

Omron's Next Generation of Sub-miniature Photoelectric Sensors

- Utilizes Omron's "Hyper LED" technology to achieve the industry's smallest visible red beam
- Self-contained sensor ideal for space-restricted applications
- "Pin-point" beam for detecting extremely small objects
- Offered in both flat and rectangular body styles
- Retroreflective model employs Omron's Free-Angle Optics technology (FAO) to detect objects as small as 2 mm dia.
- Convergent-beam model spot diameter is 0.15 mm
- Through-beam model is capable of sensing distances of 1 meter with a 2 mm target diameter
- CE conformance
- Robotic cable versions available (See Note 2, below.)



Ordering Information

■ PHOTOELECTRIC SENSORS

Sensor type		Sensing method						
		Through-beam		Retroreflective	Diffuse reflective	Convergent-beam		
Appearance		Side-view	Flat	Side-view	Flat	Side-view		
Sensing distance		1 m	500 mm	10 to 200 mm	5 to 30 mm	5 to 15 mm	5 to 30 mm	
Part number	Light-ON	NPN	E3T-ST11	E3T-FT11	E3T-SR11	E3T-FD11N	E3T-SL11	E3T-SL21
		PNP	E3T-ST13	E3T-FT13	E3T-SR13	E3T-FD13N	E3T-SL13	E3T-SL23
	Dark-ON	NPN	E3T-ST12	E3T-FT12	E3T-SR12	E3T-FD12N	E3T-SL12	E3T-SL22
		PNP	E3T-ST14	E3T-FT14	E3T-SR14	E3T-FD14N	E3T-SL14	E3T-SL24

Note: 1. All through-beam models are packaged and sold as pairs (one transmitter and one receiver).

2. E3T sensors are available with robotic cable. To order, add the letter "R" to the end of the part number. Example: E3T-ST11R

3. 5-M cable models are available. To order, add the designation 5M to the end of the part number. Example: E3T-T11 5M

■ ACCESSORIES (ORDER SEPARATELY)

Slits (Apertures)

Slits for sensor models	Slit width	Sensing distance	Minimum sensing object (typical)	Comments	Part number
E3T-ST1□	0.5 dia.	50 mm	0.5 mm wide	One each for Emitter and Receiver	E39-S63
	1 dia.	100 mm	1 mm wide		


Slits for sensor models	Slit width	Sensing distance	Minimum sensing object (typical)	Comments	Part number
E3T-FT1□	0.5 dia.	50 mm	0.5 mm wide	One each for Emitter and Receiver	E39-S64
	1 dia.	100 mm	1 mm wide		

Reflectors

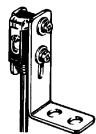


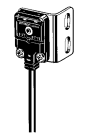

Item	Sensing distance	Minimum sensing object (typical)	Part number
Compact retroreflective model	10 to 200 mm	2 mm wide	E39-R4 (See Note.)
	10 to 100 mm		E39-R37

Note: E39-R4 reflector included with the E3T-SR1□ (can also be ordered separately).

Adjustable Aperture

For sensor models	Appearance	Part number
E3T-ST1□		E39-E10

Mounting Brackets

For sensor models	Appearance	Comments	Part number
E3T-S□		Two mounting brackets are required for through-beam models.	E39-L116
			E39-L117
			E39-L118
E3T-F□		E39-L119	
		E39-L120	

Specifications

■ RATINGS/CHARACTERISTICS

Sensing method		Through-beam				Retroreflective		Convergent beam				Diffuse reflective	
Shape		Side-view		Flat		Side-view						Flat	
Output type		NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP
Part number	Light-ON	-ST11	-ST13	-FT11	-FT13	-SR11	-SR13	-SL11	-SL13	-SL21	-SL23	-FD11	-FD13
	Dark-ON	-ST12	-ST14	-FT12	-FT14	-SR12	-SR14	-SL12	-SL14	-SL22	-SL24	-FD12	-FD14
Sensing distance		1 m (adjustable aperture is available)		500 mm		10 to 200 mm (with the E39-R4)		5 to 15 mm (50 x 50 mm Kodak white card)		5 to 30 mm (50 x 50 mm Kodak white card)		5 to 30 mm (50 x 50 mm Kodak white card)	
Standard sensing target		2 mm dia. min.				10 mm dia. min.		---					
Min. sensing target (typical)		2 mm dia. min.				2 mm dia. (sensing distance at 100 mm)		0.15 mm dia. (sensing distance at 10 mm)					
Hysteresis		---						2 mm max.		6 mm max.		6 mm max.	
Optical angle	Emitter	3° to 10°		3° to 13°		2° to 5°		---					
	Receiver	3° to 70°		3° to 70°		---							
Light source (wave length)		Red LED ("Pin-point" LED) ($\lambda=670$ nm)											
Power supply voltage		12 to 24 VDC $\pm 10\%$, ripple (p-p) 10% max.											24 VDC $\pm 10\%$
Current consumption		12 mA max. emitter/receiver				20 mA max.							
Output		Open collector, load current: 50 mA max. at 24 VDC, residual voltage: 1 V max., operation mode: Light-ON or Dark-ON (separate models)											
Circuit protection (See <i>Precautions</i> Section.)		Protection from reversed and output short-circuit				Protection from reversed polarity, output short-circuit, and mutual interference							
Response time		1 ms max. each for on and off											
Ambient light immunity	Incandescent lamp	5,000 lx max.											
	Sunlight	10,000 lx max.											
Ambient temperature	Operating	-25°C to 55°C (-13°F to 131°F)											
	Storage	-40°C to 70°C (-40°F to 158°F) with no icing or condensation											
Ambient humidity	Operating	35% to 85% RH											
	Storage	35% to 95% RH (with no condensation)											
Insulation resistance		20 M Ω min. (at 500 VDC)											
Dielectric strength		1,000 VAC, 50/60 Hz for 1 min											
Vibration resistance		10 to 2,000 Hz, 1.5-mm double amplitude or 300 m/s ² (approx. 30G) for 0.5 hrs each in X, Y, and Z axis											
Shock resistance		1,000 m/s ² (approx. 100G) 3 times each in X, Y, and Z axis											
Enclosure rating		IEC60529: IP67											
Connection method		Pre-leaded (standard length: 2 m), optional 5-M cable, optional robotic cable											
Weight (with packaging)		Approx. 40 g				Approx. 20 g							
Materials	Case	PBT											
	Lens and cover	Polycarbonate											
Accessories included		Two each of M2 mounting screws, spring washers, and flat washers, and reflector (E39-R4: retroreflective model only)											

■ TIMING CHART

Diffuse and convergent beam	Light-ON		Dark-ON	
	Target present Target not present Operation indicator (orange) ON OFF Output transistor ON OFF Load Energized De-energized			Target present Target not present Operation indicator (orange) ON OFF Output transistor ON OFF Load Energized De-energized
Retroreflective/through-beam	Light-ON		Dark-ON	
	Target present Target not present Operation indicator (orange) ON OFF Output transistor ON OFF Load Energized De-energized			Target present Target not present Operation indicator (orange) ON OFF Output transistor ON OFF Load Energized De-energized

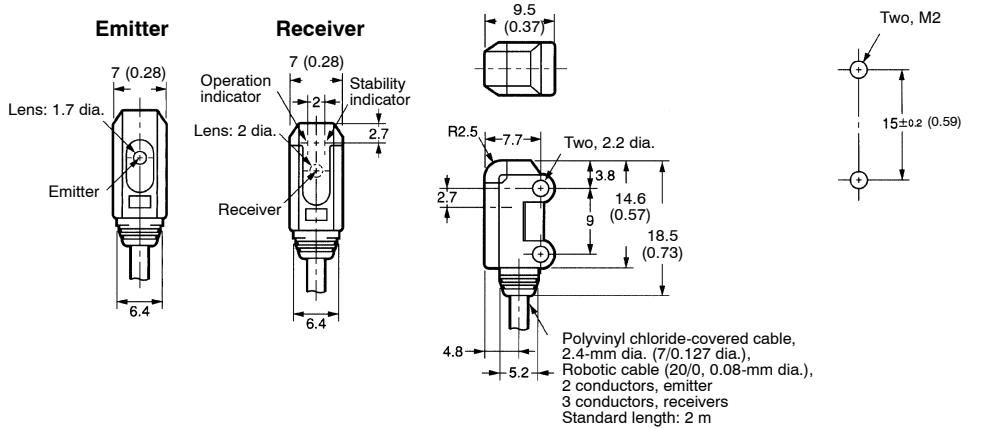
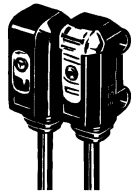
Dimensions

Unit: mm (inch)

■ SIDE-VIEW SENSORS

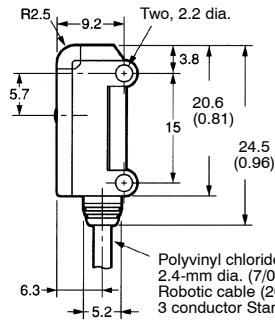
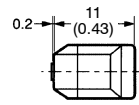
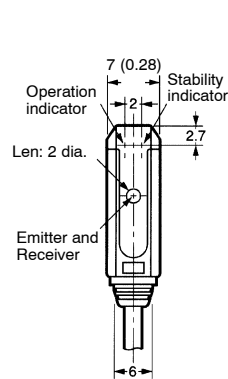
Through-Beam Models

- E3T-ST11
- E3T-ST12
- E3T-ST13
- E3T-ST14

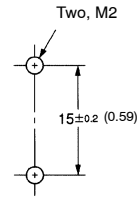


Retroreflective Models

E3T-SR11
E3T-SR12
E3T-SR13
E3T-SR14

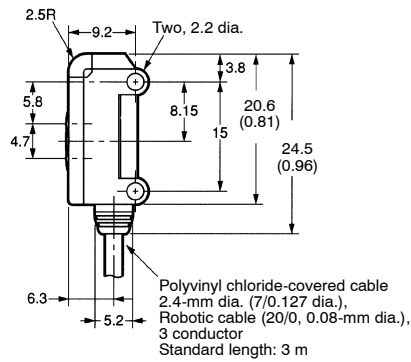
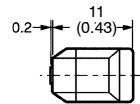
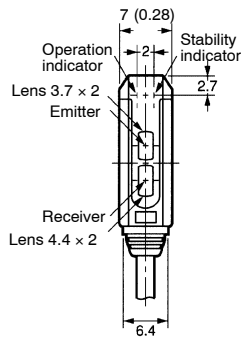


Mounting Holes

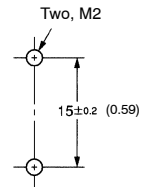


Convergent-Beam Models

E3T-SL11 E3T-SL21
E3T-SL12 E3T-SL22
E3T-SL13 E3T-SL23
E3T-SL14 E3T-SL24



Mounting Holes

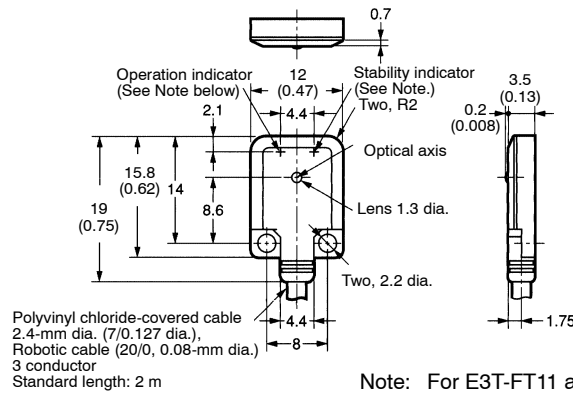
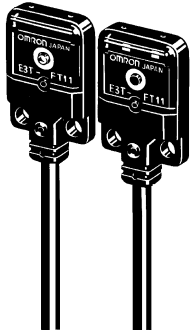


Unit: mm (inch)

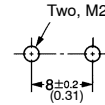
■ FLAT THIN SENSORS

Through-Beam Emitter and Receiver Models

- E3T-FT11
- E3T-FT12
- E3T-FT13
- E3T-FT14



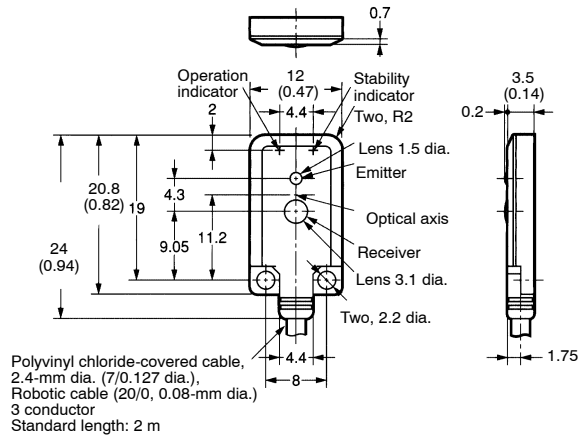
Mounting Holes



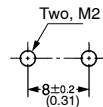
Note: For E3T-FT11 and E3T-FT12 Receivers only.

Diffuse Reflective Models

- E3T-FD11-N
- E3T-FD12-N
- E3T-FD13-N
- E3T-FD14-N



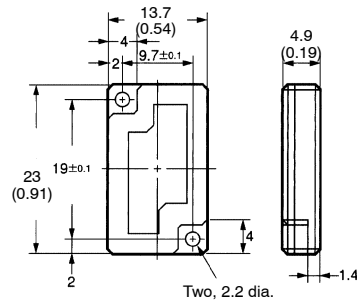
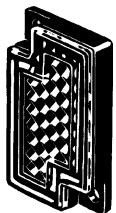
Mounting Holes

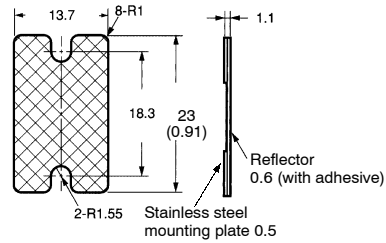
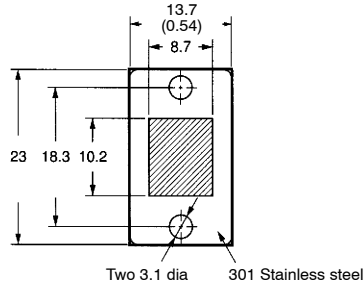
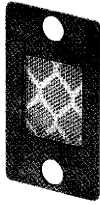


■ REFLECTORS

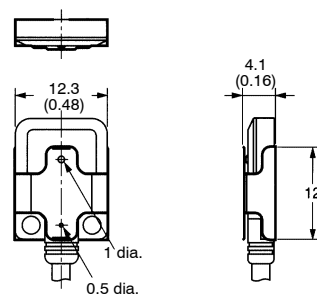
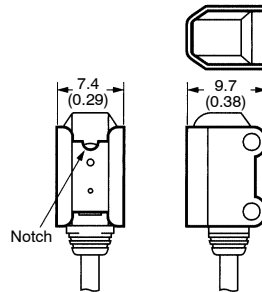
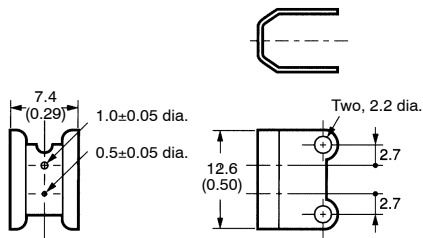
Retroreflector

E39-R4 (Provided with the E3T-SR1 □)



E39-R37 Reflector

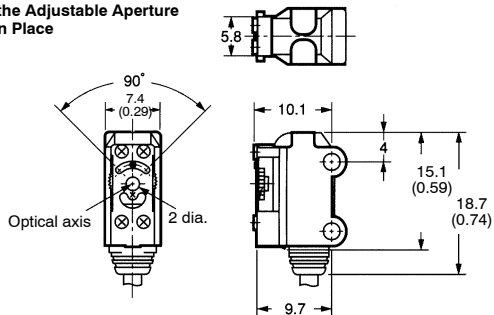
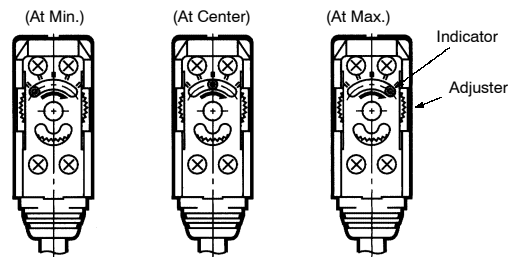
Note: A reflector and a stainless steel mounting plate are supplied together as a set.

■ SLITS/APERTURES (ORDER SEPARATELY)**E39-S63 (Use with E3T-ST1□)****Shown with Sensor****E39-S64 (Use with E3T-FT1□)**

Note: Align the notch direction of the slit when installing on the Emitter and Receiver.

Adjustable Aperture**E39-E10 (Use with E3T-ST1□)**

With the Adjustable Aperture Unit in Place

**Use of E39-E10 Adjustable Aperture (Example Dark-ON: E3T-ST12/ST14)**

For Dark-ON:

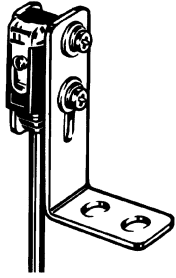
1. Mount the unit on the receiver.
2. Set the adjuster of the Unit to Max (factory setting is at Max).
3. Adjust the optical axis (align) and tighten mounting hardware.
4. Place a target between emitter and receiver and gradually turn the adjuster counterclockwise toward the Min side. Stop turning the adjuster when the operation indicator and stability indicator (green) turn ON.
5. Remove the target and confirm that the operation indicator is OFF and the stability indicator (green) is ON.

Note: For Light-ON, adjustment is similar, except that indicators would operate in opposite manner as with Dark-ON.

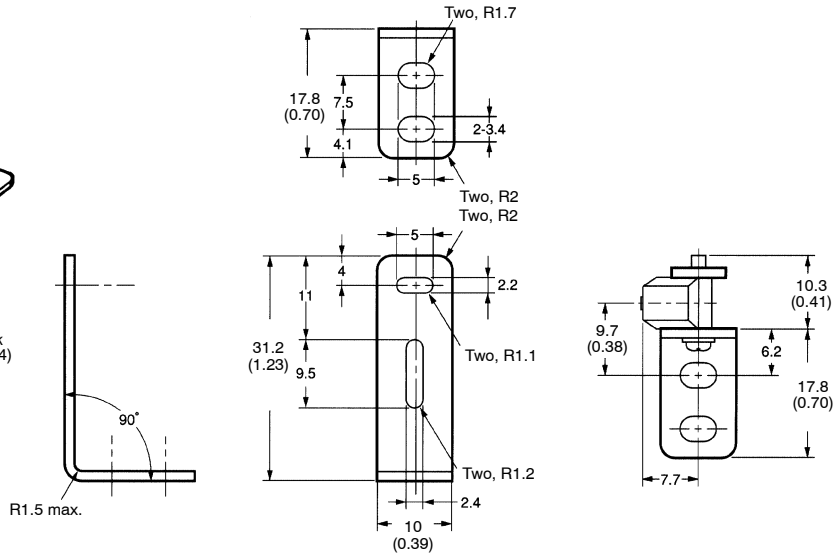
Unit: mm (inch)

■ MOUNTING BRACKETS

E39-L116 (Use with E3T-S□□□) Order Separately



Material: 1.2-mm-thick stainless steel (SS 304)



E39-L116 (Use with E3T-ST1□)

