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

C E

⚠	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	EE-SX871P 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	EE-SX872P 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

	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**
Item	**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^2) 1.5-mm double amplitude for 2 h (4-min periods) 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		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.
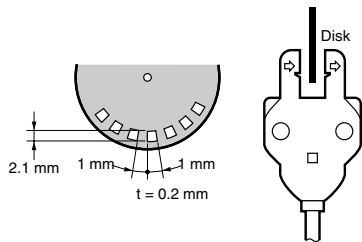
Engineering Data (Typical)

Sensing Position Characteristics	Sensing Position Characteristics	Repeated Sensing Position Characteristics

EE-SX770

Distance d (mm)

Distance d (mm)

Δd = ±0.002 mm

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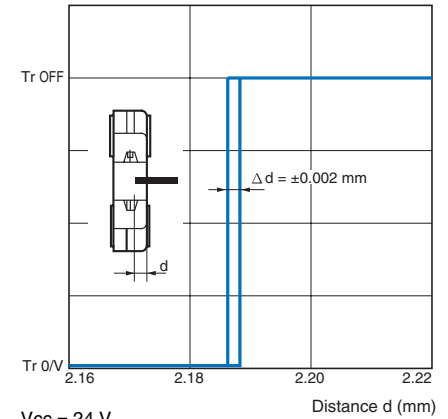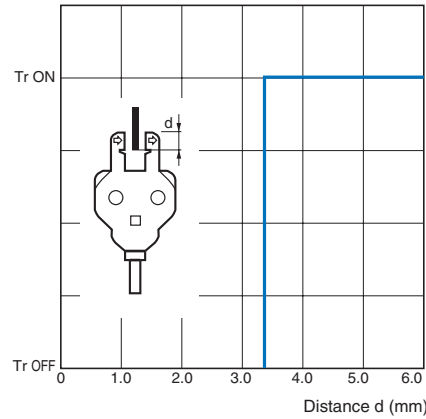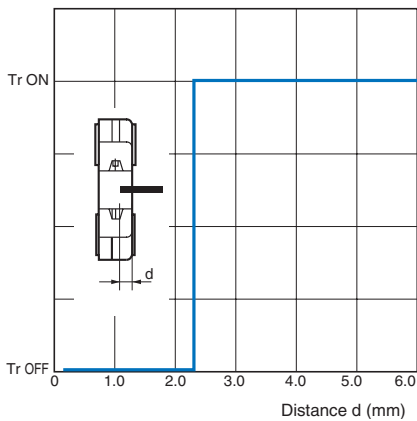
Vcc = 24 V
No. of repetitions: 20, Ta = 25°C
Note: The data applies to dark status. Operation may be affected by external light interference or light coming through the sensing object.

I/O Circuit Diagrams

NPN Output

Model	Output configuration	Timing charts	Output circuit
EE-SX770 EE-SX771 EE-SX772	Dark-ON		
EE-SX870 EE-SX871 EE-SX872	Light-ON		
EE-SX770A EE-SX771A EE-SX772A	Dark-ON		
EE-SX870A EE-SX871A EE-SX872A	Light-ON		

PNP Output

| Model	Output configuration	Timing chart	Output circuit
EE-SX770P EE-SX771P EE-SX772P	Dark-ON	Incident / Interrupted Light indicator (red) ON/OFF Output transistor ON/OFF Load (e.g., relay) Operates/Releases	Light indicator (red), Main circuit, ① Brown (Vcc), ④ Black (OUT), Load, ③ Blue (GND), 5 to 24 VDC
EE-SX870P EE-SX871P EE-SX872P	Light-ON	Incident / Interrupted Light indicator (red) ON/OFF Output transistor ON/OFF Load (e.g., relay) Operates/Releases	
EE-SX770R EE-SX771R EE-SX772R	Dark-ON	Incident / Interrupted Light indicator (red) ON/OFF Output transistor ON/OFF Load (e.g., relay) Operates/Releases	Light indicator (red), Main circuit, ① Brown (Vcc), ④ Black (OUT), Load, ③ Blue (GND), 5 to 24 VDC
EE-SX870R EE-SX871R EE-SX872R	Light-ON	Incident / Interrupted Light indicator (red) ON/OFF Output transistor ON/OFF Load (e.g., relay) Operates/Releases	

Applicable Connectors

15.8
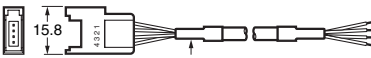
Vinyl-insulated round cable of 4 dia., 4 cores, (0.2 mm² with 1.1-mm dia. insulator)

E39-ECON□M

Note: The □ symbol is used to indicate the cable length. The cable length is 2 m or 5 m.
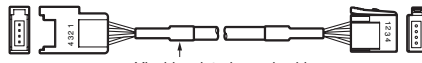
Vinyl-insulated round cable of 4 dia., 4 cores, (0.2 mm² with 1.1-mm dia. insulator)

E39-ECONW□M

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

1
2
3
4
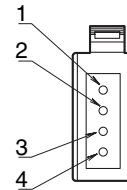
Note: Pin 2 is not used.

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.

(Unit: mm)

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

Optical axis

18

12
5
2.9
9
Two 6 dia.
6.2
22.1

0.3 | 4 | 0.3
0.7
0.45
1

Optical axis

Two, 3.2 dia. holes

Indicator window

5 dia.

$2{,}000^{+50}_{0}$

Vinyl-insulated round cable of 2.4 dia., 3 cores, (0.08 mm^2 with 0.7-mm dia. insulator); Standard length: 2 m

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

0.3
4
0.3
9
2.9

Optical axis

5
12

18
12
2
7.8
21

Four, R1.6
Optical axis
4.3

13
0.45 | 1

4
0.7

Six, R3
Indicator window

5 dia.

$2{,}000^{+50}_{0}$

4
4.6

Vinyl-insulated round cable of 2.4 dia., 3 cores, (0.08 mm^2 with 0.7-mm dia. insulator); Standard length: 2 m

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

12.3 | 3.3

Optical axis

4
19.1

12
5
2.9
9
22.1

Optical axis

12.3

12
0.7
0.45
1
4.3

Four, R1.6

Two, R3

Indicator window

5 dia.

$2{,}000^{+50}_{0}$

Vinyl-insulated round cable of 2.4 dia., 3 cores, (0.08 mm^2 with 0.7-mm dia. insulator); Standard length: 2 m

MEMO

OMRON