

# EE-SX77/87

## Slim, Compact Photomicrosensor that is still easy to use.

- Compact, thin profile enables dense mounting.
- Indicator is visible from both sides.
- Wide operating voltage range: 5 to 24 VDC



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 4.

## Ordering Information

Pre-wired Models  Infrared light

| Appearance   | Sensing method                | Cable length   | Sensing distance         |                   | Output configuration | Indicator mode    | Model                    |                   |                   |              |              |
|--------------|-------------------------------|----------------|--------------------------|-------------------|----------------------|-------------------|--------------------------|-------------------|-------------------|--------------|--------------|
|              |                               |                |                          |                   |                      |                   | NPN output               | PNP output        |                   |              |              |
| Standard<br> | Through-beam type (with slot) | 2 m            | <input type="checkbox"/> | 5 mm (slot width) | Dark-ON              | Incident light    | EE-SX770 2M              | EE-SX770P 2M      |                   |              |              |
|              |                               |                |                          |                   |                      | No incident light | EE-SX770A 2M             | EE-SX770R 2M      |                   |              |              |
| Light-ON     |                               |                |                          |                   | Incident light       | EE-SX870 2M       | EE-SX870P 2M             |                   |                   |              |              |
|              |                               |                |                          |                   | No incident light    | EE-SX870A 2M      | EE-SX870R 2M             |                   |                   |              |              |
| L-shaped<br> |                               |                |                          |                   | Dark-ON              | Incident light    | <input type="checkbox"/> | 5 mm (slot width) | Incident light    | EE-SX771 2M  | EE-SX771P 2M |
|              |                               |                |                          |                   |                      |                   |                          |                   | No incident light | EE-SX771A 2M | EE-SX771R 2M |
| T-shaped<br> | Light-ON                      | Incident light | <input type="checkbox"/> | 5 mm (slot width) | Incident light       | EE-SX871 2M       | EE-SX871P 2M             |                   |                   |              |              |
|              |                               |                |                          |                   | No incident light    | EE-SX871A 2M      | EE-SX871R 2M             |                   |                   |              |              |
| T-shaped<br> | Dark-ON                       | Incident light | <input type="checkbox"/> | 5 mm (slot width) | Incident light       | EE-SX772 2M       | EE-SX772P 2M             |                   |                   |              |              |
|              |                               |                |                          |                   | No incident light    | EE-SX772A 2M      | EE-SX772R 2M             |                   |                   |              |              |
| T-shaped<br> | Light-ON                      | Incident light | <input type="checkbox"/> | 5 mm (slot width) | Incident light       | EE-SX872 2M       | EE-SX872P 2M             |                   |                   |              |              |
|              |                               |                |                          |                   | No incident light    | EE-SX872A 2M      | EE-SX872R 2M             |                   |                   |              |              |

## Ratings and Specifications

| Item                             | Type       | Standard   | L-shaped                                   | T-shaped                                   |
|----------------------------------|------------|--|--|--|
|                                  |            | NPN models   | EE-SX770/EE-SX870<br>EE-SX770A/EE-SX870A   | EE-SX771/EE-SX871<br>EE-SX771A/EE-SX871A   |
|                                  | PNP models | EE-SX770P/EE-SX870P<br>EE-SX770R/EE-SX870R   | EE-SX771P/EE-SX871P<br>EE-SX771R/EE-SX871R | EE-SX772P/EE-SX872P<br>EE-SX772R/EE-SX872R |
| <b>Sensing distance</b>          |            | 5 mm (slot width)  |  |  |
| <b>Sensing object</b>            |            | Opaque: 2 × 0.8 mm min.  |  |  |
| <b>Differential distance</b>     |            | 0.025 mm   |  |  |
| <b>Light source</b>              |            | GaAs infrared LED with a peak wavelength of 940 nm   |  |  |
| <b>Indicator</b>                 |            | Light indicator (red) (turns ON when light is interrupted for models with A or R suffix)   |  |  |
| <b>Supply voltage</b>            |            | 5 to 24 VDC ±10%, ripple (p-p): 10% max.   |  |  |
| <b>Current consumption</b>       |            | 35 mA max. (NPN models), 30 mA max. (PNP models)   |  |  |
| <b>Control output</b>            |            | NPN open collector: 5 to 24 VDC, 100 mA max.<br>100 mA load current with a residual voltage of 0.8 V max.<br>40 mA load current with a residual voltage of 0.4 V max.<br>OFF current (leakage current): 0.5 mA max.<br>PNP open collector: 5 to 24 VDC, 50 mA max.<br>50 mA load current with a residual voltage of 1.3 V max.<br>OFF current (leakage current): 0.5 mA max. |  |  |
| <b>Response frequency *</b>      |            | 1 kHz min. (3 kHz average)   |  |  |
| <b>Ambient illumination</b>      |            | 1,000 lx max. with fluorescent light on the surface of the receiver  |  |  |
| <b>Ambient temperature range</b> |            | Operating: -25 to +55°C<br>Storage: -30 to +80°C (with no icing)   |  |  |
| <b>Ambient humidity range</b>    |            | Operating: 5% to 85%<br>Storage: 5% to 95% (with no condensation)  |  |  |
| <b>Vibration resistance</b>      |            | Destruction: 20 to 2,000 Hz (peak acceleration: 100 m/s <sup>2</sup> )<br>1.5-mm double amplitude for 2 h (4-min periods) each in X, Y, and Z directions   |  |  |
| <b>Shock resistance</b>          |            | Destruction: 500 m/s <sup>2</sup> for 3 times each in X, Y, and Z directions   |  |  |
| <b>Degree of protection</b>      |            | IEC60529 IP60  |  |  |
| <b>Connecting method</b>         |            | Pre-wired (standard cable length: 2 m)   |  |  |
| <b>Weight (packaged)</b>         |            | Approx. 20 g   |  |  |
| <b>Material</b>                  |            | Case: Polybutylene phthalate (PBT)   |  |  |

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



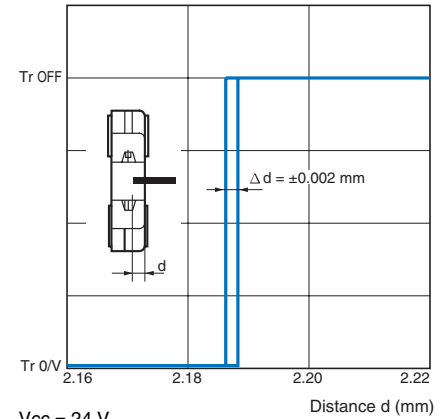
Engineering Data (Reference Value)

Sensing Position Characteristics

Sensing Position Characteristics

Repeated Sensing Position Characteristics

EE-SX770



Vcc = 24 V  
 No. of repetitions: 20, Ta = 25°C  
 Note: The data applies to dark status. Operation may be affected by external light interference or light coming through the sensing object.

I/O Circuit Diagrams

NPN Output

| Model                               | Output configuration | Timing charts  | Output circuit |
|-------------------------------------|----------------------|--|----------------|
| EE-SX770<br>EE-SX771<br>EE-SX772    | Dark-ON              | Incident Interrupted<br>Light indicator (red) ON OFF<br>Output transistor ON OFF<br>Load (e.g., relay) Operates Releases |                |
| EE-SX870<br>EE-SX871<br>EE-SX872    | Light-ON             | Incident Interrupted<br>Light indicator (red) ON OFF<br>Output transistor ON OFF<br>Load (e.g., relay) Operates Releases |                |
| EE-SX770A<br>EE-SX771A<br>EE-SX772A | Dark-ON              | Incident Interrupted<br>Light indicator (red) ON OFF<br>Output transistor ON OFF<br>Load (e.g., relay) Operates Releases |                |
| EE-SX870A<br>EE-SX871A<br>EE-SX872A | Light-ON             | Incident Interrupted<br>Light indicator (red) ON OFF<br>Output transistor ON OFF<br>Load (e.g., relay) Operates Releases |                |

PNP Output

| Model                               | Output configuration | Timing chart | Output circuit |
|-------------------------------------|----------------------|--------------|----------------|
| EE-SX770P<br>EE-SX771P<br>EE-SX772P | Dark-ON              |              |                |
| EE-SX870P<br>EE-SX871P<br>EE-SX872P | Light-ON             |              |                |
| EE-SX770R<br>EE-SX771R<br>EE-SX772R | Dark-ON              |              |                |
| EE-SX870R<br>EE-SX871R<br>EE-SX872R | Light-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.

## Dimensions

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

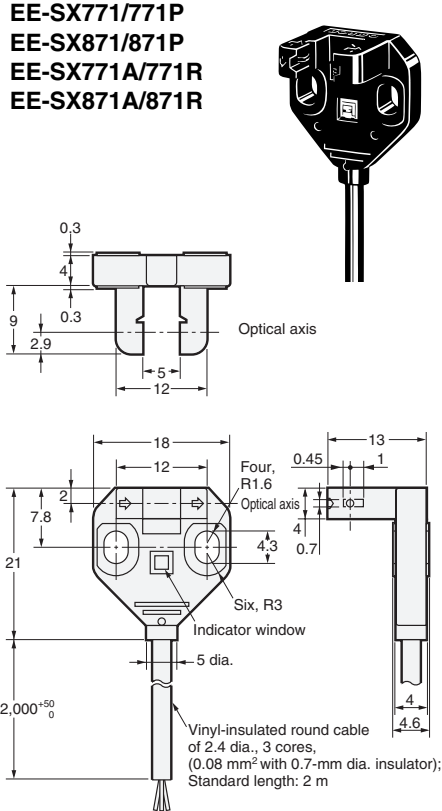
### Standard

EE-SX770/770P  
 EE-SX870/870P  
 EE-SX770A/770R  
 EE-SX870A/870R



### L-shaped

EE-SX771/771P  
 EE-SX871/871P  
 EE-SX771A/771R  
 EE-SX871A/871R



### T-shaped

EE-SX772/772P  
 EE-SX872/872P  
 EE-SX772A/772R  
 EE-SX872A/872R



## 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.

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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

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### ERRORS AND OMISSIONS

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