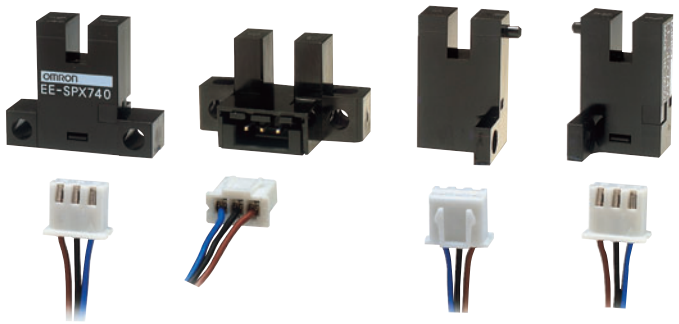
Slot-type Photomicrosensor with Connector (Modulated)

# EE-SPX74/84

CSM_EE-SPX74_84_DS_E_4_1

## Photomicrosensor with light modulation for reduced external light interference and a connector for easy maintenance.




- Built-in connectors
- Select from four easy-to-use shapes for efficient space utilization.
- Connectors with locks for safety against vibration.
- Convenient mounting method using M3 screws.
- Wide operating voltage range: 5 to 24 VDC

CE

⚠ Be sure to read *Safety Precautions* on page 4.

## Ordering Information

### Sensors

Infrared light

| Appearance | Sensing method | Sensing distance | Output type | Output configuration | Model |
|---|---|---|---|---|---|
| | Through-beam type (with slot) | 3.6 mm (slot width) | NPN output | Dark-ON | **EE-SPX740** |
| | | | | Light-ON | **EE-SPX840** |
| | | | | Dark-ON | **EE-SPX742** |
| | | | | Light-ON | **EE-SPX842** |
| | | | | Dark-ON | **EE-SPX743** |
| | | | | Light-ON | **EE-SPX843** |
| | | 5 mm (slot width) | | Dark-ON | **EE-SPX741** |
| | | | | Light-ON | **EE-SPX841** |

### Accessories (Order Separately)

#### Connector with Cable

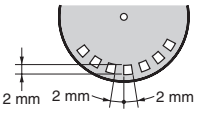
| Type | Cable length | Model |
|---|---|---|
| Connector | 1 m | **EE-1013** |

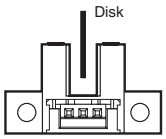
* Refer to *Accessories* for details.

## Ratings and Specifications

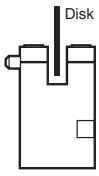
| Item \ Models | | EE-SPX740, EE-SPX840<br>EE-SPX742, EE-SPX842<br>EE-SPX743, EE-SPX843 | EE-SPX741<br>EE-SPX841 |
|---|---|---|---|
| **Sensing distance** | | 3.6 mm (slot width) | 5 mm (slot width) |
| **Sensing object** | | Opaque: 1 × 0.5mm min. | Opaque: 2 × 0.8 mm min. |
| **Differential distance** | | 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: 50 mA max.<br>OFF current: 0.5 mA max.<br>50 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$^2$ for 3 times each in X, Y, and Z directions | |
| **Degree of protection** | | IEC IP50 | |
| **Connecting method** | | Special connector | |
| **Weight** | | Approx. 2.4 g | |
| **Material** | **Case** | Polycarbonate | |
| | **Holder** | | |

*1. The indicator is a GaAlAs red LED (peak wavelength: 660 nm).
*2. The response frequency was measured by detecting the following rotating disk.

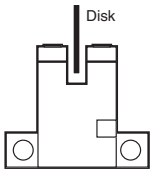



EE-SPX741/841




EE-SPX742/842
EE-SPX743/843

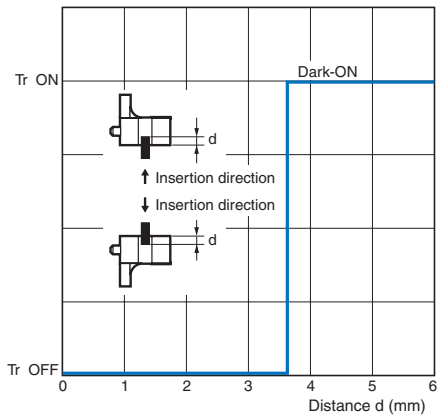


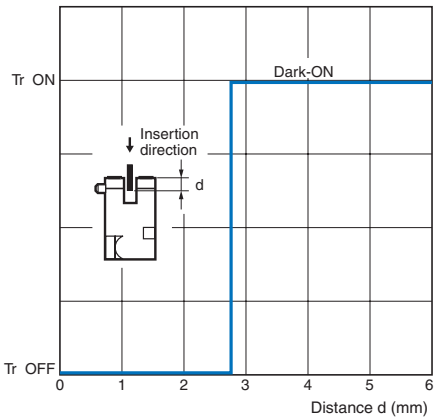

EE-SPX740/840

# Engineering Data (Typical)

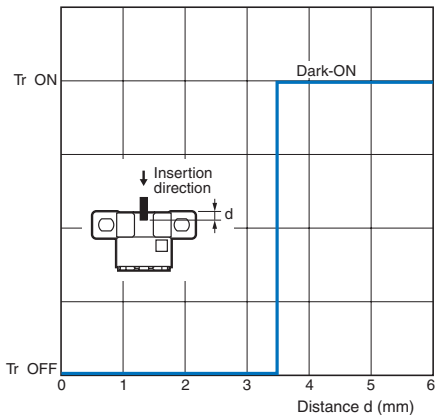
## Sensing Position Characteristics

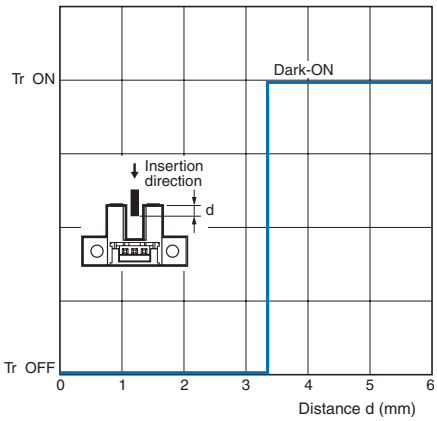
### EE-SPX740/742/743



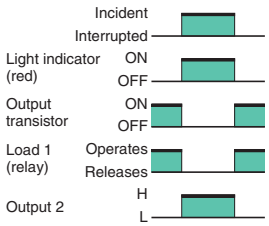
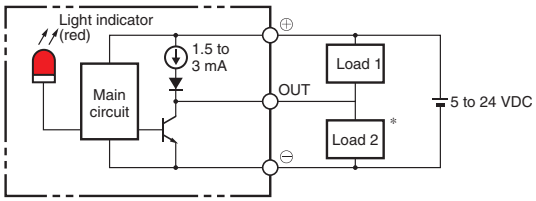
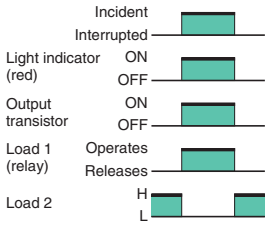

### EE-SPX741



## I/O Circuit Diagrams

### NPN Output

| Model | Output configuration | Timing charts | Output circuit |
|---|---|---|---|
| EE-SPX740<br>EE-SPX741<br>EE-SPX742<br>EE-SPX743 | Dark-ON |  |  |
| EE-SPX840<br>EE-SPX841<br>EE-SPX842<br>EE-SPX843 | Light-ON |  | |

* Voltage output (when the sensor is connected to a transistor circuit)

## 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.**

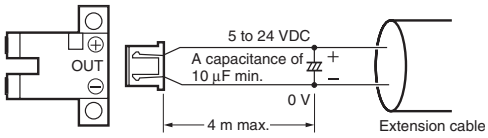
**Precautions for Correct Use**

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

### ● Design

#### Cable Extension

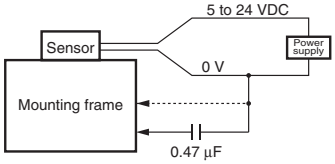
- When extending the cable, use an extension cable with conductors having a total cross-section area of 0.15 mm$^2$. The total cable length must be 4 m maximum.
- To use a cable length longer than 4 m, attach a capacitor with a capacitance of approximately 10 µF to the wires as shown below. The distance between the terminal and the capacitor must be within 4 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.

#### Effects of Inductive Noise

When there is inductive noise in the Sensor mounting frame (metal), the output of the Sensor may be affected. In this case, ensure that there is no electrical potential difference between the Sensor 0-V terminal and the Sensor mounting frame, or attach a 0.47 µF capacitor between the 0-V terminal and the frame.



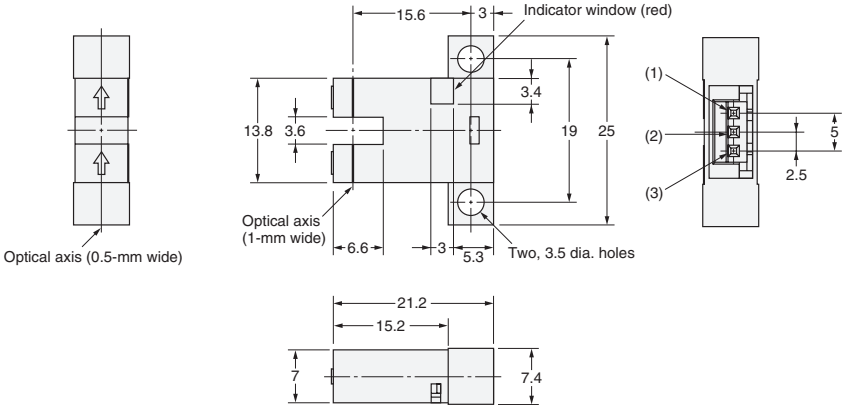
(Unit: mm)

## Dimensions

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

### Sensors

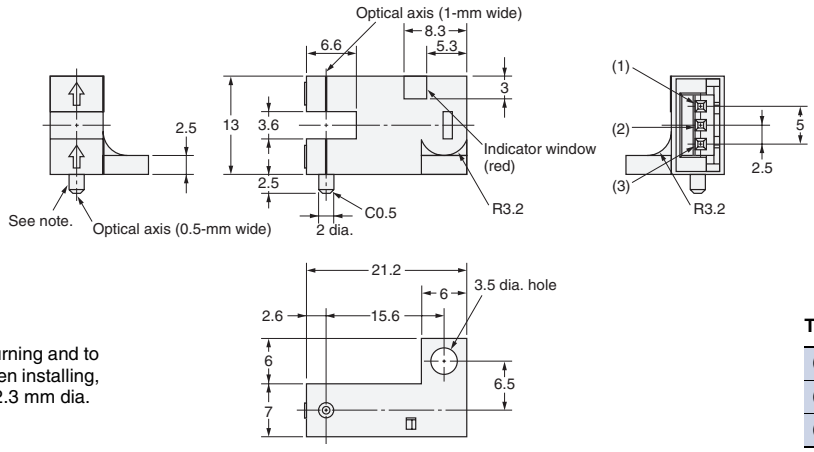
**EE-SPX740**
**EE-SPX840**




**Terminal Arrangement**

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

**EE-SPX742**
**EE-SPX842**

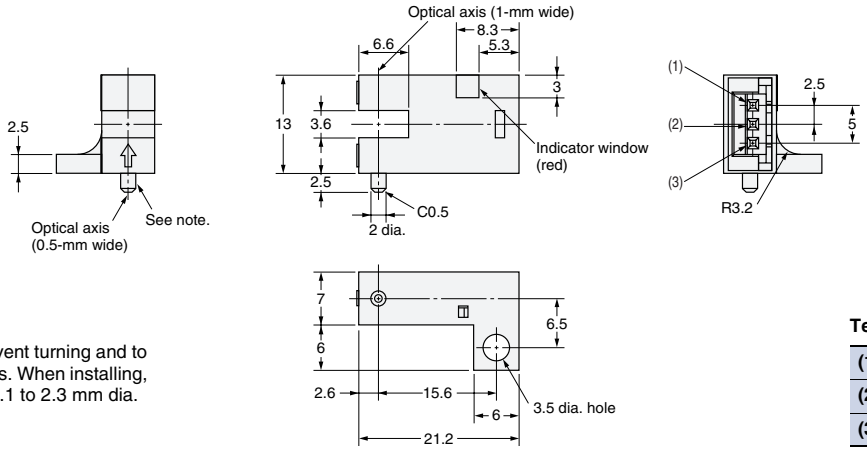



Note: The lug is used to prevent turning and to indicate the optical axis. When installing, make a fixed hole of 2.1 to 2.3 mm dia.

**Terminal Arrangement**

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

**EE-SPX743**
**EE-SPX843**

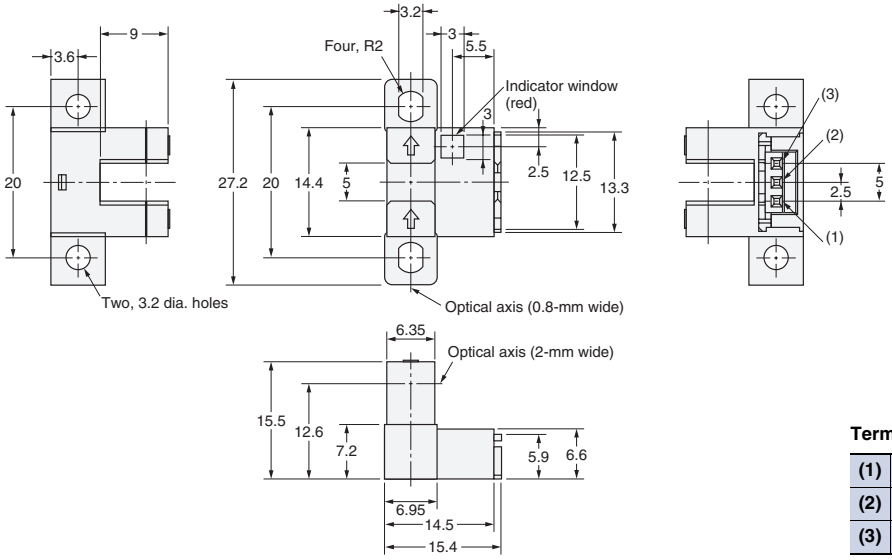



Note: The lug is used to prevent turning and to indicate the optical axis. When installing, make a fixed hole of 2.1 to 2.3 mm dia.

**Terminal Arrangement**

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

**EE-SPX741**
**EE-SPX841**

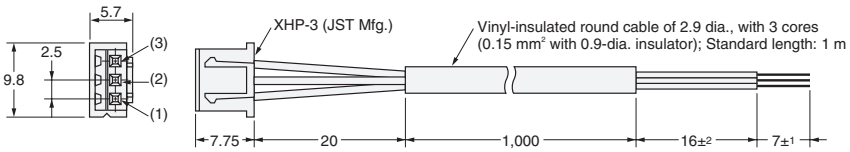



**Terminal Arrangement**

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

## Accessories (Connector with Cable)

**EE-1013**




**Terminal Arrangement**

| | | |
|---|---|---|
| **(1)** | **Blue** | GND (0 V) |
| **(2)** | **Black** | OUTPUT |
| **(3)** | **Brown** | Vcc |



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

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