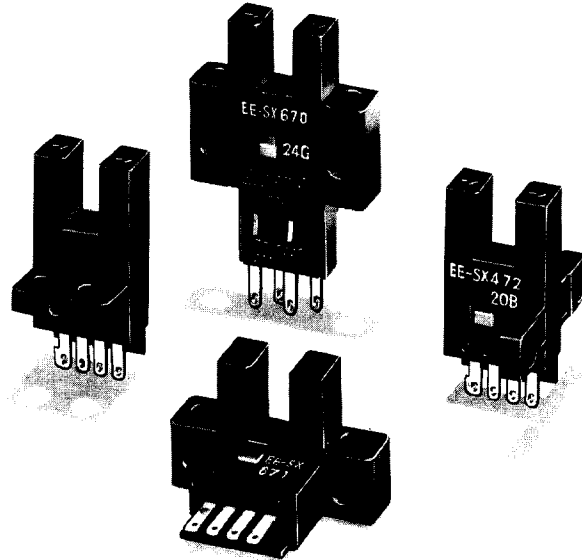


## Photomicrosensor





EE-SX670/470

### Photomicrosensor with 100-mA Switching Capacity that can be Built into Equipment

- Standard, L-shaped, T-shaped, and close mounting models available.
- Select from eight output variations, including LIGHT-ON or LIGHT-OFF/ON models.
- Response frequency as high as 1 kHz.
- Easy operation monitoring with bright LIGHT-ON indicator.
- Wide operating voltage range (5 to 24 VDC) makes smooth connection of the photomicrosensor with TTLs, relays, and programmable controllers (PC) possible.
- Dust-proof slit.



### Ordering Information

Appearance	Sensing method	Sensing distance	Output configuration	Model	Weight
<b>Standard</b> 	<b>Transmissive type</b>	5 mm	Light-OFF/ON*	EE-SX670	Approx. 3.1 g
			Light-ON	EE-SX470	
<b>L-shaped</b> 			Light-OFF/ON*	EE-SX671	Approx. 3.0 g
			Light-ON	EE-SX471	
<b>T-shaped</b> 			Light-OFF/ON*	EE-SX672	Approx. 2.4 g
			Light-ON	EE-SX472	
<b>Close-mounting</b> 			Light-OFF/ON*	EE-SX673	Approx. 2.3 g
			Light-ON	EE-SX473	

\*The Light-OFF/ON models can be used as Light-OFF models when the L terminal and positive (+) terminal are short-circuited. To use them as Light-ON models do not short-circuit these terminals.

# Specifications

## ■ Ratings

Item		Standard		L-shaped		T-shaped		Close-mounting	
		EE-SX670	EE-SX470	EE-SX671	EE-SX471	EE-SX672	EE-SX472	EE-SX673	EE-SX473
Supply voltage		5 to 24 VDC $\pm$ 10%, ripple (p-p): 10% max.							
Current consumption		35 mA max.							
Standard reference object		Opaque: 0.8 x 2 mm							
Differential distance		0.025 mm							
Control output		At 5 to 24 VDC: 100-mA load current ( $I_C$ ) with a residual voltage of 0.8 V max. When driving TTL: 40-mA load current ( $I_C$ ) with a residual voltage of 0.4 V max.							
Output configuration	Transistor on output stage without detecting object	OFF (ON) (see note 1)	ON	OFF (ON) (see note 1)	ON	OFF (ON) (see note 1)	ON	OFF (ON) (see note 1)	ON
	Transistor on output stage with detecting object	ON (OFF) (see note 1)	OFF	ON (OFF) (see note 1)	OFF	ON (OFF) (see note 1)	OFF	ON (OFF) (see note 1)	OFF
Indicator (see note 2)	Without detecting object	ON							
	With detecting object	OFF							
Response frequency		1 kHz max. (3 kHz typ.)							
Connecting method		EE-1001/1006 Connectors; soldering terminals							
Light source		GaAs infrared LED with a peak wavelength of 940 nm							
Receiver		Si phototransistor with a sensing wavelength of 850 nm max.							

**Note:** 1. The word ON or OFF in the parenthesis expresses the operating status of the LIGHT-ON model when the L terminal and positive (+) terminal are short-circuited.

2. The indicator is GaP red LED (peak emission wavelength: 690 nm).

## ■ Characteristics

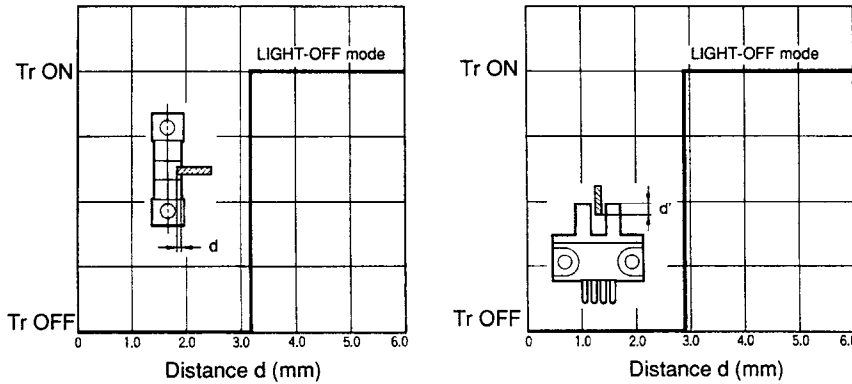
Ambient illumination (see note 1)	Fluorescent light: 1,000 lx max.
Ambient temperature	Operating: $-10^{\circ}$ to $55^{\circ}\text{C}$ Storage: $-25^{\circ}$ to $80^{\circ}\text{C}$
Ambient humidity	Operating: 45% to 85% Storage: 35% to 95%
Vibration resistance	Destruction: 20 to 2,000 Hz, (with a peak acceleration of 10G's), 1.5-mm double amplitude for 2 hrs (with 4-minute cycles) each in X, Y, and Z directions
Shock resistance	Destruction: 500 m/s <sup>2</sup> for 3 times each in X, Y, and Z directions
Soldering heat resistance	$260^{\circ}\pm 5^{\circ}\text{C}$ (see note 2) when the portion between the tip of the terminals and the position 1.5 mm from the terminal base is dipped into the solder for $10\pm 1$ seconds

**Note:** 1. The ambient illuminance is measured on the surface of the receiver.

2. This conforms to MIL-STD-750-2031-1.

# Engineering Data

## Sensing Position Characteristics (Typical)

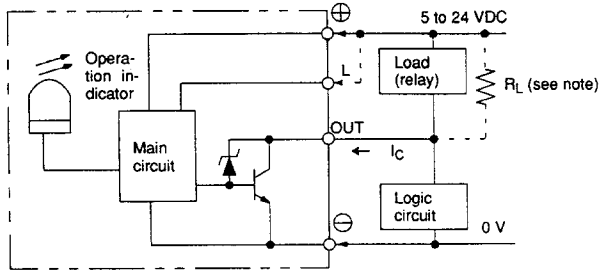


## Operation

### Output Circuit Diagrams

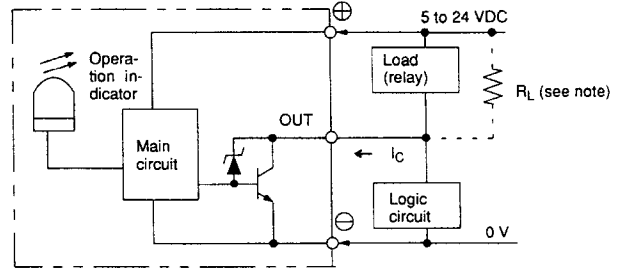
EE-SX670, -SX671, -SX672, -SX673

Light ON/OFF



EE-SX470, -SX471, -SX472, -SX473

Light ON



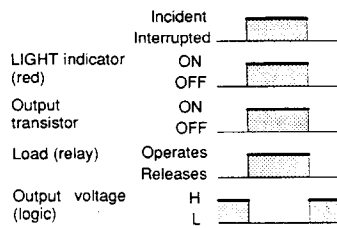
Note: Connect  $R_L$  only when a logic circuit is driven.

### Timing Chart

EE-SX670, -SX671, -SX672, -SX673

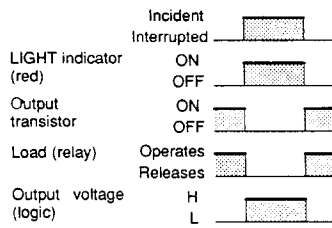
Light ON

(When terminals L and ⊕ are short-circuited)



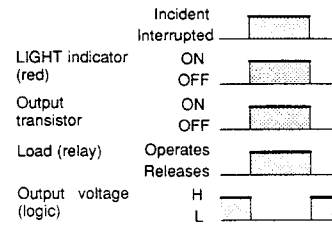
Light OFF

(When terminals L and ⊕ are open)



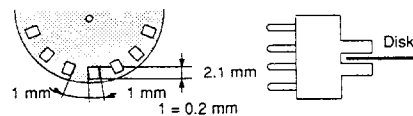
EE-SX470, -SX471, -SX472, -SX473

Light ON



### Rotating Disk for Measuring Response Frequency

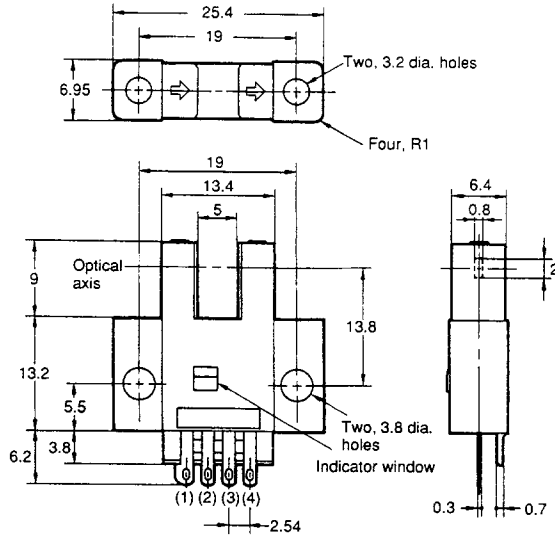
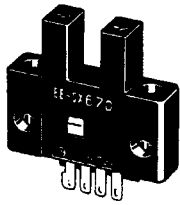
EE-SX670/SX470



# Dimensions

Note: All units are in millimeters unless otherwise indicated.

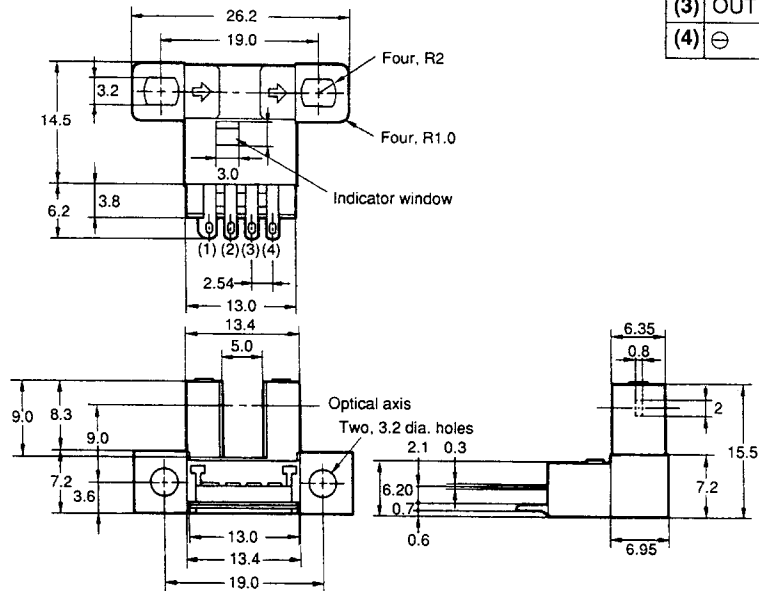
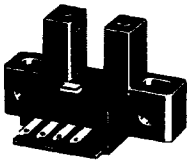
EE-SX670  
EE-SX470



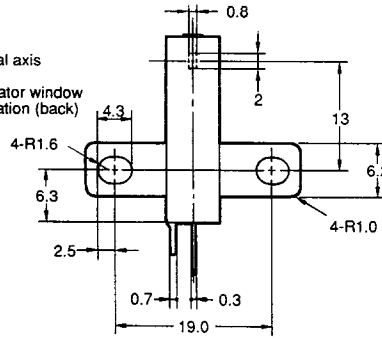
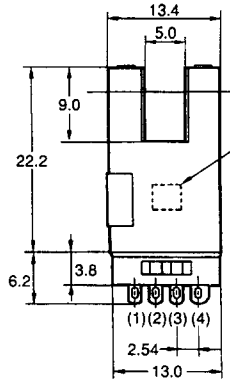
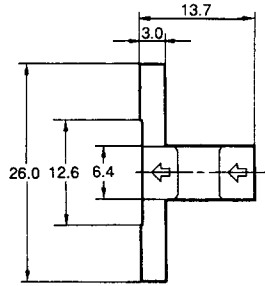
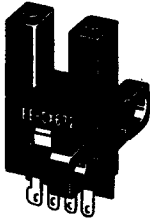
**Terminal Arrangement**

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

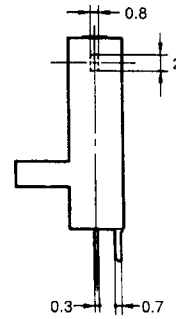
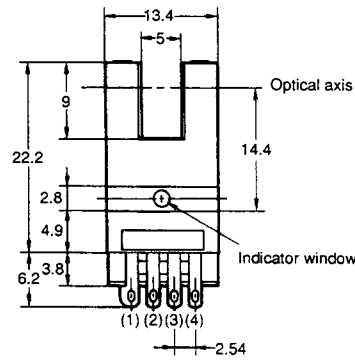
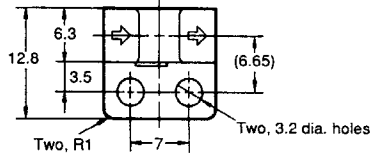
EE-SX671  
EE-SX471



EE-SX672  
EE-SX472



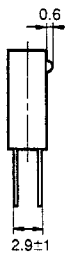
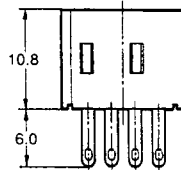
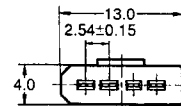
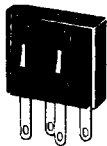
EE-SX673  
EE-SX473



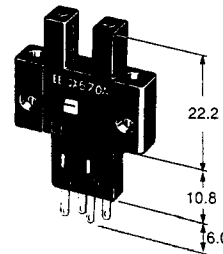
Terminal Arrangement

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

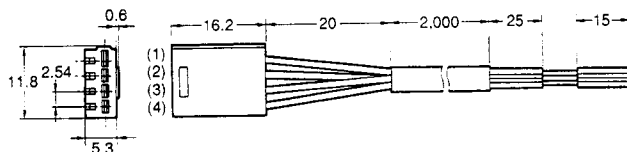
EE-1001 Connector



EE-SX67□ + EE-1001



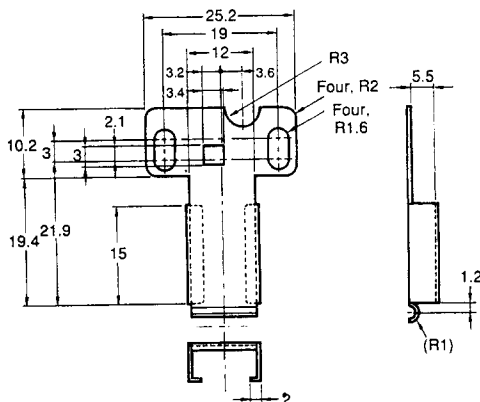
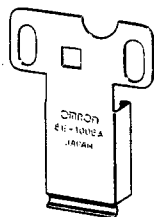
EE-1006 Connector with Cable



Terminal Arrangement

(1)	Red	⊕	VCC
(2)	Yellow	L	L
(3)	White	OUT	OUT PUT
(4)	Black	⊖	GND (0 V)

EE-1006A Connector Holder



Precautions

Refer to pages 16 to 19 for general precautions.

The sensing window is made of a polycarbonate resin which withstands chloride solvents and strong acids, but which is, however, soluble in strong alkali, aromatic hydrocarbons, and aliphatic hydrocarbonate chloride solvents.

The casing material uses a PBT resin which withstands chemicals and oil, but which is, however, soluble in strong acid or alkali solvents.

The temperature of the terminals at the time of soldering must not exceed the following:

Item	Temperature	Permissible time	Remarks
Dip	260°C	10 sec	The portion between the base of the terminals and the position 1.5 mm from the terminal base must not be soldered.
Iron	350°C	3 sec	

The terminal base uses a polycarbonate resin, which could be deformed by excessive soldering heat.

**ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.**  
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.