

# 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



CE







Be sure to read *Safety Precautions* on page 52.

## Ordering Information

### Pre-wired Models

 Infrared light

Appearance	Sensing method	Cable length	Sensing distance		Output configuration	Indicator mode	Model	
							NPN output*	PNP output
Standard 	Through-beam type (with slot)	2 m		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 					Dark-ON	Incident light	EE-SX771 2M	EE-SX771P 2M
						No incident light	EE-SX771A 2M	EE-SX771R 2M
						Light-ON	Incident light	EE-SX871 2M
No incident light							EE-SX871A 2M	EE-SX871R 2M
T-shaped 					Dark-ON	Incident light	EE-SX772 2M	EE-SX772P 2M
						No incident light	EE-SX772A 2M	EE-SX772R 2M
						Light-ON	Incident light	EE-SX872 2M
No incident light							EE-SX872A 2M	EE-SX872R 2M

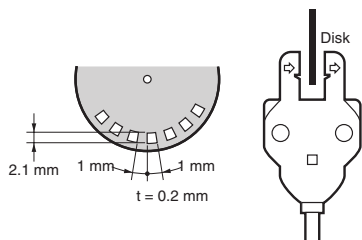
\* Models with NPN outputs are available with pre-wired e-CON connectors. Specify an NPN output by adding "-ECON" and the cable length (0.3 m or 2 m) to the end of the model number. (Example: EE-SX770-ECON 0.3M)

# EE-SX77/87

## Ratings and Specifications

Item	Type	Standard	L-shaped	T-shaped
	NPN models	EE-SX770/EE-SX870 EE-SX770A/EE-SX870A	EE-SX771/EE-SX871 EE-SX771A/EE-SX871A	EE-SX772/EE-SX872 EE-SX772A/EE-SX872A
	PNP models	EE-SX770P/EE-SX870P EE-SX770R/EE-SX870R	EE-SX771P/EE-SX871P EE-SX771R/EE-SX871R	EE-SX772P/EE-SX872P EE-SX772R/EE-SX872R
Sensing distance	5 mm (slot width)			
Sensing object	Opaque: 2 × 0.8 mm min.			
Differential distance	0.025 mm			
Light source	GaAs infrared LED with a peak wavelength of 940 nm			
Indicator	Light indicator (red) (turns ON when light is interrupted for models with A or R suffix)			
Supply voltage	5 to 24 VDC ±10%, ripple (p-p): 10% max.			
Current consumption	35 mA max. (NPN models), 30 mA max. (PNP models)			
Control output	NPN open collector: 5 to 24 VDC, 100 mA max. 100 mA load current with a residual voltage of 0.8 V max. 40 mA load current with a residual voltage of 0.4 V max. OFF current (leakage current): 0.5 mA max. PNP open collector: 5 to 24 VDC, 50 mA max. 50 mA load current with a residual voltage of 1.3 V max. OFF current (leakage current): 0.5 mA max.			
Response frequency *	1 kHz min. (3 kHz average)			
Ambient illumination	1,000 lx max. with fluorescent light on the surface of the receiver			
Ambient temperature range	Operating: -25 to +55°C Storage: -30 to +80°C (with no icing)			
Ambient humidity range	Operating: 5% to 85% Storage: 5% to 95% (with no condensation)			
Vibration resistance	Destruction: 20 to 2,000 Hz (peak acceleration: 100 m/s <sup>2</sup> ) 1.5-mm double amplitude for 2 h (4-min periods) 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	IEC60529 IP60			
Connecting method	Pre-wired (standard cable length: 2 m)			
Weight (packaged)	Approx. 20 g			
Material	Case: Polybutylene phthalate (PBT)			

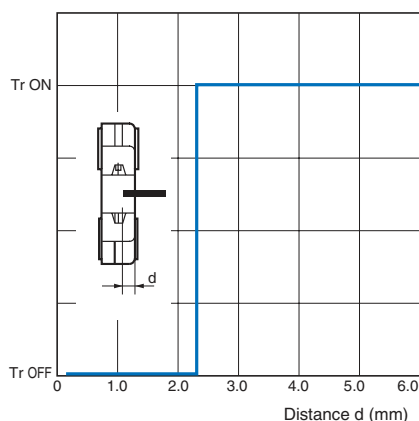
\* The response frequency was measured by detecting the following rotating disk.



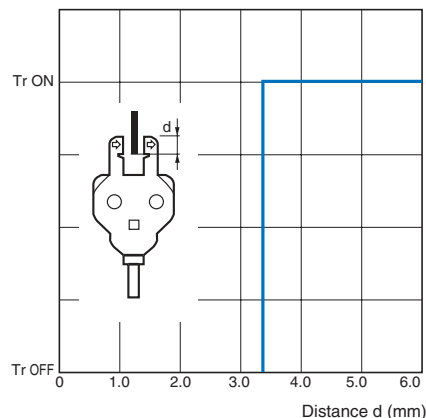
## Engineering Data (Typical)

## Sensing Position Characteristics

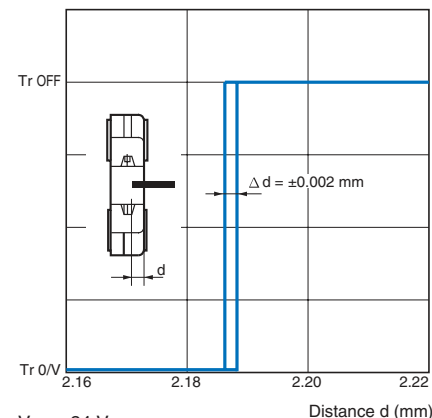
## EE-SX770



## Sensing Position Characteristics



## Repeated Sensing Position Characteristics



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 EE-SX771 EE-SX772	Dark-ON	Incident Interrupted Light indicator (red) ON OFF Output transistor ON OFF Load (e.g., relay) Operates Releases	
EE-SX870 EE-SX871 EE-SX872	Light-ON	Incident Interrupted Light indicator (red) ON OFF Output transistor ON OFF Load (e.g., relay) Operates Releases	
EE-SX770A EE-SX771A EE-SX772A	Dark-ON	Incident Interrupted Light indicator (red) ON OFF Output transistor ON OFF Load (e.g., relay) Operates Releases	
EE-SX870A EE-SX871A EE-SX872A	Light-ON	Incident Interrupted Light indicator (red) ON OFF Output transistor ON OFF Load (e.g., relay) Operates Releases	

PNP Output

Model	Output configuration	Timing chart	Output circuit
EE-SX770P EE-SX771P EE-SX772P	Dark-ON	<div>Incident Interrupted</div> <div>Light indicator (red) ON OFF</div> <div>Output transistor ON OFF</div> <div>Load (e.g., relay) Operates Releases</div>	
EE-SX870P EE-SX871P EE-SX872P	Light-ON	<div>Incident Interrupted</div> <div>Light indicator (red) ON OFF</div> <div>Output transistor ON OFF</div> <div>Load (e.g., relay) Operates Releases</div>	
EE-SX770R EE-SX771R EE-SX772R	Dark-ON	<div>Incident Interrupted</div> <div>Light indicator (red) ON OFF</div> <div>Output transistor ON OFF</div> <div>Load (e.g., relay) Operates Releases</div>	
EE-SX870R EE-SX871R EE-SX872R	Light-ON	<div>Incident Interrupted</div> <div>Light indicator (red) ON OFF</div> <div>Output transistor ON OFF</div> <div>Load (e.g., relay) Operates Releases</div>	

Applicable Connectors

Vinyl-insulated round cable of 4 dia., 4 cores, (0.2 mm<sup>2</sup> with 1.1-mm dia. insulator)

**E39-ECONM**

Note: The □ symbol is used to indicate the cable length. The cable length is 2 m or 5 m.

Vinyl-insulated round cable of 4 dia., 4 cores, (0.2 mm<sup>2</sup> with 1.1-mm dia. insulator)

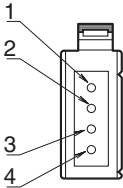
**E39-ECONW**

Note: The □ symbol is used to indicate the cable length. The cable length is 0.5 to 2 m in increments of 0.1 m.

Shield color	Pin No.	Use
Brown	(1)	Power supply (+V)
White	(2)	---
Blue	(3)	Power supply (0 V)
Black	(4)	Output

Note: Pin 2 is not used.

Pre-wired e-CON Connector  
Pin Arrangement



Note: Pin 2 is not used.

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**

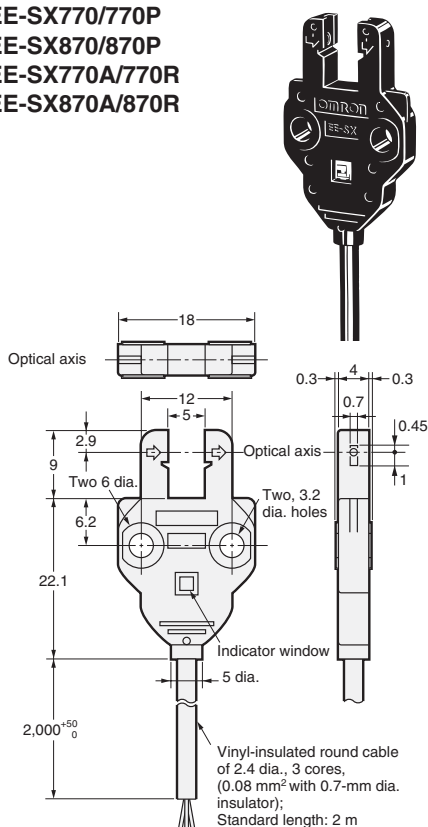
Make sure that this product is used within the rated ambient environment conditions.

## Dimensions

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

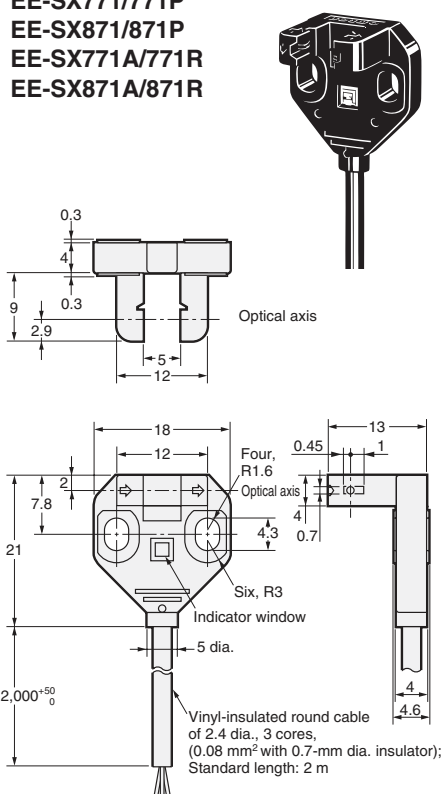
### Standard

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

