



NEW

Ultracompact, Ultrathin Photoelectric Sensors with Built-in Amplifiers

E3T Series

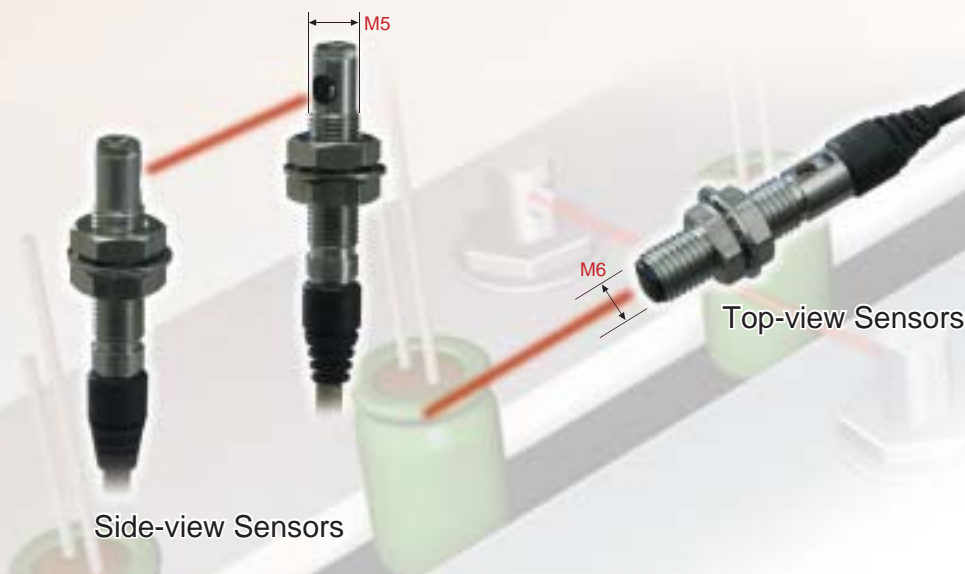


The Improved E3T Series

Makes Mounting and Installation Simpler and Smoother

Suitable for Applications in the Rechargeable Battery Industry

Small Cylindrical Sensors



M3-mounting Sensors



realizing

Simple, Low-cost Installation, Setup, and Operation

New Small Cylindrical Sensors

Installation

With Square Sensors:

- Time is required to tighten screws.
- Mounting brackets are sometimes required.



But with Small Cylindrical Sensors:

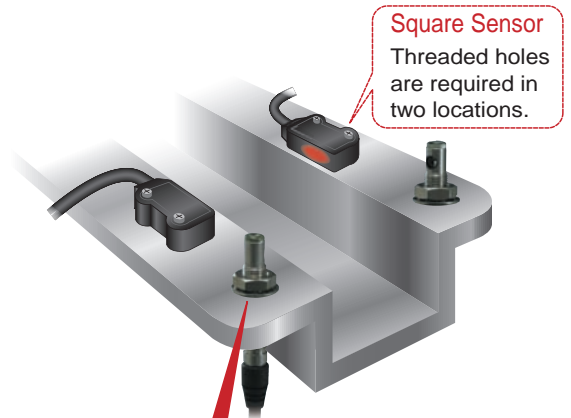
Less Drilling and Tightening Work.

Work is reduced because holes do not need to be threaded and there is only one place to tighten.

AND

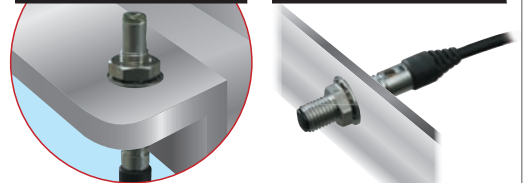
Mounting without Brackets.

For Through-beam Sensors, both Top-view and Side-view Models are available. Select the shape according to installation conditions to mount directly to the system without brackets.



Side-view Sensor Mounted to Horizontal Surface

Top-view Sensor Mounted to Vertical Surface



Sure Installation without Stress

Side-view and Flat Sensor Models for M3 Mounting

Installation

With Previous M3-mounting Sensors:

- Sensor heads were large.

With Previous M2-mounting Sensors:

- The small screws were hard to handle.



With M3-mounting Sensors:

Compact M3 Mounting. Essentially the Same Size as M2-mounting Sensors.

The width and depth are essentially the same as previous M2-mounting sensors. Easier application without increasing space requirements.

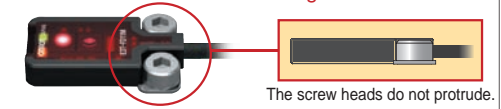
AND

Secure Tightening and Mounting. Stainless-steel Mounting Plates or Sleeves

Side-view Sensors mount with SUS304 sleeves, while Flat Sensors mount with SUS304 plates. The reliable strength provide sure tightening that will not come loose. Damage from overtightening is also prevented for sure mounting.



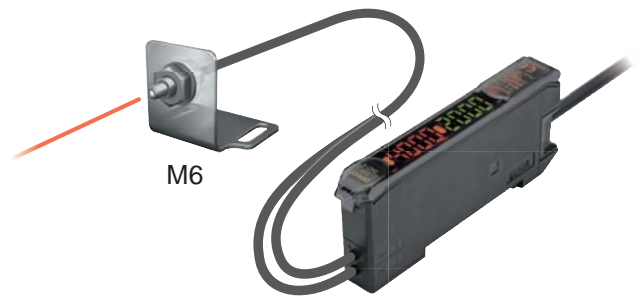
The flat sensing surface is maintained even with larger screws.



Small Cylindrical Sensors

With Fiber Sensors:

- Installation** Space is required for the Amplifier.
- Setup** Setup and installation are troublesome.
- Operation** Initial and electrical costs are high.

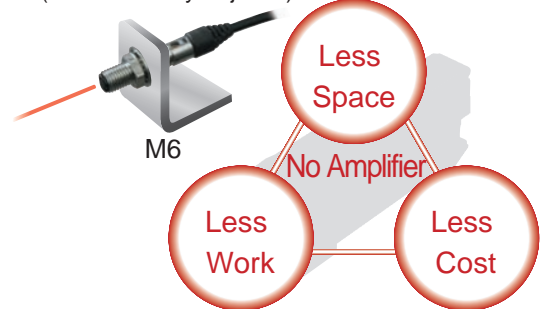


But with Small Cylindrical Sensors:

**Essentially the Same Size as the Fiber Head.
But No Amplifier Is Required.**

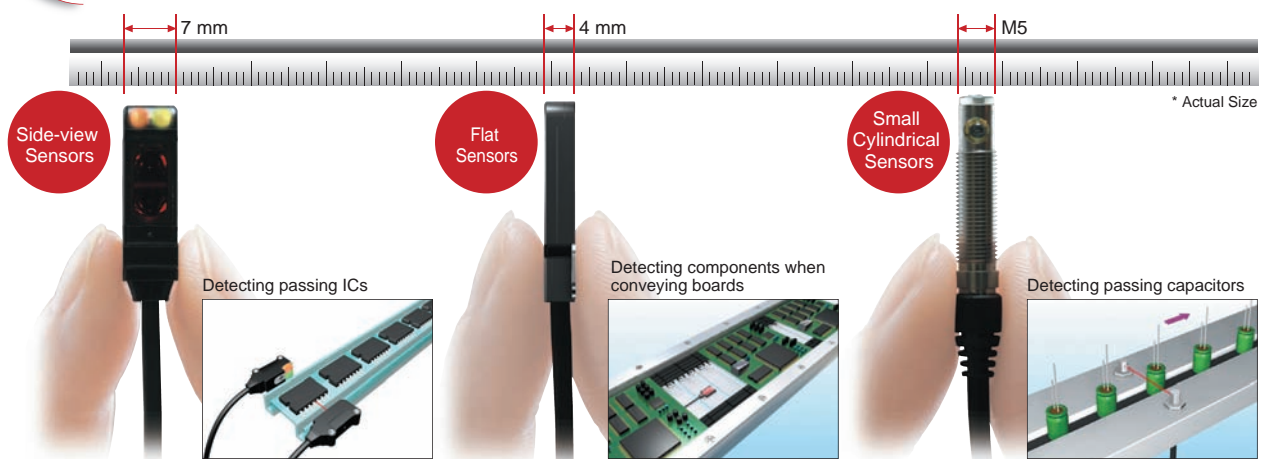
Mounting is possible in narrow spaces where only fiber sensors could previously be used. The built-in amplifier and teach-free operation reduce wiring and setup work. And initial costs and electrical costs are also reduced.

Diffuse-reflective Sensors
(with Sensitivity Adjuster)



Overall Features

Many Compact Shapes for Various Applications



Ideal for Rechargeable Battery Manufacturing Lines

All Metal Parts Are Stainless Steel. No Worries About Conductive Copper Intrusion.

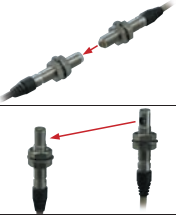

The case, nuts, and washers of the Cylindrical Sensors are all stainless steel, as are the mounting plates and sleeves of the M3-mounting Sensors. Harmful copper, zinc, and nickel plating are not used, enabling reliable application in rechargeable battery manufacturing lines. Stainless-steel screws are also available, for immediate application for rechargeable batteries.



■ Ordering Information

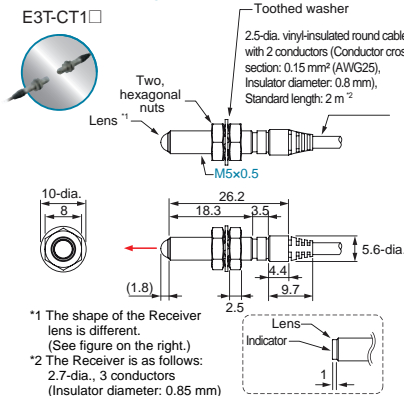
NEW Small Cylindrical Sensors

Red light Infrared light

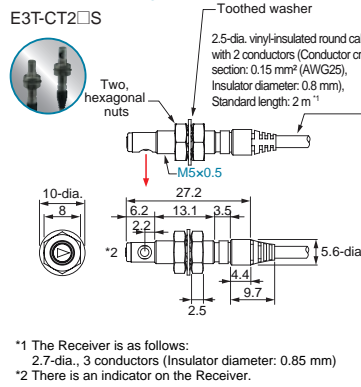
| Sensing method | Appearance | Connection method | Sensing distance | Operation mode | Model | |
|------------------------------------|---|-------------------|------------------|----------------|--------------|--------------|
| | | | | | NPN output | PNP output |
| Through-beam |  | Pre-wired (2 m)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

■ Dimensions (Unit: mm)

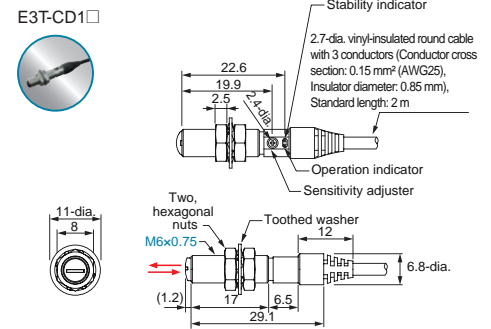
Top-view Through-beam Sensors



Side-view Through-beam Sensors






Top-view Diffuse-reflective Sensors



* Recommended Mounting Hole: M5 Through-beam Sensors: 5.5^{+0.5}₀, M6 Diffuse-reflective Sensors: 6.5^{+0.5}₀

NEW M3-mounting Sensors

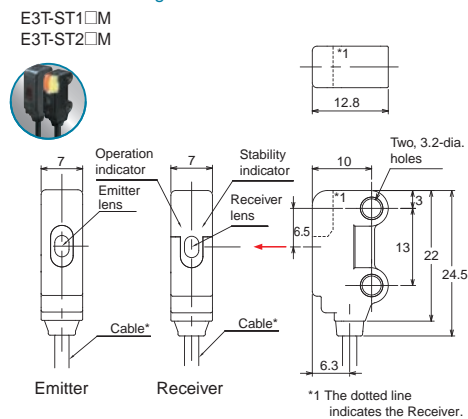
Red light

| Sensing method | Appearance | Connection method | Sensing distance | Operation mode | Model | |
|-----------------------|---|-------------------|------------------|----------------|--------------|--------------|
| | | | | | NPN output | PNP output |
| Through-beam *1 |  | Pre-wired (2 m) | 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 |

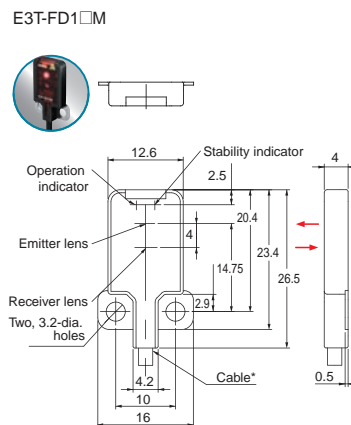
*1. The model number of the Emitter is expressed by adding an "L" to the set model number in the table. Example: E3T-ST11-L 2M
The model number of the Receiver is expressed by adding a "D" to the set model number in the table. Example: E3T-ST11-D 2M
Orders for individual Emitters and Receivers are accepted. (Modifications are required for some models.)

■ Dimensions (Unit: mm)

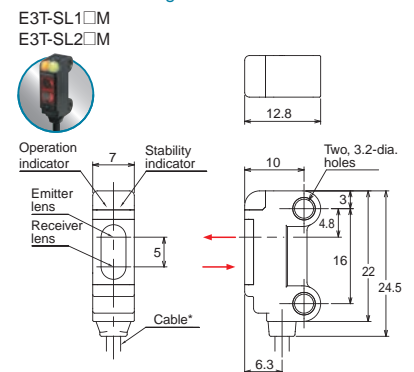
Side-view Through-beam Sensors



Flat Diffuse-reflective Sensors



Side-view Convergent-reflective Sensors



* 2.4-dia. vinyl-insulated round cable with 2 or 3 conductors (Conductor cross section: 0.1 mm² (AWG27), Insulator diameter: 0.7 mm), Standard length: 2 m

■ Accessories

These accessories are not included with the Sensor. Order them separately if required.

| Name | | Applicable Sensor | Model | Quantity | Remarks |
|---|----------|-------------------|----------|--|---|
| Slits for Through-beam Side-view Sensors | 0.5 dia. | E3T-ST1□M | E39-S76A | One each for Emitter and Receiver (2) | Sensing distance 100 mm |
| | 1 dia. | | E39-S76B | | Sensing distance 300 mm |
| M3 Mounting Bracket for Side-view Sensors * | | E3T-S□□□M | E39-L166 | 1 | Nut plate provided |
| M3 Mounting Bracket for Flat Sensors | | E3T-FD□□M | E39-L167 | | --- |
| M3 Back-mounting Spacer for Flat Sensors | | E3T-FD□□M | E39-L168 | 1 | Use this Spacer when mounting a Sensor from the back. |
| M3 SUS304 Screw Set for Flat Sensors | | E3T-FD□□M | E39-L170 | Two bolts with hexagonal hole (M3×6) | --- |
| M3 SUS304 Screw Set for Side-view Sensors * | | E3T-S□□□M | E39-L171 | Two each of the following: Bolt with hexagonal hole (M3×15), Hexagonal nuts, Spring washers, Flat washers | --- |
| M2 SUS304 Screw Set for Flat Sensors * | | E3T-F□□□ | E39-L172 | Two bolts with hexagonal hole (M2×6) | The screw set that is provided with the Sensor is zinc-plated steel. Use this SUS Screw Set when stainless steel is required. |
| M2 SUS304 Screw Set for Side-view Sensors * | | E3T-S□□□ | E39-L173 | Two each of the following: Bolt with hexagonal hole (M2×12), Hexagonal nuts, Spring washers, Flat washers | |

* For a Through-beam Sensor, order one Bracket or Screw Set for the Emitter and one for the Receiver.

■ Ratings and Specifications

| Sensing method | | Through-beam | | | | Diffuse-reflective | | Convergent-reflective | |
|-------------------------------------|----------------|--|-----------|--|------------------------|--|--|---|---|
| Appearance | | Side-view | | Cylindrical type | | Cylindrical type | Flat | Side-view | |
| | | | | Top-view | Side-view | Top-view | | | |
| NPN | Light-ON | E3T-ST11M | E3T-ST21M | --- | --- | E3T-CD11 | E3T-FD11M | E3T-SL11M | E3T-SL21M |
| | Dark-ON | E3T-ST12M | E3T-ST22M | E3T-CT12 | E3T-CT22S | --- | E3T-FD12M | E3T-SL12M | E3T-SL22M |
| PNP | Light-ON | E3T-ST13M | E3T-ST23M | --- | --- | E3T-CD13 | E3T-FD13M | E3T-SL13M | E3T-SL23M |
| | Dark-ON | E3T-ST14M | E3T-ST24M | E3T-CT14 | E3T-CT24S | --- | E3T-FD14M | E3T-SL14M | E3T-SL24M |
| Sensing distance | | 1 m | 300 mm | 1 m | 500 mm | 3 to 50 mm (100 × 100 mm white paper) | 5 to 30 mm (50 × 50 mm white paper) | 5 to 15 mm (50 × 50 mm white paper) | 5 to 30 mm (50 × 50 mm white paper) |
| Standard sensing object | | Opaque, 2-mm dia. min. | | Opaque, 4-mm dia. min. | Opaque, 5-mm dia. min. | --- | | | |
| Minimum detectable object (typical) | | Opaque, 2-mm dia. | | --- | | --- | 0.15-mm dia. (sensing distance 10 mm) | | |
| Hysteresis (white paper) | | --- | | | | 15% or less of the sensing distance | 6 mm max. | 2 mm max. | 6 mm max. |
| Directional angle | | Emitter: 2 to 20°, Receiver: 2 to 70° | | Receiver: 2° | Receiver: 10° | --- | | | |
| Light source (wavelength) | | Red LED (650 nm) | | Red LED (630 nm) | Red LED (625 nm) | Infrared LED (870 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. | | Incandescent lamp: 3,000 lx max. | | | Incandescent lamp: 5,000 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 55 Hz, 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 | | | 1,000 m/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 | | Approx. 40 g | | Approx. 60 g | | Approx. 40 g | Approx. 20 g | | |
| Materials | Case | PBT (polybutylene terephthalate) | | SUS303 | | PBT (polybutylene terephthalate) | | | |
| | Display window | Denatured polyarylate | | Polysulfone | | Epoxy | Denatured polyarylate | | |
| | Lens | Denatured polyarylate | | Polysulfone | | Denatured polyarylate | | | |
| Accessories | | Instruction manual ^{*1} | | Instruction manual Hexagonal nuts ^{*3} Toothed washers ^{*3} | | Instruction manual Hexagonal nuts ^{*4} Toothed washers ^{*4} Adjustment driver ^{*5} | Instruction manual ^{*2} | Instruction manual ^{*1} | |

^{*1} Order the E39-L171 Screw Set separately if required.

^{*2} Order the E39-L170 Screw Set separately if required.

^{*3} A E39-M5 SUS Nut Set is included with the Sensor, but it can also be ordered separately.

^{*4} A E39-M6 SUS Nut Set is included with the Sensor, but it can also be ordered separately.

^{*5} A E39-G17 Adjustment Driver is included with the Sensor, but it can also be ordered separately.

■ Ordering Information

Previous Sensors E3T-series Sensors, M2-mounting Sensors

 Red light

| Sensing method | Appearance | Connection method | Sensing distance | Operation mode | Model | |
|---|--|-------------------|---|----------------|----------------|----------------|
| | | | | | NPN output | PNP output |
| Through-beam (Emitter + Receiver) *1 |  | Pre-wired (2 m) | 1 m (Sensitivity Adjustment Unit can be used.) | Light-ON | E3T-ST11 2M | E3T-ST13 2M |
| | | | 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] *2 | Light-ON | E3T-SR41 2M *3 | E3T-SR43 2M *3 |
| | | | Using the E39-R37-CA 100 mm [10 mm] *2 | Dark-ON | E3T-SR42 2M *3 | E3T-SR44 2M *3 |
| Diffuse-reflective |  | | 5 to 30 mm | Light-ON | E3T-FD11 2M | E3T-FD13 2M |
| | | | | Dark-ON | E3T-FD12 2M | E3T-FD14 2M |
| Convergent-reflective |  | | 5 to 15 mm | Light-ON | E3T-SL11 2M | E3T-SL13 2M |
| | | | | Dark-ON | E3T-SL12 2M | E3T-SL14 2M |
| | | | 5 to 30 mm | Light-ON | E3T-SL21 2M | E3T-SL23 2M |
| | | | | Dark-ON | E3T-SL22 2M | E3T-SL24 2M |
| BGS-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 |

*1. 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

Orders for individual Emitters and Receivers are accepted. (Modifications are required for some models.)

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

*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

Note: The mounting holes on M2-mounting Sensors are SUS301 stainless steel.

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1. **Offer; Acceptance.** These terms and conditions (these "Terms") are deemed part of all quotes, agreements, purchase orders, acknowledgments, price lists, catalogs, manuals, brochures and other documents, whether electronic or in writing, relating to the sale of products or services (collectively, the "Products") by Omron Electronics LLC and its subsidiary companies ("Omron"). Omron objects to any terms or conditions proposed in Buyer's purchase order or other documents which are inconsistent with, or in addition to, these Terms.
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 - d. Delivery and shipping dates are estimates only; and
 - e. Omron will package Products as it deems proper for protection against normal handling and extra charges apply to special conditions.
12. **Claims.** Any claim by Buyer against Omron for shortage or damage to the Products occurring before delivery to the carrier must be presented in writing to Omron within 30 days of receipt of shipment and include the original transportation bill signed by the carrier noting that the carrier received the Products from Omron in the condition claimed.
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16. **Property; Confidentiality.** Any intellectual property in the Products is the exclusive property of Omron Companies and Buyer shall not attempt to duplicate it in any way without the written permission of Omron. Notwithstanding any charges to Buyer for engineering or tooling, all engineering and tooling shall remain the exclusive property of Omron. All information and materials supplied by Omron to Buyer relating to the Products are confidential and proprietary, and Buyer shall limit distribution thereof to its trusted employees and strictly prevent disclosure to any third party.
17. **Export Controls.** Buyer shall comply with all applicable laws, regulations and licenses regarding (i) export of products or information; (ii) sale of products to "forbidden" or other proscribed persons; and (iii) disclosure to non-citizens of regulated technology or information.
18. **Miscellaneous.** (a) **Waiver.** No failure or delay by Omron in exercising any right and no course of dealing between Buyer and Omron shall operate as a waiver of rights by Omron. (b) **Assignment.** Buyer may not assign its rights hereunder without Omron's written consent. (c) **Law.** These Terms are governed by the law of the jurisdiction of the home office of the Omron company from which Buyer is purchasing the Products (without regard to conflict of law principles). (d) **Amendment.** These Terms constitute the entire agreement between Buyer and Omron relating to the Products, and no provision may be changed or waived unless in writing signed by the parties. (e) **Severability.** If any provision hereof is rendered ineffective or invalid, such provision shall not invalidate any other provision. (f) **Setoff.** Buyer shall have no right to set off any amounts against the amount owing in respect of this invoice. (g) **Definitions.** As used herein, "including" means "including without limitation"; and "Omron Companies" (or similar words) mean Omron Corporation and any direct or indirect subsidiary or affiliate thereof.

Certain Precautions on Specifications and Use

1. **Suitability of Use.** Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases but the following is a non-exhaustive list of applications for which particular attention must be given:
 - (i) Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this document.
 - (ii) Use in consumer products or any use in significant quantities.
 - (iii) Energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
 - (iv) Systems, machines and equipment that could present a risk to life or property. Please know and observe all prohibitions of use applicable to this Product.
 NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY OR IN LARGE QUANTITIES WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON'S PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.
2. **Programmable Products.** Omron Companies shall not be responsible for the user's programming of a programmable Product, or any consequence thereof.
3. **Performance Data.** Data presented in Omron Company websites, catalogs and other materials is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of Omron's test conditions, and the user must correlate it to actual application requirements. Actual performance is subject to the Omron's Warranty and Limitations of Liability.
4. **Change in Specifications.** Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change part numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the Product may be changed without any notice. When in doubt, special part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Omron's representative at any time to confirm actual specifications of purchased Product.
5. **Errors and Omissions.** Information presented by Omron Companies has been checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.



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