differential travel		15% max. of sensing sensing distance (when adjusted to 25 mm ±10% with standard sensing object)			
Response frequency		70 Hz		10 Hz	
Power supply voltage (operating voltage range)		12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.		100 to 220 VAC (90 to 250 VAC), 50/60 Hz	
Current consumption		E and F Models: 10 mA max. at 12 VDC, 16 mA max. at 24 VDC			
Leakage current		Y Models: 1 mA max. at 100 VAC (50/60 Hz) with output turned OFF, 2 mA max. at 200 VAC (50/60 Hz) with output turned OFF			
Control output	Load current	200 mA max.		5 to 200 mA (resistive load)	
	Residual voltage	2 V max. (Load current: 200 mA, Cable length: 2 m)		Refer to *Engineering Data* on page 4.	
Indicators		Detection indicator (red)		Operation indicator (red)	
Operation mode (with sensing object approaching)		E1, F1, and Y1 Models: NO E2, F2, and Y2 Models: NC	Refer to the timing charts under *I/O Circuit Diagrams* on page 5 for details.		
Protection circuits		Reverse polarity protection, Surge suppressor		Surge suppressor	
Ambient temperature range		Operating/Storage: –25 to 70°C (with no icing or condensation)			
Ambient humidity range		Operating/Storage: 35% to 95% (with no condensation)			
Temperature influence		±15% max. of sensing distance at 23°C in the temperature range of –10 to 55°C ±25% max. of sensing distance at 23°C in the temperature range of –25 to 70°C			
Voltage influence		±2% max. of sensing distance at the rated voltage in rated voltage ±15% range		±2% max. of sensing distance at the rated voltage in rated voltage +20%, –10% range at 100 VAC, ±20% range at 200 VAC	
Insulation resistance		50 MΩ min. (at 500 VDC) between current-carrying parts and case			
Dielectric strength		1,000 VAC, 50/60 Hz for 1 min between current-carrying parts and case		1,500 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^2 10 times each in X, Y, and Z directions			
Degree of protection		IEC 60529 IP66			
Connection method		Pre-wired Models (Standard cable length: 2 m)			
Weight (packed state)		Approx. 200 g			
Materials	Case	Heat-resistant ABS			
	Sensing surface				
Accessories		Mounting Bracket, M4 screws, Instruction manual			

* The set distances are sensing distances applicable to standard sensing objects. Refer to *Engineering Data* on page 4 for other materials.

Noise-resistant Models

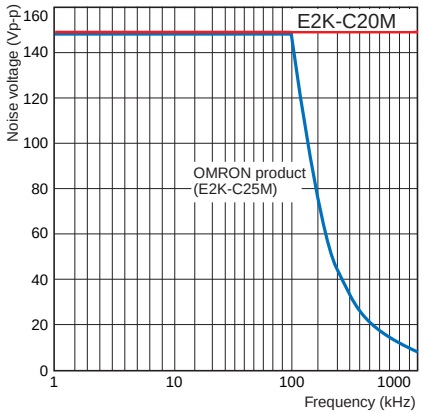
Item	Model	E2K-C20MC1	E2K-C20MC2	E2K-C20MT1	E2K-C20MT2
Sensing distance *1		20 mm			
Sensing distance adjustable range		3 to 20 mm			
Detectable object		Conductors and dielectrics			
Standard sensing object		Grounded metal plate: 50 × 50 × 1 mm			
Differential travel		15% max. of sensing distance (when adjusted to 20 mm ±10% with standard sensing object)			
Response frequency *2		40 Hz		AC power: 25 Hz, DC power: 40 Hz	
Power supply voltage (operating voltage range)		12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.		24 to 240 VAC (20 to 250 VAC), 50/60 Hz; 24 to 240 VDC (20 to 250 VDC)	
Current consumption		13 mA max. at 24 VDC		---	
Leakage current		---		1.5 mA max. at 24 VDC, 1.7 mA max. at 110 VAC (50/60 Hz), 2.5 mA max. at 250 VAC (50/60 Hz) Refer to *Engineering Data* on page 4.	
Control output	Load current	250 mA max.		5 to 200 mA (resistive load)	
	Residual voltage	2.5 V max. (Load current: 250 mA, Cable length: 2 m)		AC power: 10 V max., DC power: 8 V max. Refer to *Engineering Data* on page 4.	
Indicators		Operation indicator (yellow)			
Operation mode (with sensing object approaching)		C1/T1 Models: NO C2/T2 Models: NC Refer to the timing charts under *I/O Circuit Diagrams* on page 5 for details.			
Protection circuits		Reverse polarity protection, Load short-circuit protection		---	
Ambient temperature range		Operating/Storage: –25 to 70°C (with no icing or condensation)			
Ambient humidity range		Operating/Storage: 35% to 95% (with no condensation)			
Temperature influence		±15% max. of sensing distance at 23°C in the temperature range of –10 to 55°C ±25% max. of sensing distance at 23°C in the temperature range of –25 to 70°C			
Voltage influence		±2% max. of sensing distance at the rated voltage in rated voltage ±15% range			
Insulation resistance		50 MΩ min. (at 500 VDC) between current-carrying parts and case			
Dielectric strength		1,000 VAC, 50/60 Hz for 1 min between current-carrying parts and case		1,500 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^2 10 times each in X, Y, and Z directions			
Degree of protection		IEC 60529 IP65			
Connection method *3		Pre-wired Models (Standard cable length: 2 m)			
Weight (packed state)		Approx. 240 g			
Materials	Case	PBT			
	Sensing surface				
Accessories		Mounting Bracket, M4 screws, Instruction manual			

*1. The set distances are sensing distances applicable to standard sensing objects. Refer to *Engineering Data* on page 4 for other materials.
*2. The response frequency is an average value.
*3. Only 2-m cables are available. Use a cable with a conductor cross section of 0.5 mm^2 or greater to extend the cable.

Engineering Data (Reference Value)

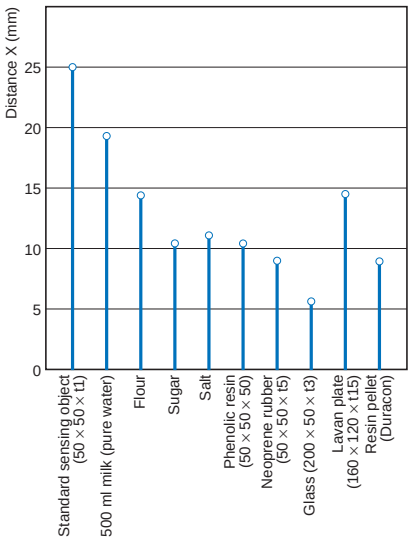
Common Mode Continuous Noise

E2K-C20M

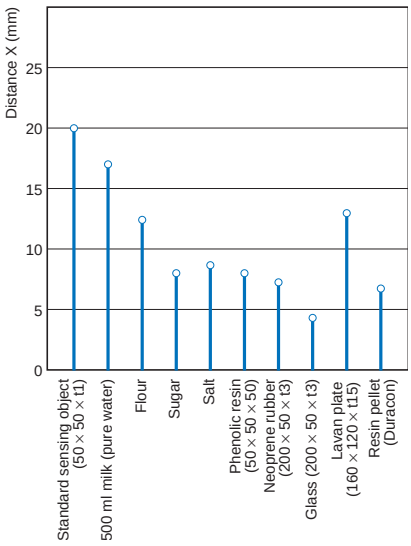


Sensing Distance Change by Sensing Object

E2K-C25M□□

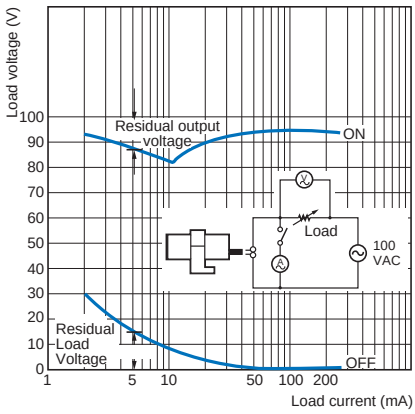


E2K-C20M□□

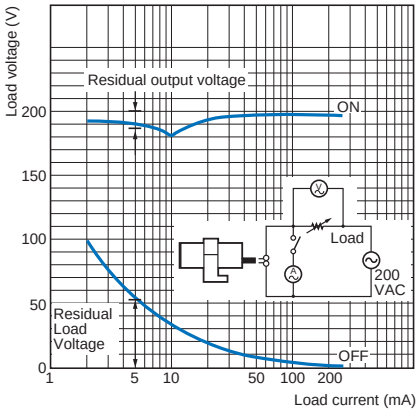


Residual Output Voltage

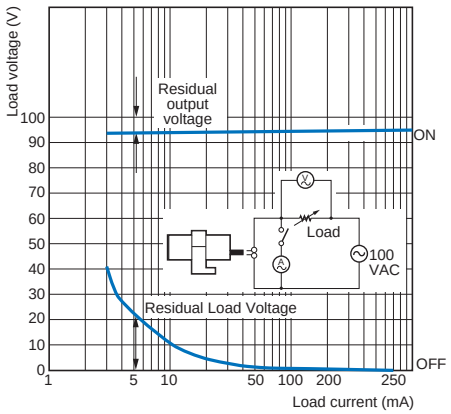
E2K-C25MY at 100 VAC



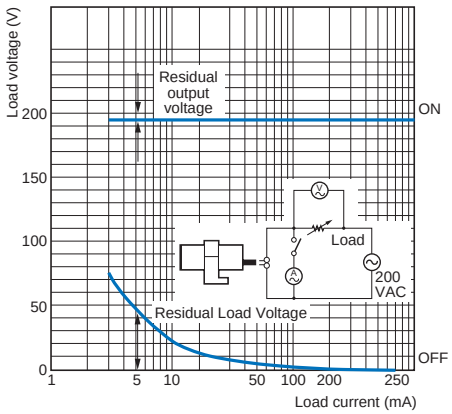
E2K-C25MY at 200 VAC



E2K-C20MT at 100 VAC

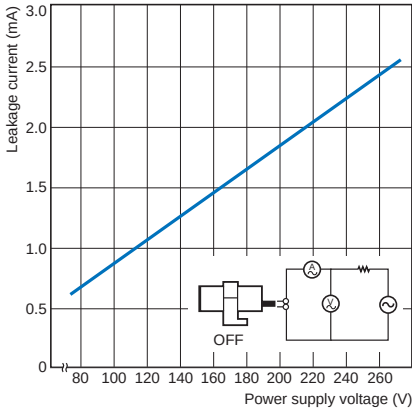


E2K-C20MT at 200 VAC

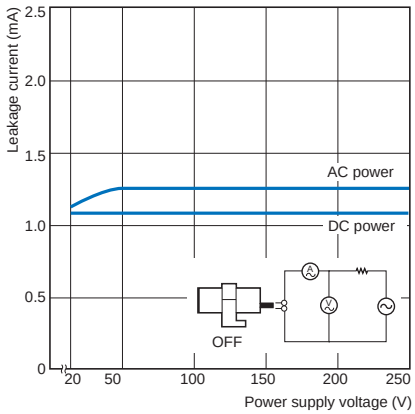


Leakage Current

E2K-C25MY

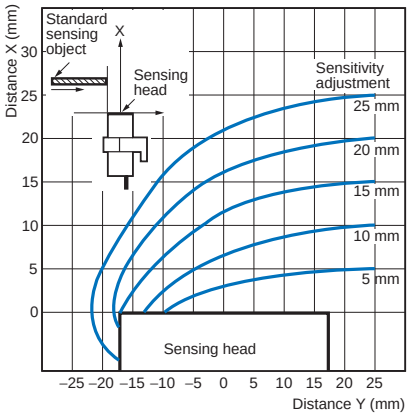


E2K-C20MT



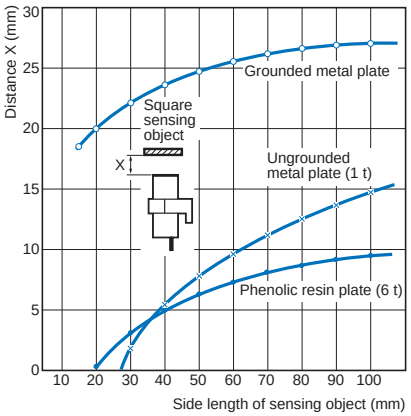
Sensing Area (Grounded Metal Plate)

E2K-C25M□□



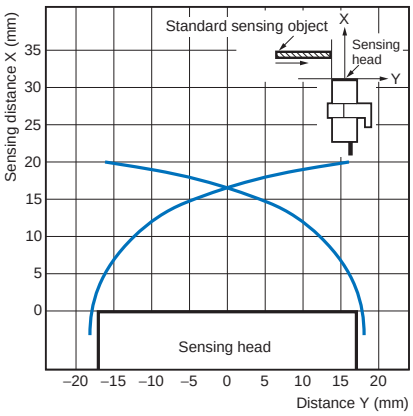
Sensing Object Size vs. Sensing Distance

E2K-C25M□□



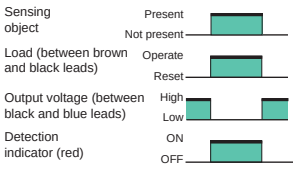
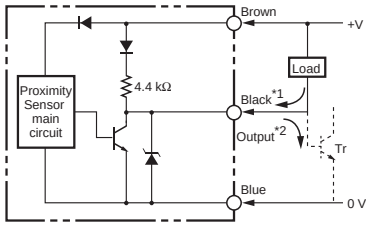
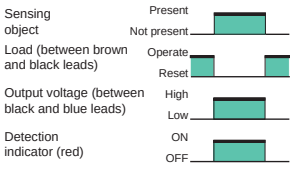
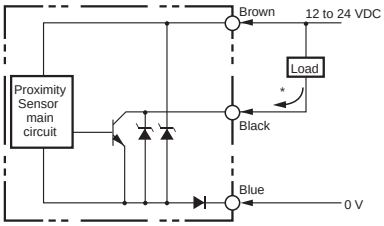
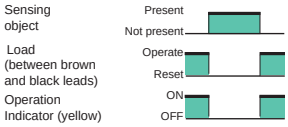
Sensing area

E2K-C20M□□



I/O Circuit Diagrams

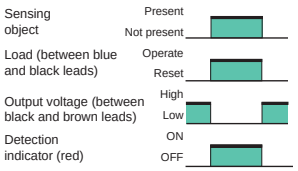
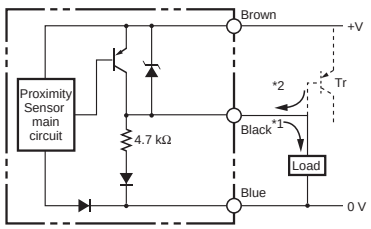
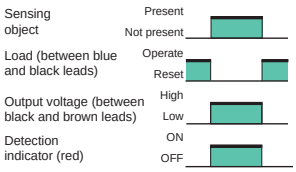
DC 3-Wire Models (NPN)

Operation mode	Model	Timing chart	Output circuit
NO	E2K-C25ME1		
NC	E2K-C25ME2		
NO	E2K-C20MC1		
NC	E2K-C20MC2		

*1. Load current: 200 mA max.
*2. When a transistor is connected.

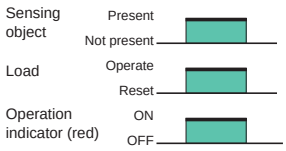
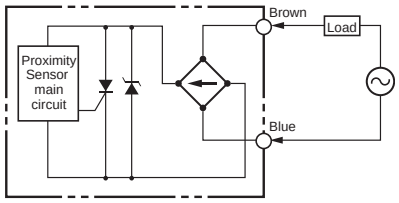
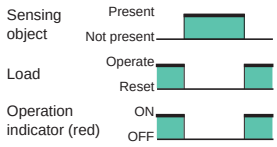
* Load current: 250 mA max.

DC 3-Wire Models (PNP)

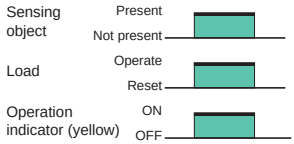
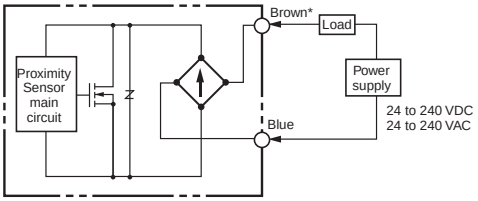
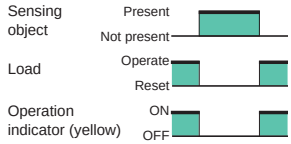
Operation mode	Model	Timing chart	Output circuit
NO	E2K-C25MF1		
NC	E2K-C25MF2		

*1. Load current: 200 mA max.
*2. When a transistor is connected.

AC 2-Wire Models

Operation mode	Model	Timing chart	Output circuit
NO	E2K-C25MY1		
NC	E2K-C25MY2		

AC/DC 2-Wire Models

Operation mode	Model	Timing chart	Output circuit
NO	E2K-C20MT1		
NC	E2K-C20MT2		

* Load current: 200 mA max.

Note: The load can be connected to either the +V or 0 V side.
There is no need to be concemed about the polarity (brown/blue) of the Proximity Sensor.

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.

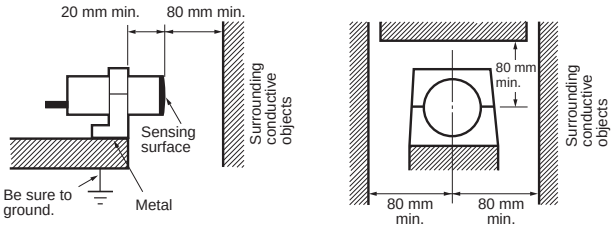
Precautions for Correct Use

Do not use this product under ambient conditions that exceed the ratings.

● Design

Influence of Surrounding Metal

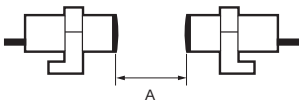
When mounting a Proximity Sensor, be sure to provide a distance of 80 mm min. from surrounding metal objects to prevent the Sensor from being affected by metal objects other than the sensing object. When mounting the Sensor with the L-shaped Mounting Bracket, be sure to provide a distance of 20 mm min. between the face of the sensing head and the Mounting Bracket.



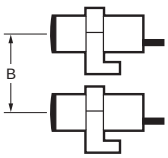
Mutual Interference

When installing Sensors face-to-face or side-by-side, ensure that the minimum distances given in the following table are maintained.

Face-to-face Mounting



Parallel Mounting



Mutual Interference (Unit: mm)

Dimension / Model	A	B
E2K-C25M□□	100	100
E2K-C20M□□		105

Effects of a High-frequency Electromagnetic Field

The E2K-C 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.

Sensing Objects

- Sensing Object Material
  The E2K-C can detect almost any type of object. The sensing distance of the E2K-C, 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-C will be obtained if the object is made of grounded metal.
- Indirect Detection
  To detect objects in metal containers, each metal container must have a nonmetallic window.

Power ON Conditions

Sensing is enabled within 200 ms for the E2K-C20M□□. Design the system so that the power for the Sensor is turned ON before the power for the load.

● Miscellaneous

Organic Solvents

The Sensor has a case made of heat-resistant ABS resin or PBT resin. Be sure that the case is free from organic solvents or solutions containing organic solvents.

● Mounting

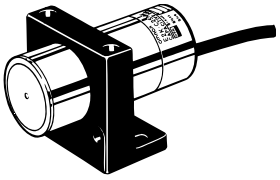
Sensitivity Adjustment

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

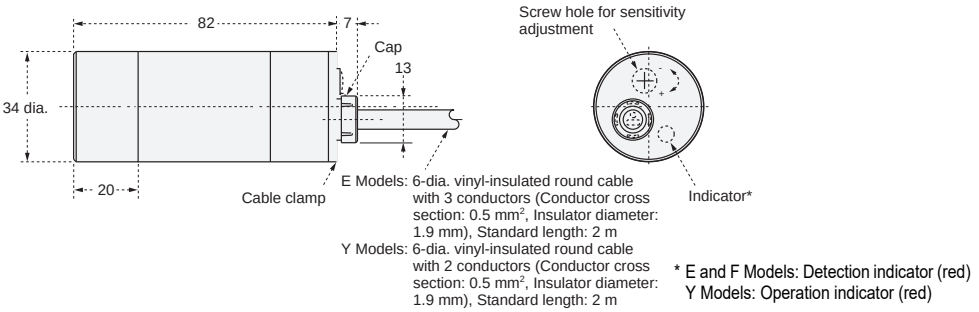
Dimensions

(Unit: mm)
Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.

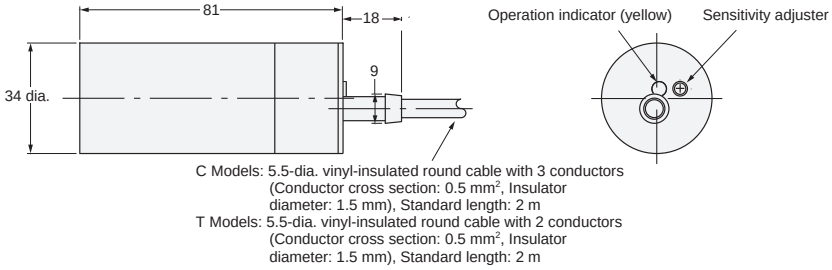
Sensors



E2K-C25M□□

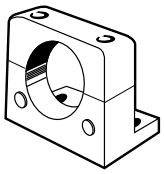


E2K-C20M□□

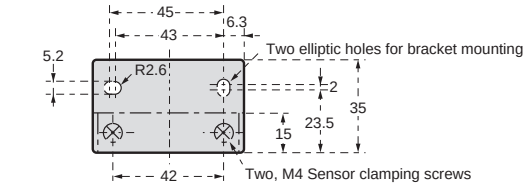


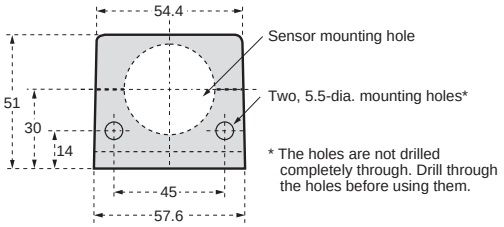
Accessories (Order Separately)

Mounting Bracket (Accessory)
Y92E-A34

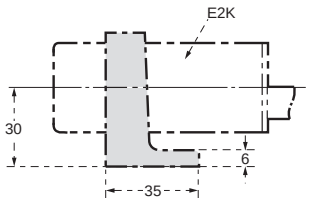


Material: Polyacetal





With Mounting Bracket Attached



Note: Provided with the product.

Terms and Conditions Agreement

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.

Warranties.
(a) Exclusive Warranty. Omron's exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Omron (or such other period expressed in writing by Omron). Omron disclaims all other warranties, express or implied.
(b) Limitations. OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCTS. BUYER ACKNOWLEDGES THAT IT ALONE HAS DETERMINED THAT THE
PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE.
Omron further disclaims all warranties and responsibility of any type for claims or expenses based on infringement by the Products or otherwise of any intellectual property right. (c) Buyer Remedy. Omron's sole obligation hereunder shall be, at Omron's election, to (i) replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product, (ii) repair the non-complying Product, or (iii) repay or credit Buyer an amount equal to the purchase price of the non-complying Product; provided that in no event shall Omron be responsible for warranty, repair, indemnity or any other claims or expenses regarding the Products unless Omron's analysis confirms that the Products were properly handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification. Return of any Products by Buyer must be approved in writing by Omron before shipment. Omron Companies shall not be liable for the suitability or unsuitability or the results from the use of Products in combination with any electrical or electronic components, circuits, system assemblies or any other materials or substances or environments. Any advice, recommendations or information given orally or in writing, are not to be construed as an amendment or addition to the above warranty.
See http://www.omron.com/global/ or contact your Omron representative for published information.

Limitation on Liability; Etc.
OMRON COMPANIES SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE OR STRICT LIABILITY.
Further, in no event shall liability of Omron Companies exceed the individual price of the Product on which liability is asserted.

Suitability of Use.
Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases.
NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY OR IN LARGE QUANTITIES WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

Programmable Products.
Omron Companies shall not be responsible for the user's programming of a programmable Product, or any consequence thereof.

Performance Data.
Data presented in Omron Company websites, catalogs and other materials is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of Omron's test conditions, and the user must correlate it to actual application requirements. Actual performance is subject to the Omron's Warranty and Limitations of Liability.

Change in Specifications.
Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change part numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the Product may be changed without any notice. When in doubt, special part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Omron's representative at any time to confirm actual specifications of purchased Product.

Errors and Omissions.
Information presented by Omron Companies has been checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.

2023.2

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

OMRON Corporation
Industrial Automation Company

http://www.ia.omron.com/