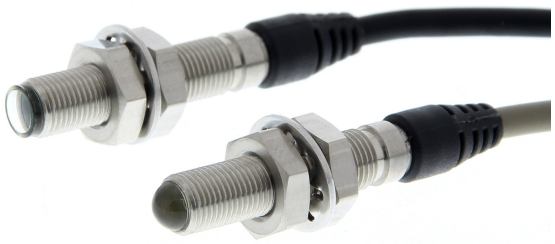
Datenblatt

Optische Miniatursensoren E3T-C

E3T-C



Bezeichnung	E3T-C
Bauform	Zylindrisch
Gehäuse	M5 / M6 Edelstahl
Reflexionslichtschranken mit Polarisationsfilter	-
Einweglichtschranke	1 m
Reflexionslichttaster (energetisch)	50 mm
Reflexionslichttaster mit Hintergrundausblendung	-
Versorgungsspannung	12 - 24 VDC
Schutzart	IP65
Betriebstemperatur	-25°C ... 55°C

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Miniature photoelectric sensors in M5 and M6 sized housing

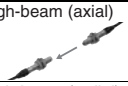
E3T-C

The E3T-C family of miniature photoelectric sensors is the ideal solution when mounting space is crucial.

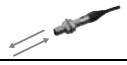
- axial and radial M5 sized through-beam sensors
- axial M6 sized diffuse-reflective sensors
- pre-wired models in stainless steel housing

Ordering Information

M5 cylindrical housing Red light Infrared light

Sensor type	Sensing distance	Operation mode	Order code	
			NPN output	PNP output
Through-beam (axial) 	1 m	Dark-ON	E3T-CT12 2M	E3T-CT14 2M
Through-beam (radial) 	500 mm	Dark-ON	E3T-CT22S 2M	E3T-CT24S 2M

M6 cylindrical housing Red light Infrared light

Sensor type	Sensing distance	Operation mode	Order code	
			NPN output	PNP output
	3 to 50 mm	Light-ON	E3T-CD11 2M	E3T-CD13 2M

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Ratings and Specifications

Item		Through-beam		Diffuse-reflective
		Cylindrical type (Top-view) 	Cylindrical type (Side-view) 	Cylindrical type (Top-view) 
NPN output	Light-ON	---	---	E3T-CD11
	Dark-ON	E3T-CT12	E3T-CT22S	---
PNP output	Light-ON	---	---	E3T-CD13
	Dark-ON	E3T-CT14	E3T-CT24S	---
Sensing distance		1 m	500 mm	3 to 50 mm (100 × 100 mm white paper)
Standard sensing object		Opaque, 4-mm dia. min.	Opaque, 5-mm dia. min.	---
Hysteresis (white paper)		---		15% or less of the sensing distance
Directional angle		Receiver: 2°	Receiver: 10°	---
Light source (wavelength)		Red LED (630 nm)	Red LED (625 nm)	Infrared LED (870 nm)
Power supply voltage		12 to 24 VDC ±10%, ripple (p-p) 10% max.		
Current consumption		30 mA max. (Emitter 15 mA max., Receiver 15 mA max.)		20 mA max.
Control output		Load power supply voltage: 30 VDC max. Load current: 80 mA max. (residual voltage: 1 V max.) Open-collector output		
Protection circuits		Power supply reverse polarity protection, Output short-circuit protection		
Response time		Operate or reset: 0.5 ms max.		
Ambient illumination		Incandescent lamp: 3,000 lx max.		
Ambient temperature range		Operating: −25 to +55°C Storage: −30 to +70°C (with no icing or condensation)		
Ambient humidity range		Operating or Storage: 35% to +85% (with no condensation)		
Insulation resistance		20 MΩ min. at 500 VDC		
Dielectric strength		500 VAC, 50/60 Hz for 1 min.		
Vibration resistance (destruction)		10 to 55Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions		
Shock resistance (destruction)		500 m/s^2 3 times each in X, Y, and Z directions		
Degree of protection		IP65 (IEC 60529)		
Connection method		Pre-wired (standard length: 2 m)		
Weight (packed state)		Approx. 60 g		Approx. 40 g
Materials	Case	SUS303		
	Display window	Polysulfone		Epoxy
	Lens	Polysulfone		
	Hexagonal nuts	SUS303		
	Toothed washers	SUS303		
Accessories		Instruction manual, Hexagonal nuts, Toothed washers		Instruction manual, Hexagonal nuts, Toothed washers, Adjustment driver

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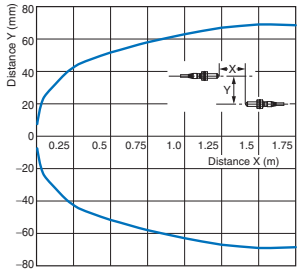
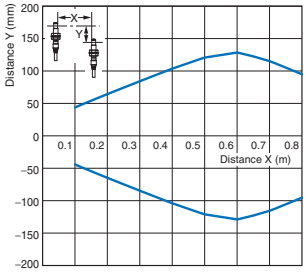
Engineering Data (Typical)

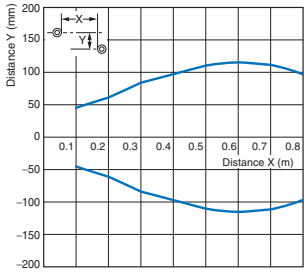
Parallel Operating Range
Through-beam
E3T-CT1□



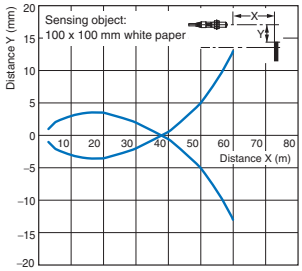
E3T-CT2□S (Top to Bottom)



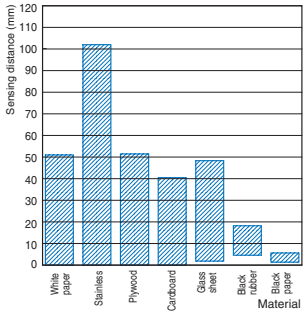
E3T-CT2□S (Right to Left)



Operating Range
Diffuse-reflective
E3T-CD1□



Sensing Distance vs. Material
Diffuse-reflective
E3T-CD1□



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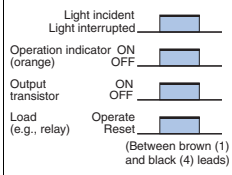
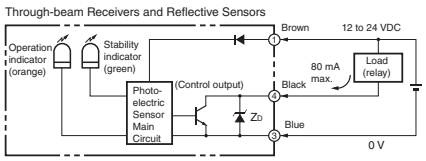
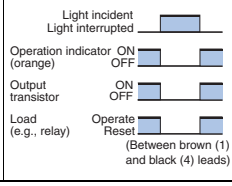
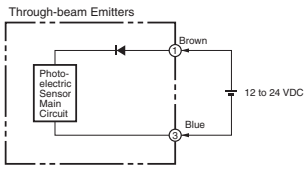
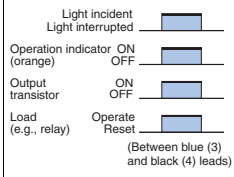
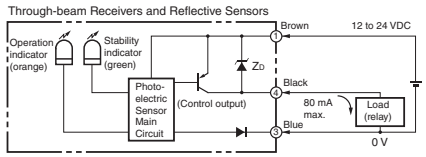
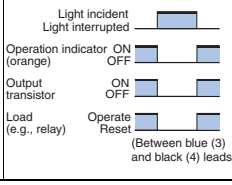
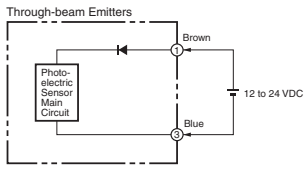
I/O Circuit Diagrams

NPN Output

Model	Operation mode	Timing charts	Output circuit
E3T-CD11	Light-ON		
E3T-CT12 E3T-CT22S	Dark-ON		

PNP Output

Model	Operation mode	Timing charts	Output circuit
E3T-CD13	Light-ON		
E3T-CT14 E3T-CT24S	Dark-ON		

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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

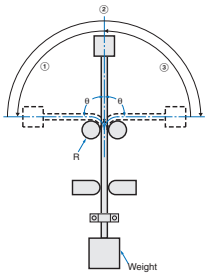
The E3T incorporates a load short-circuit protection function. If the load short-circuits, the output of the E3T will be turned OFF. Then, recheck the wiring and turn on the E3T again to reset the load short-circuit protection function. The load short-circuit protection function will work if there is 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
Small Cylindrical Sensors: 1 N·m max

Mounting the Sensor on Moving Parts

Consider models that use break resistant cables (e.g., Robotics Cables) if the Sensor will be mounted on a moving part, such as a robot hand. The flexing resistance of Robotics Cable at approximately 400 thousand times is far superior to that of standard cable at approximately 14 thousand times.



Cable Bending Rupture Test (Tough Cable Breaking Test)

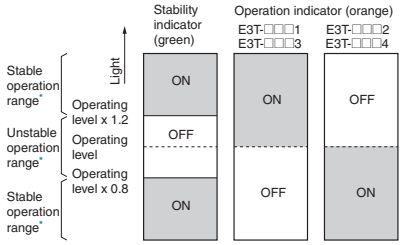
The cable is repeatedly bent with power supplied to check the number of bends until the current is turned OFF.

Test	Specimen	Standard cable 2.4-mm dia. (7/0.127-mm dia.), 3 conductors	Robotics cable 2.4-mm dia. (20/0.08-mm dia.), 3 conductors
Con-tents/ condi-tions	Bending angle (θ)	90° each to the left and right	
	Bending speed	50 times/min	
	Load	200 g	
	Operation per bend	Once in 1 to 3 in the diagram	
	Curvature radius of support point (R)	5 mm	
Result		Approx. 14,000 times	Approx. 400,000 times

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.

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

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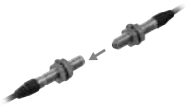
Dimensions

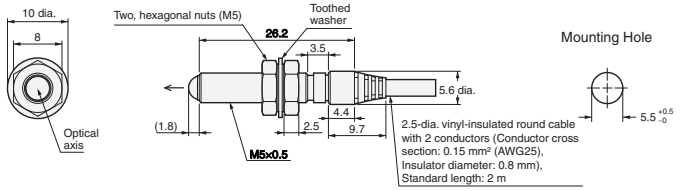
(Unit: mm)
Tolerance class IT16 applies to dimensions in this datasheet unless otherwise specified.

Small Cylindrical Sensors

Through-beam Top-view Sensors

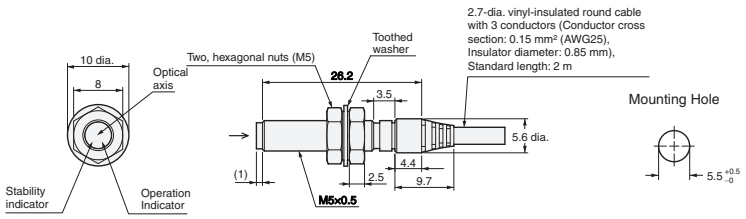
E3T-CT1□ (Emitter)





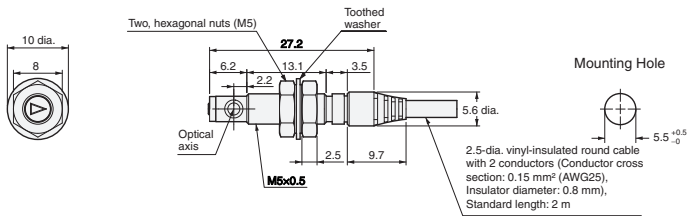
Emitter: E3T-CT1□-L
Receiver: E3T-CT1□-D

E3T-CT1□ (Receiver)



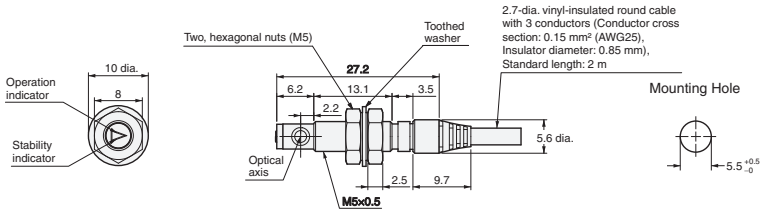
Through-beam Side-view Sensors

E3T-CT2□S (Emitter)



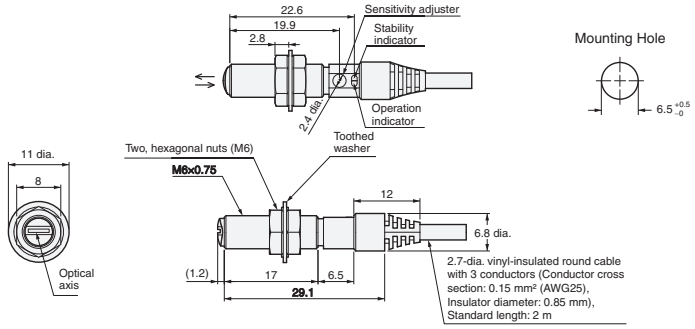
Emitter: E3T-CT2□S-L
Receiver: E3T-CT2□S-D

E3T-CT2□S (Receiver)



Diffuse-reflective Top-view Sensors

E3T-CD1□



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Cat. No. E70E-EN-01 **In the interest of product improvement, specifications are subject to change without notice.**

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