


General-purpose Threaded Capacitive Sensor




- Product lineup with M12, M18, and M30 models.
- Fixed sensing distance requires no sensitivity adjustment.



 Be sure to read *Safety Precautions* on page 5.

Ordering Information

Sensors [Refer to *Dimensions* on page 6.]

Appearance		Sensing distance		Output configuration	Model	
					Operation mode	
					NO	NC
Unshielded 	M12	4 mm		DC 3-wire, NPN	E2K-X4ME1 2M	E2K-X4ME2 2M
				DC 3-wire, PNP	E2K-X4MF1 2M	E2K-X4MF2 2M
				AC 2-wire	E2K-X4MY1 2M	E2K-X4MY2 2M
	M18	8 mm		DC 3-wire, NPN	E2K-X8ME1 2M	E2K-X8ME2 2M
				DC 3-wire, PNP	E2K-X8MF1 2M	E2K-X8MF2 2M
				AC 2-wire	E2K-X8MY1 2M	E2K-X8MY2 2M
	M30	15 mm		DC 3-wire, NPN	E2K-X15ME1 2M	E2K-X15ME2 2M
				DC 3-wire, PNP	E2K-X15MF1 2M	E2K-X15MF2 2M
				AC 2-wire	E2K-X15MY1 2M	E2K-X15MY2 2M

Accessories (Order Separately)

Mounting Brackets

Refer to Y92□ for details.

Ratings and Specifications

Item	Model	E2K-X4ME□, E2K-X4MF□, E2K-X4MY□	E2K-X8ME□, E2K-X8MF□, E2K-X8MY□	E2K-X15ME□, E2K-X15MF□, E2K-X15MY□
Sensing distance		4mm ±10%	8 mm ±10%	15 mm ±10%
Set distance *1		0 to 2.8 mm	0 to 5.6 mm	0 to 10 mm
Differential travel		4% to 20% of sensing distance		
Detectable object		Conductors and dielectrics		
Standard sensing object		Grounded metal plate: 50 × 50 × 1 mm		
Response frequency		E and F Models: 100 Hz, Y Models: 10 Hz		
Power supply voltage*2 (operating voltage range)		E and F Models: 12 to 24 VDC (10 to 30 VDC) Y Models: 100 to 220 VAC (90 to 250 VAC)		
Current consumption		E and F Models: 15 mA max.		
Leakage current		Y Models: 2.2 mA max. (Refer to page 4.)		
Control output	Load current	E and F Models: 200 mA max.*2, Y Models: 10 to 200 mA		
	Residual voltage	E and F Models: 2 V max. (Load current: 200 mA, Cable length: 2 m), Y Models: Refer to <i>Engineering Data</i> on page 4.		
Indicators		E and F Models: Detection indicator (red), Y Models: 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>I/O Circuit Diagrams</i> on page 4 for details.		
Protection circuits		E and F Models: Reverse polarity protection, Surge suppressor, load short-circuit protection, output reverse polarity protection, Y Models: Surge suppressor		
Ambient temperature range		Operating/Storage: -25 to 70°C (with no icing or condensation)		Operating/Storage: -10 to 55°C (with no icing or condensation)
Ambient humidity range		Operating/Storage: 35% to 95% (with no condensation)		
Temperature influence		±20% max. of sensing distance at 23°C in the operating temperature range		
Voltage influence		E and F Models: ±2% max. of sensing distance at rated voltage at rated voltage ±20% Y Models: ±2% max. of sensing distance at rated voltage at rated voltage ±10%		
Insulation resistance		50 MΩ min. (at 500 VDC) between current-carrying parts and case		
Dielectric strength		E and F Models: 1,000 VAC, 50/60 Hz for 1 min between current-carrying parts and case Y Models: 2,000 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 3 times each in X, Y, and Z directions		
Degree of protection		IP66 (IEC), in-house standards: oil-resistant		
Connection method		Pre-wired Models (Standard cable length: 2 m)		
Weight (packed state)		Approx. 65 g	Approx. 145 g	Approx. 205 g
Materials	Case	Heat-resistant ABS		
	Sensing surface			
	Clamping nuts			
Accessories		Instruction manual		

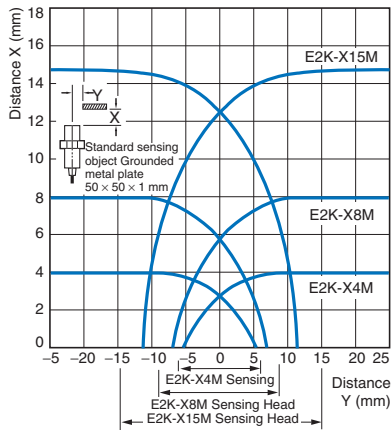
*1. The above values are sensing distances for the standard sensing object. Refer to *Engineering Data* on page 3 for other materials.

*2. E and F Models (DC switching models): A full-wave rectification power supply of 24 VDC ±20% (average value) can be used.

Engineering Data (Reference Value)

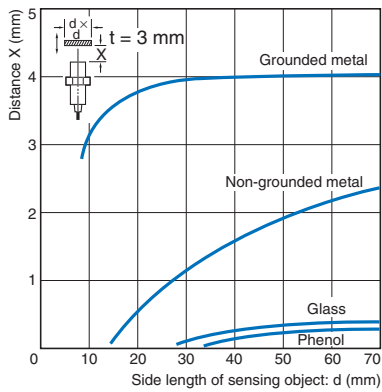
Sensing Area (Grounded Metal Plate)

E2K-X4M

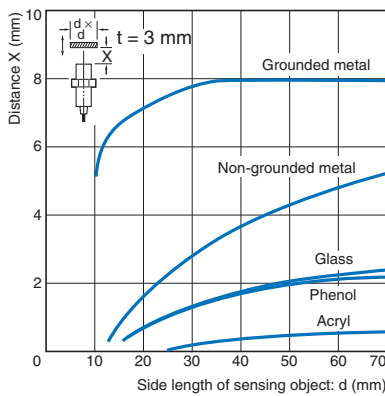


Influence of Sensing Object Size and Material

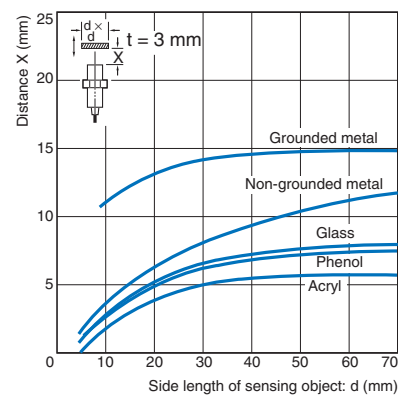
E2K-X4M



E2K-X8M

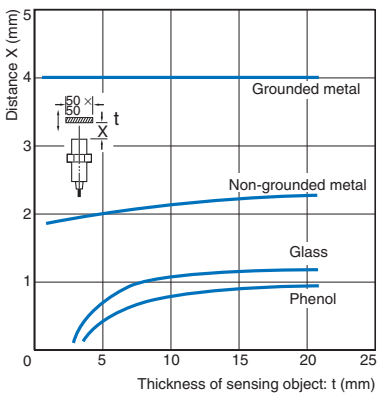


E2K-X15M

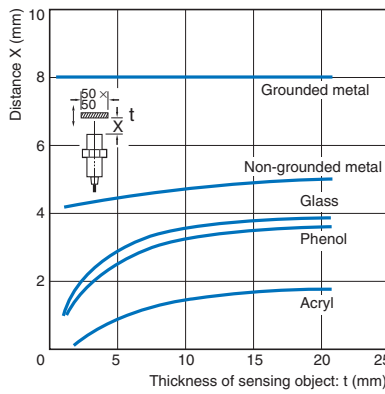


Sensing Object Thickness and Material vs. Sensing Distance

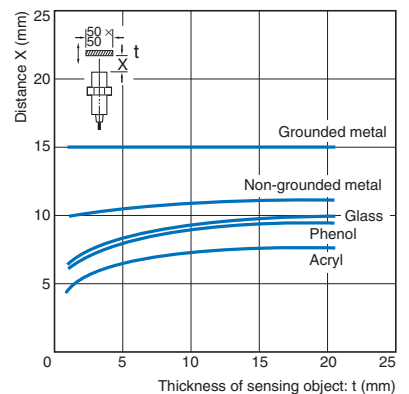
E2K-X4M



E2K-X8M

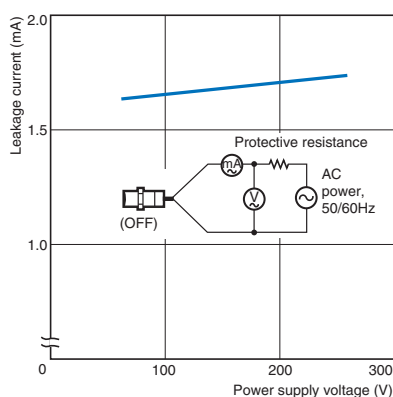


E2K-X15M



Leakage Current

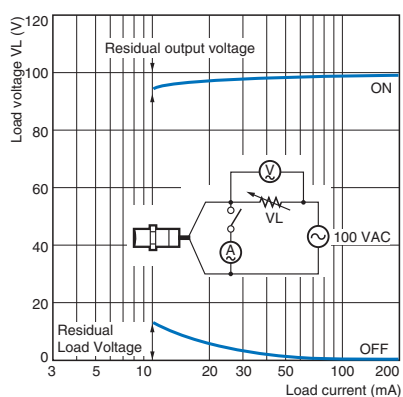
E2K-X□MY



Residual Output Voltage

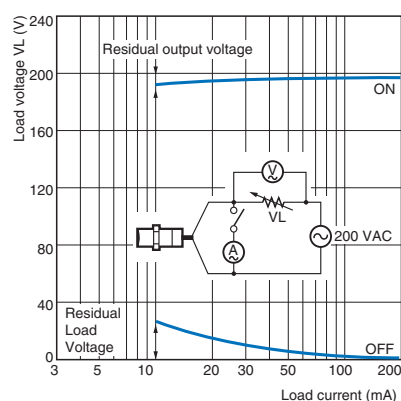
E2K-X□MY□

at 100 VAC



E2K-X□MY□

at 200 VAC



I/O Circuit Diagrams

DC 3-Wire Models (NPN)

Operation mode	Model	Timing chart	Output circuit
NO	E2K-X4ME1 E2K-X8ME1 E2K-X15ME1	Sensing object: Present (High), Not present (Low) Load (between brown and black leads): Operate (High), Reset (Low) Output voltage (between black and blue leads): High, Low Detection indicator (red): ON, OFF	<p>*1. Load current: 200 mA max. *2. When a transistor is connected.</p>
		Sensing object: Present (High), Not present (Low) Load (between brown and black leads): Operate (High), Reset (Low) Output voltage (between black and blue leads): High, Low Detection indicator (red): ON, OFF	
NC	E2K-X4ME2 E2K-X8ME2 E2K-X15ME2	Sensing object: Present (High), Not present (Low) Load (between brown and black leads): Operate (High), Reset (Low) Output voltage (between black and blue leads): High, Low Detection indicator (red): ON, OFF	<p>*1. Load current: 200 mA max. *2. When a transistor is connected.</p>
		Sensing object: Present (High), Not present (Low) Load (between brown and black leads): Operate (High), Reset (Low) Output voltage (between black and blue leads): High, Low Detection indicator (red): ON, OFF	

DC 3-Wire Models (PNP)

Operation mode	Model	Timing chart	Output circuit
NO	E2K-X4MF1 E2K-X8MF1 E2K-X15MF1	Sensing object: Present (High), Not present (Low) Load (between blue and black leads): Operate (High), Reset (Low) Output voltage (between black and brown leads): High, Low Detection indicator (red): ON, OFF	<p>*1. Load current: 200 mA max. *2. When a transistor is connected.</p>
		Sensing object: Present (High), Not present (Low) Load (between blue and black leads): Operate (High), Reset (Low) Output voltage (between black and brown leads): High, Low Detection indicator (red): ON, OFF	
NC	E2K-X4MF2 E2K-X8MF2 E2K-X15MF2	Sensing object: Present (High), Not present (Low) Load (between blue and black leads): Operate (High), Reset (Low) Output voltage (between black and brown leads): High, Low Detection indicator (red): ON, OFF	<p>*1. Load current: 200 mA max. *2. When a transistor is connected.</p>
		Sensing object: Present (High), Not present (Low) Load (between blue and black leads): Operate (High), Reset (Low) Output voltage (between black and brown leads): High, Low Detection indicator (red): ON, OFF	

AC 2-Wire Models

Operation mode	Model	Timing chart	Output circuit
NO	E2K-X4MY1 E2K-X8MY1 E2K-X15MY1	Sensing object: Present (High), Not present (Low) Load: Operate (High), Reset (Low) Operation indicator (red): ON, OFF	
		Sensing object: Present (High), Not present (Low) Load: Operate (High), Reset (Low) Operation indicator (red): ON, OFF	
NC	E2K-X4MY2 E2K-X8MY2 E2K-X15MY2	Sensing object: Present (High), Not present (Low) Load: Operate (High), Reset (Low) Operation indicator (red): ON, OFF	
		Sensing object: Present (High), Not present (Low) Load: Operate (High), Reset (Low) Operation indicator (red): ON, OFF	

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.

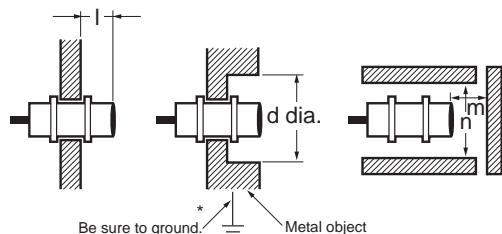
● Design

Ambient Environment

The Sensor may malfunction if subjected to water, oil, chemicals, or condensation by falsely detecting these as sensing objects. The E2K-X15M is highly sensitive to inductive objects and can thus be affected even by small quantities of water drops.

Influence of Surrounding Objects

If the Sensor is embedded in metal, maintain at least the following distances between the Sensor and the metal. The Sensor is also affected by other materials, such as resins. Separate the Sensor from other materials by the same distance as for metal.



* Be sure to ground the metal object, otherwise Sensor operation will not be stable.

Influence of Surrounding Metal (Unit: mm)

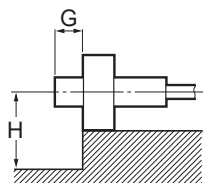
Model	Dimension	l	d	m	n
E2K-X4M	20	50	8	12	60
E2K-X8M					
E2K-X15M	10		25		

If a mounting bracket is used, be sure that at least the following distances are maintained.

Influence of Surrounding Metal

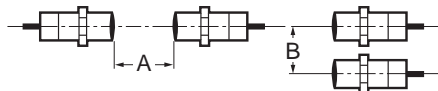
(Unit: mm)

Model	Dimension	G	H
E2K-X4M	20	30	30
E2K-X8M			
E2K-X15M	10		



Mutual Interference

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



Mutual Interference (Unit: mm)

Model	Dimension	A	B
E2K-X4M		80	70
E2K-X8M		150	110
E2K-X15M		300	200

Sensing Objects

The maximum sensing distance will decrease if the sensing object is a non-grounded metal object or dielectric object.

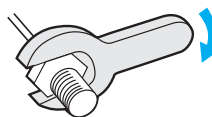
- Sensing Object Material
The E2K-X can detect almost any type of object. The sensing distance of the E2K-X, however, will vary with the electrical characteristics of the object, such as the conductance and inductance of the object, and the water content and capacity of the object. The maximum sensing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

Effects of a High-frequency Electromagnetic Field

The E2K-X may malfunction if there is an ultrasonic washer, high-frequency generator, transceiver, or inverter nearby. For major measures, refer to *Noise of Warranty and Limitations of Liability* for Photoelectric Sensors.

Mounting

Do not tighten the nut with excessive force. Always use washers when tightening the nuts and do not exceed the torque in the following table.



Model	Torque
E2K-X4M	0.78 N·m
E2K-X8M	2 N·m
E2K-X15M	

● Miscellaneous

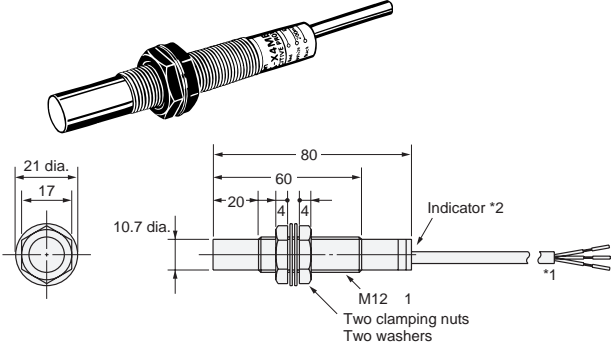
Organic Solvents

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

Dimensions

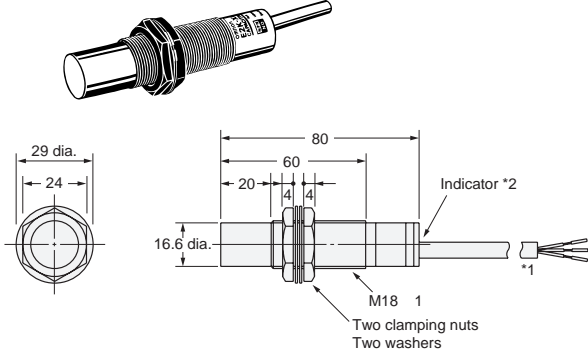
Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.

- E2K-X4ME□
- E2K-X4MF□
- E2K-X4MY□



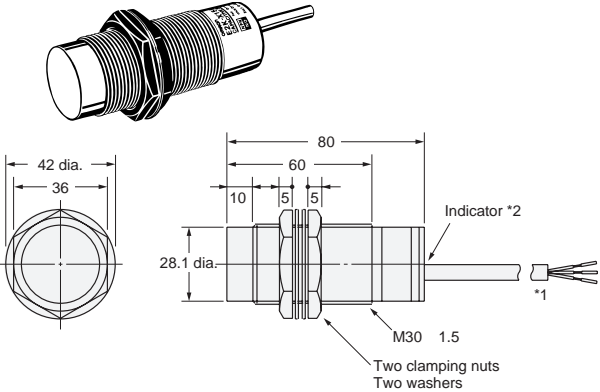
*1. E and F Models: 4-dia. vinyl-insulated round cable with 3 conductors (Conductor cross section: 0.2 mm², Insulator diameter: 1.2 mm), Standard length: 2 m
 Y Models: 4-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.3 mm², Insulator diameter: 1.3 mm), Standard length: 2 m
 *2. E and F Models: Detection indicator (red)
 Y Models: Operation indicator (red)

- E2K-X8ME□
- E2K-X8MF□
- E2K-X8MY□



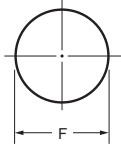
*1. E and F Models: 6-dia. vinyl-insulated round cable with 3 conductors (Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m
 Y Models: 6-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m
 *2. E and F Models: Detection indicator (red)
 Y Models: Operation indicator (red)

- E2K-X15ME□
- E2K-X15MF□
- E2K-X15MY□



*1. E and F Models: 6-dia. vinyl-insulated round cable with 3 conductors (Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m
 Y Models: 6-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m
 *2. E and F Models: Detection indicator (red)
 Y Models: Operation indicator (red)

Mounting Hole Dimensions



Model	F (mm)
E2K-X4M□□	12.5 ^{+0.5} ₀ dia.
E2K-X8M□□	18.5 ^{+0.5} ₀ dia.
E2K-X15M□□	30.5 ^{+0.5} ₀ dia.

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.

2014.1

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

OMRON Corporation
Industrial Automation Company

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

(c)Copyright OMRON Corporation 2014 All Right Reserved.