

## Photomicrosensor with light modulation for reduced external light interference.

- Easy adjustment and optical axis monitoring with a light indicator.
- Wide operating voltage range: 5 to 24 VDC
- Supports connection with Programmable Controllers (PLCs).
- Easy-to-wire connectors assure easy maintenance.



Be sure to read *Safety Precautions* on page 3.

For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

## Ordering Information

### Sensors

Infrared light

Appearance	Sensing method	Sensing distance			Output type	Output configuration	Model
	Retroreflective type	<div style="border: 1px solid pink; width: 100px; height: 15px; margin: 0 auto;"></div> 200 mm			NPN output	Dark-ON	<b>EE-SPZ301-A</b>
		Light-ON	<b>EE-SPZ401-A</b>				

### Accessories (Order Separately)

Type	Cable length	Model	Remarks
Connector		<b>EE-1002</b>	
Connector with Cable	1 m	<b>EE-1003</b>	
NPN/PNP Conversion Connector	0.46 m (total length)	<b>EE-2001</b>	
Connector Hold-down Clip		<b>EE-1003A</b>	For EE-1003 only.
Reflector		<b>E39-R1</b>	

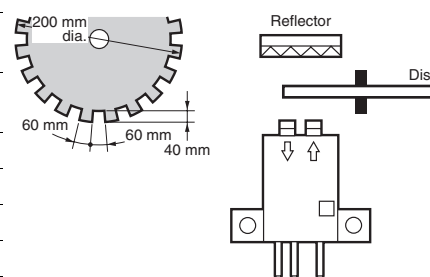
\* Refer to *Accessories* for details.

\* Refer to the *E39-L/E39-S/E39-R Datasheet* for information on Reflectors.

## Ratings and Specifications

Item	Models	EE-SPZ301-A, EE-SPZ401-A
Sensing distance *1		200 mm (using E39-R1 reflector)
Light source		GaAs infrared LED (pulse lighting) with a peak wavelength of 940 nm
Indicator *2		Light indicator (red)
Supply voltage		5 to 24 VDC $\pm 10\%$ , ripple (p-p): 5% max.
Current consumption		Average: 15 mA max., Peak: 50 mA max.
Control output		NPN voltage output Load power supply voltage: 5 to 24 VDC Load current: 80 mA max. OFF current: 0.5 mA max. 80 mA load current with a residual voltage of 1.0 V max. 10 mA load current with a residual voltage of 0.4 V max.
Response frequency *3		100 Hz min.
Ambient illumination		3,000 lx max. with incandescent light or sunlight on the surface of the receiver
Ambient temperature range		Operating: $-10$ to $+55^{\circ}\text{C}$ Storage: $-25$ to $+65^{\circ}\text{C}$
Ambient humidity range		Operating: 5% to 85% Storage: 5% to 95%
Vibration resistance		Destruction: 10 to 55 Hz, 1.5-mm double amplitude for 2 h 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
Degree of protection		IEC IP50
Connecting method		Special connector (soldering not possible)
Weight (packaged)		Approx. 3 g
Material	Case	Polycarbonate
	Lens	

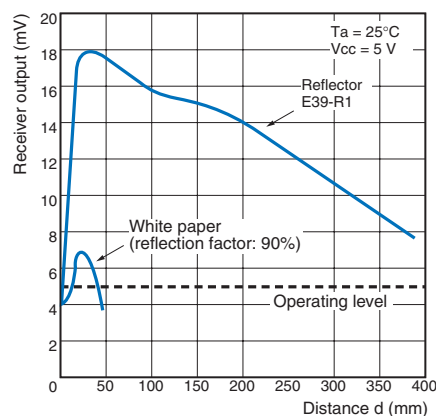
\*1. Operation may not be possible near the sensor.  
 \*2. The indicator is a GaP red LED (peak wavelength: 700 nm).  
 \*3. The response frequency was measured by detecting the following rotating disk.



## Engineering Data (Reference Value)

### Receiver Output Excess Gain vs. Sensing Distance Characteristics

EE-SPZ301-A } + E39-R1 Reflector  
 EE-SPZ401-A }



I/O Circuits

NPN Output

Model	Output configuration	Timing charts	Output circuit
EE-SPZ401-A	Light-ON	Incident Interrupted Light indicator (red) ON OFF Output transistor ON OFF Load 1 (relay) Operates Releases Load 2 H L	<p>* Voltage output (when the sensor is connected to a transistor circuit)</p>
EE-SPZ301-A	Dark-ON	Incident Interrupted Light indicator (red) ON OFF Output transistor ON OFF Load 1 (relay) Operates Releases Load 2 H L	

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.

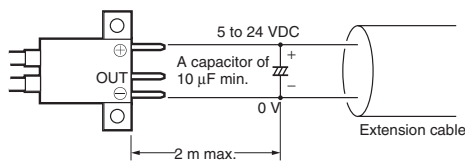


**Precautions for Correct Use**

Make sure that this product is used within the rated ambient environment conditions.

● **Wiring**

- Connection is made using a connector. Do not solder to the pins (leads).
- When extending the cable, use an extension cable with conductors having a total cross-section area of 0.3 mm<sup>2</sup>. The total cable length must be 2 m maximum.
- To use a cable length longer than 2 m, attach a capacitor with a capacitance of approximately 10 μF to the wires as shown below. The distance between the terminal and the capacitor must be within 2 m. (Use a capacitor with a dielectric strength that is at least twice the Sensor's power supply voltage.)



- Make sure the total length of the power cable connected to the product is less than 10 m even if a capacitor is inserted.

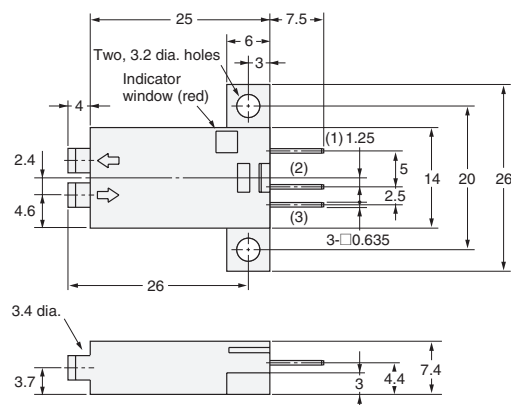
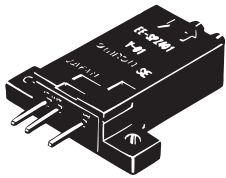
(Unit: mm)

## Dimensions

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

## Sensors

EE-SPZ301-A  
EE-SPZ401-A



### Terminal Arrangement

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

\* Refer to *Accessories* for details.

\* Refer to the *E39-L/E39-S/E39-R Datasheet* for information on Reflectors.

## Read and Understand This Catalog

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

## Warranty and Limitations of Liability

### WARRANTY

OMRON's exclusive warranty is that the products are free from defects in materials and workmanship for a period of one year (or other period if specified) from date of sale by OMRON.

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- Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this catalog.
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- Systems, machines, and equipment that could present a risk to life or property.

Please know and observe all prohibitions of use applicable to the products.

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### PROGRAMMABLE PRODUCTS

OMRON shall not be responsible for the user's programming of a programmable product, or any consequence thereof.

## Disclaimers

### CHANGE IN SPECIFICATIONS

Product specifications and accessories may be changed at any time based on improvements and other reasons.

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### DIMENSIONS AND WEIGHTS

Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.

### PERFORMANCE DATA

Performance data given in this catalog 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 users must correlate it to actual application requirements. Actual performance is subject to the OMRON Warranty and Limitations of Liability.

### ERRORS AND OMISSIONS

The information in this document has been carefully checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical, or proofreading errors, or omissions.

2012.8

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

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Industrial Automation Company

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