Photomicrosensor with Cable (Non-modulated)
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

⚠ Be sure to read *Safety Precautions* on page 944.

CE

Ordering Information

Pre-wired Models

☐ Infrared light

Appearance	Sensing method	Sensing distance		Output configuration	Cable length	Model	
						NPN output *1	**PNP output** *2
Standard	Through-beam type	☐	5 mm (slot width)	Dark-ON	2 m	**EE-SX770** **EE-SX770A**	**EE-SX770P** **EE-SX770R**
				Light-ON		**EE-SX870** **EE-SX870A**	**EE-SX870P** **EE-SX870R**
L-shaped				Dark-ON		**EE-SX771** **EE-SX771A**	**EE-SX771P** **EE-SX771R**
				Light-ON		**EE-SX871** **EE-SX871A**	**EE-SX871P** **EE-SX871R**
T-shaped				Dark-ON		**EE-SX772** **EE-SX772A**	**EE-SX772P** **EE-SX772R**
				Light-ON		**EE-SX872** **EE-SX872A**	**EE-SX872P** **EE-SX872R**

*1. Model numbers ending in suffix A (e.g., EE-SX770A) indicate models for which the operation indicator will turn ON when the light is interrupted.
*2. Model numbers ending in suffix R (e.g., EE-SX770R) indicate models for which the operation indicator will turn ON when the light is interrupted.

e-CON Junction Connector Models *

Infrared light

Appearance	Sensing method	Sensing distance		Output configuration	Cable length	Model
						NPN output
Standard	Through-beam type		5 mm (slot width)	Dark-ON	0.3 m	EE-SX770-ECON
						EE-SX770A-ECON
					2 m	EE-SX770-ECON
						EE-SX770A-ECON
				Light-ON	0.3 m	EE-SX870-ECON
						EE-SX870A-ECON
					2 m	EE-SX870-ECON
						EE-SX870A-ECON
L-shaped				Dark-ON	0.3 m	EE-SX771-ECON
						EE-SX771A-ECON
					2 m	EE-SX771-ECON
						EE-SX771A-ECON
				Light-ON	0.3 m	EE-SX871-ECON
						EE-SX871A-ECON
					2 m	EE-SX871-ECON
						EE-SX871A-ECON
T-shaped				Dark-ON	0.3 m	EE-SX772-ECON
						EE-SX772A-ECON
					2 m	EE-SX772-ECON
						EE-SX772A-ECON
				Light-ON	0.3 m	EE-SX872-ECON
						EE-SX872A-ECON
					2 m	EE-SX872-ECON
						EE-SX872A-ECON

* e-CON is a new industrial standard being promoted by manufacturers of FA devices and connectors.
  The E39-ECON□M (cable length: 2 m or 5 m) with an e-CON connector on one end, and the E39-ECONW□M (cable length: 0.5 m to 2 m in units of 0.1 m)
  with e-CON connectors on both ends are available.
  The □ symbol is used to indicate the cable length (e.g., E39-ECON2M).

EE-SX77/87

Ratings and Specifications

Photomicro-
sensors

Sensing
Guide

Slot Type

Through-beam

Slot-type
Reflective

Convergent
Reflective

Optical
Fiber

Application

Peripheral
Devices

Other
Information

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. PNP open collector: 5 to 24 VDC, 50 mA max. 50 mA load current with a residual voltage of 1.3 V 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		Operating: −25 to +55°C Storage: −30 to +80°C (with no icing)		
Ambient humidity		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		
Enclosure rating		IEC 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.
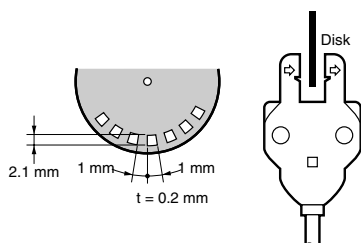
2.1 mm 1 mm 1 mm t = 0.2 mm Disk

Engineering Data (Typical)

Sensing Position Characteristics

EE-SX770

Distance d (mm)

Sensing Position Characteristics

Distance d (mm)

Repeated Sensing Position Characteristics

Distance d (mm)

$\triangle$ d = ±0.002 mm
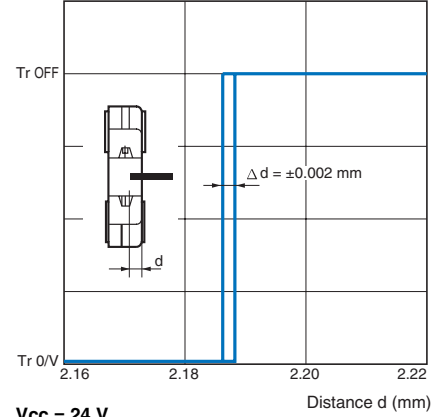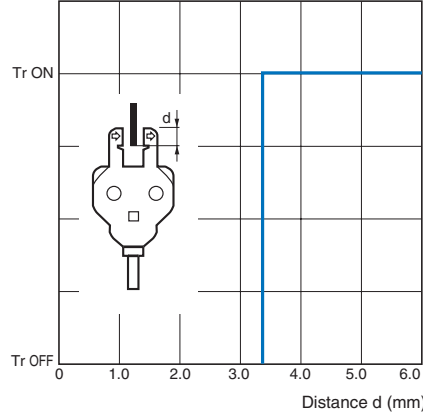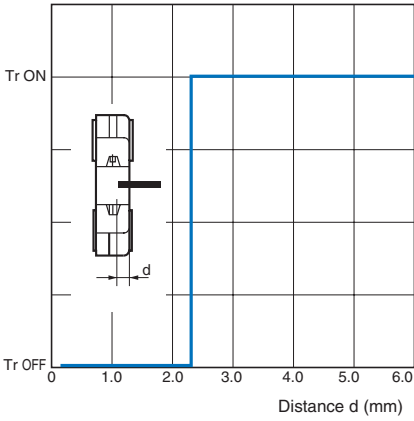
Vcc = 24 V
No. of repetitions: 20, Ta = 25°C

I/O Circuits

NPN Output

Model	Output configuration	Timing charts	Output circuit
EE-SX770 EE-SX771 EE-SX772	Dark-ON		**Connector pin arrangement for e-CON junction connector** Light indicator (red) · Main circuit · ① Brown (Vcc) · Load · ④ Black (OUT) (control output) 100 mA max. · ③ Blue (GND) · 5 to 24 VDC Note: Pin 2 is not used.
EE-SX870 EE-SX871 EE-SX872	Light-ON		
EE-SX770A EE-SX771A EE-SX772A	Dark-ON		**Connector pin arrangement for e-CON junction connector** Light indicator (red) · Main circuit · ① Brown (Vcc) · Load · ④ Black (OUT) (control output) 100 mA max. · ③ Blue (GND) · 5 to 24 VDC Note: Pin 2 is not used.
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 — Brown (Vcc) (1) — Black (OUT) (4) — Blue (GND) (3) — Load — 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 — Brown (Vcc) (1) — Black (OUT) (4) — Blue (GND) (3) — Load — 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
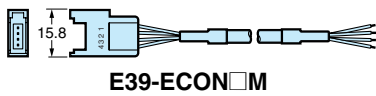
E39-ECON☐M   **E39-ECONW☐M**

*1. The E39-ECON☐M (cable length: 2 m or 5 m) with an e-CON connector on one end, and the E39-ECONW☐M with e-CON connectors on both ends (cable length: 0.5 m to 2 m in units of 0.1 m) are available.
*2. The ☐ symbol is used to indicate the cable length (e.g., E39-ECON2M).

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.

Safety Precautions

Refer to *Warranty and Limitations of Liability* on page F-2.

⚠ WARNING
Do not use this product in sensing devices designed to provide human safety. 🚫

Precautions for Correct Use
Make sure that this product is used within the rated ambient environment conditions.

Dimensions

(Unit: mm)

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

CAD data

Optical axis

18

Optical axis

12
5
2.9
Optical axis
9
Two 6 dia.
6.2
Two, 3.2 dia. holes
22.1
Indicator window
5 dia.

0.3 | 4 | 0.3
0.8
8 | 2

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

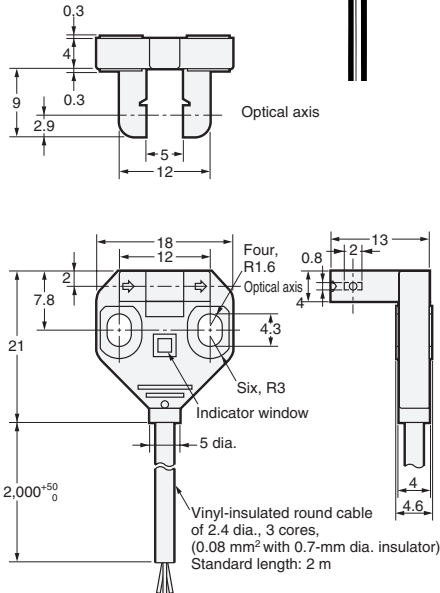Vinyl-insulated round cable of 2.4 dia., 3 cores, (0.08 mm^2 with 0.7-mm dia. insulator); Standard length: 2 m
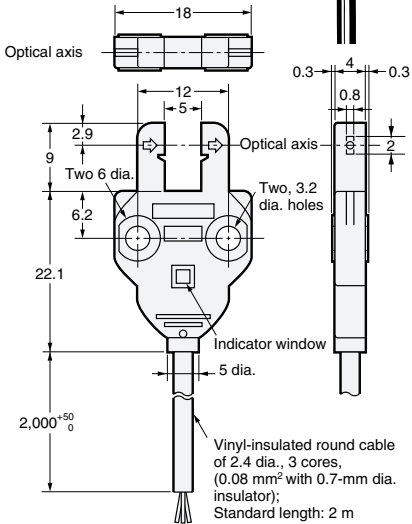
L-shaped
EE-SX771/771P
EE-SX871/871P
EE-SX771A/771R
EE-SX871A/871R

CAD data

0.3
4
0.3
9
2.9
Optical axis
5
12

18
12
Four, R1.6
2
Optical axis
7.8
4.3
21
Six, R3
Indicator window
5 dia.

0.8 | 2 | 13
4

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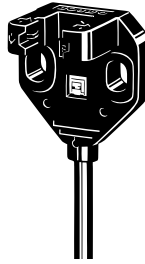
T-shaped
EE-SX772/772P
EE-SX872/872P
EE-SX772A/772R
EE-SX872A/872R

CAD data

12.3 | 3.3
Optical axis
4 | 19.1

12
5
2.9
Optical axis
9
12.3
4.3
22.1
Indicator window
5 dia.

12
0.8
8 | 2
Four, R1.6
Two, R3

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

e-CON Junction Connector

EE-SX□□□-ECON

5.9
1 2 3 4
15
15.6

Vinyl-insulated round cable of 2.4 dia., 3 cores: 0.3/2 m

Terminal	Specifications
1	+ V
2	---
3	0 V
4	Output

e-CON Junction Connector

EE-SX□□□-ECON

5.9
1 2 3 4
15
15.6

Vinyl-insulated round cable of 2.4 dia., 3 cores: 0.3/2 m

Terminal	Specifications
1	+ V
2	---
3	0 V
4	Output

e-CON Junction Connector

EE-SX□□□-ECON

5.9
1 2 3 4
15
15.6

Vinyl-insulated round cable of 2.4 dia., 3 cores: 0.3/2 m

Terminal	Specifications
1	+ V
2	---
3	0 V
4	Output

Photomicro-sensors

Sensing Guide

Slot Type

Through-beam

Slot-type Reflective

Convergent Reflective

Optical Fiber

Application

Peripheral Devices

Other Information
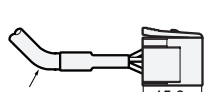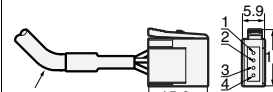
Cat. No. E831-E1-01   **In the interest of product improvement, specifications are subject to change without notice.**

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