

# 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

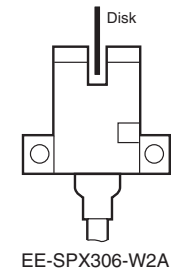
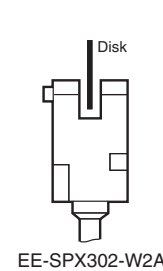
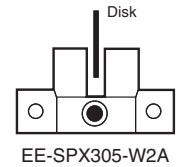
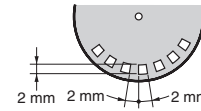
| Appearance   | Sensing method    | Sensing distance (slot width)   |        | Output type | Output configuration | Cable length | Model             |
|--|-------------------|---|--------|-------------|----------------------|--------------|-------------------|
|  | Through-beam type |   | 3.6 mm | NPN 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<br>EE-SPX304-W2A, EE-SPX404-W2A<br>EE-SPX306-W2A, EE-SPX406-W2A  | EE-SPX305-W2A<br>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:<br>Load power supply voltage: 5 to 24 VDC<br>Load current: 80 mA max.<br>OFF current: 0.5 mA max.<br>80 mA load current with a residual voltage of 1.0 V max.<br>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<br>Storage: -25 to +65°C  |                                |
| Ambient humidity range    |        | Operating: 5% to 85%<br>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

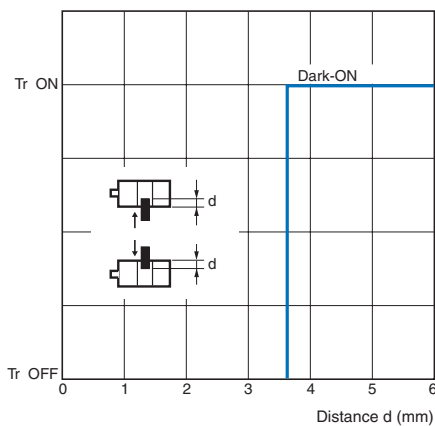
NPN Output

| Model  | Output configuration | Timing charts | Output circuit   |
|--|----------------------|---------------|--|
| EE-SPX402-W2A<br>EE-SPX404-W2A<br>EE-SPX405-W2A<br>EE-SPX406-W2A | Light-ON             |               | <p>* Voltage output (when the sensor is connected to a transistor circuit)</p> |
| EE-SPX302-W2A<br>EE-SPX304-W2A<br>EE-SPX305-W2A<br>EE-SPX306-W2A | Dark-ON              |               |  |

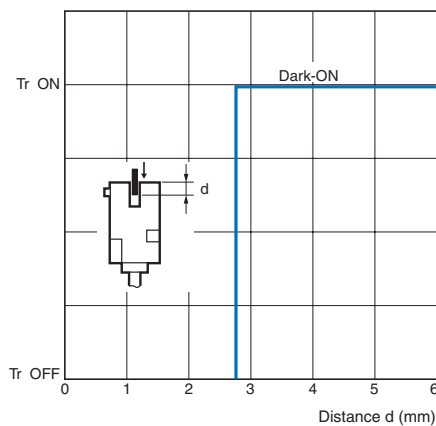
## Engineering Data (Typical)

### Sensing Position Characteristics

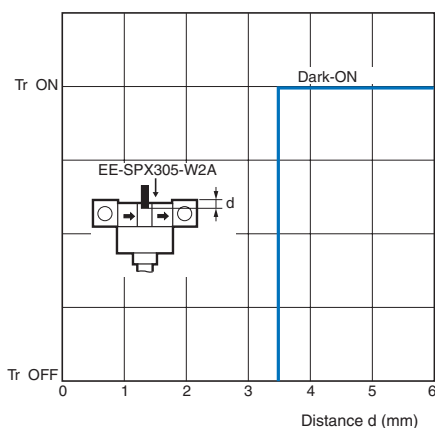
EE-SPX302-W2A  
EE-SPX304-W2A  
EE-SPX306-W2A



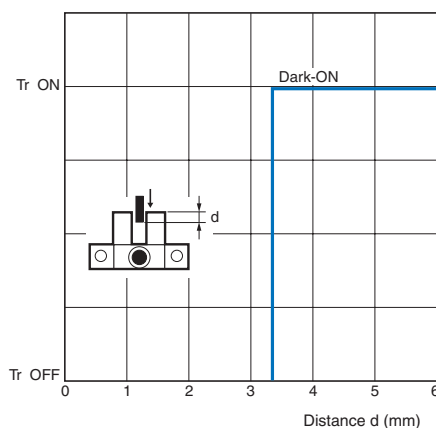
EE-SPX302-W2A  
EE-SPX304-W2A  
EE-SPX306-W2A



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.

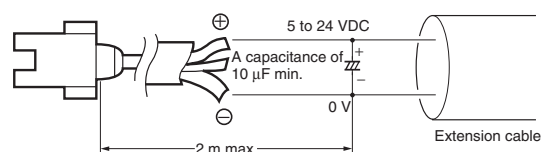


### Precautions for Correct Use

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.

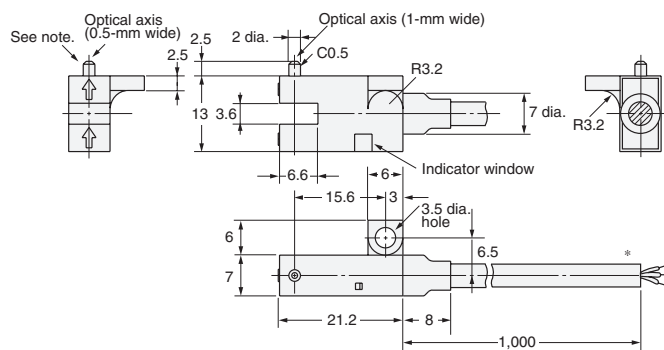
### EE-SPX302-W2A EE-SPX402-W2A



\* 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.

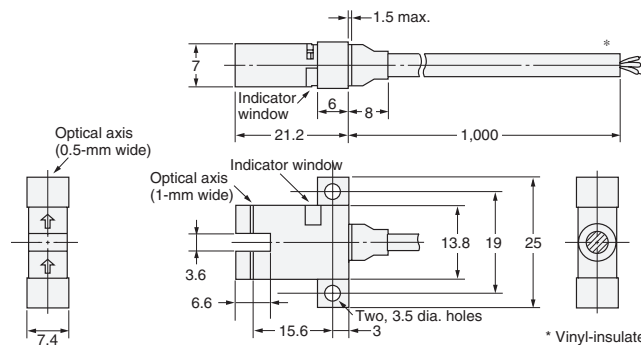
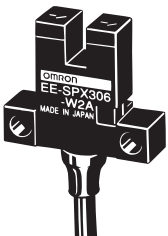
### EE-SPX304-W2A EE-SPX404-W2A



\* 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

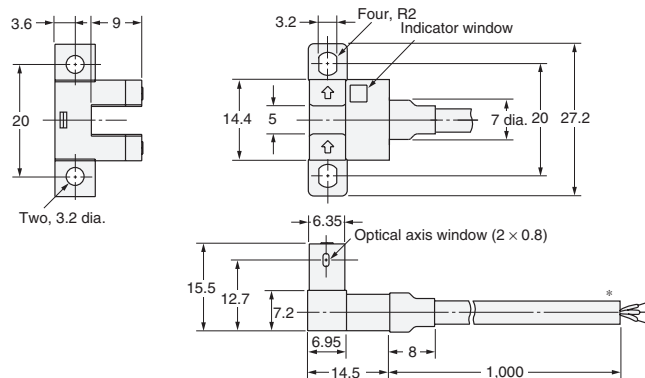
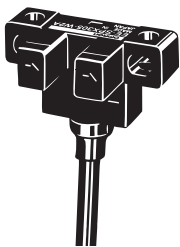
Note: The lug is used to prevent turning and to indicate the optical axis.  
When installing, make a fixed hole of 2.1 to 2.3 mm dia.

### 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

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

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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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### 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

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### ERRORS AND OMISSIONS

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2010.8

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

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