WINSOURCE ELECTRONICS

THE DATASHEET OF

EE-SX671P

Slot-type Photomicrosensor (Non-modulated) *1

EE-SX47/67

CSM_EE-SX47/67_DS_E_13_2

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	Connecting 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 *4	Incident light	EE-SX670	EE-SX670P
					No incident light	EE-SX670A	EE-SX670R
				Light-ON	Incident light	EE-SX470	---
L-shaped				Dark-ON/Light-ON (selectable) *3 *4	Incident light	EE-SX671	EE-SX671P
					No incident light	EE-SX671A	EE-SX671R
				Light-ON	Incident light	EE-SX471	---
T-shaped, slot center 7 mm				Dark-ON/Light-ON (selectable) *3 *4	Incident light	EE-SX672	EE-SX672P
					No incident light	EE-SX672A	EE-SX672R
				Light-ON	Incident light	EE-SX472	---
Close-mounting				Dark-ON/Light-ON (selectable) *3 *4	Incident light	EE-SX673	EE-SX673P
					No incident light	EE-SX673A	EE-SX673R
				Light-ON	Incident light	EE-SX473	---
Close-mounting				Dark-ON/Light-ON (selectable) *3 *4	Incident light	EE-SX674	EE-SX674P
					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	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.
*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

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) *1 *2	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**

*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 *	
	Connector with Cable	1 m	**EE-1006 1M**	
			EE-1010 1M *	
		2 m	**EE-1006 2M**	
			EE-1010 2M *	
	Connector with Robot Cable	1 m	**EE-1010-R 1M** *	
		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.)

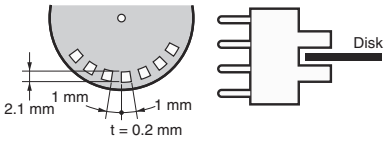
Note: For details, refer to the Photomicro Sensors Accessories on EE-□ which can be accessed from your OMRON website.

* 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

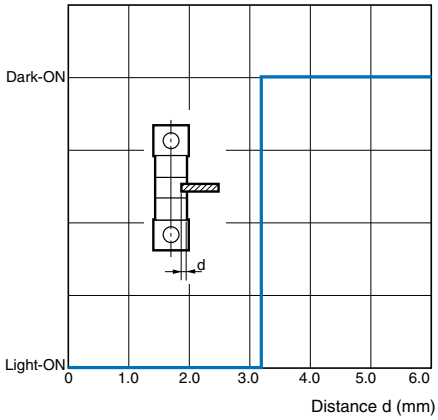
Item			Type	Standard	L-shaped	T-shaped, slot center 7 mm	Close-mounting		T-shaped, slot center 10 mm	F-shaped	R-shaped
	NPN models		Connector models	EE-SX670 EE-SX670A EE-SX470	EE-SX671 EE-SX671A EE-SX471	EE-SX672 EE-SX672A EE-SX472	EE-SX673 EE-SX673A EE-SX473	EE-SX674 EE-SX674A EE-SX474	EE-SX675	EE-SX676	EE-SX677
			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
Sensing distance				5 mm (slot width)							
Sensing object				Opaque: 2 × 0.8 mm min.							
Differential distance				0.025 mm							
Light source				Infrared LED with a peak wavelength of 940 nm							
Indicator *1				Light indicator (red) (turns ON when light is interrupted for models with A or R suffix)							
Supply voltage				5 to 24 VDC ±10%, ripple (p-p): 10% max.							
Current consumption				12 mA max. (Connector models, L terminal open), 35 mA max. (NPN pre-wired models), 30 mA max. (PNP pre-wired models)							
Control output				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.							
Protection circuits				Load short circuit protection (Connector models), No circuit protection (Pre-wired models)							
Response frequency *2				1 kHz min. (3 kHz average)							
Ambient illumination				1,000 lx max. with fluorescent light on the surface of the receiver.							
Ambient temperature range				Operating: −25 to +55°C, Storage: −30 to +80°C (with no icing or condensation)							
Ambient humidity range				Operating: 5% to 85%, Storage: 5% to 95% (with no icing or condensation)							
Vibration resistance				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							
Shock resistance				Destruction: 500 m/s^2 for 3 times each in X, Y, and Z directions							
Degree of protection				IEC60529 IP50							
Connecting method				Connector Models (direct soldering possible), Pre-wired Models (Standard cable length: 1 m), Models with Connectors (Standard cable length: 0.1 m)							
Weight	Connector 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
	Pre-wired 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
Material	Case			Polybutylene phthalate (PBT)							
	Cover			Polycarbonate							
	Emitter/receiver										

*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.

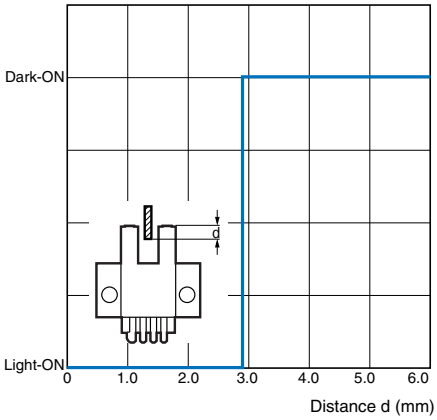


Engineering Data (Reference Value)

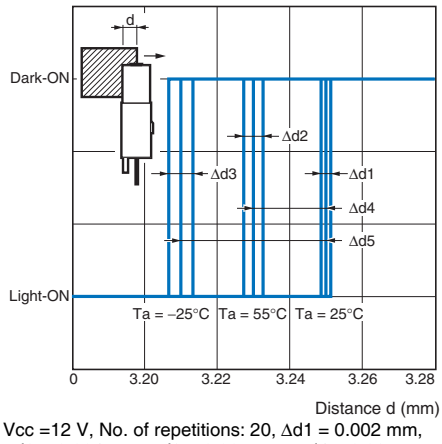
Sensing Position Characteristics
EE-SX47□/67□



Sensing Position Characteristics
EE-SX47□/67□



Repeated Sensing Position Characteristics
EE-SX47□/67□

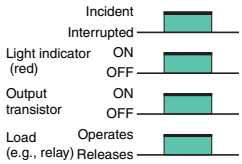
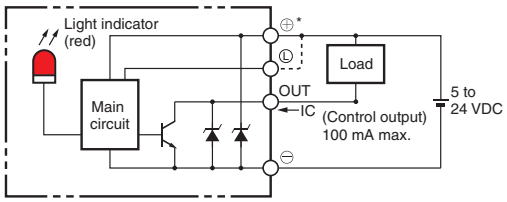
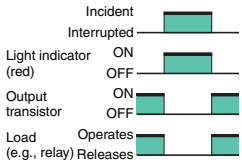
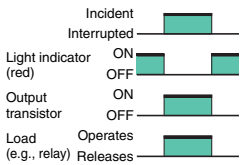
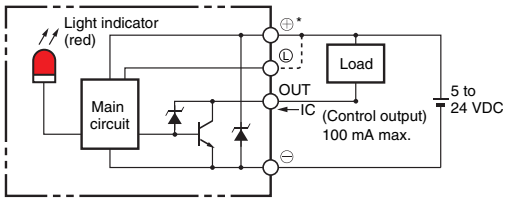
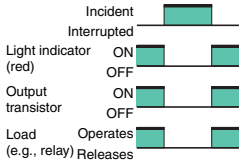
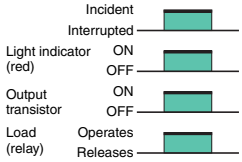
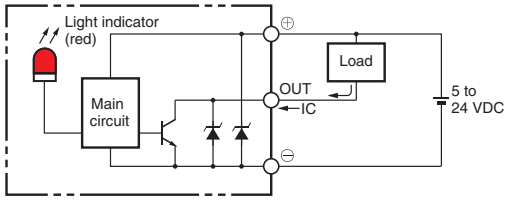


Vcc =12 V, No. of repetitions: 20, Δd1 = 0.002 mm, Δd2 = 0.004 mm, Δd3 = 0.005 mm, Δd4 = 0.02 mm, Δd5 = 0.04 mm

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

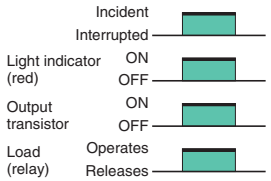
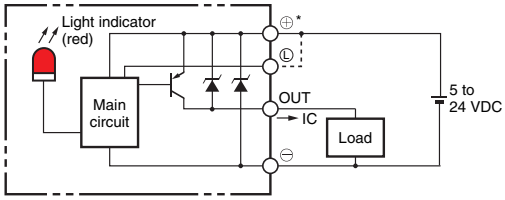
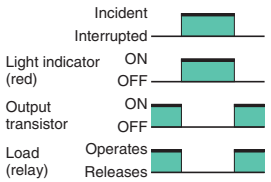
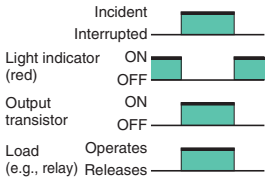
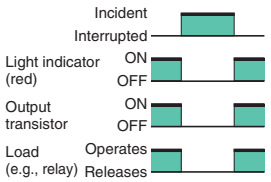
Model	Output configuration	Timing charts	Terminal connections	Output circuit
EE-SX67□ EE-SX67□-WR	Light-ON		Short-circuited between Ⓛ terminal and positive ⊕ terminal	**EE-SX67□** **EE-SX67□A** 
	Dark-ON		Open between Ⓛ terminal and positive ⊕ terminal *1 *2	
EE-SX670A EE-SX671A EE-SX672A EE-SX673A EE-SX674A	Light-ON		Short-circuited between Ⓛ terminal and positive ⊕ terminal	**EE-SX67□-WR** 
	Dark-ON		Open between Ⓛ terminal and positive ⊕ terminal *1 *2	
EE-SX470 EE-SX471 EE-SX472 EE-SX473 EE-SX474	Light-ON		---	

*The terminal arrangement depends on the model. Check the dimensional diagrams.

*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		Short-circuited between Ⓛ terminal and positive ⊕ terminal	
	Dark-ON		Open between Ⓛ terminal and positive ⊕ terminal *1 *2	
EE-SX670R EE-SX671R EE-SX672R EE-SX673R EE-SX674R	Light-ON		Short-circuited between Ⓛ terminal and positive ⊕ terminal	*The terminal arrangement depends on the model. Check the dimensional diagrams.
	Dark-ON		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*.

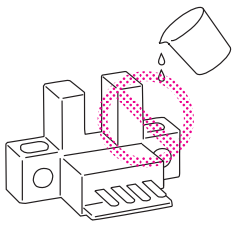
⚠ WARNING

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

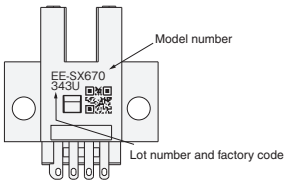
Item	Temperature	Permissible time	Remarks
Soldering iron	350°C max.	3 s max.	The portion between the base of the terminals and the position 1.5 mm from the terminal base must not be soldered.

- 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□



(Unit: mm)

Dimensions

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

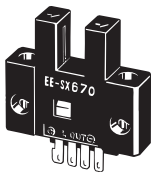
Sensors

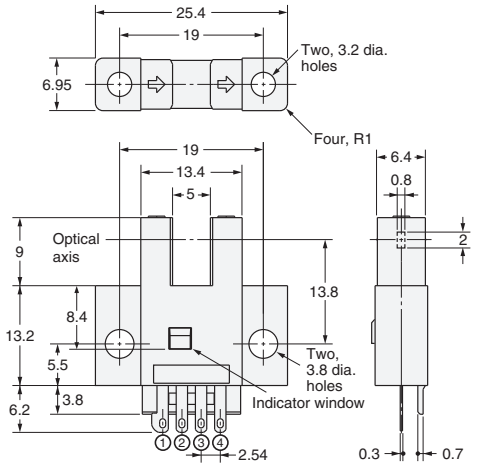
EE-SX670/670P
EE-SX670A/670R
EE-SX470

Terminal Arrangement

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

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



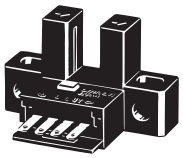


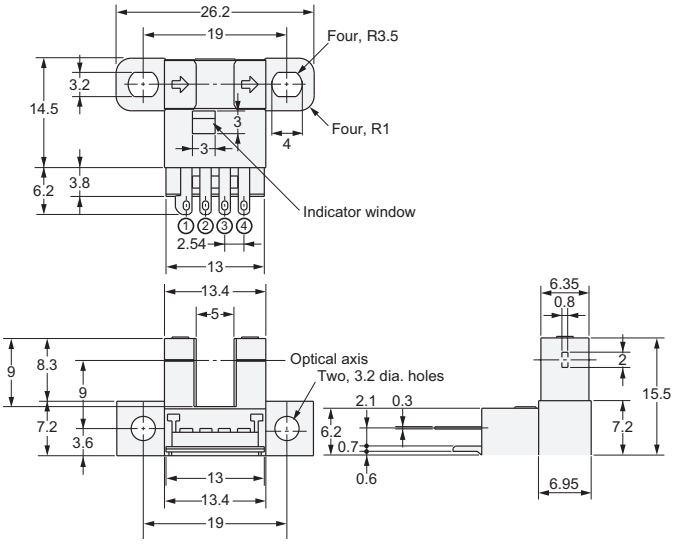
EE-SX671/671P
EE-SX671A/671R
EE-SX471

Terminal Arrangement

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

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



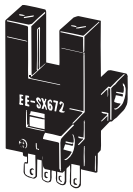


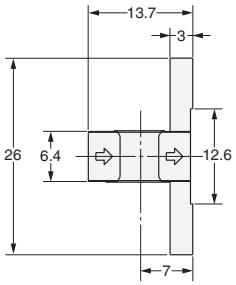
EE-SX672/672P
EE-SX672A/672R
EE-SX472

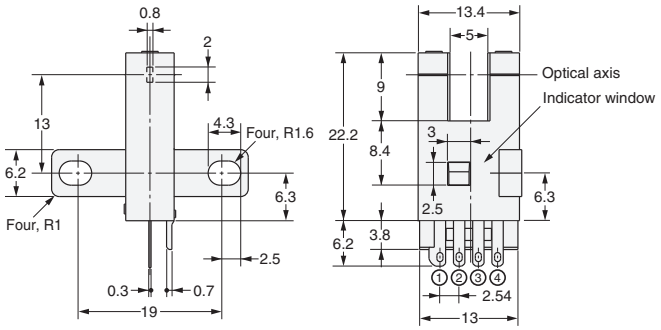
Terminal Arrangement

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

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





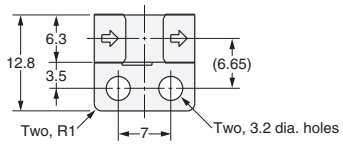


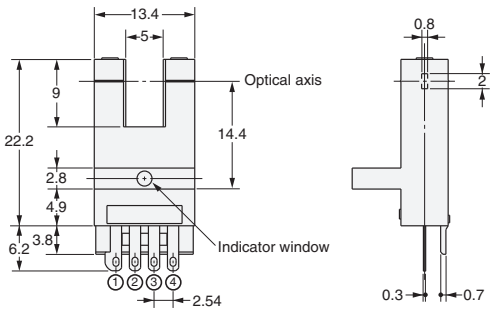
EE-SX673/673P
EE-SX673A/673R
EE-SX473

Terminal Arrangement

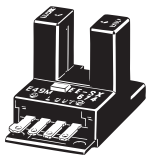
(1)	⊕	Vcc
(2)	L	L*
(3)	OUT	OUTPUT
(4)	⊖	GND (0 V)

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





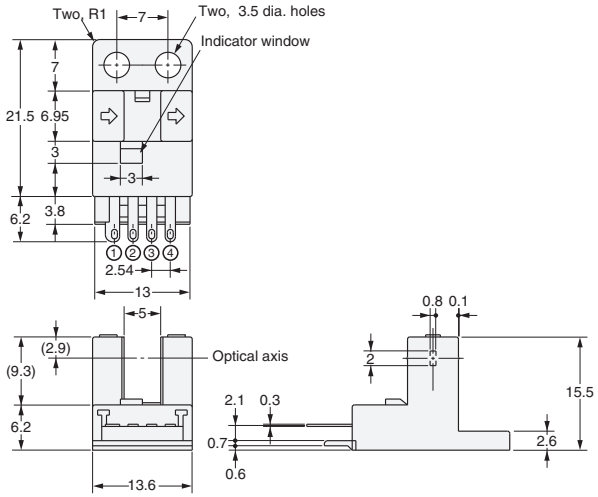
EE-SX674/674P
EE-SX674A/674R
EE-SX474



Terminal Arrangement

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

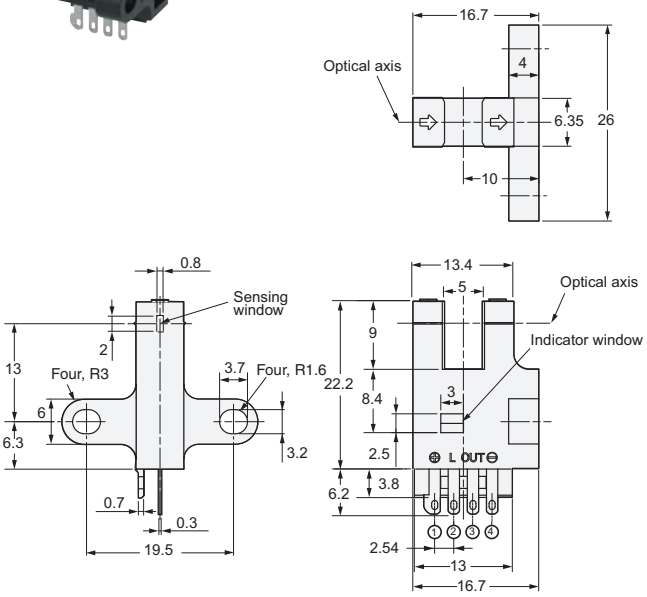
* Pin 2 is not used for the EE-SX474.



EE-SX675/675P

Terminal Arrangement

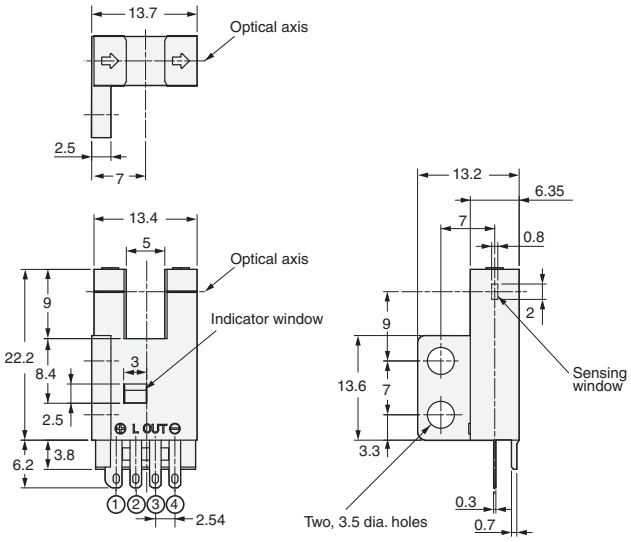
(1)	⊕	Vcc
(2)	L	L
(3)	OUT	OUTPUT
(4)	⊖	GND (0 V)



EE-SX676/676P

Terminal Arrangement

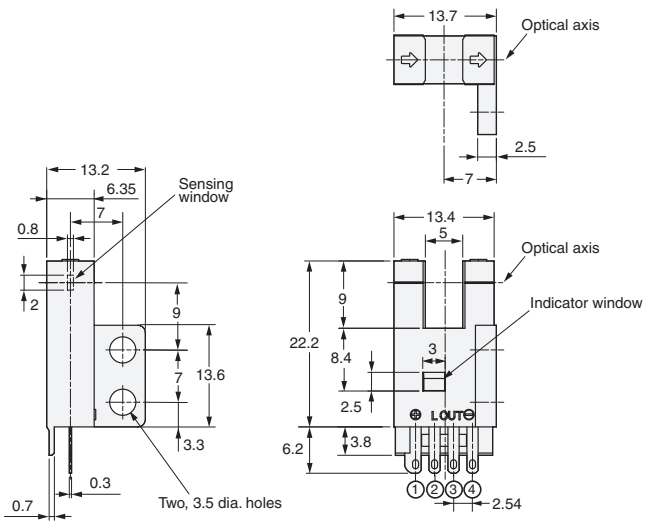
(1)	⊕	Vcc
(2)	L	L
(3)	OUT	OUTPUT
(4)	⊖	GND (0 V)



EE-SX677/677P

Terminal Arrangement

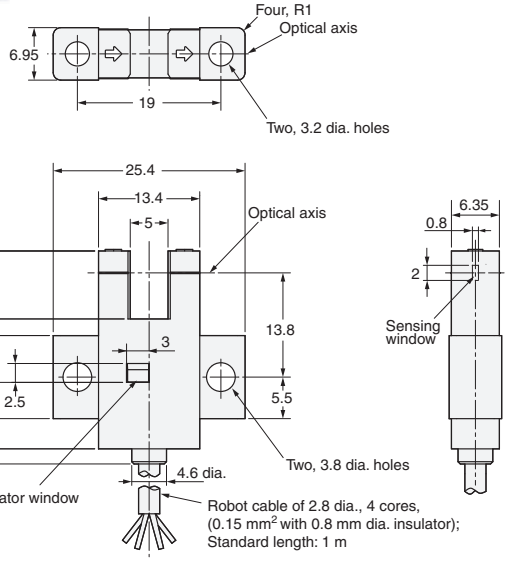
(1)	⊕	Vcc
(2)	L	L
(3)	OUT	OUTPUT
(4)	⊖	GND (0 V)



EE-SX670-WR/670P-WR

Terminal Arrangement

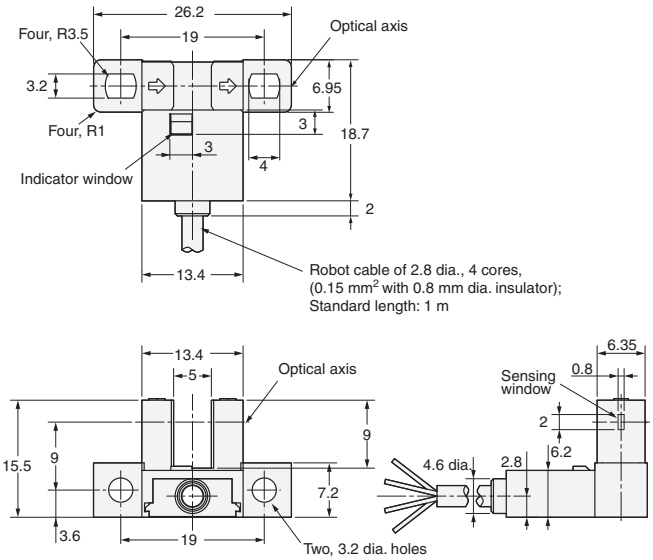
Brown	Vcc
Pink	L
Blue	GND (0 V)
Black	OUTPUT



EE-SX671-WR/671P-WR

Terminal Arrangement

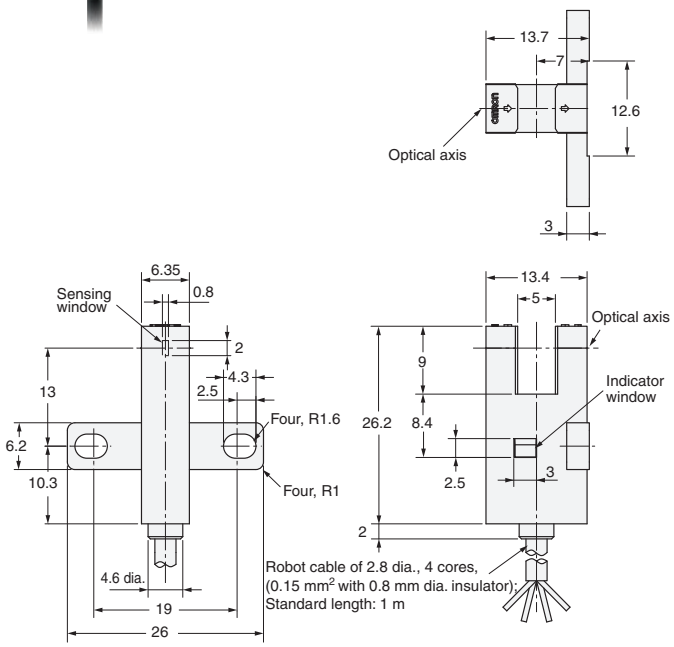
Brown	Vcc
Pink	L
Blue	GND (0 V)
Black	OUTPUT



EE-SX672-WR/672P-WR

Terminal Arrangement

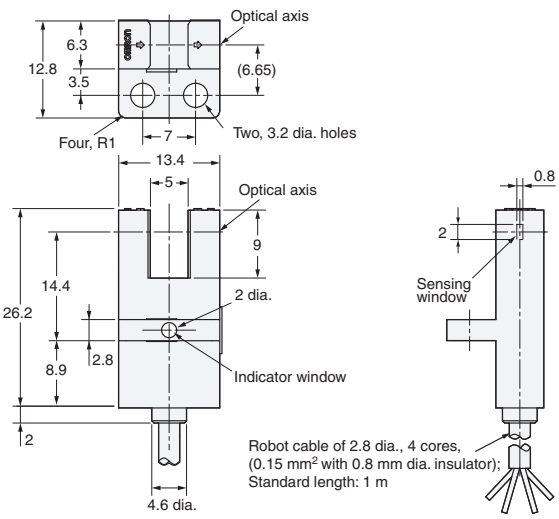
Brown	Vcc
Pink	L
Blue	GND (0 V)
Black	OUTPUT



EE-SX673-WR/673P-WR

Terminal Arrangement

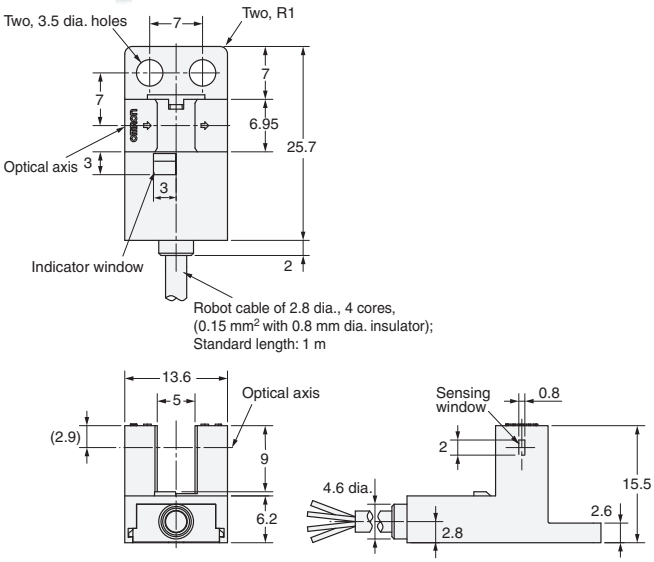
Brown	Vcc
Pink	L
Blue	GND (0 V)
Black	OUTPUT



EE-SX674-WR/674P-WR

Terminal Arrangement

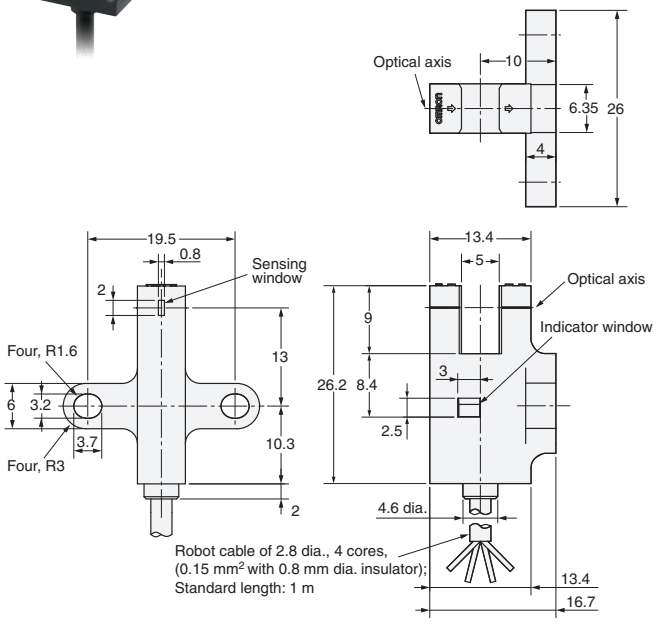
Brown	Vcc
Pink	L
Blue	GND(0V)
Black	OUTPUT



EE-SX675-WR/675P-WR

Terminal Arrangement

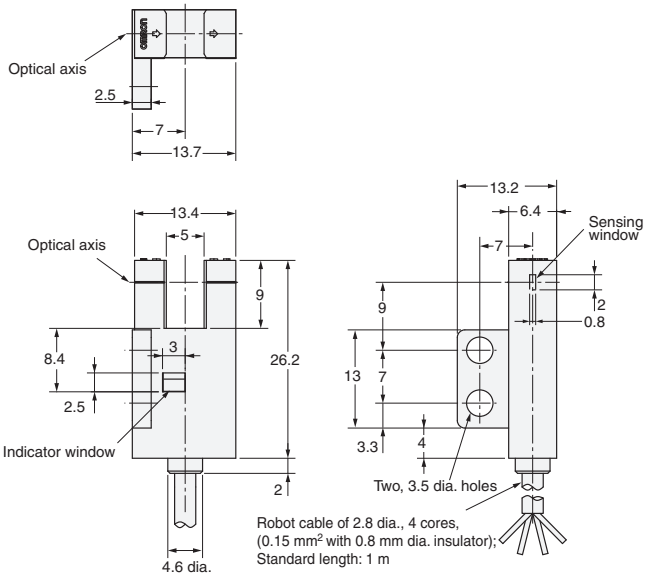
Brown	Vcc
Pink	L
Blue	GND(0V)
Black	OUTPUT



EE-SX676-WR/676P-WR

Terminal Arrangement

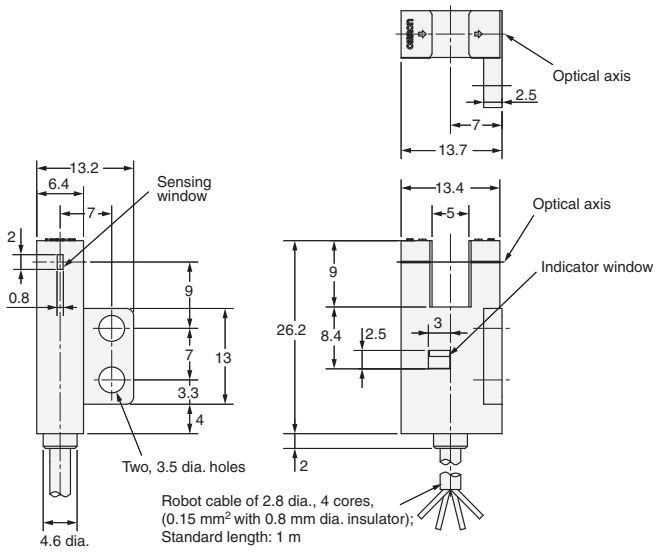
Brown	Vcc
Pink	L
Blue	GND(0V)
Black	OUTPUT



EE-SX677-WR/677P-WR

Terminal Arrangement

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



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