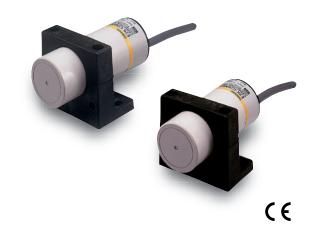
E2K-C

CSM F2K-C DS F 4

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.



 \wedge

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

Ordering Information

Sensors [Refer to Dimensions on page 8.]

Appearance		Sensing distance		Model				
				Output configuration	Operation mode			
				Output configuration		NO	NC	
Standard Models				0 +0 05		DC 3-wire, NPN	E2K-C25ME1 2M	E2K-C25ME2 2M
Standard Models	Unshielded			3 to 25	mm	AC 2-wire	E2K-C25MY1 2M	E2K-C25MY2 2M
Noise-resistant Models	34 dia.		2 +	10 00 mr	m —	DC 3-wire, NPN	E2K-C20MC1 2M	E2K-C20MC2 2M
TYOISC TOSISIANT MIDDEIS			31	to 20 mr		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.

OMRON 1

Ratings and Specifications

Standard Models

Item	Model	E2K-C25ME1	E2K-C25ME2	E2K-C25MY1	E2K-C25MY2				
Sensin	g distance	25 mm							
* Concin									
	ng area able object	3 to 25 mm t Conductors and dielectrics							
Standa									
	g object	Grounded metal plate: $50 \times 50 \times 1$ mm							
Differe	ntial travel	15% max. of sensing sensing distance (when adjusted to 25 mm ±10% with standard sensing object)							
Respo freque		70 Hz 10 Hz							
voltage (opera		12 to 24 VDC (10 to 40 VDC),	ripple (p-p): 10% max.	100 to 220 VAC (90 to 250 VAC), 50/60 Hz					
Curren	nt mption	E Models: 10 mA max. at 12 \	/DC, 16 mA max. at 24 VDC						
Leakaç	ge current	Y Models: 1 mA max. at 100 V OFF	AC (50/60 Hz) with output turn	ed OFF, 2 mA max. at 200 VAC	(50/60 Hz) with output turned				
Con- trol	Load current	200 mA max.		5 to 200 mA (resistive load)					
out- put	Residual voltage	2 V max. (Load current: 200 m	nA, Cable length: 2 m)	Refer to Engineering Data on	page 4.				
Indicat	Indicators Detection indicator (red)			Operation indicator (red)					
(with s	eration mode th sensing ect approach-) E1/Y1 Models: NO E2/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			urge suppressor	Surge suppressor					
Ambie ature r	nt temper- ange	Operating/Storage: –25 to 70°C (with no icing or condensation)							
Ambie humid	nt ity range	Operating/Storage: 35% to 95	% (with no condensation)						
Tempe influen			e at 23°C in the temperature ra e at 23°C in the temperature ra						
Voltag	e influence	±2% max. of sensing distance voltage ±15% range	at the rated voltage in rated	$\pm2\%$ max, of sensing distance at the rated voltage in rated voltage +20%, –10% range at 100 VAC, $\pm20\%$ range at 20 VAC					
Insulat resista		50 M Ω min. (at 500 VDC) betw	veen current-carrying parts and	d case					
Dielect streng		1,000 VAC, 50/60 Hz for 1 mir parts and case	n between current-carrying	1,500 VAC, 50/60 Hz for 1 mir parts and case	n between current-carrying				
Vibrati resista	I Destruction: 10 to 55 Hz 1 5-mm dolinia amplituda for 2 hours agen in x x and 2 directions								
Shock	resistance	Destruction: 500 m/s² 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									
Mate- Case Hardward ARG									
rials	Sensing surface	Heat-resistant ABS							
Acces	sories	Mounting Bracket, M4 screws	Instruction manual						
The set	distance are	sensing distances applicable to sta	ndord consing chicata Defer to Co	nin iin - Data an an an Afan ath an a					

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

Noise-resistant Models

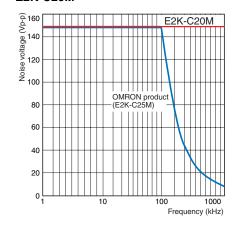
Item	Model	E2K-C20MC1	E2K-C20MC2	E2K-C20MT1	E2K-C20MT2				
Sensir *1	ng distance	20 mm							
Sensir	ng area	3 to 20 mm							
Detect	table object	Conductors and dielectrics							
Standa sensin	ard ng object	Grounded metal plate: $50 \times 50 \times 1 \text{ mm}$							
Differe	ential travel	15% max. of sensing distance (when adjusted to 20 mm ±10% with standard sensing object)							
Respo freque	ency *2	40 Hz		AC power: 25 Hz, DC power: 40 Hz					
Power supply voltage (operating voltage range)		1 12 to 24 VIII: (11) to 36 VIII:) rippie (p-p): 10% may		24 to 240 VAC (20 to 250 VAC), 50/60 Hz; 24 to 240 VDC (20 to 250 VDC)					
Currer consu	nt mption	13 mA max. at 24 VDC							
Leakage current		-		1.5 mA max. at 24 VDC, 1.7 m/ 2.5 mA max. at 250 VAC (50/6 Refer to <i>Engineering Data</i> on	60 Hz)				
Con- trol	Load current	250 mA max.		5 to 200 mA (resistive load)					
out- put	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 <i>Engineering Data</i> on page 4.					
Indica	tors	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.				ils.					
Protection circuits		Reverse polarity protection, Lo	oad short-circuit protection		-				
Ambie ature r	ent temper- range	Operating/Storage: -25 to 70°C (with no icing or condensation)							
Ambie humid	ent lity range	Operating/Storage: 35% to 95	% (with no condensation)						
Temperature ±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									
Voltag	je influence	±2% max. of sensing distance	at the rated voltage in rated vo	oltage ±15% range					
Insulat resista		50 M Ω min. (at 500 VDC) betw	ween current-carrying parts and	d case					
Dielec streng		1,000 VAC, 50/60 Hz for 1 mir parts and case	n between current-carrying	1,500 VAC, 50/60 Hz for 1 mir parts and case	n between current-carrying				
Vibration resistance Destruction: 10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions			5						
Shock resistance Destruction: 500 m/s² 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)							
Weigh (packe	t ed state)	Approx. 240 g							
Mate- Case									
rials	Sensing surface	РВТ							
Acces	sories	Mounting Bracket, M4 screws	, Instruction manual						
4 Th				Engineering Data on page 4 for other					

^{*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 mm² or greater to extend the cable.

Engineering Data (Typical)

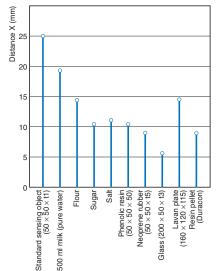
Common Mode Continuous Noise

E2K-C20M

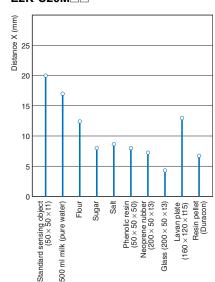


Sensing Distance Change by Sensing Object

E2K-C25M□□

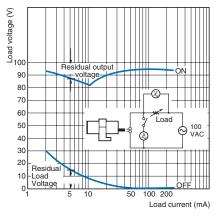


E2K-C20M

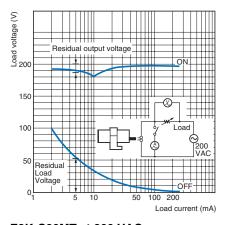


Residual Output Voltage

E2K-C25MY at 100 VAC

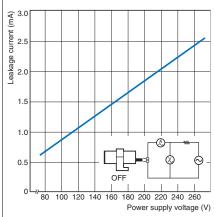


E2K-C25MY at 200 VAC

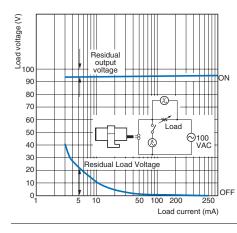


Leakage Current

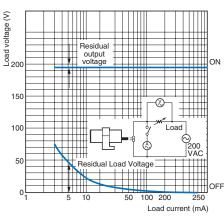
E2K-C25MY



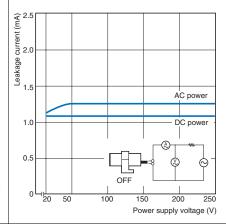
E2K-C20MT at 100 VAC



E2K-C20MT at 200 VAC



E2K-C20MT

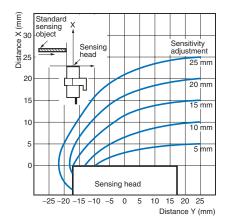


Sensing Area (Grounded Metal Plate)

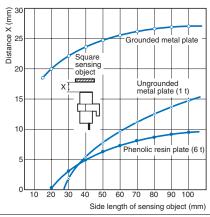
Sensing Object Size vs. Sensing Distance

Sensing area

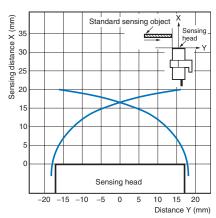








E2K-C20M□□



I/O Circuit Diagrams

DC 3-Wire Models

Operation mode	Model	Timing chart	Output circuit
NO	E2K-C25ME1	Sensing Present object Not present Load (between brown Operate and black leads) Reset Output voltage (between black and blue leads) Low Detection ON indicator (red) OFF	Brown +V Proximity Sensor main
NC	E2K-C25ME2	Sensing Present object Not present Load (between brown Operate and black leads) Reset Output voltage (between High black and blue leads) Low Detection ON indicator (red) OFF	*1. Load current: 200 mA max. *2. When a transistor is connected.
NO	E2K-C20MC1	Sensing Present object Not present Load Operate (between brown and black leads) Operation ON Indicator (yellow) OFF	Proximity Sensor main circuit Black
NC	E2K-C20MC2	Sensing Present object Not present Load Operate (between brown and black leads) Operation ON Indicator (yellow) OFF	* Load current: 250 mA max.

AC 2-Wire Models

Operation mode	Model	Timing chart	Output circuit
NO	E2K-C25MY1	Sensing Present object Not present Load Operate Reset Operation ON indicator (red) OFF	Proximity Sensor main
NC	E2K-C25MY2	Sensing Present object Not present Load Operate Reset Operation ON indicator (red) OFF	Blue

AC/DC 2-Wire Models

Operation mode	Model	Timing chart	Output circuit
NO	E2K-C20MT1	Sensing Present object Not present Load Operate Reset Operation ON indicator (yellow) OFF	Brown* 24 to 240 VDC Load Proximity Sensor main circuit
NC	E2K-C20MT2	Sensing Present object Not present Load Operate Reset Operation ON indicator (yellow) OFF	* Load current: 200 mA max.

Safety Precautions

Refer to Warranty and Limitations of Liability.



This product is not designed or rated for ensuring safety of persons either directly or indirectly. Do not use it for such purposes.



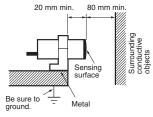
Precautions for Correct Use

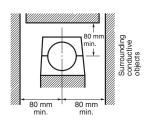
Do not use this product under ambient conditions that exceed the ratings.

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.

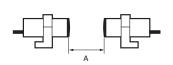




Mutual Interference

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







Mutual Interference (Unit: mm)

Dimension Model	Α	В
E2K-C25M□□	100	100
E2K-C20M□□	100	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 \square . Design the system so that the power for the Sensor is turned ON before the power for the load.

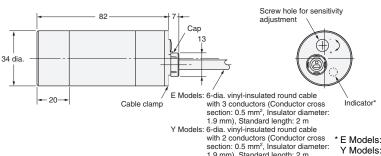
Miscellaneous

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.

Sensors

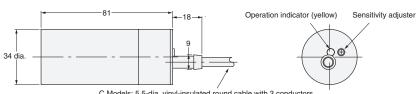
E2K-C25M



* E Models: Detection indicator (red) Y Models: Operation indicator (red) 1.9 mm), Standard length: 2 m



E2K-C20M□□



C Models: 5.5-dia. vinyl-insulated round cable with 3 conductors (Conductor cross section: 0.5 mm², Insulator diameter: 1.5 mm), Standard length: 2 m

T Models: 5.5-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.5 mm², Insulator diameter: 1.5 mm), Standard length: 2 m

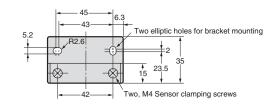
Accessories (Order Separately)

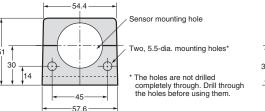
Mounting Bracket (Accessory) Y92E-A34

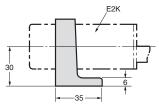


Material: Polyacetal

Note: Provided with the product.







With Mounting Bracket Attached

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.

Warranty and Limitations of Liability

WARRANTY

OMRON's exclusive warranty is that the products are free from defects in materials and workmanship for a period of one year (or other period if specified) from date of sale by OMRON.

OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, REGARDING NON-INFRINGEMENT, MERCHANTABILITY, OR FITNESS FOR PARTICULAR PURPOSE OF THE PRODUCTS. ANY BUYER OR USER ACKNOWLEDGES THAT THE BUYER OR USER ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. OMRON DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED.

LIMITATIONS OF LIABILITY

OMRON SHALL NOT BE RESPONSIBLE FOR SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED ON CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT LIABILITY

In no event shall the responsibility of OMRON for any act exceed the individual price of the product on which liability is asserted.

IN NO EVENT SHALL OMRON BE RESPONSIBLE FOR WARRANTY, REPAIR, OR OTHER CLAIMS 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 OR REPAIR.

Application Considerations

SUITABILITY FOR USE

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of products in the customer's application or use of the products.

At the customer's request, OMRON will provide applicable third party certification documents identifying ratings and limitations of use that apply to the products. This information by itself is not sufficient for a complete determination of the suitability of the products in combination with the end product, machine, system, or other application or use.

The following are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible uses of the products, nor is it intended to imply that the uses listed may be suitable for the products:

- Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this catalog.
- Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
- Systems, machines, and equipment that could present a risk to life or property.

Please know and observe all prohibitions of use applicable to the products.

NEVER USE THE PRODUCTS 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 PRODUCTS ARE PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

PROGRAMMABLE PRODUCTS

OMRON shall not be responsible for the user's programming of a programmable product, or any consequence thereof.

Disclaimers

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 model numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the products may be changed without any notice. When in doubt, special model numbers may be assigned to fix or establish key specifications for your application on your request. Please consult with your OMRON representative at any time to confirm actual specifications of purchased products.

DIMENSIONS AND WEIGHTS

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

PERFORMANCE DATA

Performance data given in this catalog 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 users must correlate it to actual application requirements. Actual performance is subject to the OMRON Warranty and Limitations of Liability.

ERRORS AND OMISSIONS

The information in this document has been carefully checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical, or proofreading errors, or omissions.

2010.8

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

