Slot-type Photomicrosensor (Non-modulated) *1
EE-SX47/67

CSM_EE-SX47/67_DS_E_11_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	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 *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.

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Pre-wired Models

▭ Infrared light

Appearance	Sensing method	Sensing distance		Output configura-tion	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	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	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.
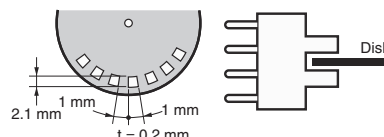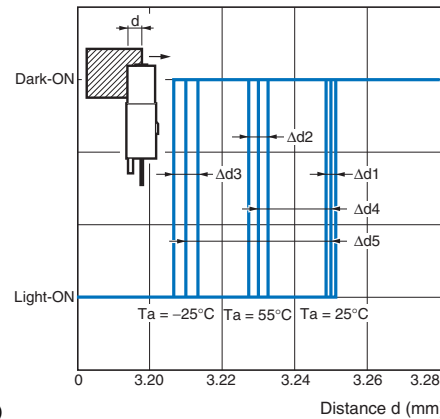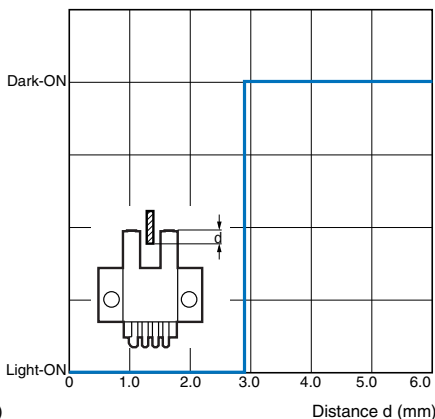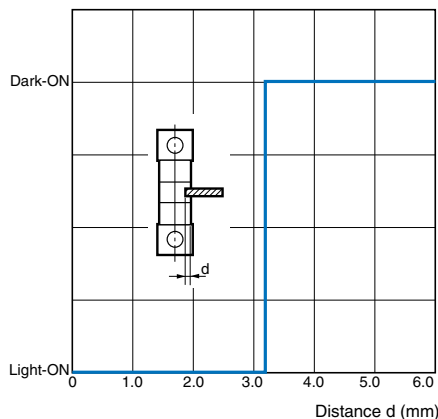
Engineering Data (Reference Value)

Sensing Position Characteristics

Distance d (mm)

Sensing Position Characteristics

Distance d (mm)

Repeated Sensing Position Characteristics

Distance d (mm)

Vcc =12 V, No. of repetitions: 20, $\Delta d1$ = 0.002 mm, $\Delta d2$ = 0.004 mm, $\Delta d3$ = 0.005 mm, $\Delta d4$ = 0.02 mm, $\Delta d5$ = 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 (e.g., relay) Operates/Releases	Short-circuited between Ⓛ terminal and positive ⊕ terminal	**EE-SX67☐** **EE-SX67☐A** *The terminal arrangement depends on the model. Check the dimensional diagrams.
	Dark-ON	Incident / Interrupted; Light indicator (red) ON/OFF; Output transistor ON/OFF; Load (e.g., relay) Operates/Releases	Open between Ⓛ terminal and positive ⊕ terminal *1 *2	
EE-SX670A EE-SX671A EE-SX672A EE-SX673A EE-SX674A	Light-ON	Incident / Interrupted; Light indicator (red) ON/OFF; Output transistor ON/OFF; Load (e.g., relay) Operates/Releases	Short-circuited between Ⓛ terminal and positive ⊕ terminal	**EE-SX67☐-WR** *The terminal arrangement depends on the model. Check the dimensional diagrams.
	Dark-ON	Incident / Interrupted; Light indicator (red) ON/OFF; Output transistor ON/OFF; Load (e.g., relay) Operates/Releases	Open between Ⓛ terminal and positive ⊕ terminal *1 *2	
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.

*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 (red): ON / OFF Output transistor: ON / OFF Load (relay): Operates / Releases	Short-circuited between Ⓛ terminal and positive ⊕ terminal	
	Dark-ON	Incident / Interrupted Light indicator (red): ON / OFF Output transistor: ON / OFF Load (relay): Operates / Releases	Open between Ⓛ terminal and positive ⊕ terminal *1 *2	
EE-SX670R EE-SX671R EE-SX672R EE-SX673R EE-SX674R	Light-ON	Incident / Interrupted Light indicator (red): ON / OFF Output transistor: ON / OFF Load (e.g., relay): Operates / Releases	Short-circuited between Ⓛ terminal and positive ⊕ terminal	
	Dark-ON	Incident / Interrupted Light indicator (red): ON / OFF Output transistor: ON / OFF Load (e.g., relay): Operates / Releases	Open between Ⓛ terminal and positive ⊕ terminal *1 *2	

*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.

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.
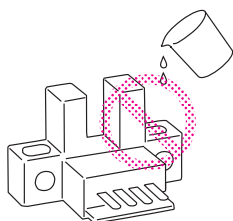
Precautions for Correct Use

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□

OMRON

5

(Unit: mm)
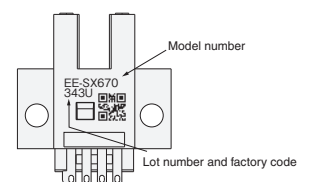
Dimensions

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

Sensors

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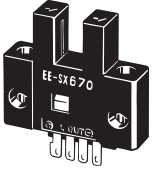
Terminal Arrangement

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

* Pin 2 is not used for the EE-SX470.
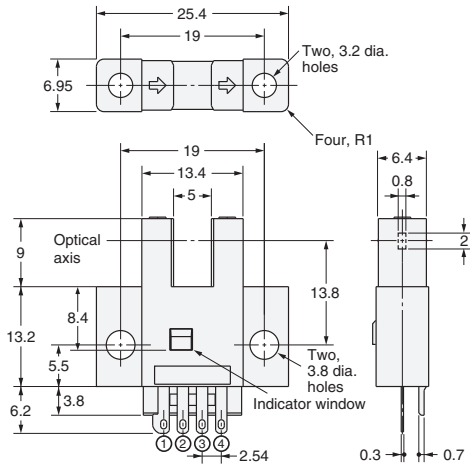
EE-SX671/671P
EE-SX671A/671R
EE-SX471

Terminal Arrangement

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

* Pin 2 is not used for the EE-SX471.
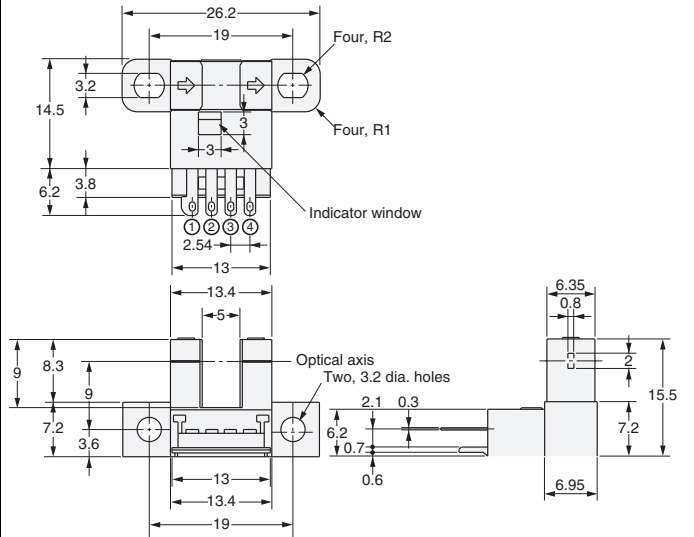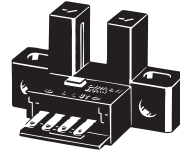
EE-SX672/672P
EE-SX672A/672R
EE-SX472
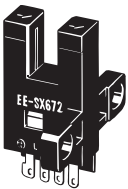
Terminal Arrangement

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

* Pin 2 is not used for the EE-SX472.
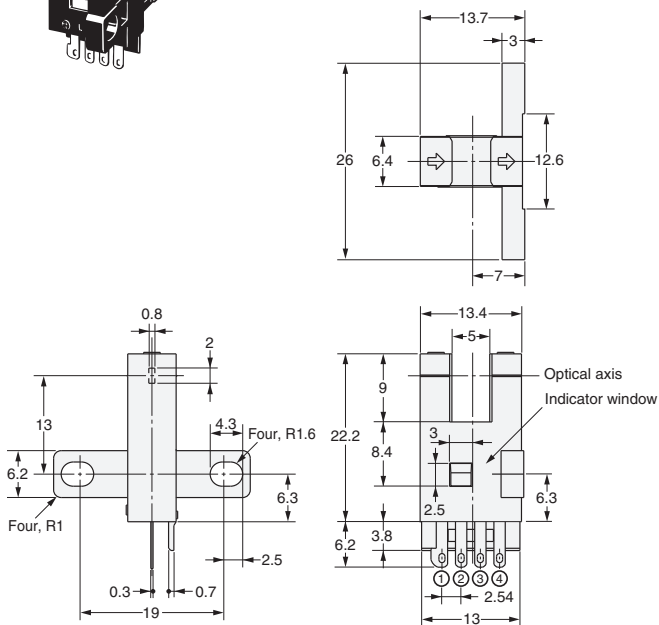
EE-SX673/673P
EE-SX673A/673R
EE-SX473

Terminal Arrangement

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

* Pin 2 is not used for the EE-SX473.
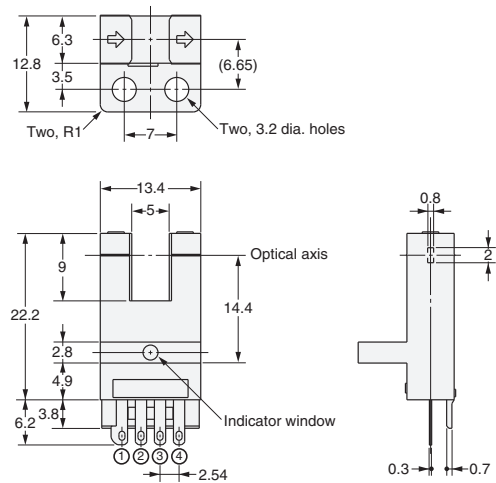
EE-SX674/674P
EE-SX674A/674R
EE-SX474

Terminal Arrangement

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

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

Two, R1 7   Two, 3.5 dia. holes
Indicator window
7
21.5 6.95
3
3
6.2 3.8
① ② ③ ④
2.54
13

(2.9) 5
(9.3) Optical axis
6.2
13.6
2.1 0.3
2
0.8 0.1
15.5
0.7 2.6
0.6
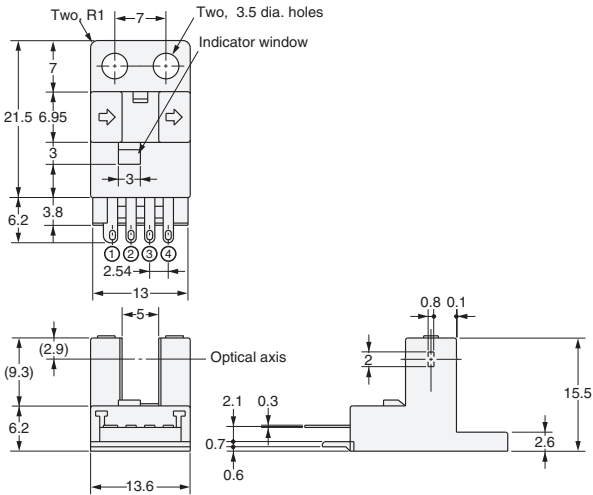
EE-SX675/675P

Terminal Arrangement

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

16.7
Optical axis
4
6.35 26
10

0.8
Sensing window
2
13
(R) 3.7 (R)
6
6.3 3.2
0.7 0.3
19.5

13.4
5 Optical axis
Indicator window
9
22.2
8.4 3
2.5
⊕ L OUT ⊖
6.2 3.8
① ② ③ ④
2.54
13
16.7
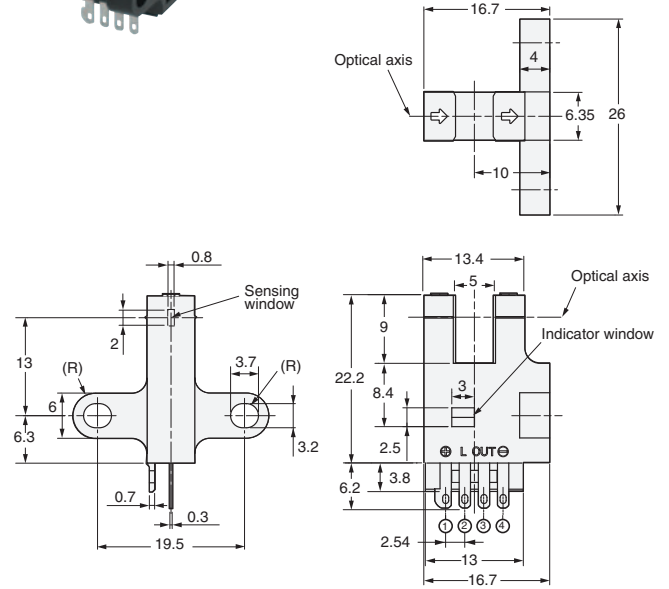
EE-SX676/676P

Terminal Arrangement

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

13.7 Optical axis
2.5
7

13.4
5 Optical axis
Indicator window
9
22.2
8.4 3
2.5
⊕ L OUT ⊖
6.2 3.8
① ② ③ ④
2.54

13.2 6.35
7
0.8
9 2
9
13.6 7
3.3
Two, 3.5 dia. holes
Sensing window
0.3
0.7
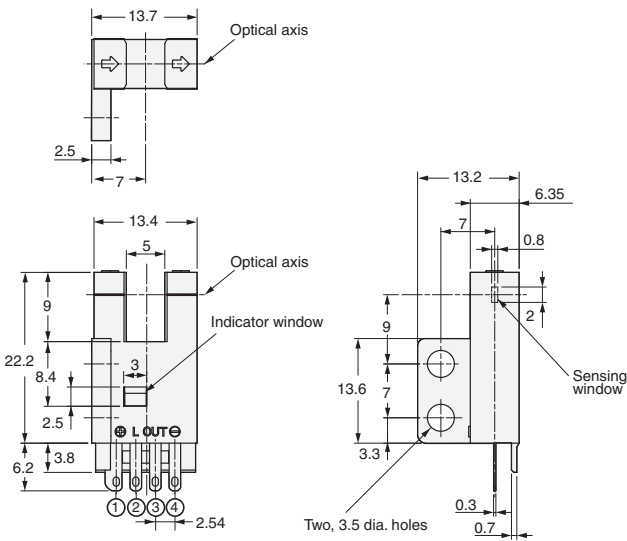
EE-SX677/677P

Terminal Arrangement

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

13.7 Optical axis
2.5
7

13.2 6.35 Sensing window
0.8 7
2
9
9
13.6
7
3.3
Two, 3.5 dia. holes
0.7 0.3

13.4
5 Optical axis
Indicator window
9
22.2
8.4 3
2.5
⊕ L OUT ⊖
6.2 3.8
① ② ③ ④
2.54
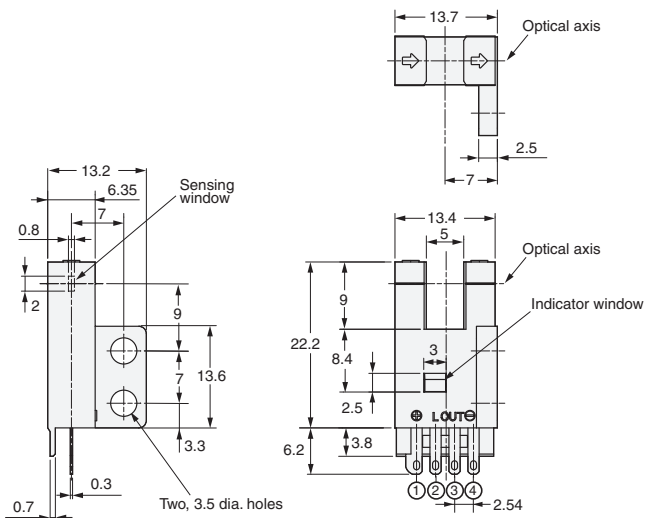
EE-SX670-WR/670P-WR

Terminal Arrangement

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

R1
Optical axis
6.95
19
3.2 dia.

25.4
13.4
5
Optical axis
6.35
0.8
2
11.2
9
13.8
Sensing window
26.2
8.4
3
11
5.5
2.5
3.8 dia.
2
4.6 dia.
Indicator window
Robot cable of 2.8 dia., 4 cores, (0.15 mm² with 0.8 mm dia. insulator); Standard length: 1 m
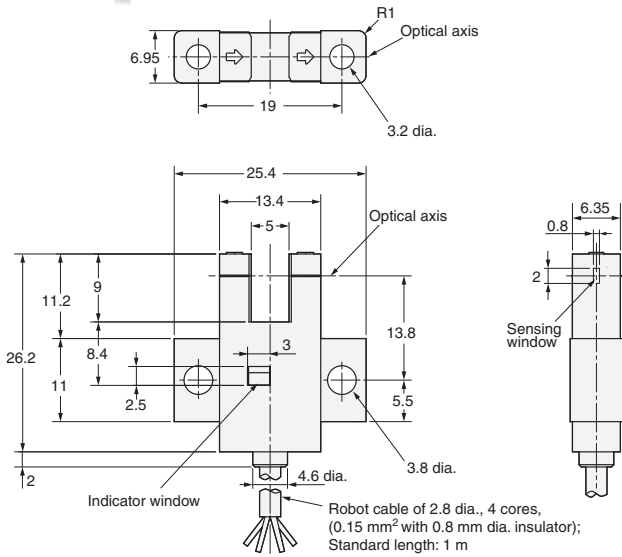
EE-SX671-WR/671P-WR

Terminal Arrangement

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

26.2
19
Optical axis
R3.5
3.2
6.95
R1
3
18.7
Indicator window
3
2
13.4
Robot cable of 2.8 dia., 4 cores, (0.15 mm² with 0.8 mm dia. insulator); Standard length: 1 m

13.4
5
Optical axis
6.35
Sensing window
0.8
15.5
9
9
2
7.2
4.6 dia.
2.8
6.2
3.6
19
3.2 dia.
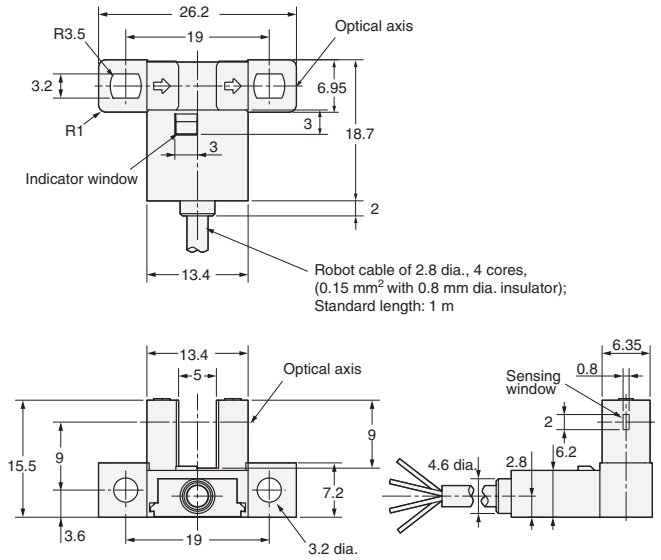
EE-SX672-WR/672P-WR

Terminal Arrangement

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

13.7
7
12.6
Optical axis
3

6.35
0.8
Sensing window
2
13
2.5
4.3
6.2
R1.6
10.3
R1
4.6 dia.
19
26

13.4
5
Optical axis
9
Indicator window
26.2
8.4
3
2.5
2
Robot cable of 2.8 dia., 4 cores, (0.15 mm² with 0.8 mm dia. insulator); Standard length: 1 m
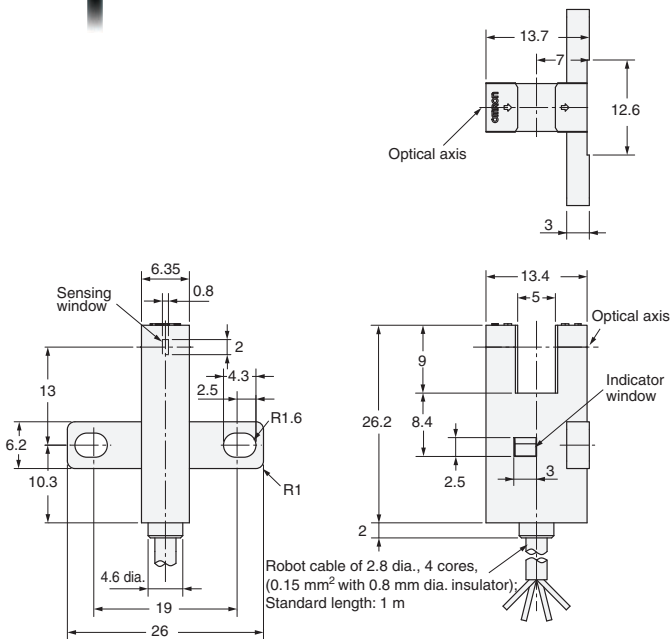
EE-SX673-WR/673P-WR

Terminal Arrangement

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

6.3
Optical axis
12.8
3.5
(6.65)
R1
7
3.2 dia.

13.4
5
Optical axis
0.8
9
2
14.4
2 dia.
Sensing window
26.2
8.9
2.8
Indicator window
2
4.6 dia.
Robot cable of 2.8 dia., 4 cores, (0.15 mm² with 0.8 mm dia. insulator); Standard length: 1 m
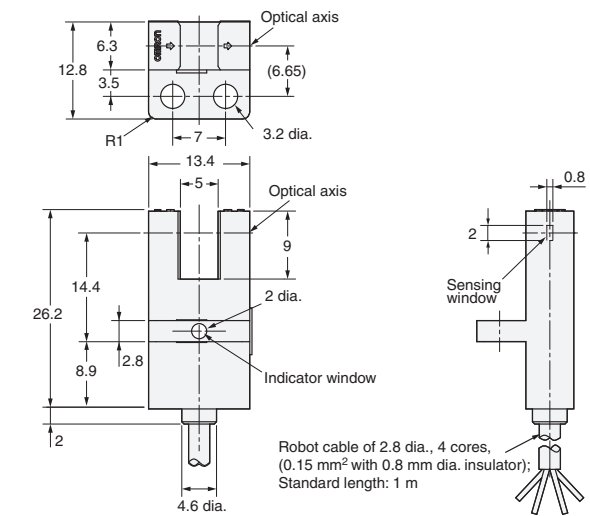
EE-SX674-WR/674P-WR

Terminal Arrangement

Brown	Vcc
Pink	L
Blue	GND(0V)
Black	OUTPUT
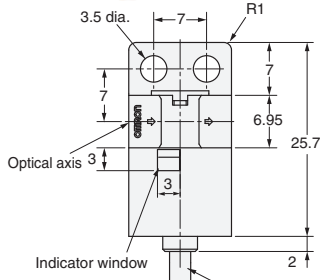
Robot cable of 2.8 dia., 4 cores,
(0.15 mm² with 0.8 mm dia. insulator);
Standard length: 1 m
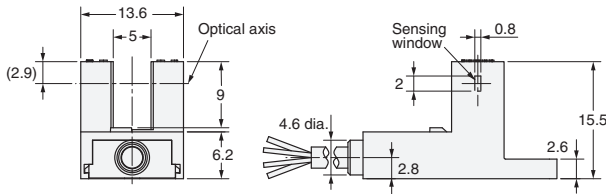
EE-SX675-WR/675P-WR

Terminal Arrangement

Brown	Vcc
Pink	L
Blue	GND(0V)
Black	OUTPUT
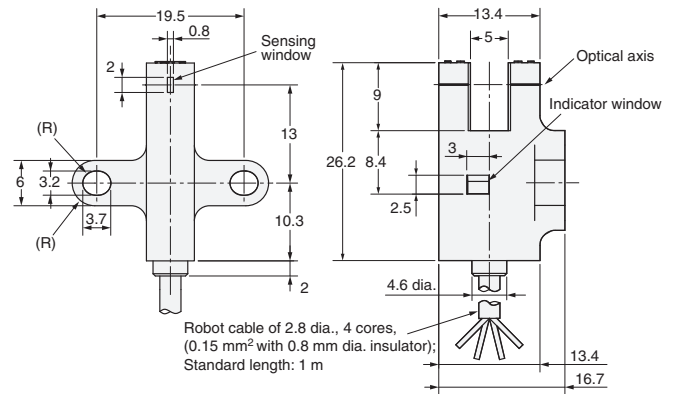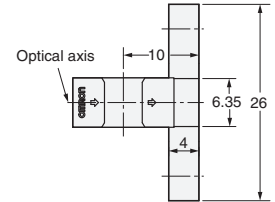
Robot cable of 2.8 dia., 4 cores,
(0.15 mm² with 0.8 mm dia. insulator);
Standard length: 1 m

EE-SX676-WR/676P-WR

Terminal Arrangement

Brown	Vcc
Pink	L
Blue	GND(0V)
Black	OUTPUT
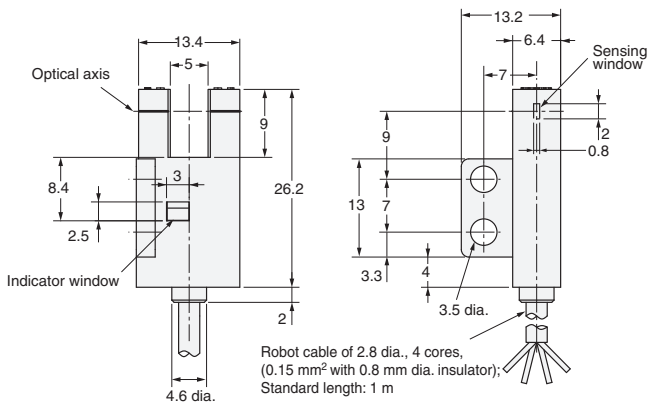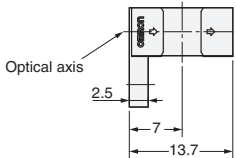
Robot cable of 2.8 dia., 4 cores,
(0.15 mm² with 0.8 mm dia. insulator);
Standard length: 1 m

EE-SX677-WR/677P-WR

Terminal Arrangement

Brown	Vcc
Pink	L
Blue	GND(0V)
Black	OUTPUT
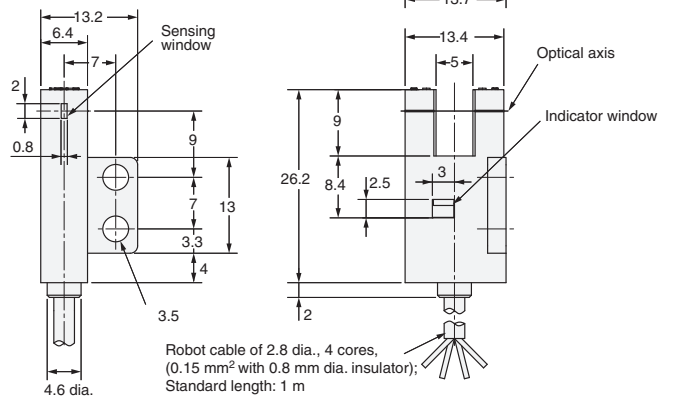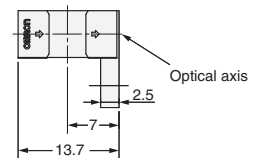
Robot cable of 2.8 dia., 4 cores,
(0.15 mm² with 0.8 mm dia. insulator);
Standard length: 1 m

Terms and Conditions Agreement

2015.11

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

OMRON Corporation
Industrial Automation Company

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