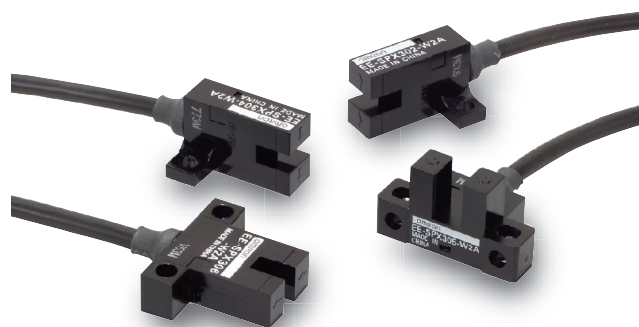



# Slot-type Photomicrosensor with Cable EE-SPX-W

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

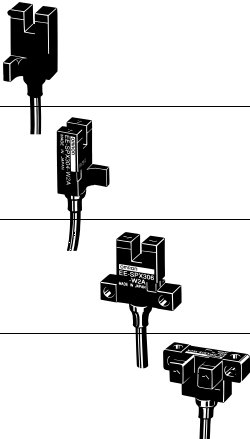




- Light modulation effectively reduces external light interference.
- Wide operation voltage range: 5 to 24 VDC
- Easy operation monitoring with bright light indicator.



 Refer to *Precautions* on page 49.

## Ordering Information

 Infrared light

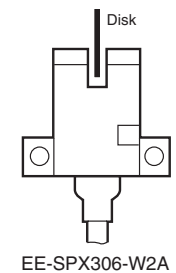
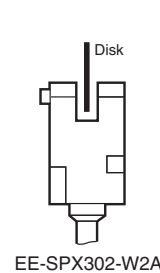
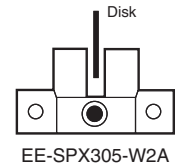
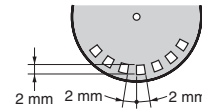
| Appearance   | Sensing method    | Sensing distance (slot width)   |        | Output type | Output configuration | Cable length | Model                        |
|--|-------------------|---|--------|-------------|----------------------|--------------|------------------------------|
|  | Through-beam type |  | 3.6 mm | NPN output  | Dark-ON              | 1 m          | EE-SPX302-W2A                |
|  |                   |   | 3.6 mm |             | Light-ON             |              | EE-SPX402-W2A                |
|  |                   |  | 3.6 mm |             | Dark-ON              |              | EE-SPX304-W2A                |
|  |                   |   | 3.6 mm |             | Light-ON             |              | EE-SPX404-W2A                |
|  |                   |  | 3.6 mm |             | Dark-ON              |              | EE-SPX306-W2A                |
|  |                   |   | 3.6 mm |             | Light-ON             |              | EE-SPX406-W2A                |
|  |                   |  | 5.0 mm |             | Dark-ON              |              | EE-SPX305-W2A<br>(See note.) |
|  |                   |   | 5.0 mm |             | Light-ON             |              | EE-SPX405-W2A<br>(See note.) |

**Note:** The EE-SPX305-W2A/SPX405-W2A are not CE certified due to their internal structures. All other Photomicrosensors are CE certified.

## Ratings/Characteristics

| 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>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   |        | Operating: -10 to +55°C<br>Storage: -25 to +65°C  |                                |
| Ambient humidity      |        | 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  |                                |
| Enclosure rating      |        | 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 emission wavelength: 700 nm).
- \* 2. The response frequency was measured by detecting the following rotating disk.



## I/O Circuits

### NPN Output

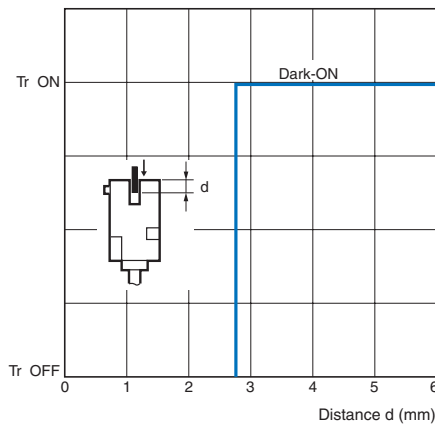
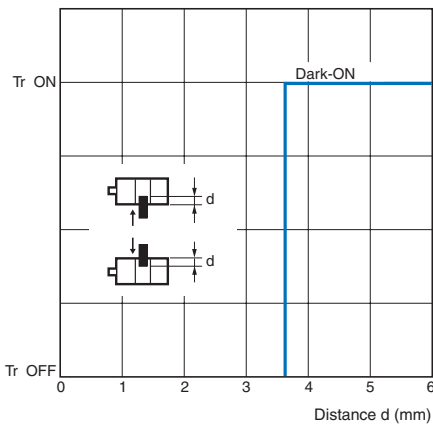
| Model  | Output configuration | Timing charts   | Output circuit   |
|--|----------------------|---|--|
| EE-SPX402-W2A<br>EE-SPX404-W2A<br>EE-SPX405-W2A<br>EE-SPX406-W2A | Light-ON             | <p>Incident Interrupted</p> <p>Light indicator (red) ON OFF</p> <p>Output transistor ON OFF</p> <p>Load 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<br>EE-SPX304-W2A<br>EE-SPX305-W2A<br>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

### Sensing Position Characteristics (Typical)

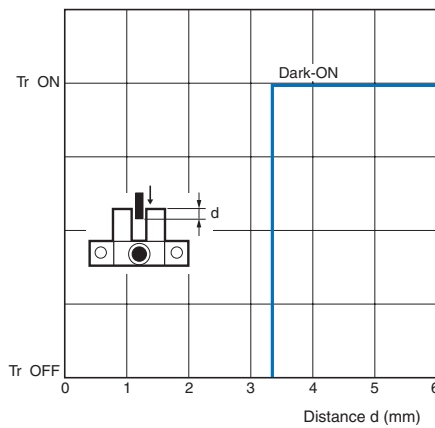
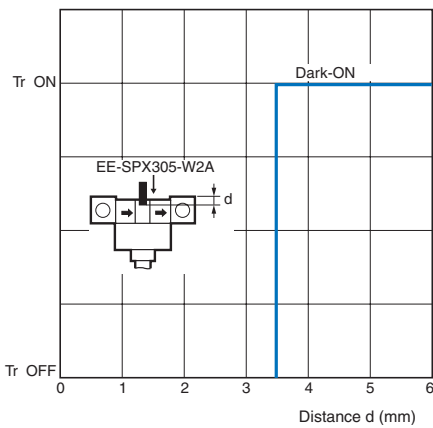
EE-SPX302-W2A  
 EE-SPX304-W2A  
 EE-SPX306-W2A

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



EE-SPX305-W2A

EE-SPX305-W2A



## Precautions

Refer to *General Precautions* on page 23 to 28 for general precautions.

### Warning

**Do not use this product in sensing devices designed to provide human safety.**

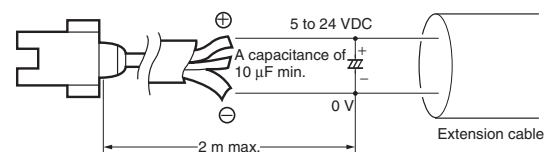


### Precautions for Correct Use

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

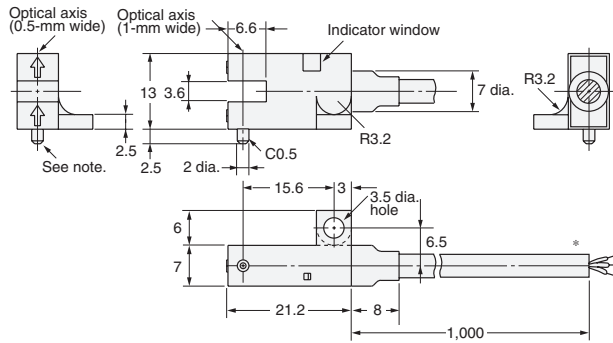
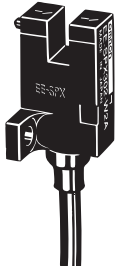
#### Wiring

- 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.)



Dimensions (Unit: mm)

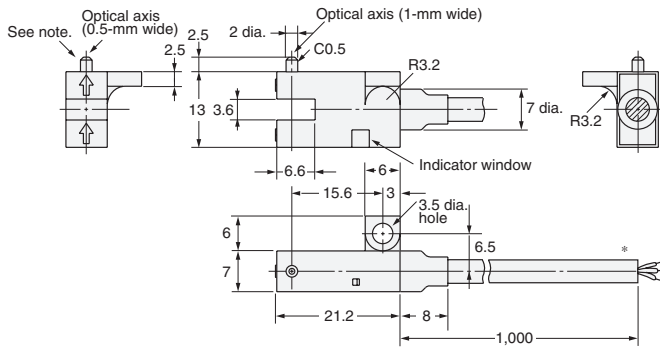
EE-SPX302-W2A  
EE-SPX402-W2A



\* 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.

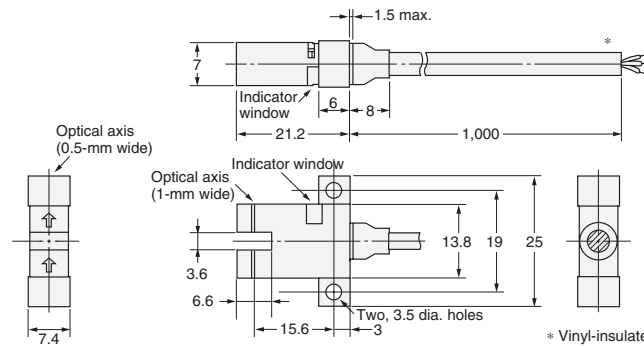
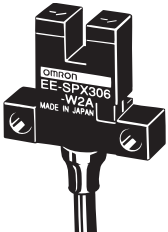
EE-SPX304-W2A  
EE-SPX404-W2A



\* 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

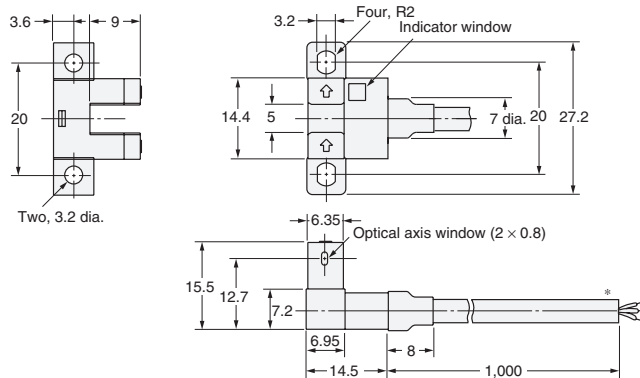
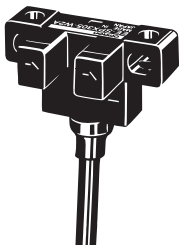
Note: The lug is used to prevent turning and to indicate the optical axis.  
When installing, make a fixed hole of 2.1 to 2.3 mm dia.

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

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[T55](#) [HOA0870-T51](#)