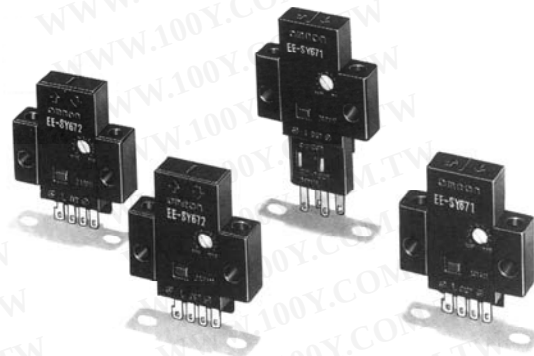


Photomicrosensor

EE-SY671/672

Reflective Photomicrosensor with Sensitivity Adjuster

- Easy adjustment with a built-in sensitivity adjuster.
- Model with a Sensor mounted on the top or side of the body.
- Light-OFF and Light-ON switchable (Light-ON when the L terminal and the positive terminal are short-circuited).
- Easy optical axis monitoring with an light indicator.
- Compact photomicrosensor with a built-in amplifier and special IC makes it possible to directly switch currents up to 100 mA.
- Wide operating voltage range (5 to 24 VDC) makes smooth connection possible with a TTLs, relays, and programmable controllers (PC).



Ordering Information

Appearance	Sensing method	Sensing distance	Output configuration	Model	Weight
Horizontal type 	Reflective type	1 to 5 mm (white paper with reflection factor of 90%)	Light-ON/OFF Switchable-type (see note 1)	EE-SY671	Approx. 3.5 g
Vertical type 				EE-SY672	Approx. 3.5 g

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

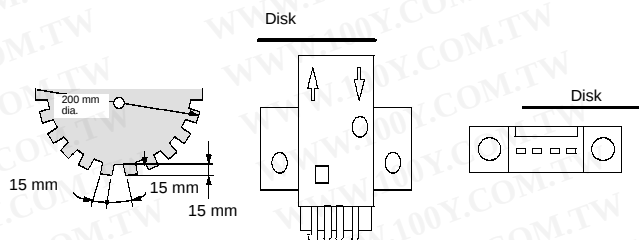
Specifications

■ Ratings

Item	EE-SY671/EE-SY672
Supply voltage	5 to 24 VDC $\pm 10\%$, ripple (p-p): 10% max.
Current consumption	40 mA max.
Sensing distance	1 to 5 mm (white paper with reflection factor of 90%, $15 \times 15 \text{ mm}^2$)
Standard reference object	Transparent, opaque
Differential distance	0.5 mm (with a sensing distance of 3 mm, horizontally)
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.
Indicator (see note 1)	Light indicator (red)
Response frequency (see note 2)	50 Hz max. (the response frequency of 0 to 50 Hz are the guaranteed values, the average value is 500 Hz.)
Connecting method	Dedicated connectors: EE-1009/1010/1010-1/1006 (A)/1001 Connectors; direct soldering.
Light source	GaAs infrared LED (pulse lighting) with a peak wavelength of 940 nm
Receiver	Si photo-transistor with a sensing wavelength of 850 nm max.

- Note:** 1. The indicator is a GaP red LED (peak emission wavelength: 690 nm).
2. The response frequency was measured by detecting the following rotating disks.

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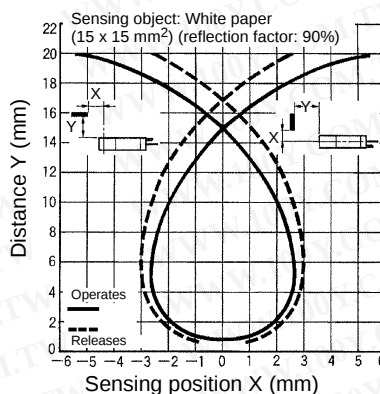
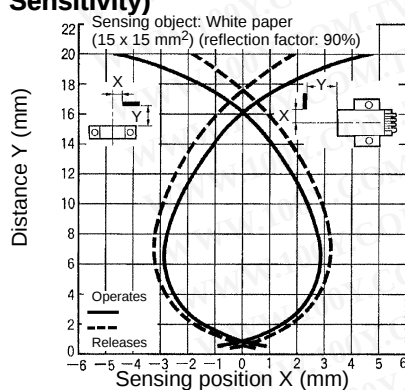
■ Characteristics

Ambient illumination (see note)		Fluorescent light: 1,500 lx max.
Enclosure ratings		IEC IP50
Cable length		10 m max.
Ambient temperature		Operating: -25° to 55°C Storage: -30° to 80°C
Ambient humidity		Operating: 5% to 85% Storage: 5% to 95%
Material	Case	Polybutylene phthalate (PBT)
	Emitter/receiver	Polycarbonate (PC)
Vibration resistance		Destruction: 20 to 2,000 Hz (peak acceleration 100 m/s ² (10G), 1.5-mm double amplitude for 2 hrs (4 min periods) each in X, Y, and Z directions.
Shock resistance		Destruction: 500 m/s ² (50G) for 3 times each in X, Y, and Z directions
Soldering heat resistance		260 ± 5 °C from the base of the terminal to a point 1.5 mm away. 10 ± 1 s permeation.

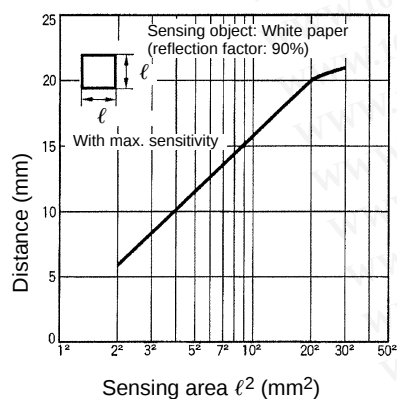
Note: The ambient illuminance is measured on the surface of the receiver.

Engineering Data

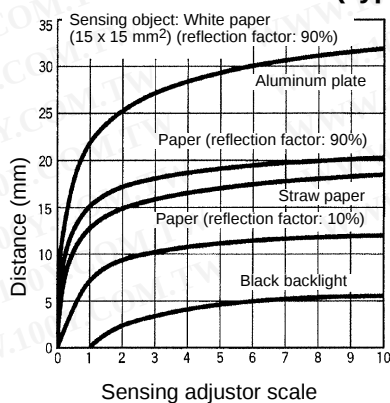
Operating Range (Typical, Max. Sensitivity)



Sensing Distance vs. Object Area (Typical)



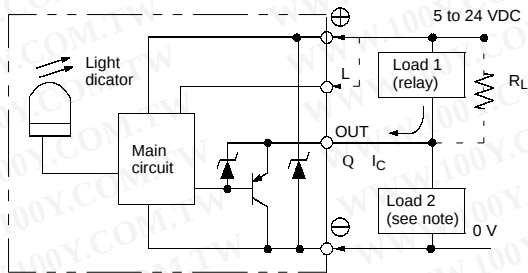
Sensing Distance vs. Sensitivity Volume Characteristics (Typical)



Operation

Output Circuit Diagrams

Light ON/OFF

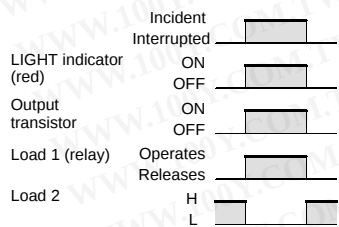


Note: When using on voltage output, always insert a resistor in RL and use load 2.

Timing Chart

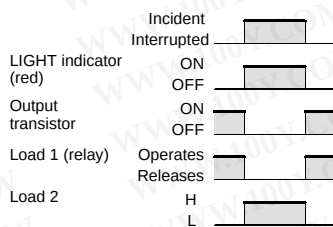
Light ON

(When terminals L and ⊕ are short-circuited)



Light OFF

(When terminals L and ⊕ are open)

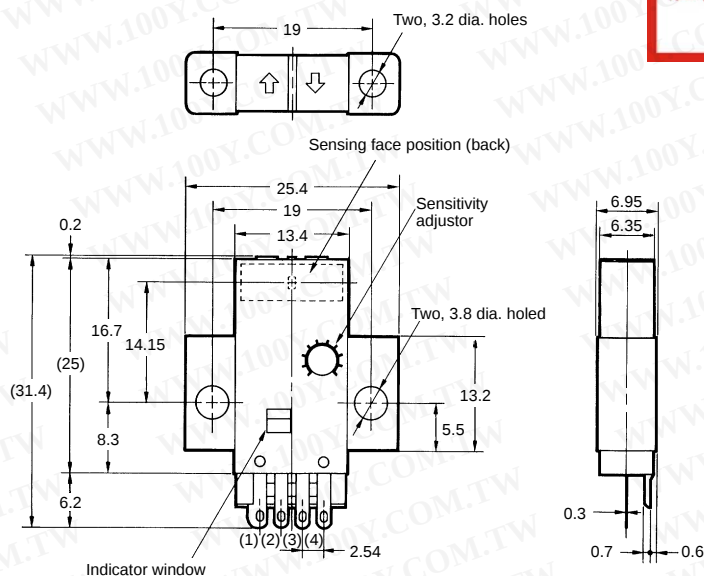


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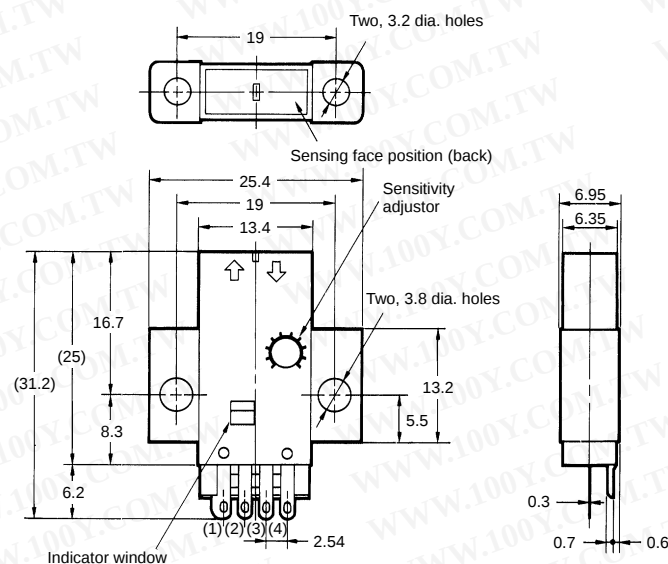
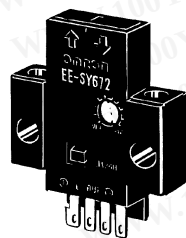
Dimensions

Note: All units are in millimeters unless otherwise indicated.

EE-SY671



EE-SY672



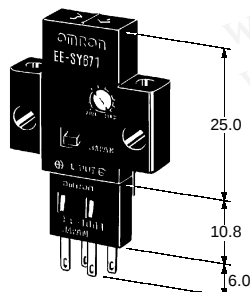
Terminal Arrangement

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

Applicable Connectors

EE-1009/1010/1001-01/1006(A)/1001. Refer to page 70 for details.

EE-SY67 j + EE-1001



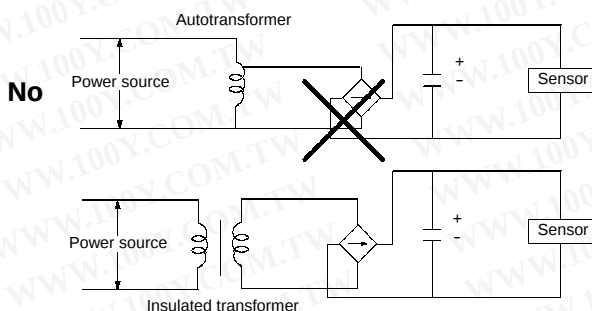
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Sensitivity Adjustment

Use the special screwdriver (sold together) for sensitivity adjustment.

The sensitivity adjuster can be turned clockwise and counterclockwise endlessly. This means when the sensitivity of the photomicrosensor is at the maximum, turning the adjuster further clockwise will abruptly drop the sensitivity to the minimum. For this reason, use due caution when using the photomicrosensor at its maximum sensitivity.

The shaft of the sensitivity adjuster is charged. Connect a DC power supply incorporating an insulated transformer to the photomicrosensor. Do not connect a DC power supply incorporating an autotransformer or the user may receive an electric shock when adjusting the sensitivity.



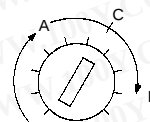
Sensitivity Adjustment with Background Object

1. Set the sensitivity of the photomicrosensor to minimum, place the sensing object in the sensing position, turn the sensitivity adjuster clockwise slowly until the light indicator is lit (point A).
2. Remove the sensing object, at which time the light indicator will be OFF. Further turn the sensitivity adjuster clockwise slowly until the light indicator is lit again (point B). The operation indicator will not light again if the background object does not reflect light, in which case refer to "Sensitivity Adjustment with No Background Object".

3. Set the sensitivity adjuster at the center (point C) between points A and B. Points A and B will be very close if the sensor is influenced by excessive light reflected by the background object, in which case take the following preventive measures.

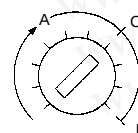
- Separate the sensor and the background object by a distance of 20 mm min.
- Cover the surface of the background object with a material with a small reflection factor, such as a black sponge.

4. After setting the sensitivity adjuster to point C, check if the light indicator is lit on placing the sensing object at the sensing position and not lit on removing the sensing object.



Sensitivity Adjustment with No Background Object

1. Set the sensitivity of the photomicrosensor to minimum, place the sensing object at the sensing position, turn the sensitivity adjuster clockwise slowly until the light indicator is lit (point A).
2. Set the sensitivity adjuster at the center (point C) between points A and B (the point where the sensitivity is maximum).
3. After setting the sensitivity adjuster to point C, check if the light indicator is not lit on removing the sensing object.



Precautions

Refer to page NO TAG, *Precautions* in *Technical Information*, for general precautions.

When direct soldering to the terminal, use the following guidelines.

Soldering Conditions

	Temperature	Permissible time	Remarks
Soldering iron	350°C max.	3 sec 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.

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