Slot-type Photomicrosensor (Non-modulated) +

EE-SX47/67

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.

Pre-wired Models are available only in the EE-SX67 Series.

*2. Only for Pre-wired Models.

Ordering Information

Connector								Infrared light	
Appearance Sensing		Connect-	Sensing distance		Output	Indicator mode	Model		
	method	ing method	J		configuration		NPN output	PNP output	
Standard					Dark-ON/Light-ON	Incident light	EE-SX670	EE-SX670P	
1 mm				5 mm	(selectable) 3 4	No incident light	EE-SX670A	EE-SX670R	
68	10				Light-ON	Incident light	EE-SX470		
L-shaped					Dark-ON/Light-ON (selectable) *3 *4	Incident light	EE-SX671	EE-SX671P	
20						No incident light	EE-SX671A	EE-SX671R	
1111					Light-ON	Incident light	EE-SX471		
T-shaped,					Dark-ON/Light-ON (selectable) *3 *4	Incident light	EE-SX672	EE-SX672P	
slot center 7 mm	10					No incident light	EE-SX672A	EE-SX672R	
2	40				Light-ON	Incident light	EE-SX472		
Close-					Dark-ON/Light-ON (selectable) *3 *4	Incident light	EE-SX673	EE-SX673P	
mounting	Through-					No incident light	EE-SX673A	EE-SX673R	
6	beam type	Connector (4 poles)			Light-ON	Incident light	EE-SX473		
Close-	(with slot)	(1 perce)		(SIOL WIGHT)	Dark-ON/Light-ON (selectable) *3 *4	Incident light	EE-SX674	EE-SX674P	
mounting						No incident light	EE-SX674A	EE-SX674R	
2000					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	1					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.



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

Pre-wired Models	5							Infrared light
Appearance	Sensing method	Sensing o	distance	Output configura- tion	Indicator mode	Connecting method	Mc NPN output	odel 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			5 mm (slot width) 5 mm (slot width) 5 mm (slec 1 *2	Dark-ON/ Light-ON	Incident	Pre-wired	EE-SX672-WR 1M	EE-SX672P-WR 1M
Close- mounting	Through- beam	5					EE-SX673-WR 1M	EE-SX673P-WR 1M
Close- mounting	type (with slot)			(selectable) *1 *2	light	Models (1m)	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.

*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.

Accessories (Order Separately) Connector Models

Type Cable length		Model	Remarks	
Connector			EE-1001	
			EE-1001-1	L terminal and positive (+) terminal are already short-circuited.
			EE-1009 *	
		1 m	EE-1006 1M	
Connector with Cable	1 111	EE-1010 1M *		
		2 m	EE-1006 2M	
		2 111	EE-1010 2M *	
	Connector with Robot	1 m	EE-1010-R 1M *	
Cable		2 m	EE-1010-R 2M *	
Connector Hold-down Clip			EE-1006A	Applicable Photomicrosensors For EE-SX670 and 470 only. (Can be used only with EE-1006 Connectors for the Photomicrosensors listed above.)

Note: For details, refer to the Photomicro Sensors Accessories on EE-... which can be accessed from your OMRON website.

* EE-1009- or EE-1010-series Connectors have a builtin locking mechanism to prevent cable disconnection when only the cable is pulled. To remove the Connector from the Sensor, grip the top and bottom of the Connector firmly and push into the Sensor once before pulling out. The locking mechanism prevents the Connector from being removed by pulling on the cable only and enables removal only when the Connector (housing) is pulled.

Ratings and Specifications

Туре		Standard	L-shaped	T-shaped, slot center 7 mm	Close-m	ounting	T-shaped, slot center 10 mm	F-shaped	R-shaped		
	NPN	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	
	models	Pre-wired models	EE-SX670- WR	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-SX670P EE-SX670R	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-SX670P- WR	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 widt	n)							
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						
Indicator *1 Light indicator (red) (turns ON when light is interrupted for models with A or R suffix)						x)					
Supp	y 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							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	it protection (Co	nnector models),	No circuit protect	tion (Pre-wired n	nodels)			
Resp	onse frequ	iency *2	1 kHz min. (3 kHz average)								
Ambi	ent illumin	ation	1,000 lx max. with fluorescent light on the surface of the receiver.								
Ambi	ent tempe	rature range	Operating: -25	to +55°C, Storag	e: -30 to +80°C	(with no icing or o	condensation)				
Ambi	ent humid	ity range	Operating: 5% t	o 85%, Storage:	5% to 95% (with	no icing or cond	ensation)				
Vibra	tion resist	ance	ce Destruction: 20 to 2,000 Hz (peak acceleration: 100 m/s ²) 1.5-mm double amplitude for 2 h (4-min periods) each in X, Y, and Z directions								
Shoc	Shock resistance Destruction: 500 m/s ² for 3 times each in X, Y, and Z directions										
Degre	e of prote	ction	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	Approx. 18.9 g	Approx. 17.3 g	Approx. 17.8 g	Approx. 16.8 g	Approx. 17.1 g	Approx. 18.3 g	Approx. 16.9 g	Approx. 16.9 g	
Ma-	Case		Polybutylene ph	nthalate (PBT)							
teri- al	Cover		Polycarbonate								
	Emitter/r	eceiver									

*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)



I/O Circuit Diagrams

NPN Output				
Model	Output configuration	Timing charts	Terminal connections	Output circuit
EE-SX67⊡ EE-SX67⊡-WR	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 ⊕ terminal	EE-SX67 EE-SX67 Light indicator
	Dark-ON	Incident Interrupted Light indicator ON (red) OFF Output ON transistor OFF Load Operates (e.g., relay) Releases	Open between © terminal and positive ⊕ terminal *1 *2	*The terminal arrangement depends on the model. Check the dimensional diagrams.
EE-SX670A EE-SX671A EE-SX672A EE-SX673A EE-SX674A	Light-ON	Incident Interrupted Light indicator ON (red) OFF Output ON transistor OFF Load Operates (e.g., relay) Releases	Short-circuited between © terminal and positive ⊕ terminal	EE-SX67D-WR
	Dark-ON	Incident Interrupted Light indicator ON (red) OFF Output ON transistor OFF Load Operates (e.g., relay) Releases	Open between © 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 Load Operates (relay) Releases		Light indicator (red) Main circuit Circuit

*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 EE-SX67□P-WR	Light-ON	Incident Interrupted Light indicator ON (red) OFF Output ON transistor OFF Load Operates (relay) Releases	Short-circuited between © terminal and positive ⊕ terminal	
	Dark-ON	Light indicator ON (red) OFF OFF OFF OFF OFF Comparison OFF Compar	Open between © terminal and positive ⊕ terminal *1 *2	Light indicator (red) Main Main UT T 24 VDC
EE-SX670R EE-SX671R EE-SX672R EE-SX673R EE-SX674R	Light-ON	Incident Interrupted Light indicator ON (red) OFF Output ON transistor OFF Load Operates (e.g., relay) Releases	Short-circuited between ℚ terminal and positive ⊕ terminal	*The terminal arrangement depends on the model. Check the dimensional diagrams.
	Dark-ON	Incident Interrupted Light indicator ON (red) OFF Output ON transistor OFF Load Operates (e.g., relay) Releases	Open between © terminal and positive ⊕ terminal *1 *2	

*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.

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					
Caldaring	250%0		The portion between the base of					

	ature	time	
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.



(Unit: mm)

Dimensions

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

Sensors









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