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## A Wide Slot Width of 13 mm and Superior Resistance to Light Interference and Noise.



- Noise resistance equivalent to photomicrosensors with built-in amplifiers.
- Resistance to common noise at least 30 times that of previous models.
- Resistance to inverter noise at least 10 times that of previous models.
- Reverse polarity protection built in.



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

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

## Ordering Information

### Sensors

Infrared light

| Appearance | Sensing method                | Sensing distance (slot width) |  | Output type | Output configuration | Model      |
|------------|-------------------------------|-------------------------------|--|-------------|----------------------|------------|
|            | Through-beam type (with slot) |                               |  | NPN output  | Dark-ON              | EE-SPX303N |
|            |                               |                               |  |             | Light-ON             | EE-SPX403N |

### Accessories (Order Separately)

| Type                         | Cable length          | Model          |
|------------------------------|-----------------------|----------------|
| Connector                    |                       | EE-1001        |
|                              |                       | EE-1009 *      |
| Connector with Cable         | 1 m                   | EE-1006 1M     |
|                              |                       | EE-1010 1M *   |
|                              | 2 m                   | EE-1006 2M     |
|                              |                       | EE-1010 2M *   |
| Connector with Robot Cable   | 1 m                   | EE-1010-R 1M * |
|                              | 2 m                   | EE-1010-R 2M * |
| NPN/PNP Conversion Connector | 0.46 m (total length) | EE-2002        |

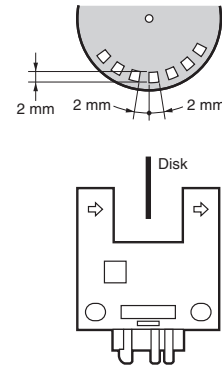
Note: Refer to *Accessories* for details.

\* EE-1009- or EE-1010-series Connectors have a builtin locking mechanism to prevent cable disconnection when only the cable is pulled. To remove the Connector from the Sensor, grip the top and bottom of the Connector firmly and push into the Sensor once before pulling out. The locking mechanism prevents the Connector from being removed by pulling on the cable only and enables removal only when the Connector (housing) is pulled.

## Ratings and Specifications

| Item                      | Models | EE-SPX303N, EE-SPX403N   |
|---------------------------|--------|--|
| Sensing distance          |        | 13 mm (slot width)   |
| Sensing object            |        | Opaque: 2.2 × 0.5 mm min.  |
| Differential distance     |        | 0.05 mm max.   |
| Light source              |        | Infrared LED (pulse lighting) with a peak wavelength of 940 nm   |
| Indicator                 |        | Light indicator (red)  |
| Supply voltage            |        | 12 to 24 VDC ±10%, ripple (p-p): 5% max.   |
| Current consumption       |        | 15 mA max.   |
| Control output            |        | NPN voltage output:<br>Load power supply voltage: 12 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 2.0 V max.<br>10 mA load current with a residual voltage of 1.0 V max. |
| Protection circuits       |        | Power supply reverse polarity protection,<br>Output reverse polarity protection  |
| Response frequency *      |        | 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°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         |        | Special connector (soldering not possible)   |
| Weight                    |        | Approx. 4 g  |
| Material                  |        | Polycarbonate  |

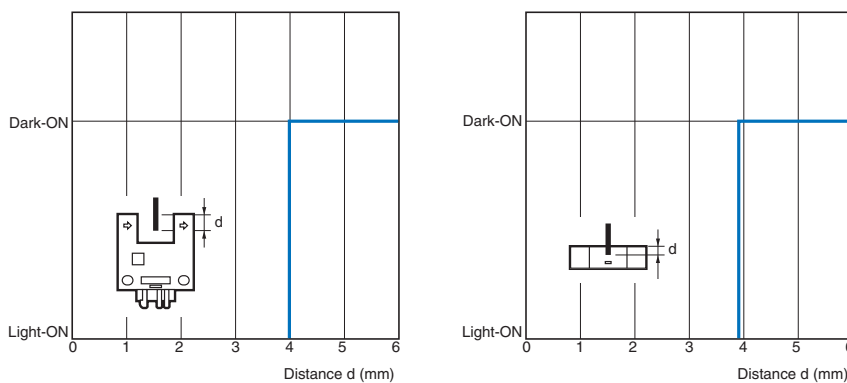
\* The response frequency was measured by detecting the following rotating disk.



## Engineering Data (Reference Value)

### Sensing Position Characteristics

#### EE-SPX303N



## I/O Circuit Diagrams

### NPN Output

| Model      | Output configuration | Timing charts | Output circuit |
|------------|----------------------|---------------|----------------|
| EE-SPX403N | Light-ON             |               |                |
| EE-SPX303N | Dark-ON              |               |                |

## 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.

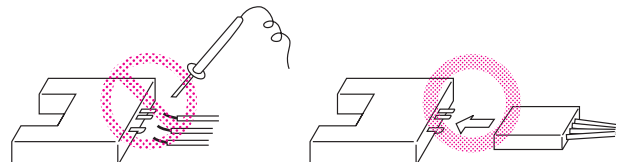


### Precautions for Correct Use

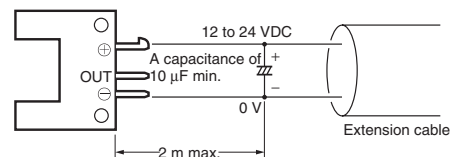
Make sure that this product is used within the rated ambient environment conditions.

#### ● Wiring

- Connection is made using a connector. Do not solder to the pins (leads). The pins (leads) are soldered to the internal board of the Sensor. Therefore, direct soldering of the pins (leads) may result in an internal disconnection causing malfunction.



- 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.



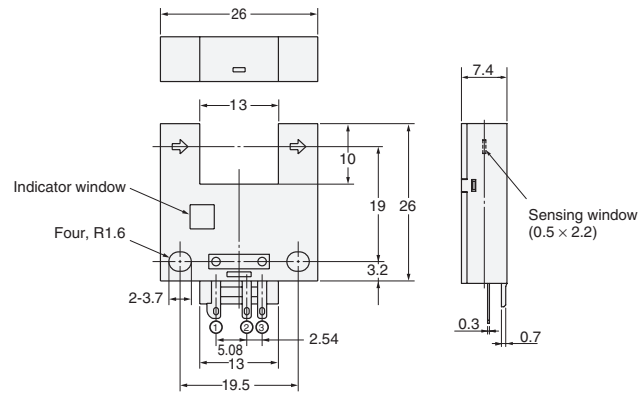
(Unit: mm)

## Dimensions

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

## Sensors

### EE-SPX303N, EE-SPX403N



#### Terminal Arrangement

|     |     |           |
|-----|-----|-----------|
| (1) | +   | Vcc       |
| (2) | OUT | OUTPUT    |
| (3) | -   | GND (0 V) |

## Accessories (Order Separately)

\* Refer to *Accessories* for details.

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