

Ultracompact, Ultrathin Photoelectric Sensor with Built-in Amplifier

E3T



The Improved E3T Series with Easier, Smoother Mounting and Installation

- Newly added Through-beam, Long-distance (2 m) Sensors (E3T-ST3□).
- Easy installation with M3-mounting Sensors (E3T-ST□□M, E3T-FD□□M, and E3T-SL□□M).
- Small Cylindrical Sensors for one-point mounting also added to the Series. (E3T-C□□□(S)).



Be sure to read *Safety Precautions* on page 12.

For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

Lineup Overview

Appearance		Sensing method	Through-beam	Retro-reflective	Diffuse-reflective	Convergent-reflective	BGS-reflective
Rectangular type	Side-view 	M2-mounting	●	●	---	●	---
		M3-mounting	●	---	---	●	---
	Flat 	M2-mounting	●	---	●	---	●
		M3-mounting	---	---	●	---	---
Cylindrical type	Top-view 	---	●	---	●	---	---
	Side-view 	---	●	---	---	---	---






E3T

Ordering Information




Sensors [Refer to Dimensions on page 13.]

■ Red light □ Infrared light

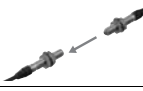
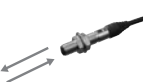
M2-mounting Sensors A set of mounting screws is included with the Sensor.

Sensing method	Appearance	Sensing distance	Operation mode	Model		
				NPN output	PNP output	
Through-beam (Emitter + Receiver) ^{*2}		2 m	Light-ON	E3T-ST31 2M	E3T-ST33 2M	
		(Sensitivity Adjustment Unit can be used.)	Dark-ON	E3T-ST32 2M	E3T-ST34 2M	
		1 m	Light-ON	E3T-ST11 2M	E3T-ST13 2M	
		(Sensitivity Adjustment Unit can be used.)	Dark-ON	E3T-ST12 2M	E3T-ST14 2M	
		300 mm	Light-ON	E3T-ST21 2M	E3T-ST23 2M	
		Dark-ON	E3T-ST22 2M	E3T-ST24 2M		
		500 mm	Light-ON	E3T-FT11 2M	E3T-FT13 2M	
		Dark-ON	E3T-FT12 2M	E3T-FT14 2M		
		300 mm	Light-ON	E3T-FT21 2M	E3T-FT23 2M	
		Dark-ON	E3T-FT22 2M	E3T-FT24 2M		
		Retro-reflective 	Using the E39-R4 Reflector provided 200 mm [30 mm] ^{*1}	Light-ON	E3T-SR41 2M ³	E3T-SR43 2M ³
			Dark-ON	E3T-SR42 2M ³	E3T-SR44 2M ³	
Using the E39-R37-CA 100 mm [10 mm] ^{*1}	Light-ON		E3T-FD11 2M	E3T-FD13 2M		
	Dark-ON		E3T-FD12 2M	E3T-FD14 2M		
Diffuse-reflective 	5 to 30 mm	Light-ON	E3T-SL11 2M	E3T-SL13 2M		
		Dark-ON	E3T-SL12 2M	E3T-SL14 2M		
	5 to 15 mm	Light-ON	E3T-SL21 2M	E3T-SL23 2M		
		Dark-ON	E3T-SL22 2M	E3T-SL24 2M		
Convergent-reflective 	1 to 15 mm	Light-ON	E3T-FL11 2M	E3T-FL13 2M		
		Dark-ON	E3T-FL12 2M	E3T-FL14 2M		
	1 to 30 mm	Light-ON	E3T-FL21 2M	E3T-FL23 2M		
		Dark-ON	E3T-FL22 2M	E3T-FL24 2M		

M3-mounting Sensors A set of mounting screws is not included with the Sensor. Order a Screw Set separately if required.

Sensing method	Appearance	Sensing distance	Operation mode	Model	
				NPN output	PNP output
Through-beam (Emitter + Receiver) ^{*2}		1 m	Light-ON	E3T-ST11M 2M	E3T-ST13M 2M
			Dark-ON	E3T-ST12M 2M	E3T-ST14M 2M
		300 mm	Light-ON	E3T-ST21M 2M	E3T-ST23M 2M
			Dark-ON	E3T-ST22M 2M	E3T-ST24M 2M
Diffuse-reflective 	5 to 30 mm	Light-ON	E3T-FD11M 2M	E3T-FD13M 2M	
		Dark-ON	E3T-FD12M 2M	E3T-FD14M 2M	
Convergent-reflective 	5 to 15 mm	Light-ON	E3T-SL11M 2M	E3T-SL13M 2M	
		Dark-ON	E3T-SL12M 2M	E3T-SL14M 2M	
	5 to 30 mm	Light-ON	E3T-SL21M 2M	E3T-SL23M 2M	
		Dark-ON	E3T-SL22M 2M	E3T-SL24M 2M	

Small Cylindrical Sensors A set of mounting nuts is included with the Sensor.

Sensing method	Appearance	Sensing distance	Operation mode	Model	
				NPN output	PNP output
Through-beam (Emitter + Receiver)		1 m	Light-ON	---	---
			Dark-ON	E3T-CT12 2M	E3T-CT14 2M
		500 mm	Light-ON	---	---
			Dark-ON	E3T-CT22S 2M	E3T-CT24S 2M
Diffuse-reflective (with adjuster)		3 to 50 mm	Light-ON	E3T-CD11 2M	E3T-CD13 2M
			Dark-ON	---	---

*1. Values in parentheses indicate the minimum required distance between the Sensor and Reflector.

*2. The model number of the Emitter is expressed by adding an "L" to the set model number in the table. Example: E3T-ST11-L 2M
The model number of the Receiver is expressed by adding a "D" to the set model number in the table. Example: E3T-ST11-D 2M

*3. Models are available either with or without the E39-R37-CA Reflector included.

Models with E39-R37-CA Reflector. E3T-SR4□-S

Models without Reflector. E3T-SR4□-C

Accessories (Order Separately)

Accessories for M2-mounting Sensors These accessories are not included with the Sensor. Order them separately if required.

Name		Applicable Sensor	Model	Quantity	Dimensions page	Remarks
Slit for Through-beam Side-view Sensors	0.5 dia.	E3T-ST3□	E39-S63	2 (One each for Emitter and Receiver; common with Slit widths of 1 dia. and 0.5 dia.)	18	Sensing distance 200 mm, Minimum detectable object (reference value) 0.5-mm dia.
		E3T-ST1□				Sensing distance 100 mm, Minimum detectable object (reference value) 0.5-mm dia.
		E3T-ST2□				Sensing distance 30 mm, Minimum detectable object (reference value) 0.5-mm dia.
	1 dia.	E3T-ST3□				Sensing distance 600 mm, Minimum detectable object (reference value) 1-mm dia.
		E3T-ST1□				Sensing distance 300 mm, Minimum detectable object (reference value) 1-mm dia.
		E3T-ST2□				Sensing distance 100 mm, Minimum detectable object (reference value) 1-mm dia.
Slit for Through-beam Flat Sensors	0.5 dia.	E3T-FT1□	E39-S64	1	18	Sensing distance 50 mm, Minimum detectable object (reference value) 0.5-mm dia.
		E3T-FT2□				Sensing distance 30 mm, Minimum detectable object (reference value) 0.5-mm dia.
	1 dia.	E3T-FT1□				Sensing distance 100 mm, Minimum detectable object (reference value) 1-mm dia.
		E3T-FT2□				Sensing distance 50 mm, Minimum detectable object (reference value) 1-mm dia.
Sensitivity Adjustment Unit for Through-beam Side-view Sensors		E3T-ST3□ E3T-ST1□	E39-E10	1	---	Sensing distance (reference value) 1,200 to 1,800 mm Sensing distance (reference value) 300 to 800 mm
Mounting Brackets for Side-view Sensors *2		E3T-S□□□	E39-L116 E39-L117 E39-L118	1	19	Nut plate provided
Mounting Brackets for Flat Sensors *2		E3T-F□□□	E39-L119 E39-L120		20	
Screw Set for Side-view Sensors *3*4		E3T-S□□□	E39-L164	2 for each	---	Material: Iron (Same type as provided with the Sensor.) Contents: Set screws (M2×14), Hexagonal nuts
Screw Set for Flat Sensors *3*4		E3T-F□□□	E39-L165			Material: Iron (Same type as provided with the Sensor.) Contents: Set screws (M2×8), Hexagonal nuts
SUS Screw Set for Flat Sensors *3		E3T-F□□□	E39-L172	2	---	Material: SUS304 Contents: Bolt with hexagonal hole (M2×6)
SUS Screw Set for Side-view Sensors *3		E3T-S□□□	E39-L173	2 for each	---	Material: SUS304 Contents: Bolt with hexagonal hole (M2×12), Hexagonal nuts, Spring washers, Flat washers

*1. An arrow indicates the polarization direction. Mutual interference can be prevented by using different polarization directions for adjacent Emitters/Receivers.

*2. When using Through-beam Sensors (E3T-ST□□, E3T-FT□□), order one bracket for the Emitter and one for the Receiver.

*3. Order two Sets, one for the Emitter and one for the Receiver, for Through-beam Sensors (E3T-ST□□ or E3T-FT□□).

This is the Screw Set for mounting the Sensor to the Mounting Bracket. Order this Set if you lose the screws. Do not use this Screw Set to mount the Mounting Bracket to the equipment.

*4. This is included with the Sensor.

Accessories for M3-mounting Sensors These accessories are not included with the Sensor. Order them separately if required.

Name	Applicable Sensor	Model	Quantity	Dimensions page	Remarks	
Slits for Through-beam Side-view Sensors	0.5 dia.	E3T-ST1□M	2 (One each for Emitter and Receiver)	18	Sensing distance 100 mm, Minimum detectable object (reference value) 0.5-mm dia.	
		E3T-ST2□M			Sensing distance 30 mm, Minimum detectable object (reference value) 0.5-mm dia.	
	1 dia.	E3T-ST1□M			E39-S76B	Sensing distance 300 mm, Minimum detectable object (reference value) 1-mm dia.
		E3T-ST2□M				Sensing distance 100 mm, Minimum detectable object (reference value) 1-mm dia.
Mounting Bracket for Side-view Sensors *1	E3T-S□□□M	E39-L166	1	21	Nut plate provided	
Mounting Bracket for Flat Sensors	E3T-FD□□M	E39-L167			---	
Back-mounting Spacer for Flat Sensors		E39-L168			Use this Spacer when mounting a Flat Sensor (E3T-FD□□M) from the back.	
SUS Screw Set for Flat Sensors *2	E3T-FD□□M	E39-L170	2	---	Material: SUS304 Contents: Bolt with hexagonal hole (M3×6)	
SUS Screw Set for Side-view Sensors *1*2	E3T-S□□□M	E39-L171	2 for each		Material: SUS304 Contents: Bolt with hexagonal hole (M3×15), Hexagonal nuts, Spring washers, Flat washers	

*1. When using Through-beam Sensors (E3T-ST□□M), order one bracket for the Emitter and one for the Receiver.

*2. This is the Screw Set for mounting the Sensor to the Mounting Bracket. Order this Set if you loose the screws. Do not use this Screw Set to mount the Mounting Bracket to the equipment.

Accessories for Small Cylindrical Sensors

Name	Applicable Sensor	Model	Quantity	Dimensions Page	Remarks
SUS Nut Set for Through-beam Sensors *1	E3T-CT□□ E3T-CT□□S	E39-M5	4 (Hexagonal nuts), 2 (Toothed washers)	---	Material: SUS303 (Same type as provided with the Sensor.)
SUS Nut Set for Diffuse-reflective Sensors	E3T-CD□□	E39-M6	2 (Hexagonal nuts), 1 (Toothed washers)		
Adjustment Driver for Diffuse-reflective Sensors		E39-G17	1		This Driver is used to turn the sensitivity adjuster. Provided with E3T-CD□□

*1. This Nut Set is for the Emitter/Receiver. This is the Nut Set for mounting the Sensor. Order this Set if you loose the screws.






Accessories for All Sensors

Name	Applicable Sensor	Model	Quantity	Dimensions Page	Remarks
Small Reflectors (for Retro-reflective Sensors)	E3T-SR4□	E39-R4	1	17	Sensing distance 200 mm [30 mm] *1 Minimum detectable object 2-mm dia. Provided with the E3T-SR4□
	E3T-SR4□-S	E39-R37-CA *2			Sensing distance 100 mm [10 mm] *1 Minimum detectable object 2-mm dia. Provided with the E3T-SR4□-S
Tape Reflectors (for Retro-reflective Sensors)	E3T-SR4□-C	E39-RS1-CA *2		18	Sensing distance 100 mm [10 mm] *1 Minimum detectable object 2-mm dia. Use Tape Reflectors in combination with the E3T-SR4□-C, which does not come with a Reflector.
		E39-RS2-CA *2			
		E39-RS3-CA *2			

*1. Values in parentheses indicate the minimum required distance between the Sensor and Reflector.





*2. The E3T-SR4□ cannot be used with the E39-R37 or E39-RS1/2/3 (without CA) Tape Reflectors.
The E39-□-CA Reflector is for use only with the E3T-SR4□. It cannot be used with other Sensors.

Ratings and Specifications

Sensing method Appearance		Through-beam							Retro-reflective (without M.S.R. function)		
		Rectangular type (Side-view)			Rectangular type (Flat)		Cylindrical type (Top-view)	Cylindrical type (Side-view)	Rectangular type (Side-view)		
Item											
	NPN output	Light-ON	E3T-ST31	E3T-ST11 E3T-ST11M	E3T-ST21 E3T-ST21M	E3T-FT11	E3T-FT21	---	---	E3T-SR41	
		Dark-ON	E3T-ST32	E3T-ST12 E3T-ST12M	E3T-ST22 E3T-ST22M	E3T-FT12	E3T-FT22	E3T-CT12	E3T-CT22S	E3T-SR42	
	PNP output	Light-ON	E3T-ST33	E3T-ST13 E3T-ST13M	E3T-ST23 E3T-ST23M	E3T-FT13	E3T-FT23	---	---	E3T-SR43	
Dark-ON		E3T-ST34	E3T-ST14 E3T-ST14M	E3T-ST24 E3T-ST24M	E3T-FT14	E3T-FT24	E3T-CT14	E3T-CT24S	E3T-SR44		
Sensing distance		2 m	1 m	300 mm	500 mm	300 mm	1 m	500 mm	200 mm [30 mm] *1 (Using the E39-R4) 100 mm [10 mm] *1 (Using the E39-R37-CA)		
Standard sensing object		Opaque, 3-mm dia. min.	Opaque, 2-mm dia. min.		Opaque, 1.3-mm dia. min.		Opaque, 4-mm dia. min.	Opaque, 5-mm dia. min.	Opaque, 27-mm dia. min.		
Minimum detectable object (reference value)		Opaque, 3-mm dia.	Opaque, 2-mm dia.		Opaque, 1.3-mm dia.		---		2-mm dia. (Sensing distance 100 mm)		
Hysteresis (white paper)		---									
Black/white error		---									
Directional angle		Emitter: 2 to 20° Receiver: 2 to 70°			Emitter: 3 to 25° Receiver: 3° min.		Receiver: 2°	Receiver: 10°	2 to 20°		
Light source (wavelength)		Red LED (650 nm)					Red LED (630 nm)	Red LED (625 nm)	Red LED (650 nm)		
Power supply voltage		12 to 24 VDC ±10%, ripple (p-p) 10% max.									
Current consumption		30 mA max. (Emitter 10 mA max., Receiver 20 mA max.)					30 mA max. (Emitter 15 mA max., Receiver 15 mA max.)		20 mA max.		
Control output		Load power supply voltage: 26.4 VDC max. Load current: 50 mA max. (residual voltage: 2 V max. for load current of 10 to 50 mA, 1 V max. for load current of less than 10 mA) Open-collector output					Load power supply voltage: 30 VDC max. Load current: 80 mA max. (residual voltage: 1 V max.) Open-collector output		Load power supply voltage: 26.4 VDC max. Load current: 50 mA max. (residual voltage: 2 V max. for load current of 10 to 50 mA, 1 V max. for load current of less than 10 mA) Open-collector output		
Protection circuits		Power supply and control output reverse polarity protection, Output short-circuit protection					Power supply reverse polarity protection, Output short-circuit protection		Power supply and control output reverse polarity protection, Output short-circuit protection, Mutual interference prevention		
Response time		Operate or reset: 1 ms max.					Operate or reset: 0.5 ms max.		Operate or reset: 1 ms max.		
Ambient illumination		Incandescent lamp: 5,000 lx max., Sunlight: 10,000 lx max.					Incandescent lamp: 3,000 lx max.		Incandescent lamp: 5,000 lx max., Sunlight: 10,000 lx max.		
Ambient temperature range		Operating: -25 to +55°C Storage: -40 to +70°C (with no icing or condensation)					Operating: -25 to +55°C Storage: -30 to +70°C (with no icing or condensation)		Operating: -25 to +55°C Storage: -40 to +70°C (with no icing or condensation)		
Ambient humidity range		Operating: 35% to +85% Storage: 35% to +95% (with no condensation)					Operating or Storage: 35% to +85% (with no condensation)		Operating: 35% to +85% Storage: 35% to +95% (with no condensation)		
Insulation resistance		20 MΩ min. at 500 VDC									
Dielectric strength		AC1,000V, 50/60 Hz for 1 min.					AC500V, 50/60 Hz for 1 min.		AC1,000V, 50/60 Hz for 1 min.		
Vibration resistance (destruction)		10 to 2,000 Hz, 1.5-mm double amplitude or 300 m/s ² for 0.5 hours each in X, Y, and Z directions					10 to 55Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions		10 to 2,000 Hz, 1.5-mm double amplitude or 300 m/s ² for 0.5 hours each in X, Y, and Z directions		
Shock resistance (destruction)		1,000 m/s ² 3 times each in X, Y, and Z directions					500 m/s ² 3 times each in X, Y, and Z directions		1,000m/s ² 3 times each in X, Y, and Z directions		
Degree of protection		IP67 (IEC 60529)					IP65 (IEC 60529)		IP67 (IEC 60529)		
Connection method		Pre-wired (standard length: 2 m)									
Weight (packed state)		Approx. 40 g					Approx. 60 g		Approx. 20 g		
Materials	Case	PBT (polybutylene terephthalate)					SUS303		PBT (polybutylene terephthalate)		
	Display window	Denatured polyarylate					Polysulfone		Denatured polyarylate		
	Lens	Denatured polyarylate					Polysulfone		Methacrylic resin		
	Hexagonal nuts	---					SUS303		---		
	Toothed washers	---					SUS303		---		
Accessories ²		Instruction manual, Set screws for mounting (Side-view Sensors: M2 × 14, Flat Sensors: M2 × 8), Nuts ^{*2}					Instruction manual, Hexagonal nuts, Toothed washers		Instruction manual, Set screws for mounting (M2×14), Nuts, E39-R4 (E3T-SR4□ only), E39-R37-CA (E3T-SR4□-S only)		

*1. Values in parentheses indicate the minimum required distance between the Sensor and Reflector.

*2. Only the *Instruction Manual* is included with an M3-mounting Sensor (E3T-ST□□M). Order the Set of Mounting Screws separately if required.

Sensing method Appearance		Diffuse-reflective		Convergent-reflective		BGS-reflective	
		Rectangular type (Flat)	Cylindrical type (Top-view)	Rectangular type (Side-view)		Rectangular type (Flat)	
Item							
NPN output	Light-ON	E3T-FD11 E3T-FD11M	E3T-CD11	E3T-SL11 E3T-SL11M	E3T-SL21 E3T-SL21M	E3T-FL11	E3T-FL21
	Dark-ON	E3T-FD12 E3T-FD12M	---	E3T-SL12 E3T-SL12M	E3T-SL22 E3T-SL22M	E3T-FL12	E3T-FL22
PNP output	Light-ON	E3T-FD13 E3T-FD13M	E3T-CD13	E3T-SL13 E3T-SL13M	E3T-SL23 E3T-SL23M	E3T-FL13	E3T-FL23
	Dark-ON	E3T-FD14 E3T-FD14M	---	E3T-SL14 E3T-SL14M	E3T-SL24 E3T-SL24M	E3T-FL14	E3T-FL24
Sensing distance		5 to 30 mm (50 × 50 mm white paper)	3 to 50 mm (100 × 100 mm white paper)	5 to 15 mm (50 × 50 mm white paper)	5 to 30 mm (50 × 50 mm white paper)	1 to 15 mm (50 × 50 mm white paper)	1 to 30 mm (50 × 50 mm white paper)
Standard sensing object		---		---		---	
Minimum detectable object (reference value)		0.15-mm dia. (sensing distance 10 mm)	---	0.15-mm dia. (sensing distance 10 mm)		0.15-mm dia. non-glossy object (sensing distance 10 mm)	
Hysteresis (white paper)		6 mm max.	15% or less of the sensing distance	2 mm max.	6 mm max.	0.5 mm max.	2 mm max.
Black/white error		---		---		15% max.	
Directional angle		---		---		---	
Light source (wavelength)		Red LED (650 nm)	Infrared LED (870 nm)	Red LED (650 nm)		---	
Power supply voltage		12 to 24 VDC ±10%, ripple (p-p) 10% max.					
Current consumption		20 mA max.					
Control output		Load power supply voltage: 26.4 VDC max. Load current: 50 mA max. (residual voltage: 2 V max. for load current of 10 to 50 mA, 1 V max. for load current of less than 10 mA) Open-collector output	Load power supply voltage: 30 VDC max. Load current: 80 mA max. (residual voltage: 1 V max.) Open-collector output	Load power supply voltage: 26.4 VDC max. Load current: 50 mA max. (residual voltage: 2 V max. for load current of 10 to 50 mA, 1 V max. for load current of less than 10 mA) Open-collector output			
Protection circuits		Power supply and control output reverse polarity protection, Output short-circuit protection, Mutual interference prevention	Power supply reverse polarity protection, Output short-circuit protection	Power supply and control output reverse polarity protection, Output short-circuit protection, Mutual interference prevention			
Response time		Operate or reset: 1 ms max.	Operate or reset: 0.5 ms max.	Operate or reset: 1 ms max.			
Ambient illumination		Incandescent lamp: 5,000 lx max., Sunlight: 10,000 lx max.	Incandescent lamp: 3,000 lx max.	Incandescent lamp: 5,000 lx max., Sunlight: 10,000 lx max.			
Ambient temperature range		Operating: -25 to +55°C Storage: -40 to +70°C (with no icing or condensation)	Operating: -25 to +55°C Storage: -30 to +70°C (with no icing or condensation)	Operating: -25 to +55°C Storage: -40 to +70°C (with no icing or condensation)			
Ambient humidity range		Operating: 35% to +85% Storage: 35% to +95% (with no condensation)	Operating or Storage: 35% to +85% (with no condensation)	Operating: 35% to +85% Storage: 35% to +95% (with no condensation)			
Insulation resistance		20 MΩ min. at 500 VDC					
Dielectric strength		1,000 VAC, 50/60 Hz for 1 min.	500 VAC, 50/60 Hz for 1 min.	1,000 VAC, 50/60 Hz for 1 min.			
Vibration resistance (destruction)		10 to 2,000 Hz, 1.5-mm double amplitude or 300 m/s ² for 0.5 hours each in X, Y, and Z directions	10 to 55Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions	10 to 2,000 Hz, 1.5-mm double amplitude or 300 m/s ² for 0.5 hours each in X, Y, and Z directions			
Shock resistance (destruction)		1,000 m/s ² 3 times each in X, Y, and Z directions	500 m/s ² 3 times each in X, Y, and Z directions	1,000m/s ² 3 times each in X, Y, and Z directions			
Degree of protection		IP67 (IEC 60529)	IP65 (IEC 60529)	IP67 (IEC 60529)			
Connection method		Pre-wired (standard length: 2 m)					
Weight (packed state)		Approx. 20 g	Approx. 40 g	Approx. 20 g			
Materials	Case	PBT (polybutylene terephthalate)	SUS303	PBT (polybutylene terephthalate)			
	Display window	Denatured polyarylate	Epoxy	Denatured polyarylate			
	Lens	Denatured polyarylate	Polysulfone	Denatured polyarylate			
	Hexagonal nuts	---	SUS303	---			
	Toothed washers	---	SUS303	---			
Accessories *		Instruction manual, Set screws for mounting (M2 × 8), Nuts *	Instruction manual, Hexagonal nuts, Toothed washers, Adjustment driver	Instruction manual, Set screws for mounting (M2 × 14), Nuts *		Instruction manual, Set screws for mounting (M2 × 8), Nuts	

*Only the *Instruction Manual* is included with an M3-mounting Sensor (E3T-FD□□M or E3T-SL□□M). Order the Set of Mounting Screws separately if required.

Engineering Data (Reference Value)

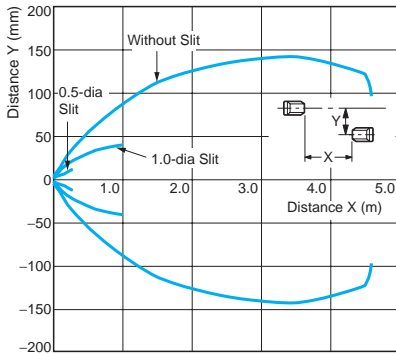
M2-mounting and M3-mounting Sensors

Parallel Operating Range

Through-beam

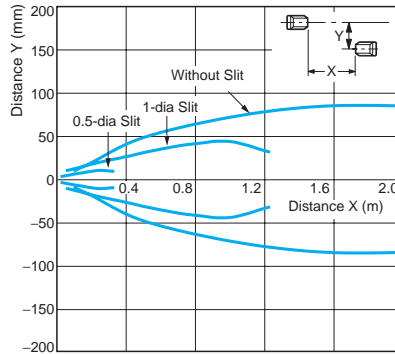
E3T-ST3□ + E39-S63 Slit

(A Slit is mounted to the Emitter and Receiver.)



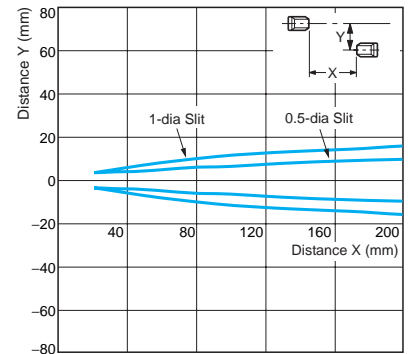
E3T-ST1□(M) + E39-S63 Slit

(A Slit is mounted to the Emitter and Receiver.)



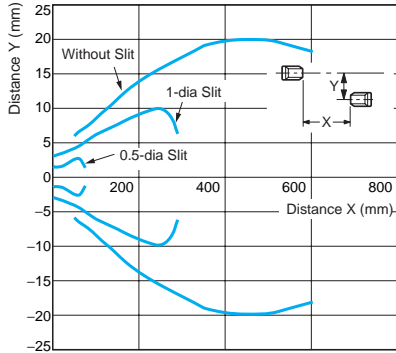
E3T-ST1□(M) + E39-S63 Slit (Enlarged graph)

(A Slit is mounted to the Emitter and Receiver.)



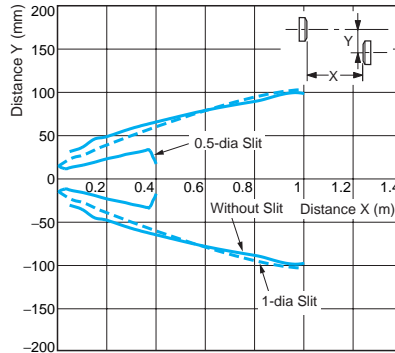
E3T-ST2□(M) + E39-S63 Slit

(A Slit is mounted to the Emitter and Receiver.)



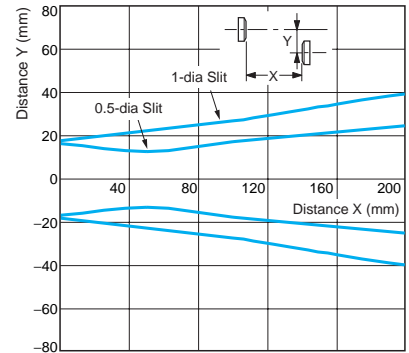
E3T-FT1□ + E39-S64 Slit

(A Slit is mounted to the Emitter and Receiver.)



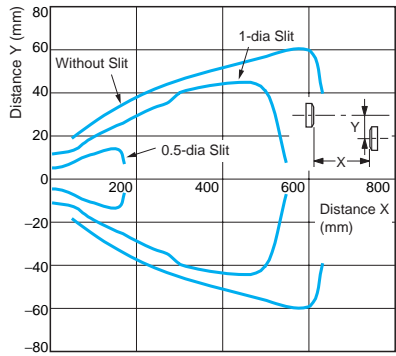
E3T-FT1□ + E39-S64 Slit (Enlarged graph)

(A Slit is mounted to the Emitter and Receiver.)



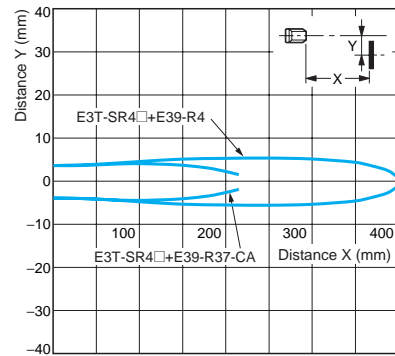
E3T-FT2□ + E39-S64 Slit

(A Slit is mounted to the Emitter and Receiver.)



Retro-reflective

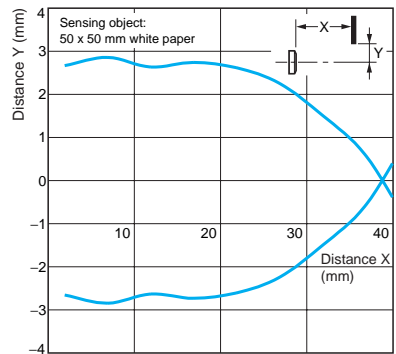
E3T-SR4□



Operating Range

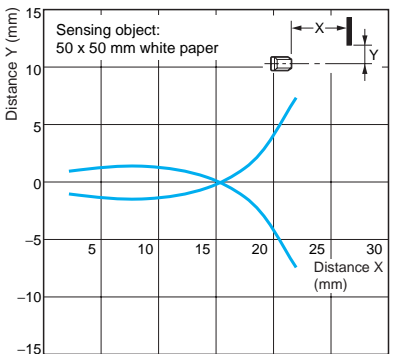
Diffuse-reflective

E3T-FD1□(M)

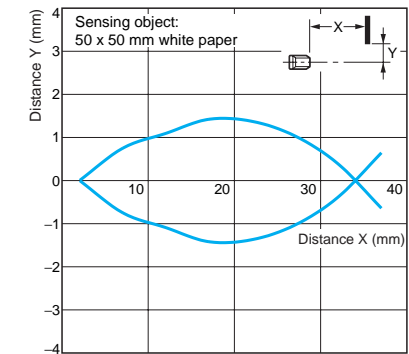


Convergent-reflective

E3T-SL1□(M)

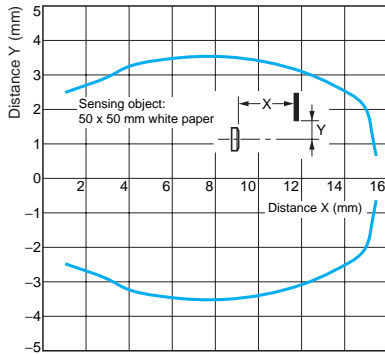


E3T-SL2□(M)

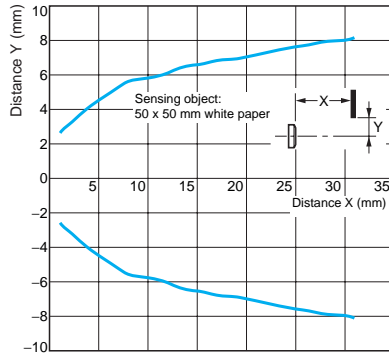


BGS-reflective

E3T-FL1□



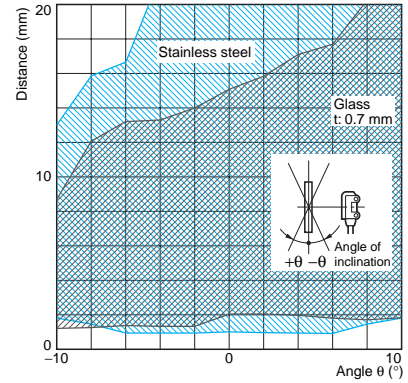
E3T-FL2□



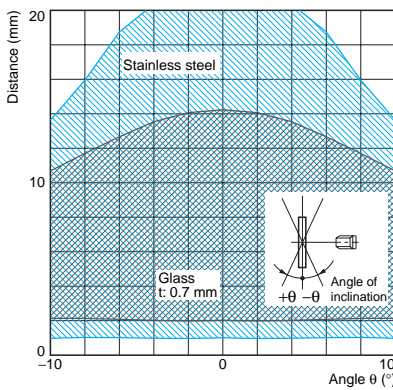
Inclination Detection Area Characteristic

Convergent-reflective

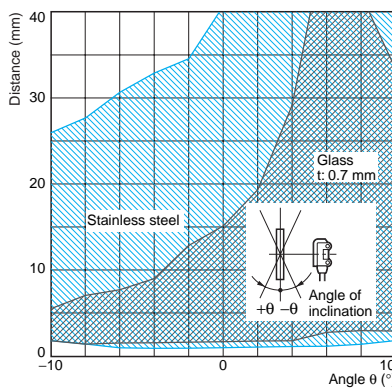
E3T-SL1□(M) (Top to Bottom)



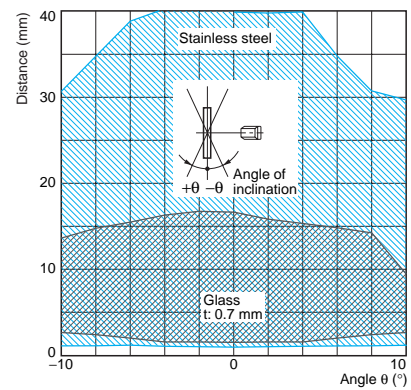
E3T-SL1□(M) (Right to Left)



E3T-SL2□(M) (Top to Bottom)

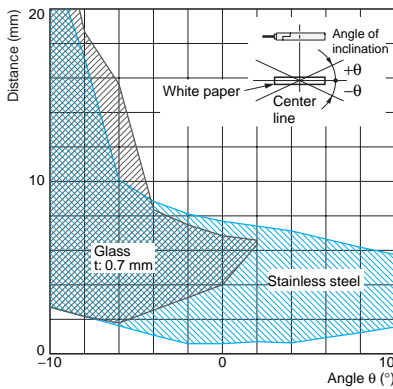


E3T-SL2□(M) (Right to Left)

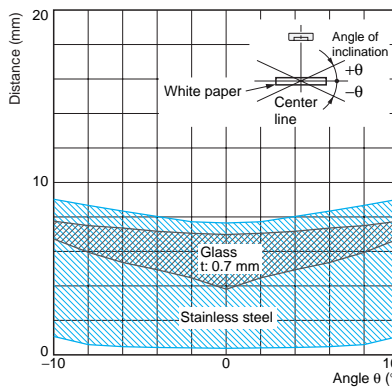


BGS-reflective

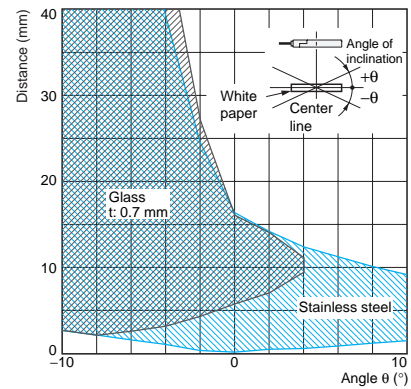
E3T-FL1□ (Top to Bottom)



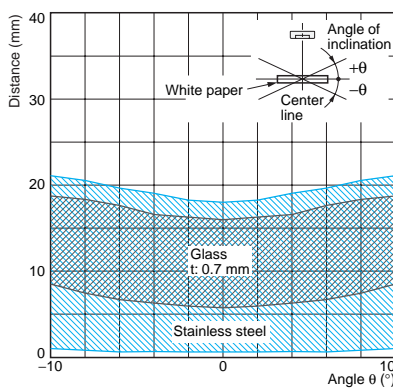
E3T-FL1□ (Right to Left)



E3T-FL2□ (Top to Bottom)



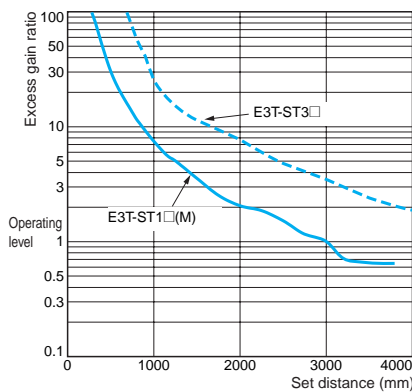
E3T-FL2□ (Right to Left)



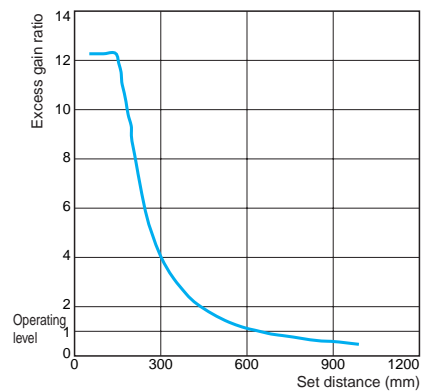
Excess Gain vs. Set Distance

Through-beam

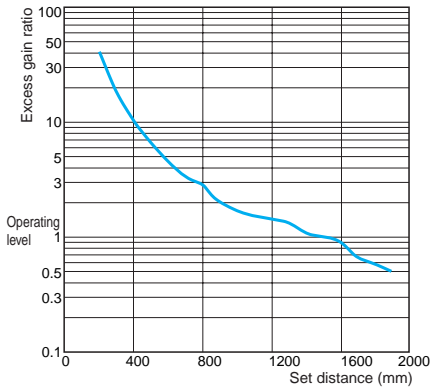
E3T-ST1□(M)/E3T-ST3□



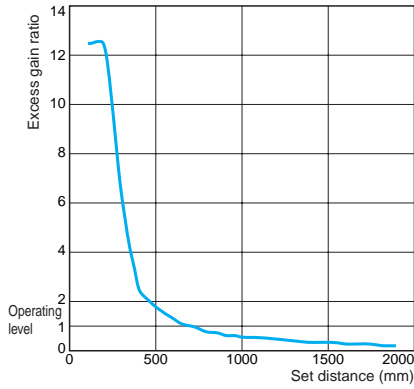
E3T-ST2□(M)



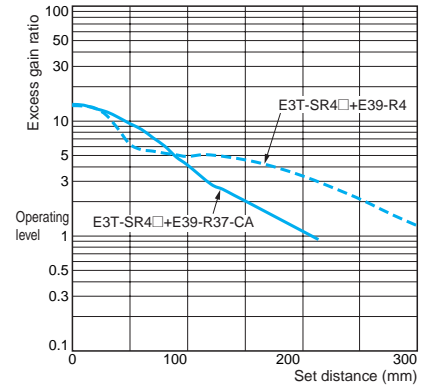
E3T-FT1 □



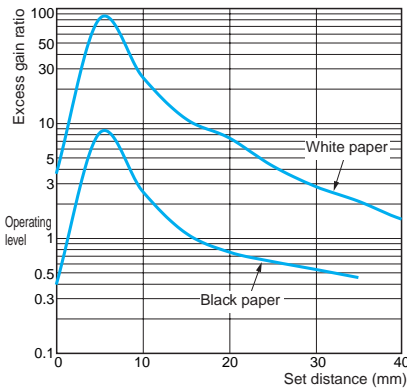
E3T-FT2 □



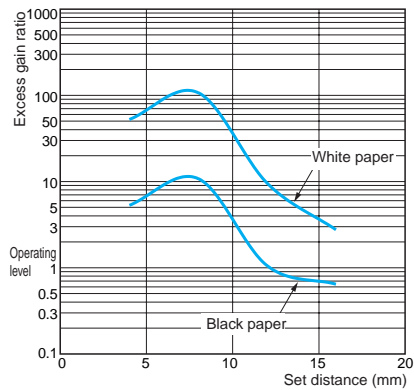
Retro-reflective
E3T-SR4 □



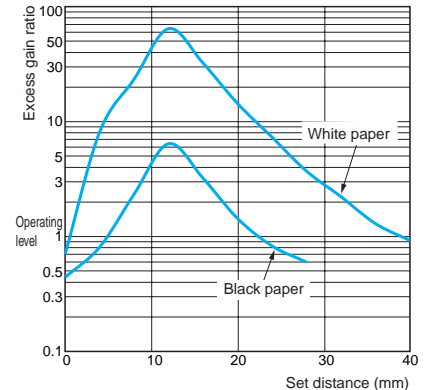
Diffuse-reflective
E3T-FD1 □(M)



Convergent-reflective
E3T-SL1 □(M)

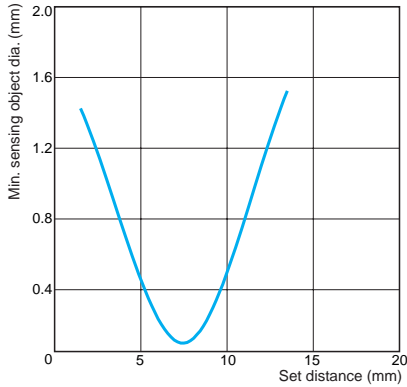


E3T-SL2 □(M)

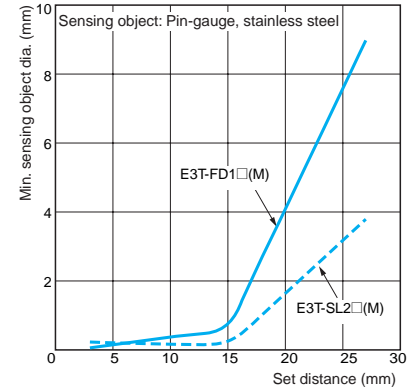


Sensing Object Size vs. Sensing Distance

Convergent-reflective
E3T-SL1 □(M)

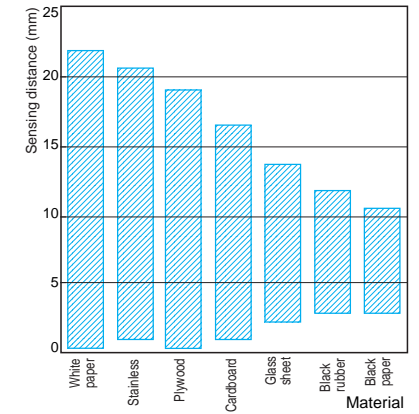


Diffuse/Convergent-reflective
E3T-FD1 □(M)/**E3T-SL2** □(M)

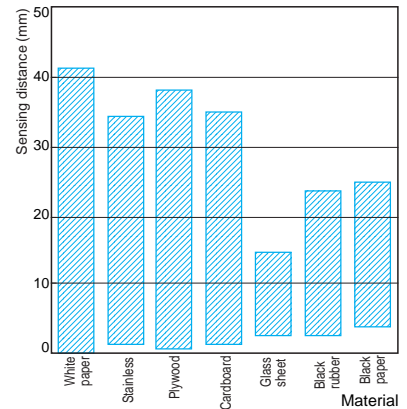


Sensing Distance vs. Material

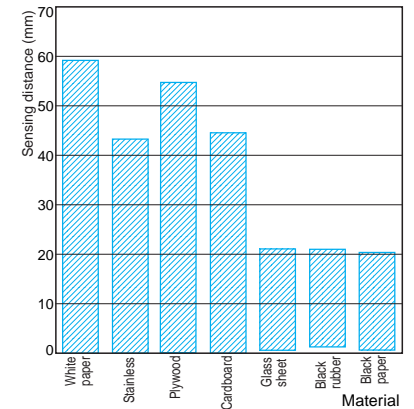
Convergent-reflective
E3T-SL1 □(M)



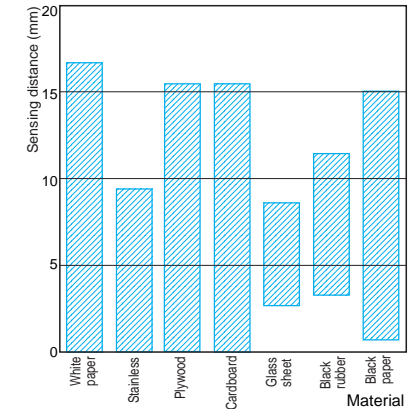
E3T-SL2 □(M)



Diffuse-reflective
E3T-FD1 □(M)

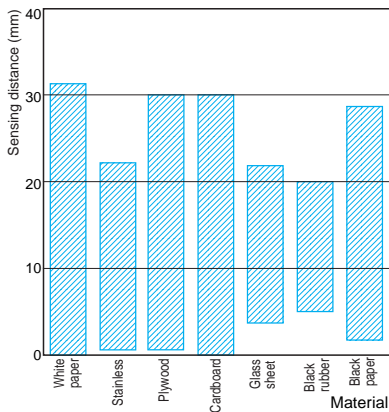


BGS-reflective
E3T-FL1 □

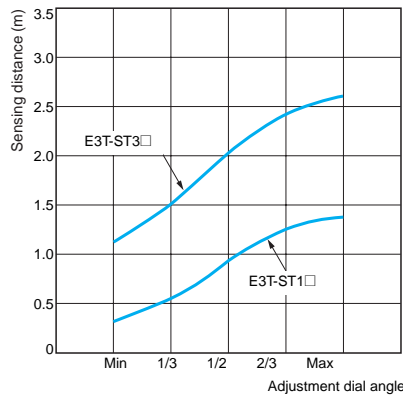


Sensing Distance Characteristics of Sensitivity Adjustment Unit (when Completing Optical Axis Adjustment)

E3T-FL2□



E3T-ST1□ + E39-E10 Sensitivity Adjustment Unit
E3T-ST3□ + E39-E10 Sensitivity Adjustment Unit

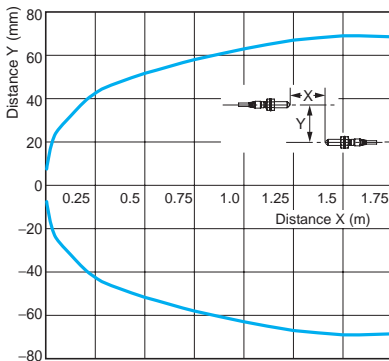


Small Cylindrical Sensors

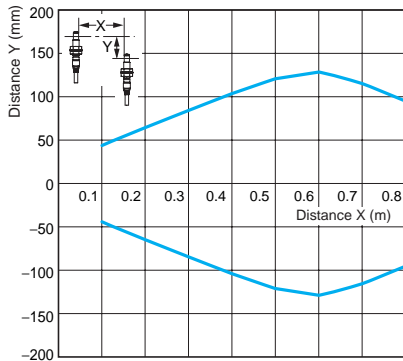
Parallel Operating Range

Through-beam

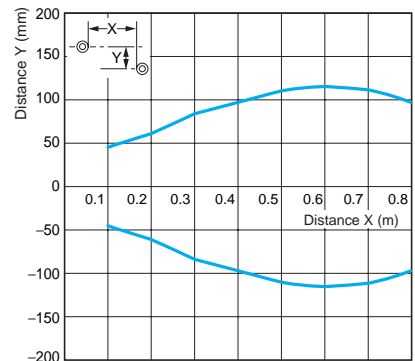
E3T-CT1□



E3T-CT2□S (Top to Bottom)



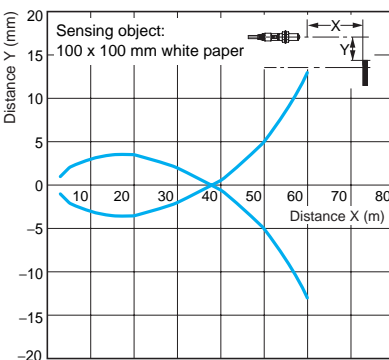
E3T-CT2□S (Right to Left)



Operating Range

Diffuse-reflective

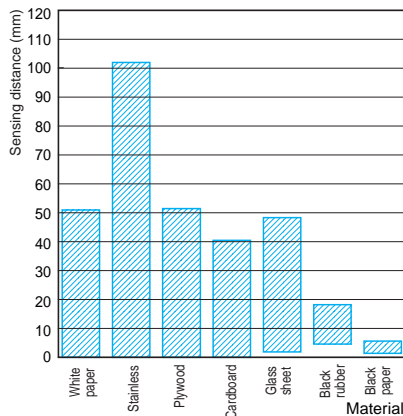
E3T-CD1□



Sensing Distance vs. Material

Diffuse-reflective

E3T-CD1□



I/O Circuit Diagrams

NPN Output

Model	Operation mode	Timing charts	Output circuit
E3T-□□□1 E3T-□□□1M	Light-ON	<p>(Between brown (1) and black (4) leads)</p>	<p>Through-beam Receivers and Reflective Sensors</p> <p>Through-beam Emitters</p> <p>*1. There is no diode for Small Cylindrical Sensors (E3T-C□□□(S)). *2. This is 80 mA max. for Small Cylindrical Sensors (E3T-C□□□(S)).</p>
E3T-□□□2 E3T-□□□2M E3T-□□□2S	Dark-ON	<p>(Between brown (1) and black (4) leads)</p>	<p>Through-beam Receivers and Reflective Sensors</p> <p>Through-beam Emitters</p> <p>*1. There is no diode for Small Cylindrical Sensors (E3T-C□□□(S)). *2. This is 80 mA max. for Small Cylindrical Sensors (E3T-C□□□(S)).</p>

PNP Output

Model	Operation mode	Timing charts	Output circuit
E3T-□□□3 E3T-□□□3M	Light-ON	<p>(Between blue (3) and black (4) leads)</p>	<p>Through-beam Receivers and Reflective Sensors</p> <p>Through-beam Emitters</p> <p>*1. There is no diode for Small Cylindrical Sensors (E3T-C□□□(S)). *2. This is 80 mA max. for Small Cylindrical Sensors (E3T-C□□□(S)).</p>
E3T-□□□4 E3T-□□□4M E3T-□□□4S	Dark-ON	<p>(Between blue (3) and black (4) leads)</p>	<p>Through-beam Receivers and Reflective Sensors</p> <p>Through-beam Emitters</p> <p>*1. There is no diode for Small Cylindrical Sensors (E3T-C□□□(S)). *2. This is 80 mA max. for Small Cylindrical Sensors (E3T-C□□□(S)).</p>

E3T

Safety Precautions

Refer to *Warranty and Limitations of Liability*.

⚠ WARNING

This product is not designed or rated for ensuring safety of persons. Do not use it for such purpose.

Do not apply AC power to the E3T, otherwise the E3T may rupture.

Precautions for Correct Use

Do not use the product in atmospheres or environments that exceed product ratings.

● Wiring

The maximum power supply voltage is 26.4 VDC. Before turning the power ON, make sure that the power supply voltage be not more than maximum voltage.

Load short-circuit protection

The E3T incorporates a load short-circuit protection function. If the load short-circuits, the output of the E3T will be turned OFF. Then, recheck the wiring and turn on the E3T again to reset the load short-circuit protection function. The load short-circuit protection function will work if there is a current flow that is 1.5 times larger than the rated load current. When using a capacitance load, be sure that the inrush current will not exceed 1.5 times larger than the rated current.

● Mounting

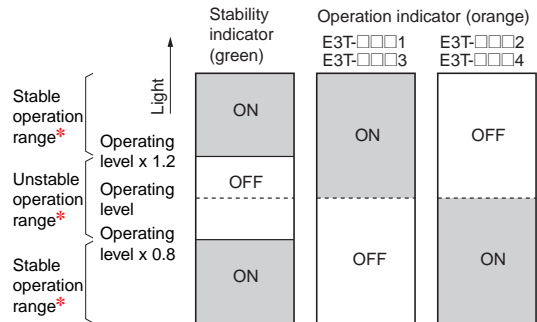
When mounting the Sensor, never strike it with a heavy object, such as a hammer. Doing so may reduce its watertight properties. Use screws with spring, flat, or toothed washers to secure the Sensor.

Tightening Torque
 M2-mounting Sensors: 0.15 N·m max
 M3-mounting Sensors: 0.5 N·m max
 Small Cylindrical Sensors: 1 N·m max

● Adjusting

Indicators

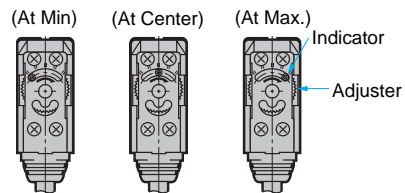
- The following graphs indicate the status of each operating level.
- Be sure to use the E3T within the stable operating range.



* If the E3T fs operating level is set to the stable operation range, the E3T will be in most reliable operation without being influenced by temperature change, voltage fluctuation, dust, or setting change. If the operating level cannot be set to the stable operation range, pay attention to environmental changes while operating the E3T.

Use of E39-E10 Sensitivity Adjustment Unit

(Dark-ON: E3T-ST12)



1. Mount the Unit on the Receiver.
2. Set the adjuster of the Sensitivity Adjustment Unit to Max. (Before shipping: Max.)
3. After mounting on the Sensor, adjust the optical axis and secure the Sensor.
4. Place a workpiece between the 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 workpiece and confirm that the operation indicator is OFF and the stability indicator (green) is ON. This completes the adjustment.

Note: If the light attenuation rate due to a workpiece is 40% or less, the stability indicator will not turn ON whether or not light is received. When the variation of light is small such as when sensing semi-transparent workpieces, carefully perform preliminary testing.

E3T-CD□□ Sensitivity Adjustment

Use the special screwdriver that is provided with the Sensor to adjust the sensitivity. Do not exceed 0.8 N·m when turning the adjuster.

● Others

Do not install the E3T in the following locations.

- Locations subject to excessive dust or dirt
- Locations subject to direct sunlight
- Locations subject to corrosive gas
- Locations subject to contact with organic solvents
- Locations subject to vibration and shock
- Locations subject to contact with water, oil, or chemicals
- Locations subject to high humidities that might result in condensation

Dimensions

(Unit: mm)

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

Sensors

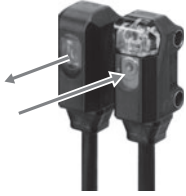
M2-mounting Sensors

Through-beam Side-view Sensors

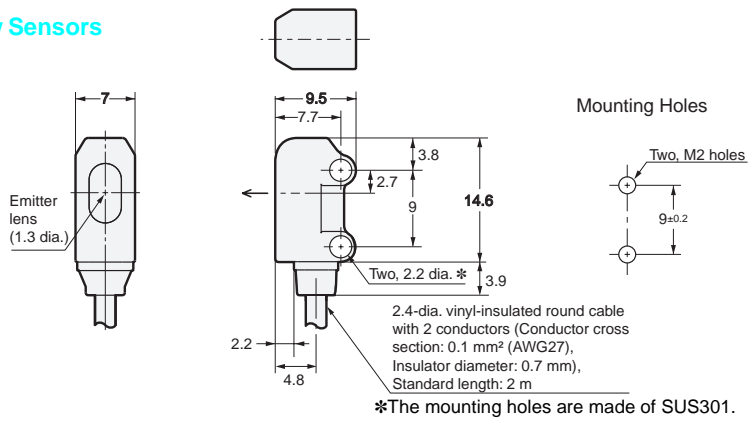
E3T-ST1□ (Emitter)

E3T-ST2□ (Emitter)

E3T-ST3□ (Emitter)



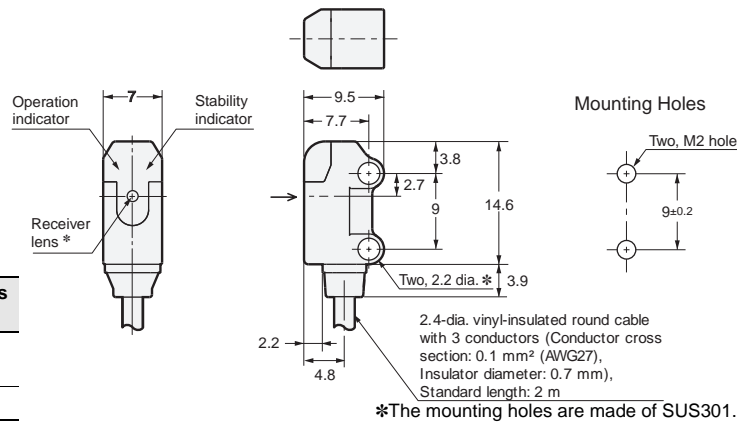
Emitter: E3T-ST□□-L
Receiver: E3T-ST□□-D



E3T-ST1□ (Receiver)

E3T-ST2□ (Receiver)

E3T-ST3□ (Receiver)



*The receiver lens diameters are given below.

Model	Receiver lens diameter
E3T-ST1□-D E3T-ST2□-D	(1.3 dia.)
E3T-ST3□-D	(2.4 dia.)

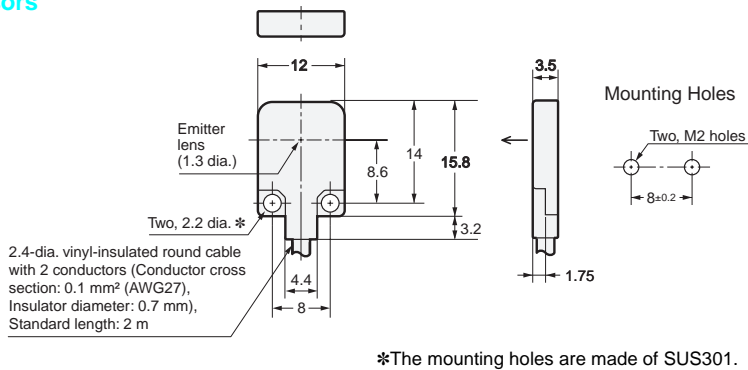
Through-beam Flat Sensors

E3T-FT1□ (Emitter)

E3T-FT2□ (Emitter)

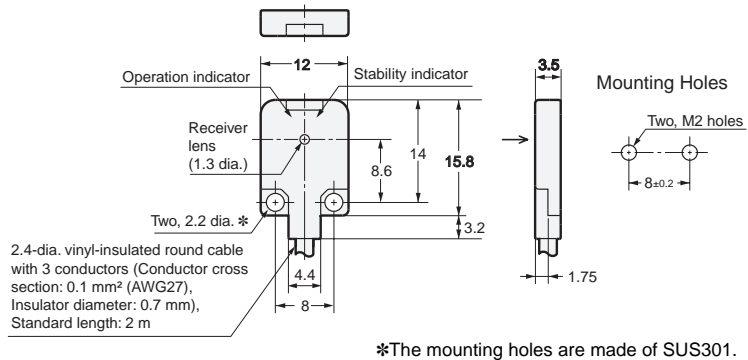


Emitter: E3T-FT□□-L
Receiver: E3T-FT□□-D



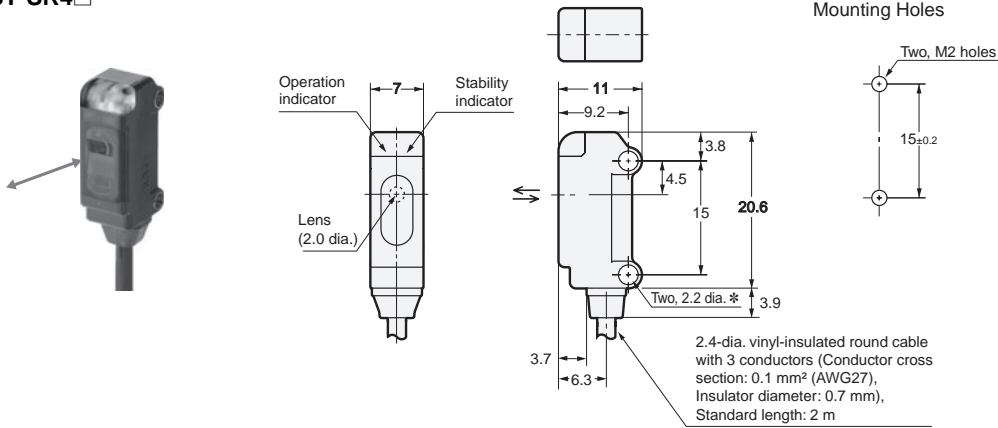
E3T-FT1□ (Receiver)

E3T-FT2□ (Receiver)



Retro-reflective Side-view Sensors

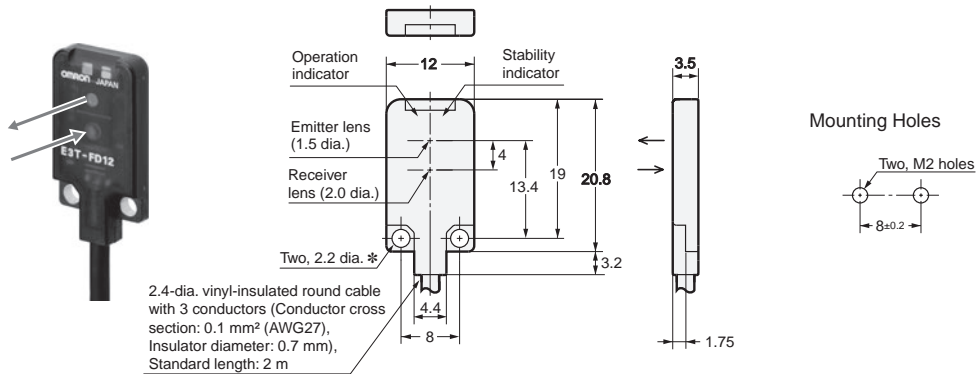
E3T-SR4□



*The mounting holes are made of SUS301.

Diffuse-reflective Flat Sensors

E3T-FD1□

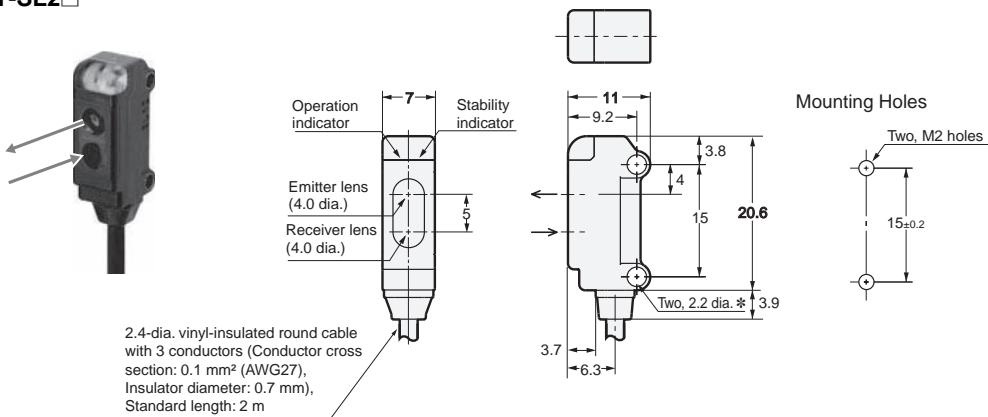


*The mounting holes are made of SUS301.

Convergent-reflective Side-view Sensors

E3T-SL1□

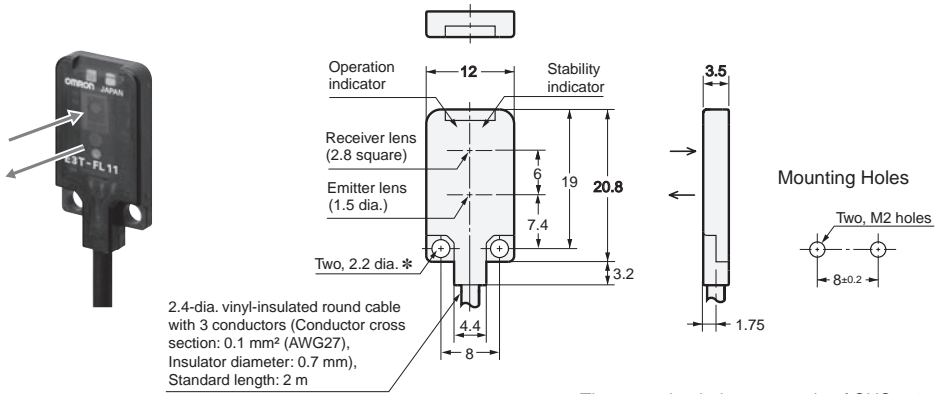
E3T-SL2□



*The mounting holes are made of SUS301.

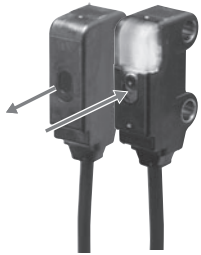
BGS-reflective Flat Sensors

- E3T-FL1□
- E3T-FL2□

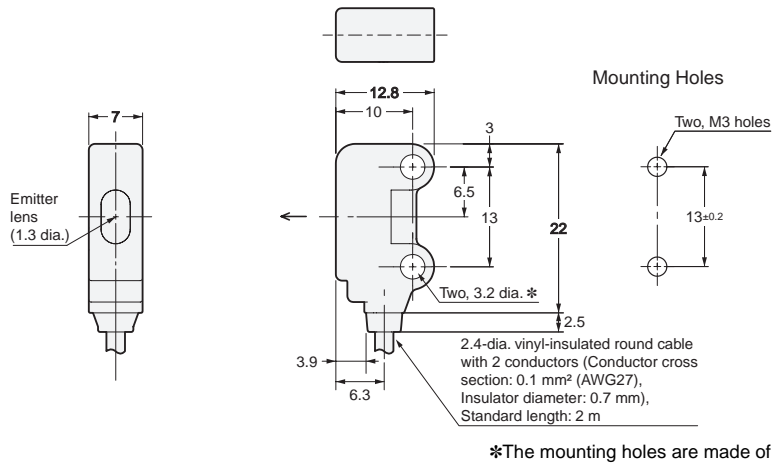


M3-mounting Sensors
Through-beam Side-view Sensors

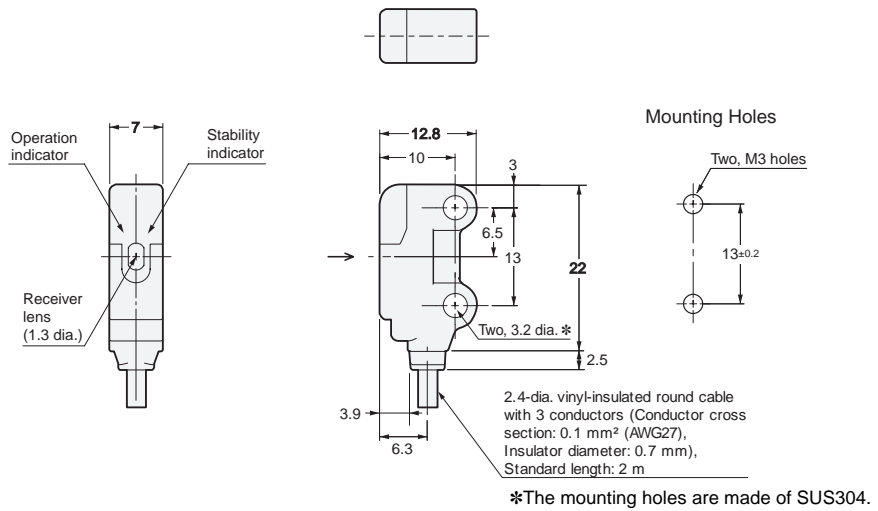
- E3T-ST1□M (Emitter)
- E3T-ST2□M (Emitter)



Emitter: E3T-ST□□M-L
Receiver: E3T-ST□□M-D

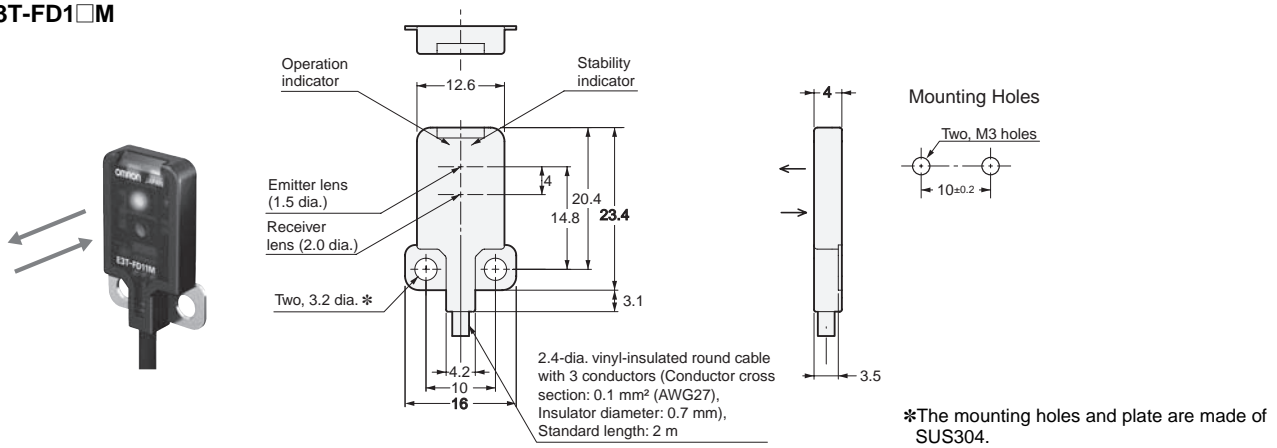


- E3T-ST1□M (Receiver)
- E3T-ST2□M (Receiver)



Diffuse-reflective Flat Sensors

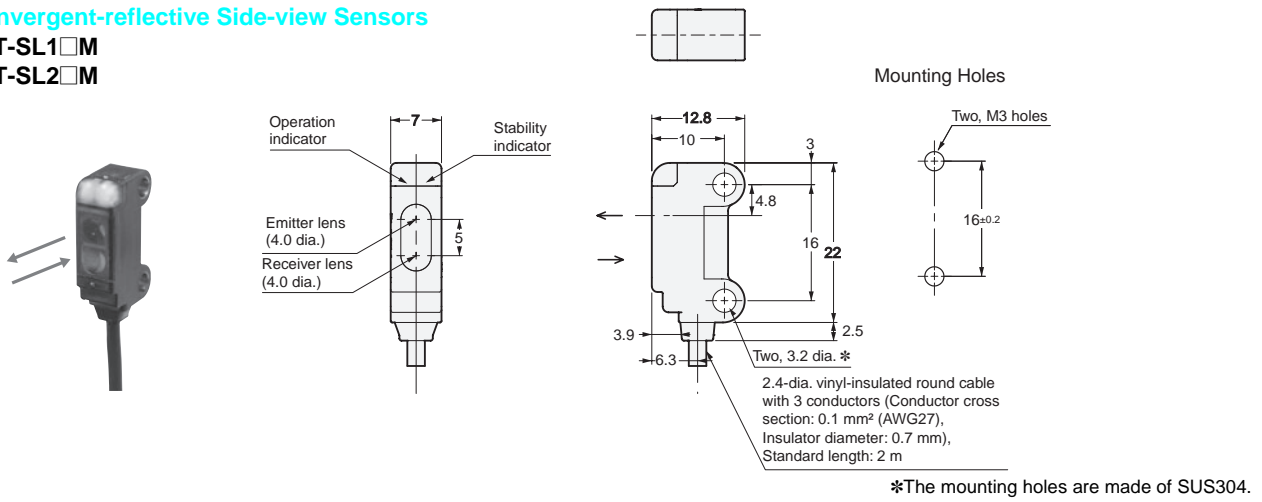
E3T-FD1□M



Convergent-reflective Side-view Sensors

E3T-SL1□M

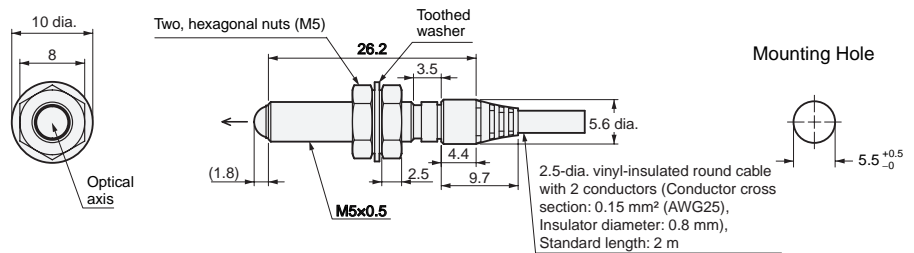
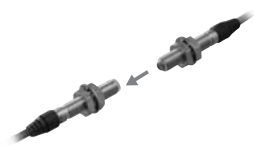
E3T-SL2□M



Small Cylindrical Sensors

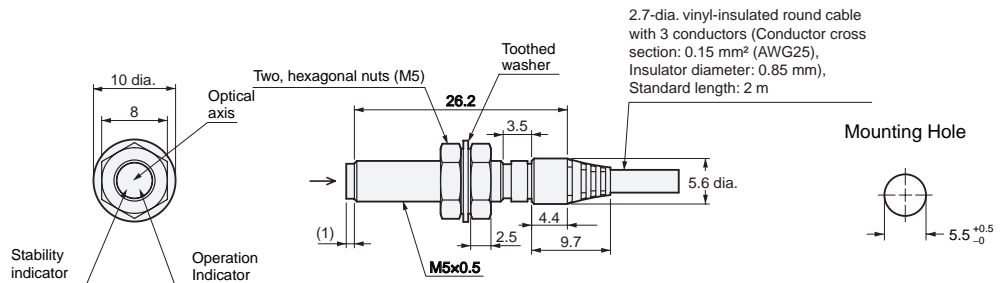
Through-beam Top-view Sensors

E3T-CT1□ (Emitter)



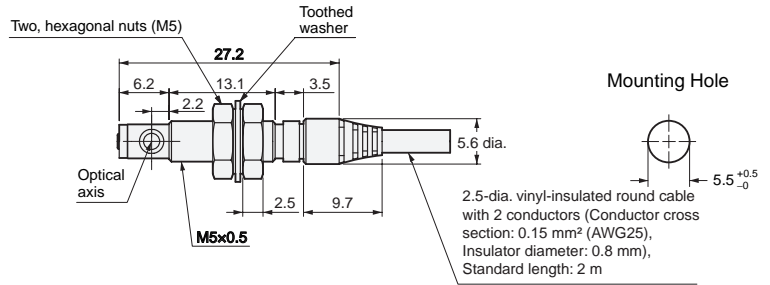
Emitter: E3T-CT1□-L
Receiver: E3T-CT1□-D

E3T-CT1□ (Receiver)



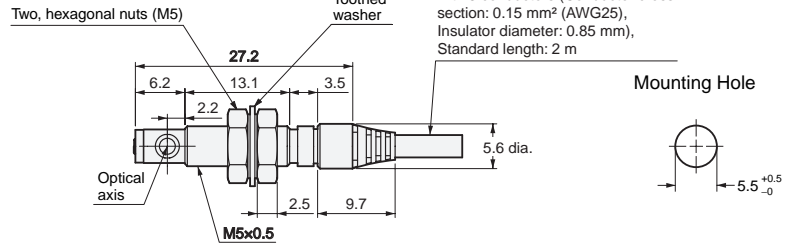
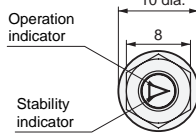
Through-beam Side-view Sensors

E3T-CT2□S (Emitter)



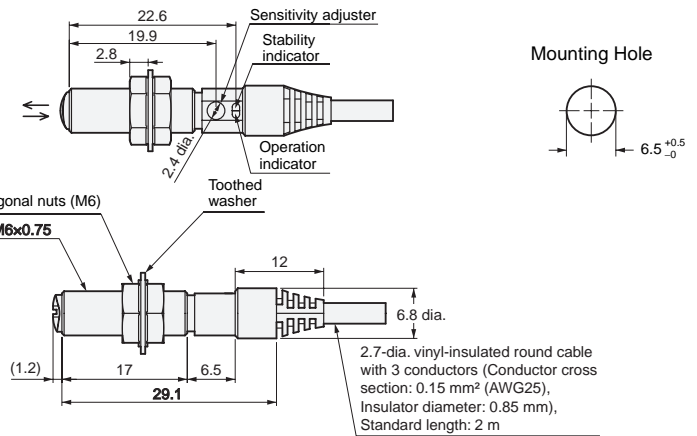
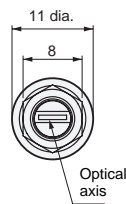
Emitter: E3T-CT2□S-L
Receiver: E3T-CT2□S-D

E3T-CT2□S (Receiver)



Diffuse-reflective Top-view Sensors

E3T-CD1□



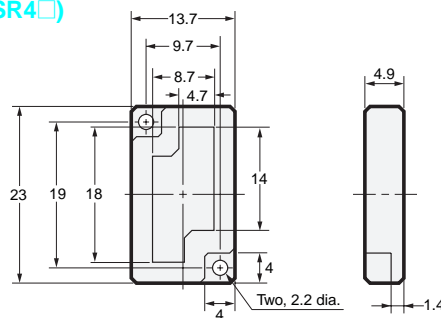
Accessories

Reflector (Provided with E3T-SR4□)

E39-R4



Material, reflective surface: acrylic
Rear surface: ABS

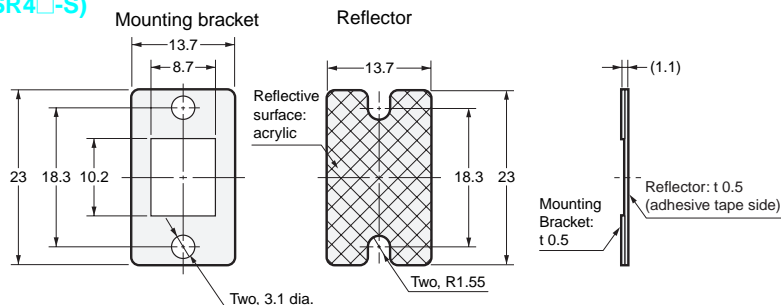


Reflector (Provided with E3T-SR4□-S)

E39-R37-CA



Material: Mounting plate: stainless steel (SUS301)
Reflective surface: acrylic

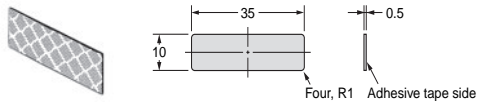


Note: The reflective plate and mounting plate (1) come as a set.

Accessories (Order Separately)

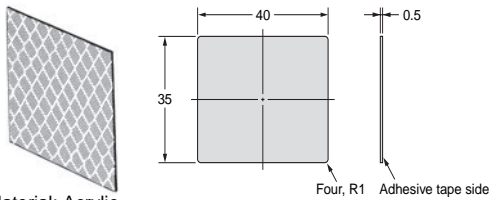
Tape Reflectors

E39-RS1-CA



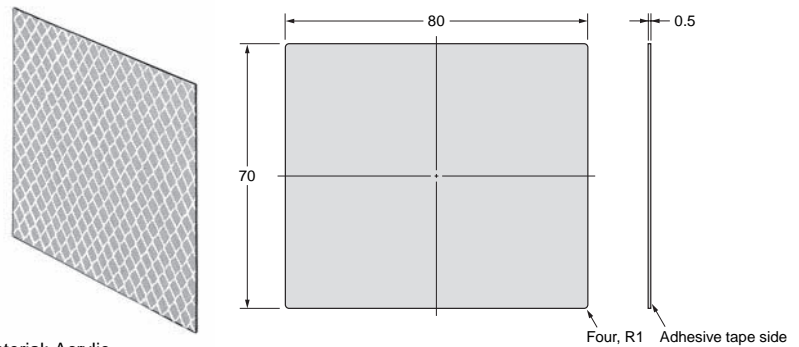
Material: Acrylic

E39-RS2-CA



Material: Acrylic

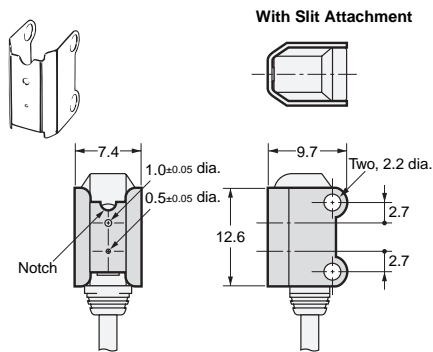
E39-RS3-CA



Material: Acrylic

Slit for E3T-ST□□ Through-beam Sensors

E39-S63

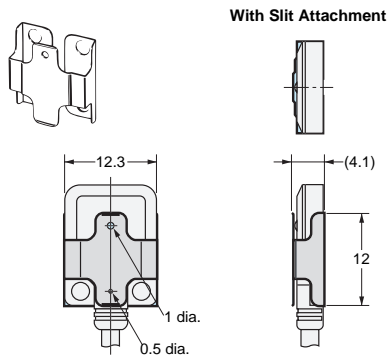


Material: 0.2-mm thick stainless steel (SUS301)

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

Slit for E3T-FT□□ Through-beam Sensors

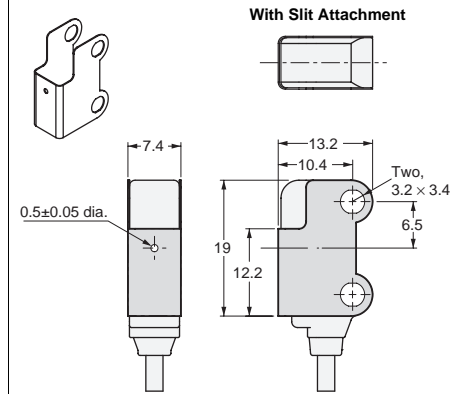
E39-S64



Material: 0.1-mm thick stainless steel (SUS301)

0.5-dia Slit for E3T-ST□□M Through-beam Sensors

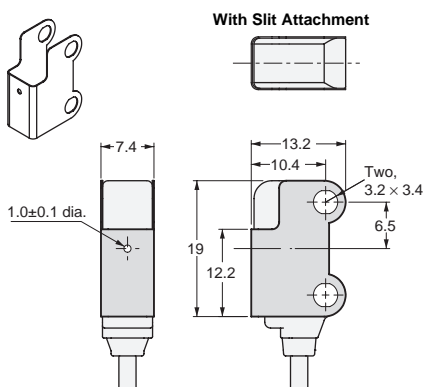
E39-S76A



Material: 0.2-mm thick stainless steel (SUS301)

1-dia Slit for E3T-ST□□M Through-beam Sensors

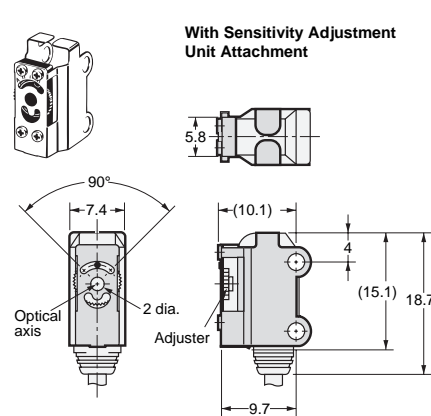
E39-S76B



Material: 0.2-mm thick stainless steel (SUS301)

Sensitivity Adjustment Unit for E3T-ST1□/ST3□ Through-beam Sensors

E39-E10



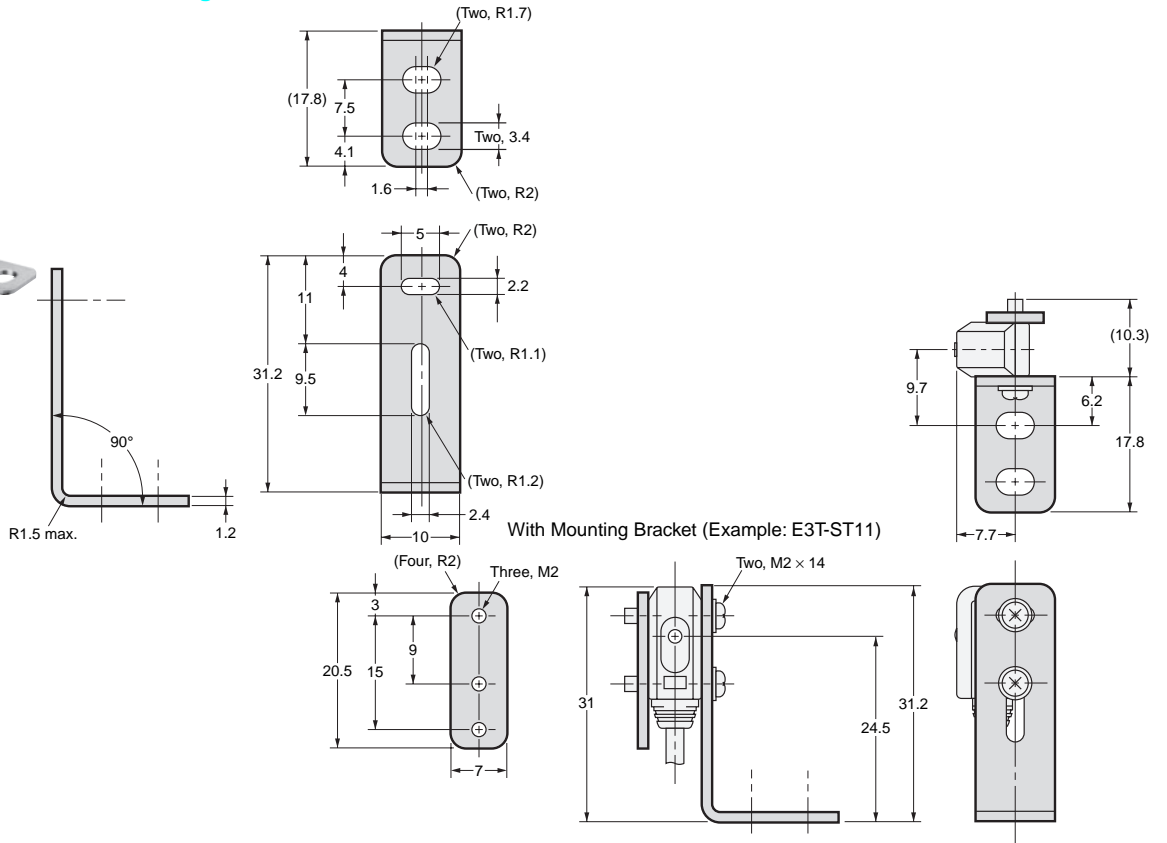
Material: stainless steel (SUS301)

Mounting Bracket for M2-mounting Side-view Sensors

E39-L116



Material: 1.2-mm-thick stainless steel (SUS304)

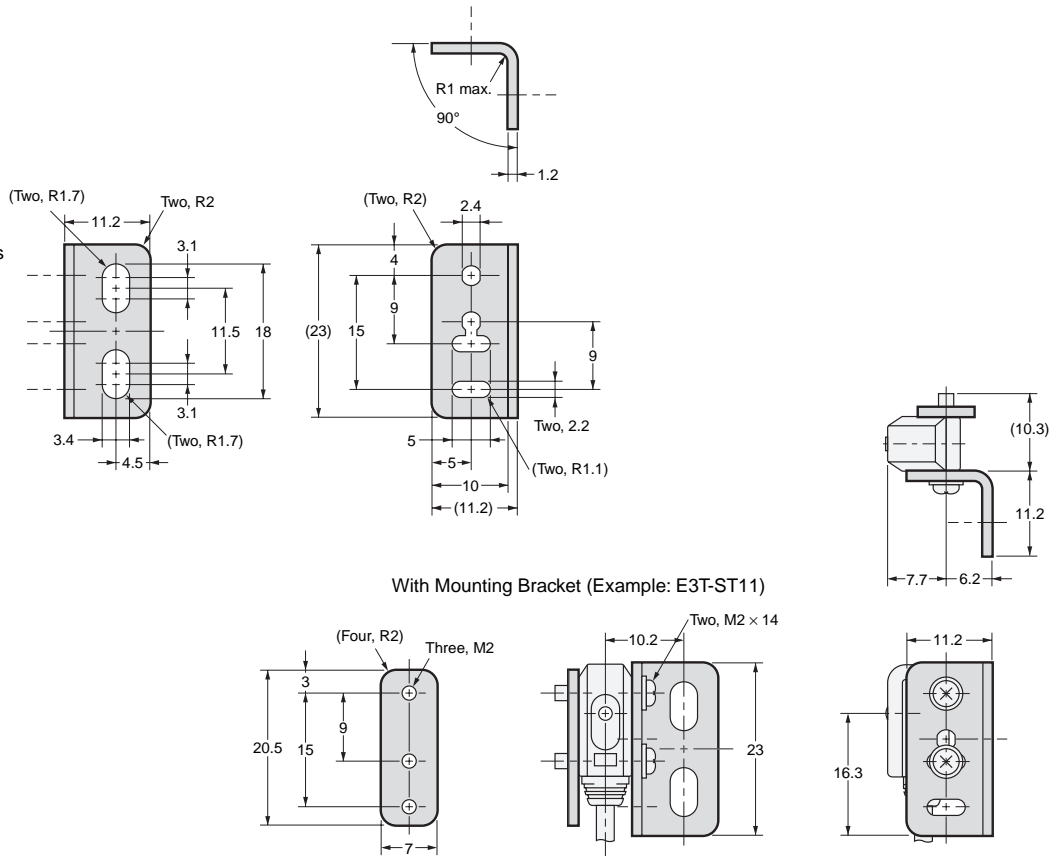


Mounting Bracket for M2-mounting Side-view Sensors

E39-L117



Material: 1.2-mm-thick stainless steel (SUS304)

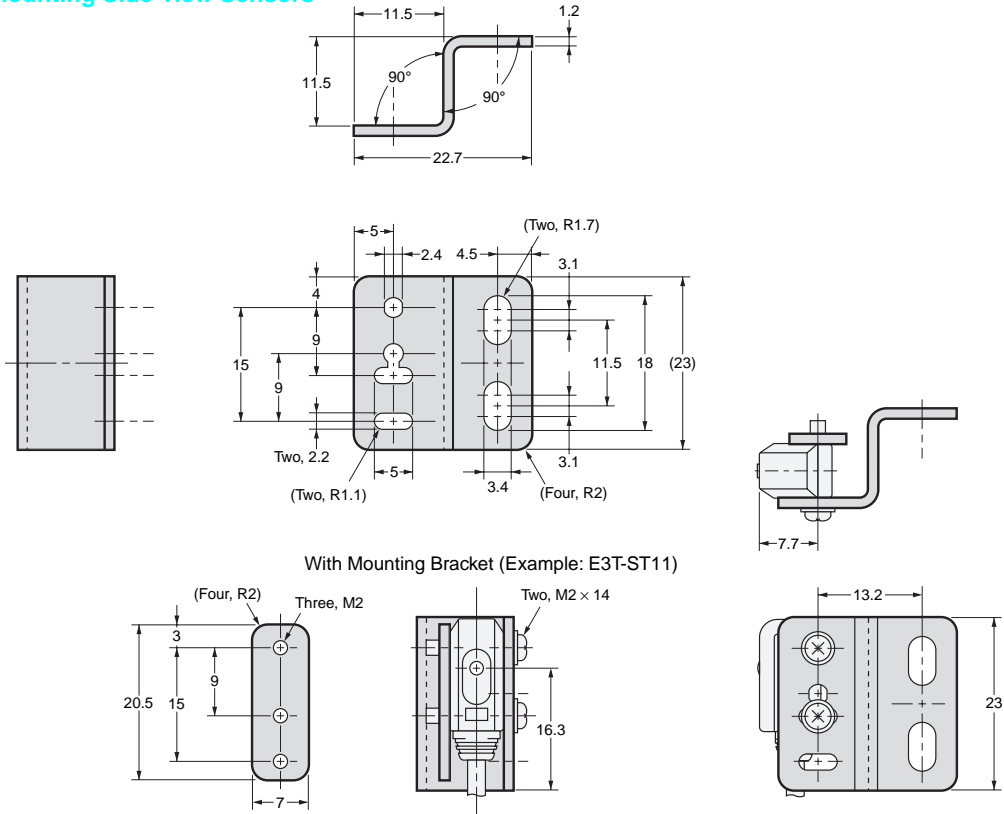


Mounting Bracket for M2-mounting Side-view Sensors

E39-L118



Material: 1.2-mm-thick stainless steel (SUS304)

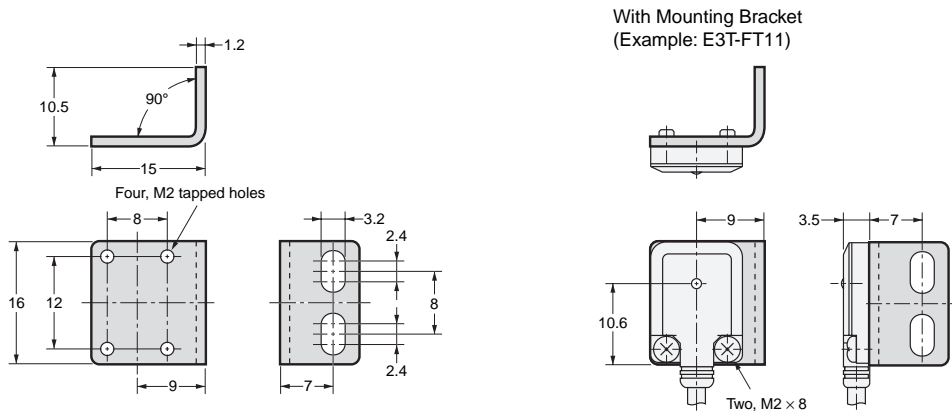


Mounting Bracket for M2-mounting Flat Sensors

E39-L119



Material: 1.2-mm-thick stainless steel (SUS304)

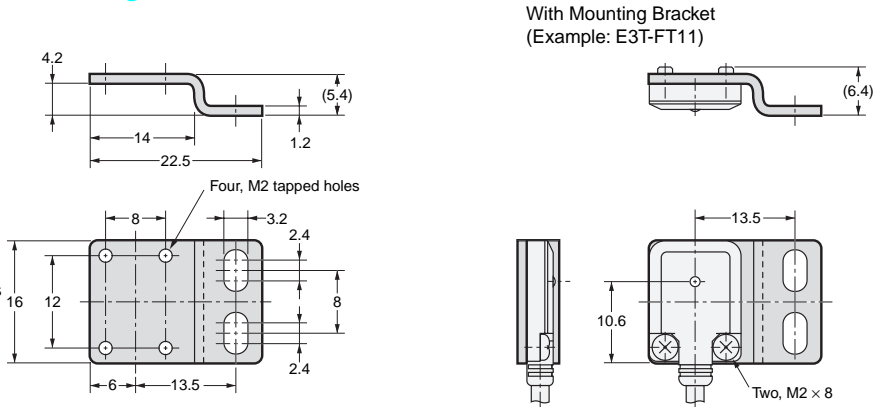


Mounting Bracket for M2-mounting Flat Sensors

E39-L120



Material: 1.2-mm-thick stainless steel (SUS304)



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