EE-SX47/67

CSM_EE-SX47/67_DS_E_11_1

Global Standard Slot-type photomicrosensors with 50- to 100-mA direct switching capacity.

- Series includes models that enable switching between dark-ON and light-ON operation.
- Response frequency as high as 1 kHz.
- Easy operation monitoring with bright light indicator.
- Wide operating voltage range: 5 to 24 VDC
- Models in which the light indicator turns ON for dark-ON operation are also available.
- A wide range of variations in eight different shapes.
- Flexible robot cable is provided as a standard feature. *2



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

- *1. Pre-wired Models are available only in the EE-SX67 Series.
- *2. Only for Pre-wired Models.



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

Ordering Information

Connector Infrared light

Appearance	Sensing				Indicator mode	Model				
Appearance	method	ing method	Sensing distance	configuration	indicator mode	NPN output	PNP output			
Standard				Dark-ON/Light-ON	Incident light	EE-SX670	EE-SX670P			
1 mm				(selectable) *3 *4	No incident light	EE-SX670A	EE-SX670R			
9999				Light-ON	Incident light	EE-SX470				
L-shaped				Dark-ON/Light-ON	Incident light	EE-SX671	EE-SX671P			
62				(selectable) *3 *4	No incident light	EE-SX671A	EE-SX671R			
1111				Light-ON	Incident light	EE-SX471				
T-shaped,				Dark-ON/Light-ON	Incident light	EE-SX672	EE-SX672P			
slot center 7 mm				(selectable) *3 *4	No incident light	EE-SX672A	EE-SX672R			
1				Light-ON	Incident light	EE-SX472				
Close-				Dark-ON/Light-ON (selectable) *3 *4	Incident light	EE-SX673	EE-SX673P			
mounting	Through-	Connector (4 poles)			No incident light	EE-SX673A	EE-SX673R			
888	beam type		5 mm	Light-ON	Incident light	EE-SX473				
Close-	(with slot)	(: po.co)	(slot width	Dark-ON/Light-ON	Incident light	EE-SX674	EE-SX674P			
mounting				(selectable) *3 *4	No incident light	EE-SX674A	EE-SX674R			
				Light-ON	Incident light	EE-SX474				
T-shaped, slot center 10 mm				Dark-ON/Light-ON (selectable) *3 *4	Incident light	EE-SX675	EE-SX675P			
F-shaped				Dark-ON/Light-ON (selectable) *3 *4	Incident light	EE-SX676	EE-SX676P			
R-shaped								Dark-ON/Light-ON (selectable) *3 *4	Incident light	EE-SX677

^{*3.} Dark-ON when the L terminal of the connector is opened, and light-ON when the L terminal and positive (+) terminal are connected. Do not connect the L terminal to 0 V when using dark-ON operation. When using light-ON, it is useful to select the connector EE-1001-1. The L terminal and positive (+) terminal of this connector are connected in advance.

^{*4.} If you do not use the L terminal wire ((2) pink) when you use a Connector with Cable for an EE-1006 or EE-1010-series Photomicrosensor, noise may affect the Photomicrosensor. To prevent the effects of noise, cut the unused L terminal wire at the base of the connector and wrap it with insulating tape to prevent it from coming in contact with other terminals.

Pre-wired Models Infrared light

	Sensing		_	Output	Indicator	Connecting	Mo	del
Appearance	method	Sensing dis	stance	configura- tion	mode	method	NPN output	PNP output
Standard							EE-SX670-WR 1M	EE-SX670P-WR 1M
L-shaped							EE-SX671-WR 1M	EE-SX671P-WR 1M
T-shaped, slot center 7 mm							EE-SX672-WR 1M	EE-SX672P-WR 1M
Close- mounting	Through- beam	5	mm	Dark-ON/ Light-ON	Incident	Pre-wired	EE-SX673-WR 1M	EE-SX673P-WR 1M
Close- mounting	type (with slot)	(slot width)	(selectable) *1 *2	light	Models (1m) EE-SX674-WR 1	EE-SX674-WR 1M	EE-SX674P-WR 1M	
T-shaped, slot center 10 mm							EE-SX675-WR 1M	EE-SX675P-WR 1M
F-shaped							EE-SX676-WR 1M	EE-SX676P-WR 1M
R-shaped							EE-SX677-WR 1M	EE-SX677P-WR 1M

^{*1.} Dark-ON operation can be used when the L terminal is left unconnected or Light-ON operation can be used when the L terminal and positive (+) terminal are connected to each other. Do not connect the L terminal to 0 V when using dark-ON operation.

Accessories (Order Separately) Connector Models

	Туре	Cable length	Model	Remarks
Connector		·	EE-1001	
			EE-1001-1	L terminal and positive (+) terminal are already short-circuited.
			EE-1009	
		1	EE-1006 1M	
O a series and the O a half	Connector with Cable	1 m	EE-1010 1M	
	Connector with Cable	2 m	EE-1006 2M	
			EE-1010 2M	
	Connector with Robot		EE-1010-R 1M	
Cable		2 m	EE-1010-R 2M	
Connector	Hold-down Clip	'	EE-1006A	For EE-1006 only.

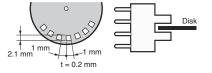
^{*} Refer to Accessories for details.

^{*2.} If you do not use the L terminal wire ((2) pink) when you use a Connector with Cable for an EE-1006 or EE-1010-series Photomicrosensor, noise may affect the Photomicrosensor. To prevent the effects of noise, cut the unused L terminal wire at the base of the connector and wrap it with insulating tape to prevent it from coming in contact with other terminals.

Ratings and Specifications

		Туре	Standard	L-shaped	T-shaped, slot center 7 mm	Close-n	nounting	T-shaped, slot center 10 mm	F-shaped	R-shaped
	NPN models	Connector models	EE-SX670 EE-SX670A EE-SX470	EE-SX671 EE-SX671A EE-SX471	EE-SX672 EE-SX672A EE-SX472	EE-SX673 EE-SX673A EE-SX473	EE-SX674 EE-SX674A EE-SX474	EE-SX675	EE-SX676	EE-SX677
	illoueis	Pre-wired models		EE-SX671- WR	EE-SX672- WR	EE-SX673- WR	EE-SX674- WR	EE-SX675- WR	EE-SX676- WR	EE-SX677- WR
	PNP	Connector models		EE-SX671P EE-SX671R	EE-SX672P EE-SX672R	EE-SX673P EE-SX673R	EE-SX674P EE-SX674R	EE-SX675P	EE-SX676P	EE-SX677P
Item	models	Pre-wired models		EE-SX671P- WR	EE-SX672P- WR	EE-SX673P- WR	EE-SX674P- WR	EE-SX675P- WR	EE-SX676P- WR	EE-SX677P- WR
Sensi	ng distan	ce	5 mm (slot widtl	mm (slot width)						
Sensi	ng object		Opaque: 2 × 0.8	3 mm min.						
Differ	ential dist	ance	0.025 mm							
Light	source		Infrared LED wi	th a peak wavele	ength of 940 nm					
Indica	ator *1		Light indicator (red) (turns ON when light is interrupted for models with A or R suffix)							
Suppl	ly voltage		5 to 24 VDC ±10%, ripple (p-p): 10% max.							
Curre	nt consun	nption	12 mA max. (Connector models, L terminal open), 35 mA max. (NPN pre-wired models), 30 mA max. (PNP pre-wired models						d models)	
Contr	ol output		100 mA load current with a residual voltage of 0.8 V max. 40 mA load current with a residual voltage of 0.4 V max. OFF current (leakage current): 0.5 mA max. PNP open collector: 5 to 24 VDC, 50 mA max. 50 mA load current with a residual voltage of 1.3 V max. OFF current (leakage current): 0.5 mA max.							
Prote	ction circu	uits	Load short circu	uit protection (Co	nnector models)	, No circuit proted	ction (Pre-wired r	models)		
Respo	onse frequ	uency *2	1 kHz min. (3 kl	Hz average)						
Ambi	ent illumir	nation	1,000 lx max. w	ith fluorescent lig	ght on the surfac	e of the receiver.				
Ambi	ent tempe	rature range	Operating: -25	to +55°C, Storag	je: -30 to +80°C	(with no icing or	condensation)			
Ambi	ent humid	ity range	Operating: 5% t	to 85%, Storage:	5% to 95% (with	no icing or cond	lensation)			
Vibrat	tion resist	ance		to 2,000 Hz (pea amplitude for 2 h		100 m/s²) each in X, Y, and	d Z directions			
Shock	k resistan	ce	Destruction: 50	0 m/s ² for 3 times	s each in X, Y, a	nd Z directions				
Degre	e of prote	ection	IEC60529 IP50							
Conn	ecting me	thod	Connector Models (direct soldering possible), Pre-wired Models (Standard cable length: 1 m), Models with Connectors (Standard cable length: 0.1 m)							
Wei-	Connect	or models	Approx. 3.1 g	Approx. 3 g	Approx. 2.4 g	Approx. 2.3 g	Approx. 3 g	Approx. 2.7 g	Approx. 2.2 g	Approx. 2.2 g
ght	Pre-wire	d models	11	11	Approx. 17.8 g	Approx. 16.8 g	Approx. 17.1 g	Approx. 18.3 g	Approx. 16.9 g	Approx. 16.9 g
Ма-	Case		Polybutylene ph	nthalate (PBT)						
teri-	Cover		Polycarbonate							
al	Emitter/r	eceiver	. Siyouibonato							

^{*1.} The indicator is a GaP red LED (peak wavelength: 690 nm).
*2. The response frequency was measured by detecting the rotating disk shown at the right.



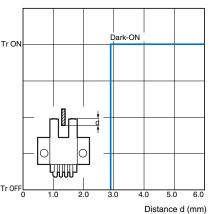
Engineering Data (Reference Value)

Sensing Position Characteristics

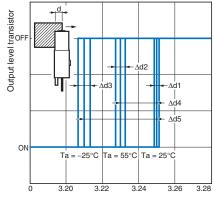
Dark-ON

Distance d (mm)

Sensing Position Characteristics



Repeated Sensing Position Characteristics



Distance d (mm)

Vcc =12 V, No. of repetitions: 20, Δ d1 = 0.002 mm, $\Delta d2 = 0.004$ mm, $\Delta d3 = 0.005$ mm, $\Delta d4 = 0.02$ mm,

 $\Delta d5 = 0.04 \text{ mm}$

Note: The data applies to dark status. Operation may be affected by external light interference or light coming through the sensing object.

I/O Circuit Diagrams

NPN Output

Model	Output configuration	Timing charts	Terminal connections	Output circuit
EE-SX67□	Light-ON	Incident Interrupted Light indicator ON (red) OFF Output ON transistor OFF Load Operates (e.g., relay) Releases	Short-circuited between ① terminal and positive ① terminal	EE-SX67□ EE-SX67□A Light indicator (red) Load
EE-SX67□-WR	Dark-ON	Incident Interrupted Light indicator ON (red) OFF Output ON transistor OFF Load Operates (e.g., relay) Releases	Open between ① terminal and positive ⊕ terminal *1 *2	*The terminal arrangement depends on the model. Check the dimensional diagrams.
EE-SX670A EE-SX671A EE-SX672A	Light-ON	Incident Interrupted Light indicator ON (red) OFF Output ON transistor OFF Load Operates (e.g., relay) Releases	Short-circuited between ① terminal and positive ① terminal	EE-SX67 - WR Light indicator (red) OUT T 24 VDC
EE-SX673A EE-SX674A	Dark-ON	Incident Interrupted Light indicator ON (red) OFF Output ON transistor OFF Load Operates (e.g., relay) Releases	Open between ① terminal and positive ⊕ terminal *1 *2	*The terminal arrangement depends on the model. Check the dimensional diagrams.
EE-SX470 EE-SX471 EE-SX472 EE-SX473 EE-SX474	Light-ON	Incident Interrupted Light indicator ON (red) OFF Output ON transistor OFF Load Operates (relay) Releases		Light indicator (red) Load OUT J 5 to 24 VDC

^{*1.} Do not connect the L terminal to 0 V when using dark-ON operation.
*2. If you do not use the L terminal wire ((2) pink) when you use a Connector with Cable for an EE-1006 or EE-1010-series Photomicrosensor, noise may affect the Photomicrosensor. To prevent the effects of noise, cut the unused L terminal wire at the base of the connector and wrap it with insulating tape to prevent it from coming in contact with other terminals.

PNP Output

Model	Output configuration	Timing charts	Terminal connections	Output circuit
EE-SX67□P	Light-ON	Incident Interrupted Light indicator ON (red) OFF Output ON transistor OFF Load Operates (relay) Releases	Short-circuited between ① terminal and positive ① terminal	
EE-SX67□P-WR	Dark-ON Dark-ON Dark-ON Dark-ON Dark-ON Dark-ON Dark-ON Cred Open between terminal and positive terminal *1 *2 Load Operates Open between terminal *1 *2	(red) Q Total VDC Total VDC		
EE-SX670R EE-SX671R FE-SX672R	Light-ON	Incident Interrupted Light indicator ON (red) OFF Output ON transistor OFF Load Operates (e.g., relay) Releases	Short-circuited between ① terminal and positive ① terminal	*The terminal arrangement depends on the model. Check the dimensional diagrams.
EE-SX672R EE-SX673R EE-SX674R	Dark-ON	Incident Interrupted Light indicator ON (red) OFF Output ON transistor OFF Load Operates (e.g., relay) Releases	Open between ① terminal and positive ⊕ terminal *1 *2	

^{*1.} Do not connect the L terminal to 0 V when using dark-ON operation.

Safety Precautions

Refer to Warranty and Limitations of Liability.



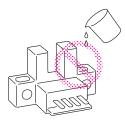
This product is not designed or rated for ensuring safety of persons either directly or indirectly. Do not use it for such purposes.



Precautions for Safe Use

Operating Environment

These Photomicrosensors have an IP50 (conforms to IEC) enclosure and do not have a water-proof or dust-proof structure. Therefore, do not use them in applications in which the sensor will be subjected to splashes from water, oil, or any other liquid. Liquid entering the Sensor may result in malfunction.



Precautions for Correct Use

Make sure that this product is used within the rated ambient environment conditions.

Installation

When direct soldering to the terminals, use the following guidelines.
 Soldering Conditions

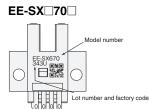
Item	Temper- ature	Permissible time	Remarks
Soldering iron	350°C max.	3 s max.	The portion between the base of the terminals and the position 1.5 mm from the terminal base must not be soldered.

 The terminal base uses a polycarbonate resin, which could be deformed by excessive soldering heat, resulting in damage to the product's functionality.

Lot Number and Model Number Legend

In the following diagrams, 343U indicates the lot number and factory where the product was manufactured. Do not include this code with the model number when ordering.

The QR code on connector models is used by OMRON only.



^{*2.} If you do not use the L terminal wire ((2) pink) when you use a Connector with Cable for an EE-1006 or EE-1010-series Photomicrosensor, noise may affect the Photomicrosensor. To prevent the effects of noise, cut the unused L terminal wire at the base of the connector and wrap it with insulating tape to prevent it from coming in contact with other terminals.

Dimensions

Sensors

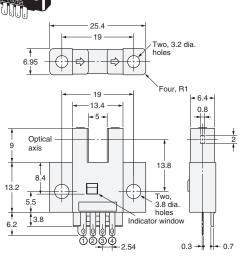
EE-SX670/670P EE-SX670A/670R EE-SX470



Terminal Arrangement

(1)	\oplus	Vcc
(2)	L	L*
(3)	OUT	OUTPUT
(4)	\ominus	GND (0 V)

* Pin 2 is not used for the EE-SX470.



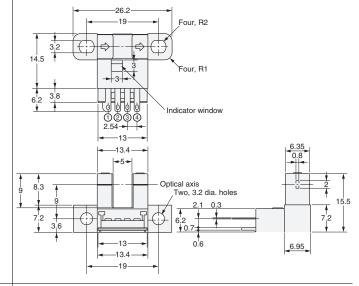
EE-SX671/671P EE-SX671A/671R EE-SX471



Terminal Arrangement

(1)	\oplus	Vcc
(2)	L	L*
(3)	OUT	OUTPUT
(4)	\ominus	GND (0 V)

* Pin 2 is not used for the EE-SX471.



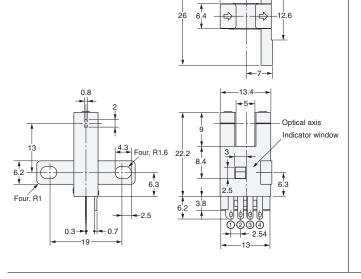
EE-SX672/672P EE-SX672A/672R EE-SX472



Terminal Arrangement

(1)	\oplus	Vcc
(2)	L	L*
(3)	OUT	OUTPUT
(4)	\oplus	GND (0 V)

* Pin 2 is not used for the EE-SX472.



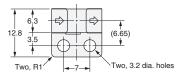
EE-SX673/673P EE-SX673A/673R EE-SX473

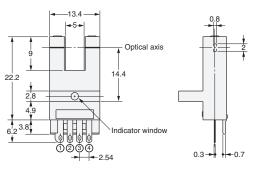


Terminal Arrangement

(1)	\oplus	Vcc
(2)	L	L*
(3)	OUT	OUTPUT
(4)	\ominus	GND (0 V)

* Pin 2 is not used for the EE-SX473.





EE-SX674/674P EE-SX674A/674R EE-SX474



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-5→

Terminal Arrangement

Two, 3.5 dia. holes

Optical axis

0.6

(1)	\oplus	Vcc
(2)	L	L*
(3)	OUT	OUTPUT
(4)	Θ	GND (0 V)

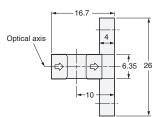
* Pin 2 is not used for the EE-SX474.

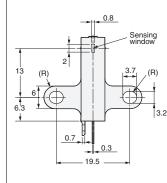
EE-SX675/675P

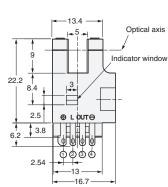


Terminal Arrangement

(1)	\oplus	Vcc
(2)	L	L
(3)	OUT	OUTPUT
(4)	Θ	GND (0 V)







EE-SX676/676P

6.2 3.8

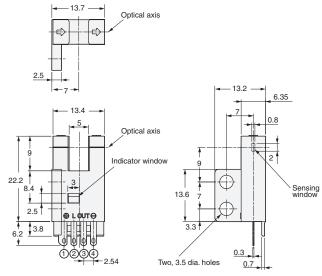
(9.3)

6.2



Terminal Arrangement

(1)	\oplus	Vcc
(2)	L	L
(3)	OUT	OUTPUT
(4)	Θ	GND (0 V)

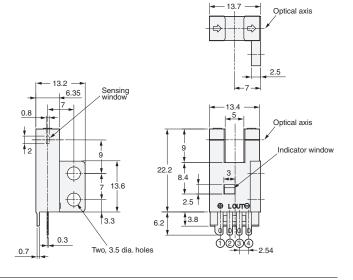


EE-SX677/677P



Terminal Arrangement

(1)	\oplus	Vcc
(2)	٦	L
(3)	OUT	OUTPUT
(4)	0	GND (0 V)



EE-SX670-WR/670P-WR

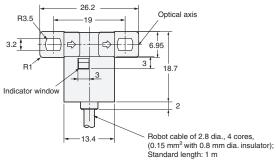
Terminal Arrangement Brown Vcc Pink Blue GND (0 V) Black OUTPUT Optical axis 3.2 dia. Optical axis 8.0 11.2 Sensing window 13.8 26.2 4.6 dia. 2 3.8 dia Indicator window Robot cable of 2.8 dia., 4 cores, (0.15 mm² with 0.8 mm dia. insulator): Standard length: 1 m

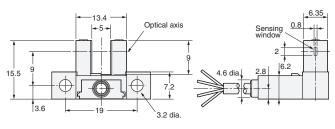
EE-SX671-WR/671P-WR



Terminal Arrangement

Brown	Vcc
Pink	L
Blue	GND (0 V)
Black	OUTPUT



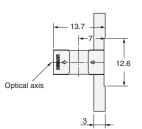


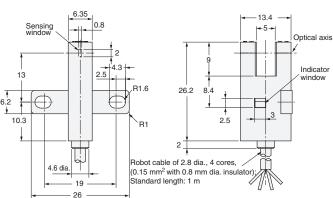
EE-SX672-WR/672P-WR



Terminal Arrangement

Brown	Vcc
Pink	L
Blue	GND (0 V)
Black	OUTPUT



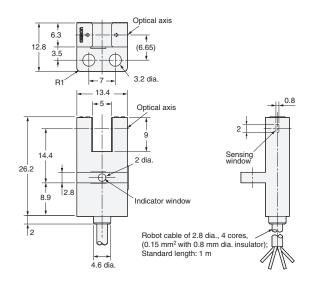


EE-SX673-WR/673P-WR



Terminal Arrangement

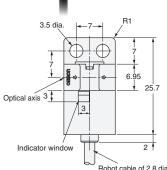
Brown	Vcc
Pink	L
Blue	GND (0 V)
Black	OUTPUT



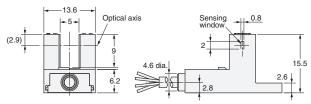
EE-SX674-WR/674P-WR

Terminal Arrangement

Brown	Vcc
Pink	L
Blue	GND(0V)
Black	OUTPUT



Robot cable of 2.8 dia., 4 cores, (0.15 mm² with 0.8 mm dia. insulator); Standard length: 1 m

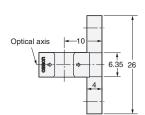


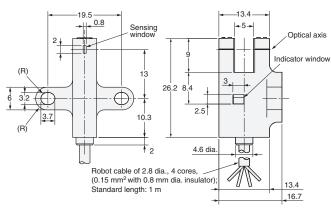
EE-SX675-WR/675P-WR



Terminal Arrangement

Brown	Vcc
Pink	L
Blue	GND(0V)
Black	OUTPUT





EE-SX676-WR/676P-WR



Terminal Arrangement

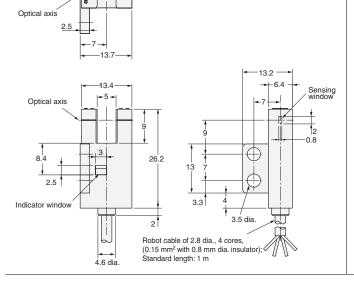
Brown	Vcc
Pink	L
Blue	GND(0V)
Black	OUTPUT

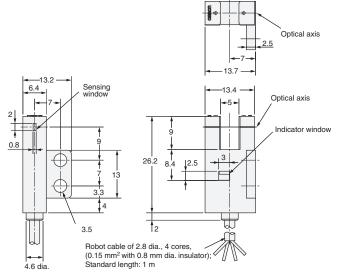


EE-SX677-WR/677P-WR

Terminal Arrangement

Brown	Vcc
Pink	L
Blue	GND(0V)
Black	OUTPUT





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.

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- (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

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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.

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

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





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