

# 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.

\*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 method	Connect-ing method	Sensing distance	Output configuration	Indicator mode	Model	
						NPN output	PNP output
Standard	Through-beam type (with slot)	Connector (4 poles)	5 mm (slot width)	Dark-ON/Light-ON (selectable) *3	Incident light	EE-SX670	EE-SX670P
					No incident light	EE-SX670A	EE-SX670R
L-shaped				Dark-ON/Light-ON (selectable) *3	Incident light	EE-SX470	---
					No incident light	EE-SX671	EE-SX671P
T-shaped, slot center 7 mm				Dark-ON/Light-ON (selectable) *3	Incident light	EE-SX471	---
					No incident light	EE-SX672	EE-SX672P
Close-mounting				Dark-ON/Light-ON (selectable) *3	Incident light	EE-SX673	EE-SX673P
					No incident light	EE-SX672A	EE-SX672R
Close-mounting				Dark-ON/Light-ON (selectable) *3	Incident light	EE-SX473	---
					No incident light	EE-SX674	EE-SX674P
T-shaped, slot center 10 mm	Dark-ON/Light-ON (selectable) *3	Incident light	EE-SX474	---			
		No incident light	EE-SX675	EE-SX675P			
F-shaped	Dark-ON/Light-ON (selectable) *3	Incident light	EE-SX676	EE-SX676P			
R-shaped	Dark-ON/Light-ON (selectable) *3	Incident light	EE-SX677	EE-SX677P			

\*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.

## Pre-wired Models

 Infrared light

Appearance	Sensing method	Sensing distance		Output configuration	Indicator mode	Connecting method	Model	
							NPN output	PNP output
Standard 	Through-beam type (with slot)		5 mm (slot width)	Dark-ON/ Light-ON (selectable) *	Incident light	Pre-wired Models (1m)	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 							EE-SX673-WR 1M	EE-SX673P-WR 1M
Close-mounting 							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

\* 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

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

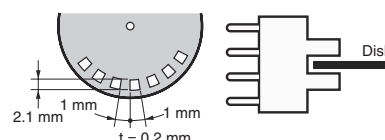
\* Refer to *Accessories* for details.

## Ratings and Specifications

Item	Type		Standard	L-shaped	T-shaped, slot center 7 mm	Close-mounting		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
		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 models	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
		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
<b>Sensing distance</b>			5 mm (slot width)							
<b>Sensing object</b>			Opaque: 2 × 0.8 mm min.							
<b>Differential distance</b>			0.025 mm							
<b>Light source</b>			Infrared LED with a peak wavelength of 940 nm							
<b>Indicator *1</b>			Light indicator (red) (turns ON when light is interrupted for models with A or R suffix)							
<b>Supply voltage</b>			5 to 24 VDC ±10%, ripple (p-p): 10% max.							
<b>Current consumption</b>			12 mA max. (Connector models), 35 mA max. (NPN pre-wired models), 30 mA max. (PNP pre-wired models)							
<b>Control output</b>			NPN open collector: 5 to 24 VDC, 100 mA max. 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.							
<b>Protection circuits</b>			Load short circuit protection (Connector models), No circuit protection (Pre-wired models)							
<b>Response frequency *2</b>			1 kHz min. (3 kHz average)							
<b>Ambient illumination</b>			1,000 lx max. with fluorescent light on the surface of the receiver.							
<b>Ambient temperature range</b>			Operating: -25 to +55°C, Storage: -30 to +80°C (with no icing or condensation)							
<b>Ambient humidity range</b>			Operating: 5% to 85%, Storage: 5% to 95% (with no icing or condensation)							
<b>Vibration resistance</b>			Destruction: 20 to 2,000 Hz (peak acceleration: 100 m/s <sup>2</sup> ) 1.5-mm double amplitude for 2 h (4-min periods) each in X, Y, and Z directions							
<b>Shock resistance</b>			Destruction: 500 m/s <sup>2</sup> for 3 times each in X, Y, and Z directions							
<b>Degree of protection</b>			IEC60529 IP50							
<b>Connecting method</b>			Connector Models (direct soldering possible), Pre-wired Models (Standard cable length: 1 m), Models with Connectors (Standard cable length: 0.1 m)							
<b>Wei- ght</b>	<b>Connector models</b>		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
	<b>Pre-wired models</b>		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
<b>Ma- ter- ial</b>	<b>Case</b>		Polybutylene phthalate (PBT)							
	<b>Cover</b>		Polycarbonate							
	<b>Emitter/receiver</b>		Polycarbonate							

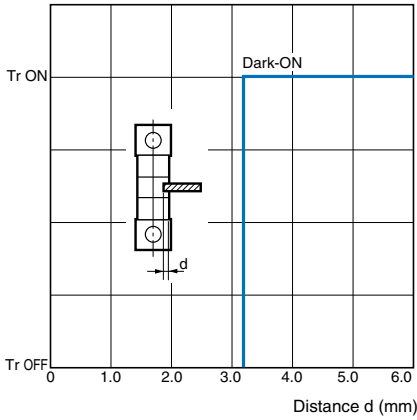
\*1. The indicator is a GaP red LED (peak wavelength: 690 nm).

\*2. The response frequency was measured by detecting the rotating disk shown at the right.

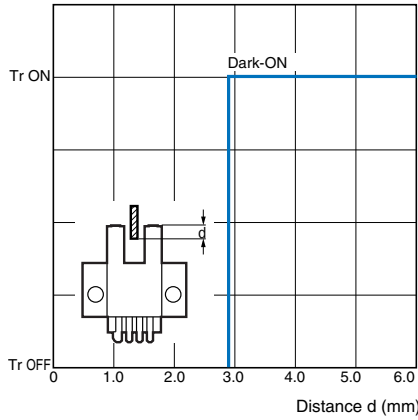


Engineering Data (Reference Value)

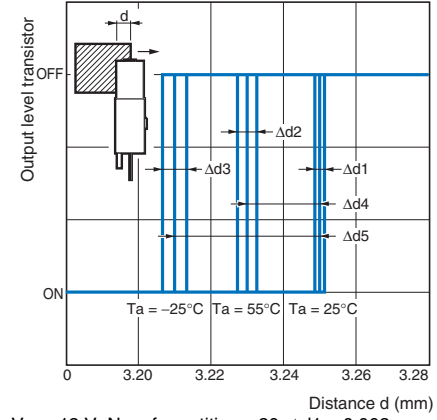
Sensing Position Characteristics



Sensing Position Characteristics



Repeated Sensing Position Characteristics



Vcc = 12 V, No. of repetitions: 20, Δd1 = 0.002 mm, Δd2 = 0.004 mm, Δd3 = 0.005 mm, Δd4 = 0.02 mm, Δd5 = 0.04 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□ EE-SX67□-WR	Light-ON	Incident Interrupted Light indicator (red) ON OFF Output transistor ON OFF Load Operates (e.g., relay) Releases	Short-circuited between ⊖ terminal and positive ⊕ terminal	<b>EE-SX67□ EE-SX67□A</b> 
	Dark-ON	Incident Interrupted Light indicator (red) ON OFF Output transistor ON OFF Load Operates (e.g., relay) Releases	Open between ⊖ terminal and positive ⊕ terminal *1	
EE-SX670A EE-SX671A EE-SX672A EE-SX673A EE-SX674A	Light-ON	Incident Interrupted Light indicator (red) ON OFF Output transistor ON OFF Load Operates (e.g., relay) Releases	Short-circuited between ⊖ terminal and positive ⊕ terminal	<b>EE-SX67□-WR</b> 
	Dark-ON	Incident Interrupted Light indicator (red) ON OFF Output transistor ON OFF Load Operates (e.g., relay) Releases	Open between ⊖ terminal and positive ⊕ terminal *1	
EE-SX470 EE-SX471 EE-SX472 EE-SX473 EE-SX474	Light-ON	Incident Interrupted Light indicator (red) ON OFF Output transistor ON OFF Load (relay) Operates Releases	---	

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

## PNP Output

Model	Output configuration	Timing charts	Terminal connections	Output circuit
EE-SX67□P EE-SX67□P-WR	Light-ON		Short-circuited between Ⓛ terminal and positive ⊕ terminal	
	Dark-ON		Open between Ⓛ terminal and positive ⊕ terminal *1	
EE-SX670R EE-SX671R EE-SX672R EE-SX673R EE-SX674R	Light-ON		Short-circuited between Ⓛ terminal and positive ⊕ terminal	<p>*The terminal arrangement depends on the model. Check the dimensional diagrams.</p>
	Dark-ON		Open between Ⓛ terminal and positive ⊕ terminal *1	

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

## Safety Precautions

Refer to *Warranty and Limitations of Liability*.

### ⚠ WARNING

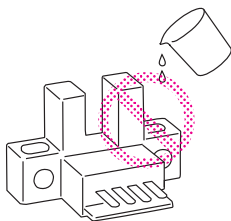
This product is not designed or rated for ensuring safety of persons either directly or indirectly. Do not use it for such purposes.



### Precautions for 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	Temperature	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.

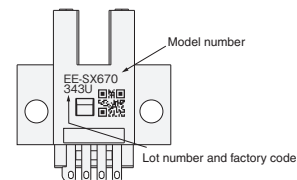
- The terminal base uses a polycarbonate resin, which could be deformed by excessive soldering heat, resulting in damage to the product's functionality.

#### ● 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.

#### EE-SX□70□



## Dimensions

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

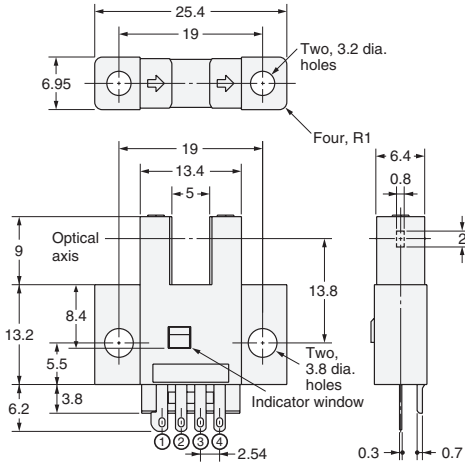
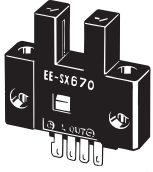
### Sensors

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

#### Terminal Arrangement

(1)	⊕	Vcc
(2)	L	L*
(3)	OUT	OUTPUT
(4)	⊖	GND (0 V)

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

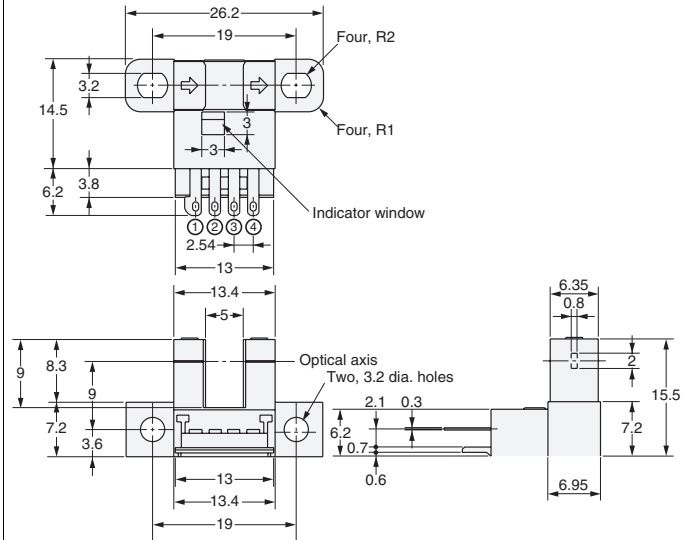
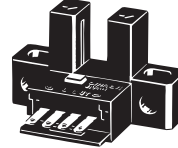


EE-SX671/671P  
EE-SX671A/671R  
EE-SX471

#### Terminal Arrangement

(1)	⊕	Vcc
(2)	L	L*
(3)	OUT	OUTPUT
(4)	⊖	GND (0 V)

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

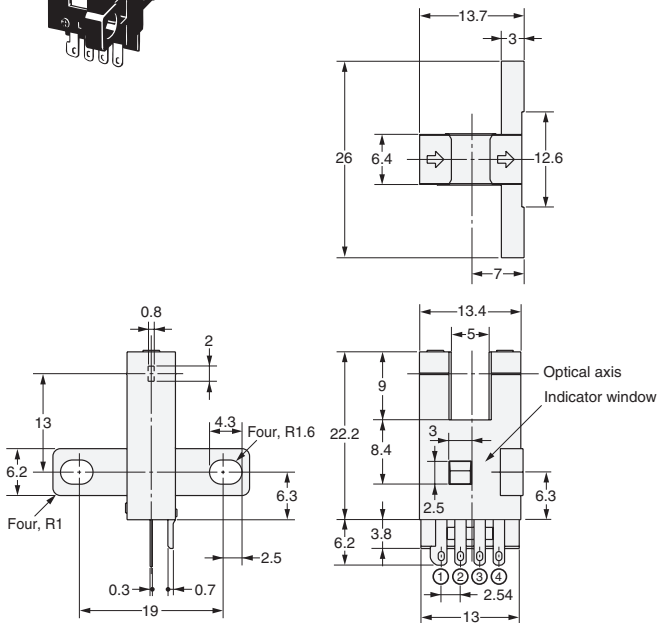
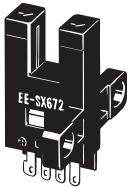


EE-SX672/672P  
EE-SX672A/672R  
EE-SX472

#### Terminal Arrangement

(1)	⊕	Vcc
(2)	L	L*
(3)	OUT	OUTPUT
(4)	⊖	GND (0 V)

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

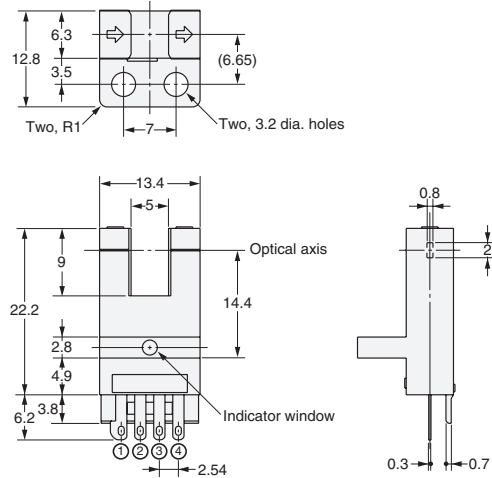


EE-SX673/673P  
EE-SX673A/673R  
EE-SX473

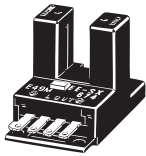
#### Terminal Arrangement

(1)	⊕	Vcc
(2)	L	L*
(3)	OUT	OUTPUT
(4)	⊖	GND (0 V)

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



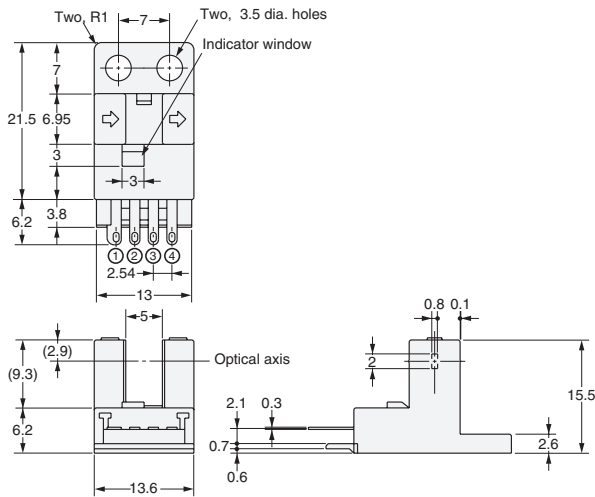
EE-SX674/674P  
EE-SX674A/674R  
EE-SX474



Terminal Arrangement

(1)	⊕	Vcc
(2)	L	L*
(3)	OUT	OUTPUT
(4)	⊖	GND (0 V)

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

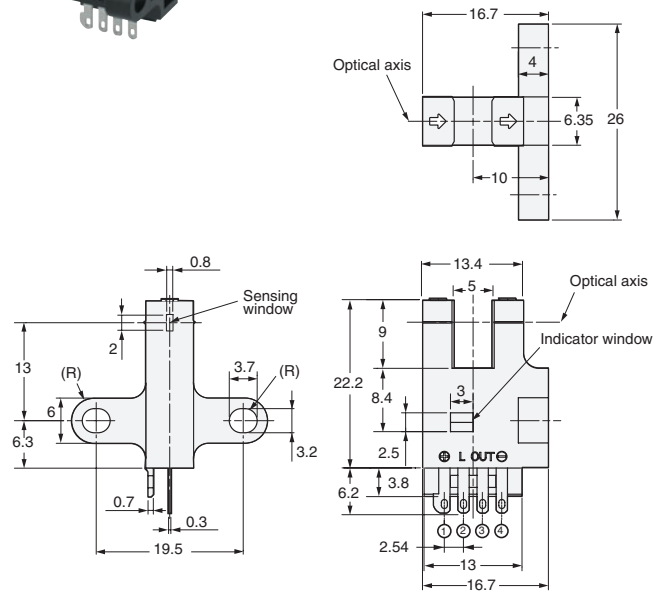


EE-SX675/675P



Terminal Arrangement

(1)	⊕	Vcc
(2)	L	L
(3)	OUT	OUTPUT
(4)	⊖	GND (0 V)

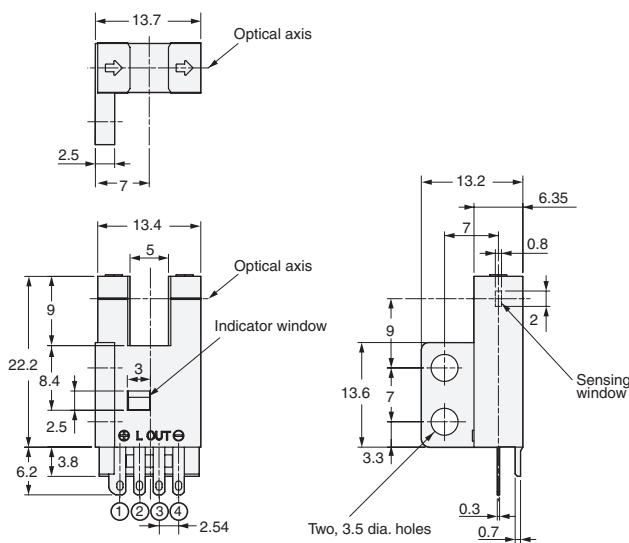


EE-SX676/676P



Terminal Arrangement

(1)	⊕	Vcc
(2)	L	L
(3)	OUT	OUTPUT
(4)	⊖	GND (0 V)

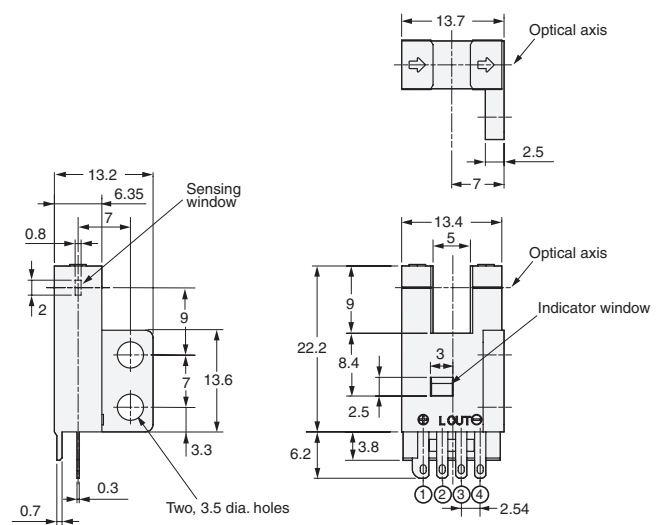


EE-SX677/677P



Terminal Arrangement

(1)	⊕	Vcc
(2)	L	L
(3)	OUT	OUTPUT
(4)	⊖	GND (0 V)

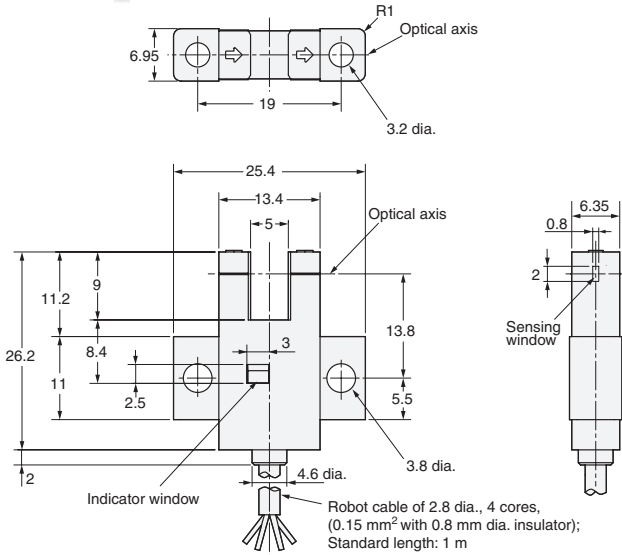


EE-SX670-WR/670P-WR



Terminal Arrangement

<b>Brown</b>	Vcc
<b>Pink</b>	L
<b>Blue</b>	GND (0 V)
<b>Black</b>	OUTPUT

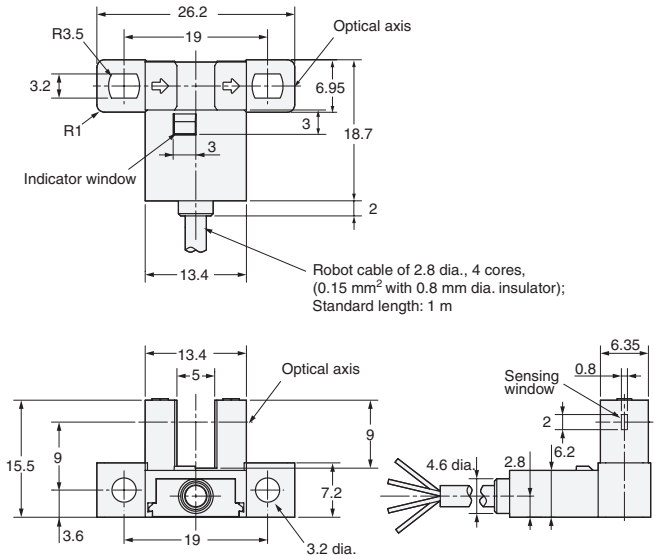


EE-SX671-WR/671P-WR



Terminal Arrangement

<b>Brown</b>	Vcc
<b>Pink</b>	L
<b>Blue</b>	GND (0 V)
<b>Black</b>	OUTPUT

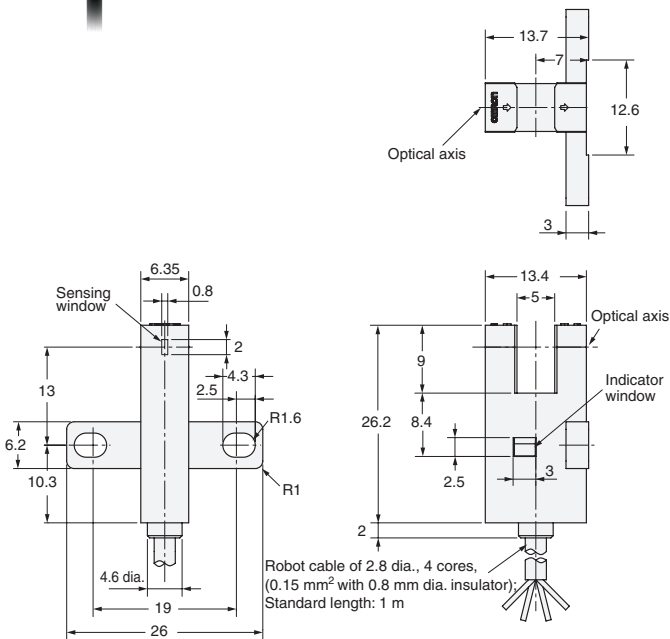


EE-SX672-WR/672P-WR



Terminal Arrangement

<b>Brown</b>	Vcc
<b>Pink</b>	L
<b>Blue</b>	GND (0 V)
<b>Black</b>	OUTPUT

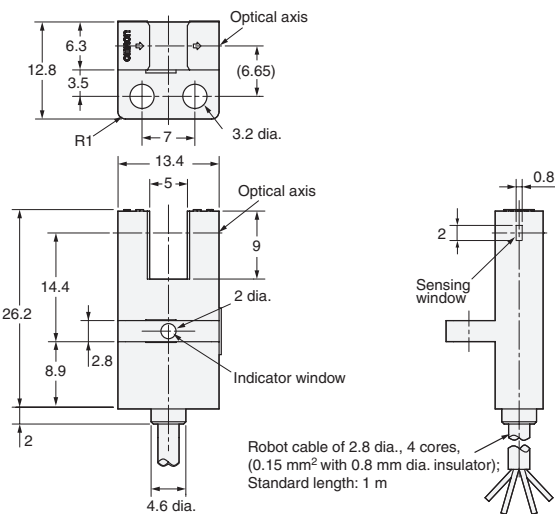


EE-SX673-WR/673P-WR



Terminal Arrangement

<b>Brown</b>	Vcc
<b>Pink</b>	L
<b>Blue</b>	GND (0 V)
<b>Black</b>	OUTPUT



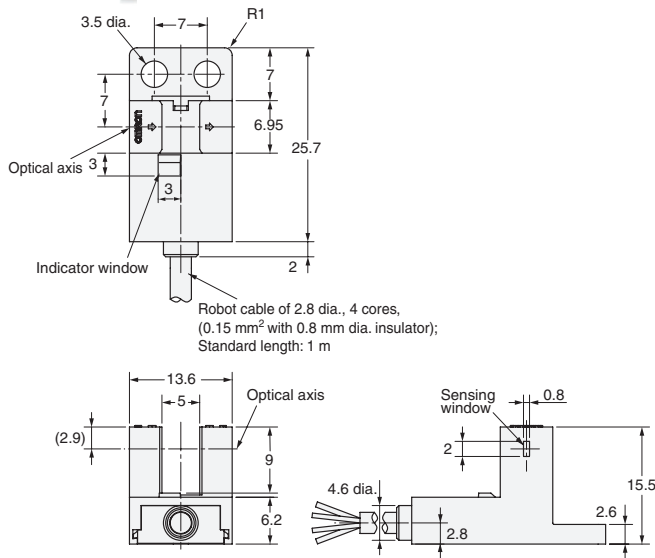


EE-SX674-WR/674P-WR



Terminal Arrangement

<b>Brown</b>	Vcc
<b>Pink</b>	L
<b>Blue</b>	GND(0V)
<b>Black</b>	OUTPUT

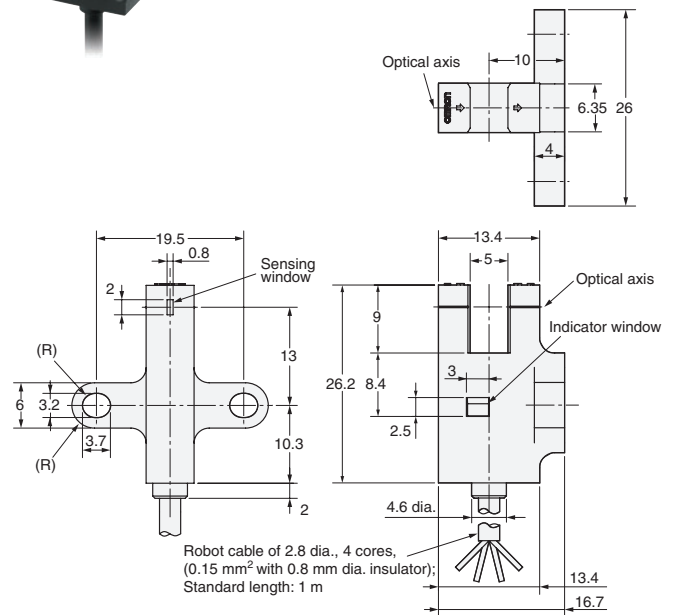


EE-SX675-WR/675P-WR



Terminal Arrangement

<b>Brown</b>	Vcc
<b>Pink</b>	L
<b>Blue</b>	GND(0V)
<b>Black</b>	OUTPUT

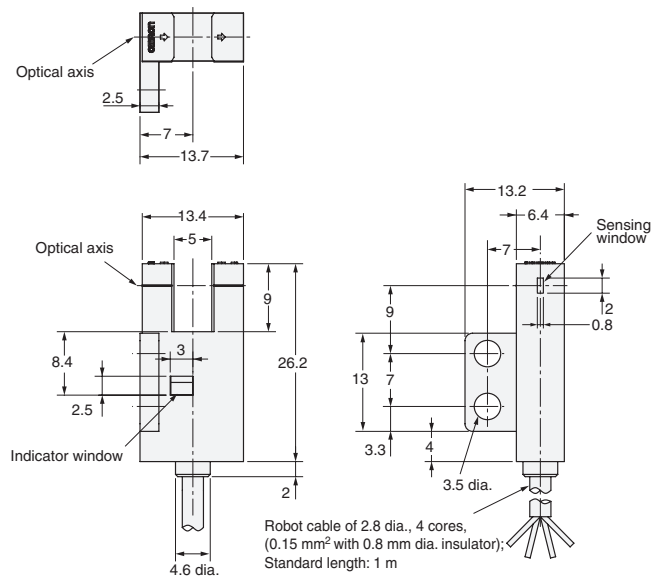


EE-SX676-WR/676P-WR



Terminal Arrangement

<b>Brown</b>	Vcc
<b>Pink</b>	L
<b>Blue</b>	GND(0V)
<b>Black</b>	OUTPUT

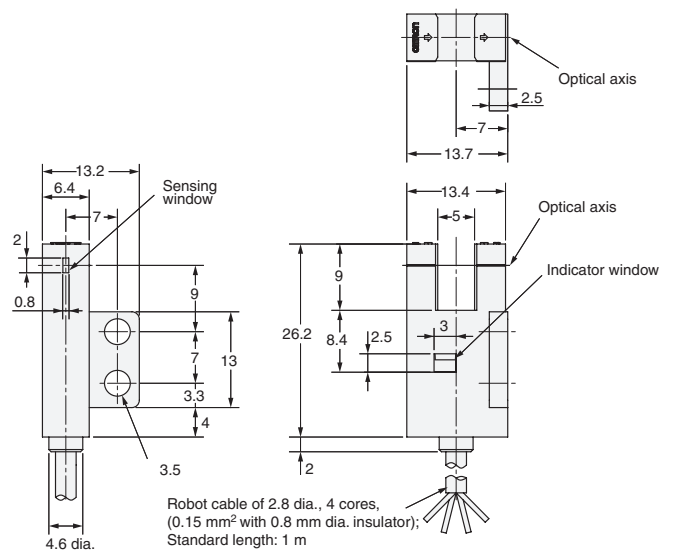


EE-SX677-WR/677P-WR



Terminal Arrangement

<b>Brown</b>	Vcc
<b>Pink</b>	L
<b>Blue</b>	GND(0V)
<b>Black</b>	OUTPUT



**MEMO**

A large grid of dashed blue lines for writing notes, consisting of 20 columns and 20 rows.

## Terms and Conditions Agreement

### Read and understand this catalog.

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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.

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

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Industrial Automation Company

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