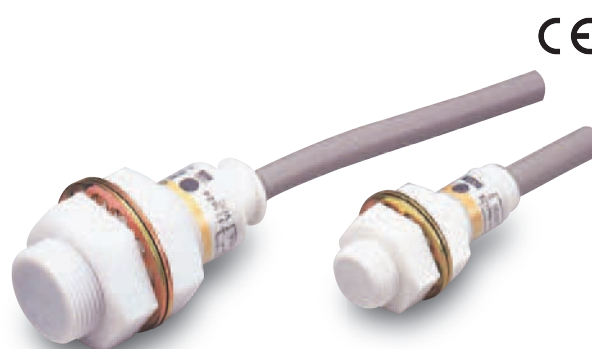


## Inductive Proximity Sensor with Chemical-resistant Fluororesin Case

- Housing and mounting are made of Fluororesin resistant to chemicals.
- Maximum sensing distance: 10 mm.



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

Note: The cable is made of vinyl chloride and requires separate protection.

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

## Ordering Information

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

Appearance	Sensing distance	Output configuration	Operation mode	Model
Shielded 	M12	2 mm	NO	DC 2-wire
				DC 3-wire, NPN
	M18	5 mm		DC 2-wire
				DC 3-wire, NPN
				AC 2-wire
	M30	10 mm		DC 2-wire
				DC 3-wire, NPN
				AC 2-wire

## Ratings and Specifications

Model		E2FQ-X2E1 E2FQ-X2D1	E2FQ-X5E1 E2FQ-X5D1, E2FQ-X5Y1	E2FQ-X10E1 E2FQ-X10D1, E2FQ-X10Y1
Item				
Sensing distance		2 mm ±10%	5 mm ±10%	10 mm ±10%
Set distance		0 to 1.6 mm	0 to 4 mm	0 to 8 mm
Differential travel		E1/Y1 Models: 10% max. of sensing distance, D1 Models: 20% max. of sensing distance		
Detectable object		Ferrous metal (The sensing distance decreases with non-ferrous metal. Refer to <i>Engineering Data</i> on page 3.)		
Standard sensing object		Iron, 12 × 12 × 1 mm	Iron, 18 × 18 × 1 mm	Iron, 30 × 30 × 1 mm
Response frequency *		E1 Models: 1.5 kHz D1 Models: 800 Hz	E1 Models: 600 Hz D1 Models: 500 Hz	E1 Models: 400 Hz D1 Models: 300 Hz
			Y1 Models: 25 Hz	
Power supply voltage (operating voltage range)		E1 Models: 12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max. Y1 Models: 24 to 240 VAC (20 to 264 VAC), 50/60 Hz D1 Models: 12 to 24 VDC (10 to 36 VDC), ripple (p-p): 20% max.		
Current consumption		E1 Models: 17 mA max.		
Leakage current		D1 Models: 0.8 mA max., Y1 Models: 1.7 mA max. (at 200 VAC)		
Control output	Load current	E1 Models: 200 mA max., D1 Models: 5 to 100 mA, Y1 Models: 5 to 300 mA		
	Residual voltage	E1 Models: 2 V max. (Load current: 200 mA, Cable length: 2 m) Y1 Models: Refer to <i>Engineering Data</i> on page 3. D1 Models: 3 V max. (Load current: 100 mA, Cable length: 2 m)		
Indicators		E Models: Detection indicator (red), Y Models: Operation indicator (red), D Models: Operation indicator (red), Setting indicator (green) (NO only)		
Operation mode (with sensing object approaching)		E1/D1/Y1 Models: NO (Refer to the timing charts under <i>I/O Circuit Diagrams</i> on page 5 for details.)		
Protection circuits		E1 Models: Load short-circuit protection, Reverse polarity protection, Surge suppressor, D1/Y1 Models: 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		±10% max. of sensing distance at 23°C in the temperature range of –25 to 70°C		
Voltage influence		E1 Models: ±2.5% max. of sensing distance at rated voltage in the rated voltage ±15% range D1 Models: ±2.5% max. of sensing distance at rated voltage in the rated voltage ±20% range Y1 Models: ±1% max. of sensing distance at rated voltage in the rated voltage ±10% range		
Insulation resistance		50 MΩ min. (at 500 VDC) between current-carrying parts and case		
Dielectric strength		E1/D1 Models: 1,000 VAC, 50/60 Hz for 1 min between current-carrying parts and case Y Models: 4,000 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 <sup>2</sup> 10 times each in X, Y, and Z directions	Destruction: 1,000 m/s <sup>2</sup> 10 times each in X, Y, and Z directions	
Degree of protection		IEC 60529 IP67, in-house standards: oil-resistant		
Connection method		Pre-wired Models (Cable length: 2 m)		
Weight (packed state)		Approx. 70 g	Approx. 130 g	Approx. 170 g
Materials	Case	Fluororesin		
	Sensing surface			
	Clamping nuts			
	Toothed washer	Zinc-plated iron		
	Cable	Vinyl chloride		
Accessories		Instruction manual		

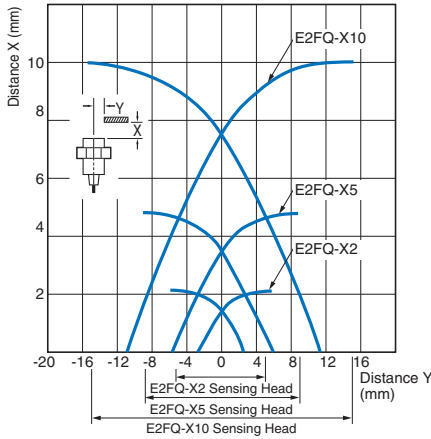
\* The response frequency is an average value.

Measurement conditions are as follows: standard sensing object, a distance of twice the standard sensing object, and a set distance of half the sensing distance.

# Engineering Data (Reference Value)

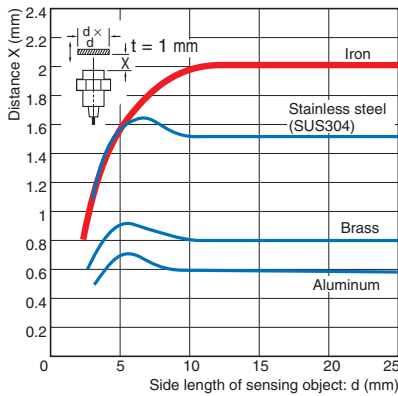
## Sensing Area

### E2FQ-X□

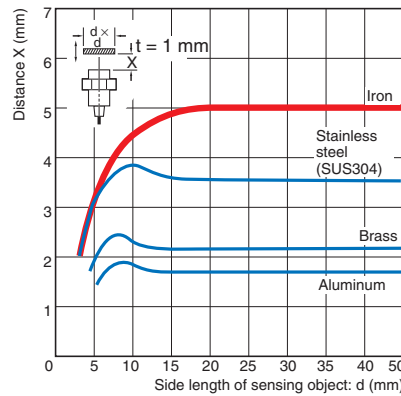


## Influence of Sensing Object Size and Material

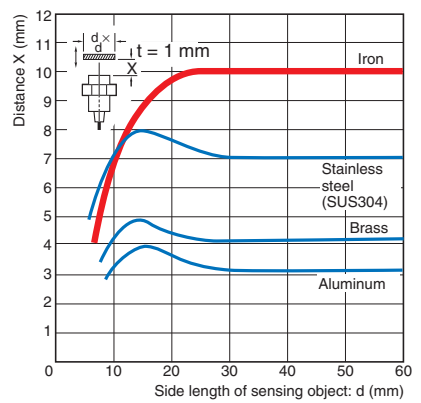
### E2FQ-X2□



### E2FQ-X5□

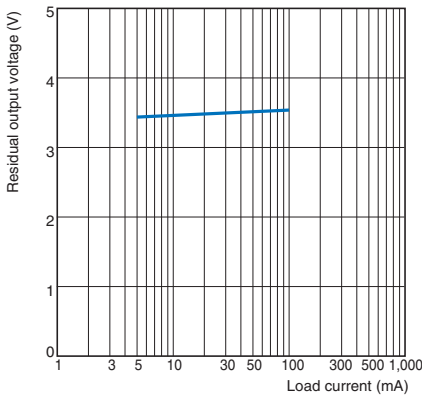


### E2FQ-X10□

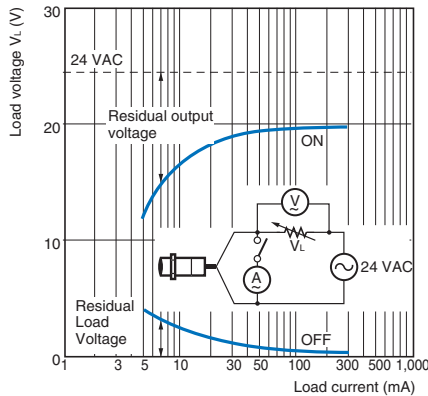


## Residual Output Voltage

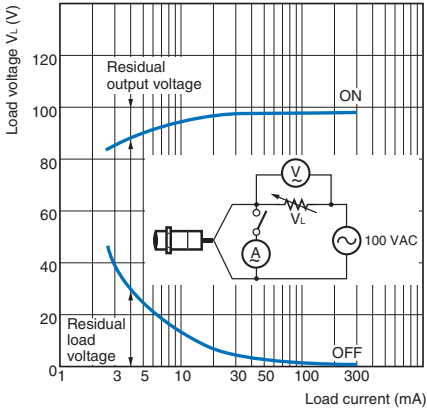
### E2FQ-X□



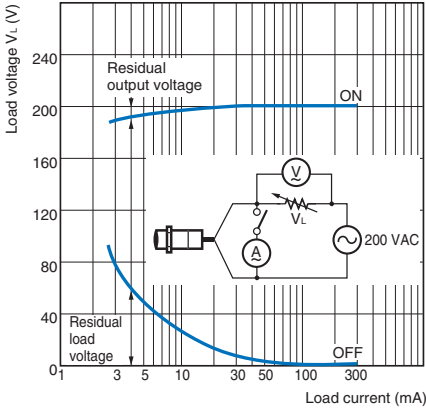
### E2FQ-X□Y1 at 24 VAC



E2FQ-X□Y1 at 100 VAC

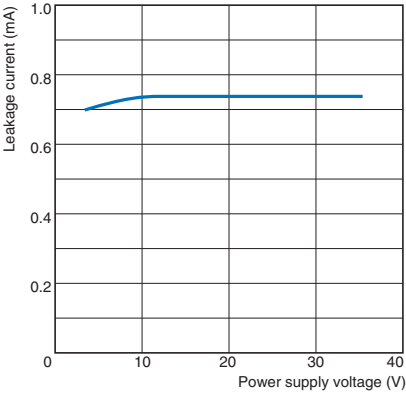


E2FQ-X□Y1 at 200 VAC

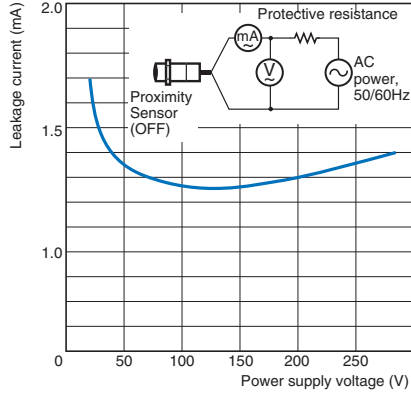


### Leakage Current

E2FQ-X□D



E2FQ-X□Y



## I/O Circuit Diagrams

Operation mode	Output configuration	Model	Timing chart	Output circuit
NO	NPN	E2FQ-X2E1 E2FQ-X5E1 E2FQ-X10E1		<p>*1. 200 mA max. (load current). *2. When a transistor is connected.</p>
	DC 2-wire	E2FQ-X2D1 E2FQ-X5D1 E2FQ-X10D1		<p>Note: The load can be connected to either the +V or 0 V side.</p>
	AC 2-wire	E2FQ-X5Y1 E2FQ-X10Y1		

## 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.



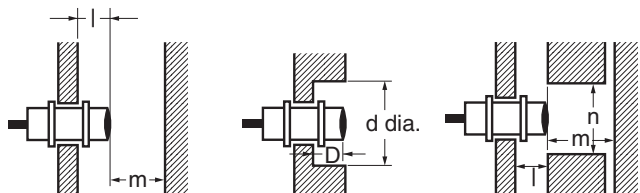
### Precautions for Correct Use

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

#### ● Design

##### Influence of Surrounding Metal

When mounting the Sensor within a metal panel, ensure that the clearances given in the following table are maintained. Failure to maintain these distances may cause deterioration in the performance of the Sensor.



##### Influence of Surrounding Metal

(Unit: mm)

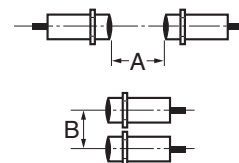
Model	Item	l	d	D	m	n
E2FQ-X2□	0		12	0	8	18
E2FQ-X5□			18		20	27
E2FQ-X10□			30		40	45

##### Mutual Interference

When installing two or more 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	Item	A	B
E2FQ-X2□		30	20
E2FQ-X5□		50	35
E2FQ-X10□		100	70



##### Mounting

Do not tighten the nut with excessive force. A washer must be used with the nut.



Note: The following torque assume washers are being used.

Model	Torque
E2FQ-X2□	0.98 N·m
E2FQ-X5□	2 N·m
E2FQ-X10□	

##### Miscellaneous

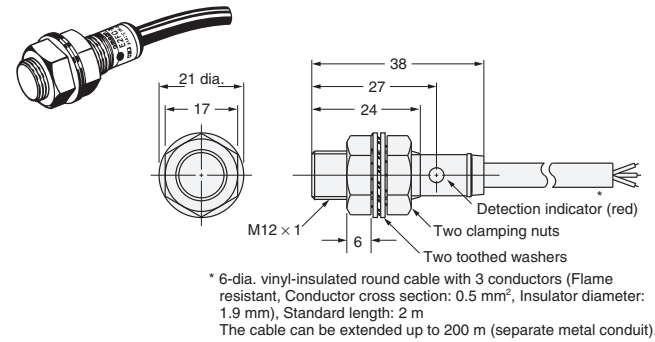
##### Chemical Resistance

Refer to *Chemical Resistance* for details.

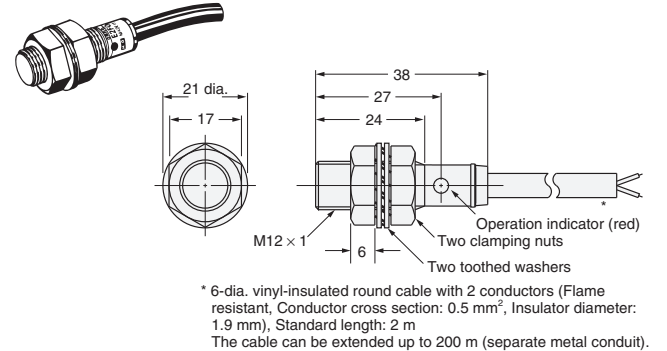
# Dimensions

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

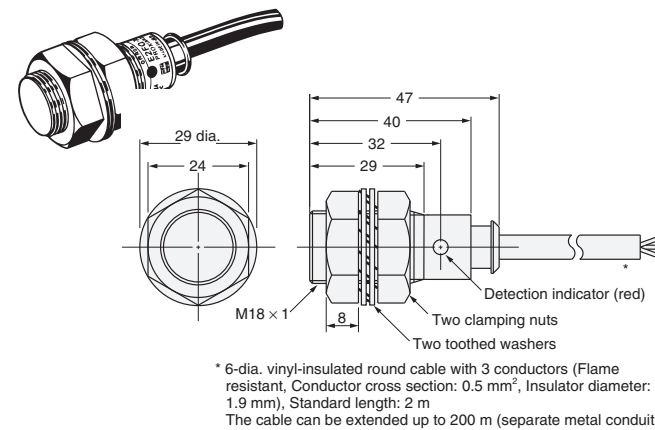
## E2FQ-X2E1



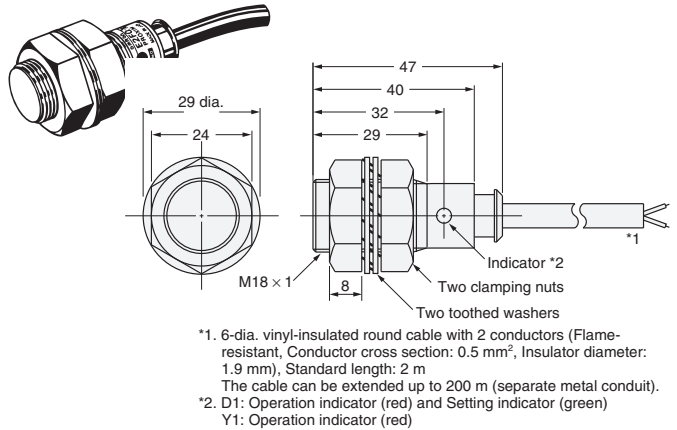
## E2FQ-X2D1



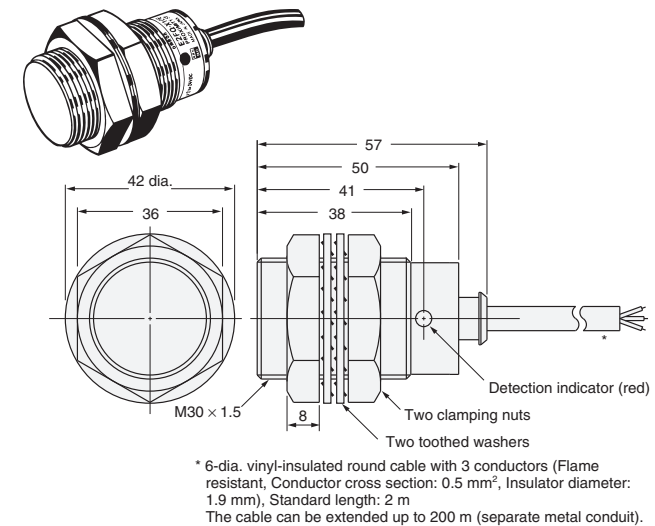
## E2FQ-X5E1



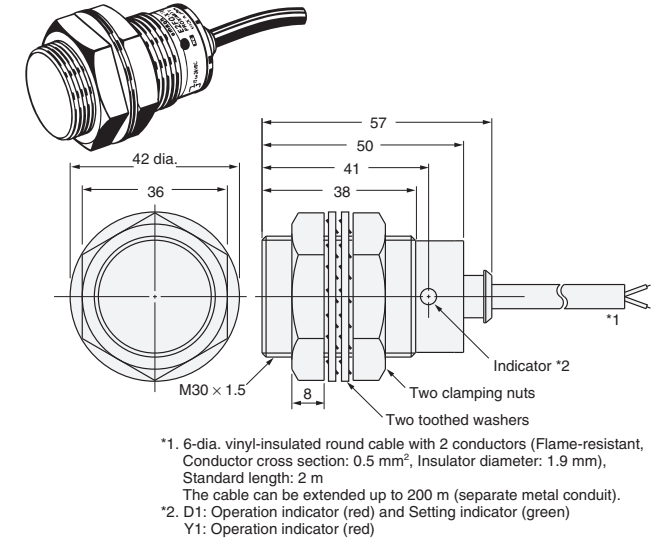
## E2FQ-X5D1 E2FQ-X5Y1



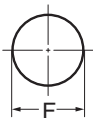
## E2FQ-X10E1



## E2FQ-X10D1 E2FQ-X10Y1



## Mounting Hole Dimensions



Model	F (mm)
E2FQ-X2□	12.5 <sup>+0.5</sup> <sub>0</sub> dia.
E2FQ-X5□	18.5 <sup>+0.5</sup> <sub>0</sub> dia.
E2FQ-X10□	30.5 <sup>+0.5</sup> <sub>0</sub> 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.