

# EE-SPX-W

## Photomicrosensor with built-in amplifier and attached cable reduces external light interference.

- Light modulation effectively reduces external light interference.
- Wide operation voltage range: 5 to 24 VDC
- Easy operation monitoring with bright light indicator.



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

## Ordering Information

 Infrared light

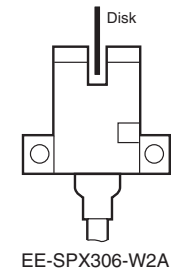
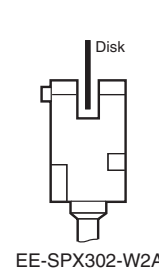
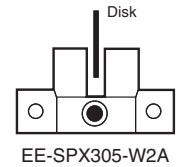
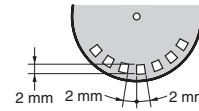
Appearance	Sensing method	Sensing distance (slot width)		Output type	Output configuration	Cable length	Model
	Through-beam type		3.6 mm	NPN output	Dark-ON	1 m	EE-SPX302-W2A 1M
					Light-ON		EE-SPX402-W2A 1M
			3.6 mm		Dark-ON		EE-SPX304-W2A 1M
					Light-ON		EE-SPX404-W2A 1M
			3.6 mm		Dark-ON		EE-SPX306-W2A 1M
					Light-ON		EE-SPX406-W2A 1M
			5 mm		Dark-ON		EE-SPX305-W2A 1M*
					Light-ON		EE-SPX405-W2A 1M*

\* These models (EE-SPX305/405-W2A only) are not conformed to CE standards.

Ratings and Specifications

Item	Models	EE-SPX302-W2A, EE-SPX402-W2A EE-SPX304-W2A, EE-SPX404-W2A EE-SPX306-W2A, EE-SPX406-W2A	EE-SPX305-W2A EE-SPX405-W2A
Sensing distance		3.6 mm (slot width)	5 mm (slot width)
Sensing object		Opaque: 1 × 0.5 mm min.	Opaque: 2 × 0.8 mm min.
Differential distance		0.05 mm max.	
Light source		GaAs infrared LED (pulse lighting) with a peak wavelength of 940 nm	
Indicator *1		Light indicator (red)	
Supply voltage		5 to 24 VDC ±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 *2		500 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°C Storage: -25 to +65°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		Pre-wired (standard cable length: 1 m)	
Weight		18.5 g	
Material	Case	Polycarbonate	
	Holder		

\*1. The indicator is a GaP red LED (peak wavelength: 700 nm).  
\*2. The response frequency was measured by detecting the following rotating disk.



I/O Circuit Diagrams

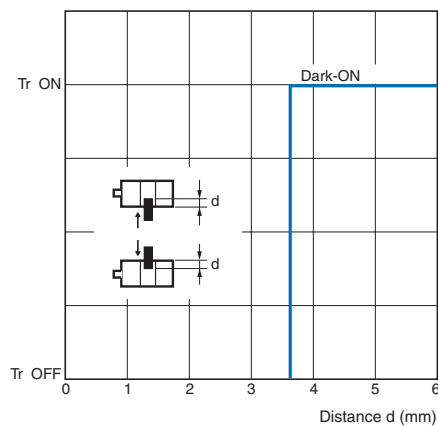
NPN Output

Model	Output configuration	Timing charts	Output circuit
EE-SPX402-W2A EE-SPX404-W2A EE-SPX405-W2A EE-SPX406-W2A	Light-ON	<p>Incident Interrupted</p> <p>Light indicator (red) ON OFF</p> <p>Output transistor ON OFF</p> <p>Load 1 (relay) Operates Releases</p> <p>Load 2 H L</p>	<p>* Voltage output (when the sensor is connected to a transistor circuit)</p>
EE-SPX302-W2A EE-SPX304-W2A EE-SPX305-W2A EE-SPX306-W2A	Dark-ON	<p>Incident Interrupted</p> <p>Light indicator (red) ON OFF</p> <p>Output transistor ON OFF</p> <p>Load 1 (relay) Operates Releases</p> <p>Load 2 H L</p>	

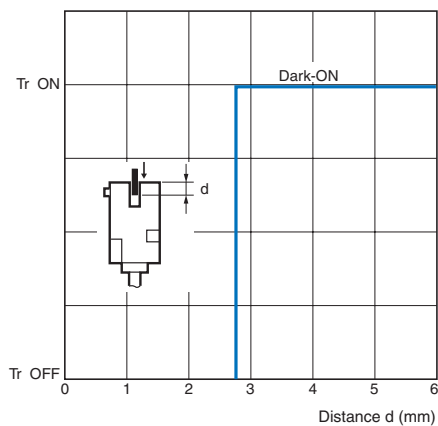
## Engineering Data (Typical)

### Sensing Position Characteristics

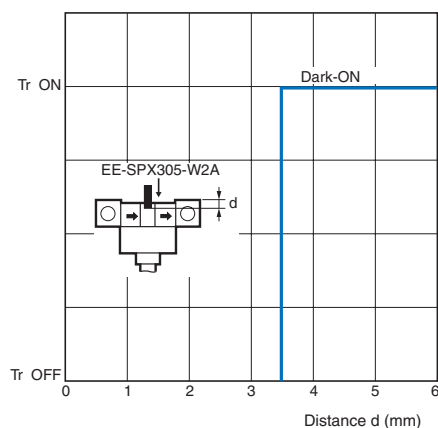
EE-SPX302-W2A  
EE-SPX304-W2A  
EE-SPX306-W2A



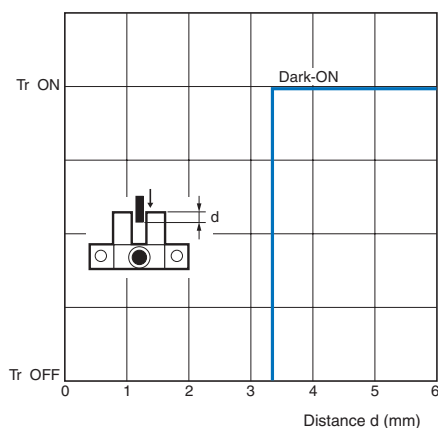
EE-SPX302-W2A  
EE-SPX304-W2A  
EE-SPX306-W2A



EE-SPX305-W2A



EE-SPX305-W2A



## 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.

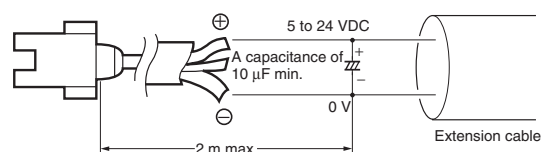


### Precautions for Correct Use

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

#### ● Wiring

- 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.

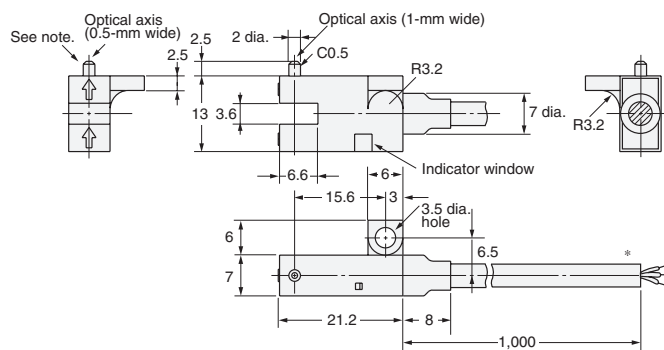
### EE-SPX302-W2A EE-SPX402-W2A



\* Vinyl-insulated round cable of 3.5 dia., 3 cores, (0.14 mm<sup>2</sup> with 1.0-dia. insulator); Standard length: 1 m

Note: The lug is used to prevent turning and to indicate the optical axis. When installing, make a fixed hole of 2.1 to 2.3 mm dia.

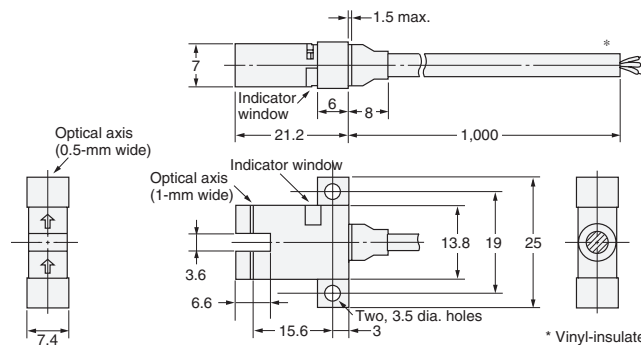
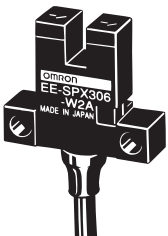
### EE-SPX304-W2A EE-SPX404-W2A



\* Vinyl-insulated round cable of 3.5 dia., 3 cores, (0.14 mm<sup>2</sup> with 1.0-dia. insulator); Standard length: 1 m

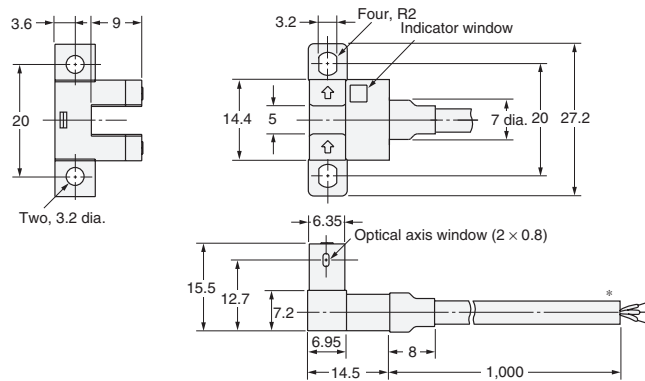
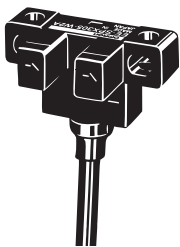
Note: The lug is used to prevent turning and to indicate the optical axis. When installing, make a fixed hole of 2.1 to 2.3 mm dia.

### EE-SPX306-W2A EE-SPX406-W2A



\* Vinyl-insulated round cable of 3.5 dia., 3 cores, (0.14 mm<sup>2</sup> with 1.0-dia. insulator); Standard length: 1 m

### EE-SPX305-W2A EE-SPX405-W2A



\* Vinyl-insulated round cable of 3.5 dia., 3 cores, (0.14 mm<sup>2</sup> with 1.0-dia. insulator); Standard length: 1 m

## Read and Understand This Catalog

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The following are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible uses of the products, nor is it intended to imply that the uses listed may be suitable for the products:

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- Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
- 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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### DIMENSIONS AND WEIGHTS

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

### PERFORMANCE DATA

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### ERRORS AND OMISSIONS

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