

Ultracompact, Ultrathin Photoelectric Sensor with Built-in Amplifier

E3T



The Improved E3T Series with Easier, Smoother Mounting and Installation

- The series includes 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 are also available (E3T-C□□□(S)).
- Infrared Sensors added to the Series (E3T-□T□□(M)F).



Be sure to read *Safety Precautions* on page 15.

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 | Limited-reflective | BGS-reflective |
|------------------|---------------|----------------|--------------|------------------|--------------------|--------------------|----------------|
| Rectangular type | Side-view | M2-mounting | ● | ● | --- | ● | --- |
| | | M3-mounting | ● | --- | --- | ● | --- |
| | Flat | M2-mounting | ● | --- | ● | --- | ● |
| | | M3-mounting | --- | --- | ● | --- | --- |
| Cylindrical type | Top-view | --- | ● | --- | ● | --- | --- |
| | Side-view | --- | ● | --- | --- | --- | --- |















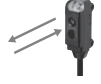





E3T

Ordering Information











Sensors [Refer to Dimensions on page 16.]

 Red light  Infrared light

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

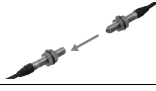
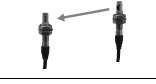

| Sensing method | Appearance | Sensing distance | Operation mode | Model | |
|--|---|--|---------------------------|---------------------------|---------------------------|
| | | | | NPN output | PNP output |
| Through-beam (Emitter + Receiver) ^{*1} |  |  2 m | Light-ON | E3T-ST31 2M | E3T-ST33 2M |
| | | (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 | |
| |  |  2 m | Light-ON | E3T-ST31F 2M | E3T-ST33F 2M |
| | | Dark-ON | E3T-ST32F 2M | E3T-ST34F 2M | |
| | |  1 m | Light-ON | E3T-ST11F 2M | E3T-ST13F 2M |
| | | Dark-ON | E3T-ST12F 2M | E3T-ST14F 2M | |
| | |  300 mm | Light-ON | E3T-ST21F 2M | E3T-ST23F 2M |
| | | Dark-ON | E3T-ST22F 2M | E3T-ST24F 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 | |
| | |  500 mm | Light-ON | E3T-FT11F 2M | E3T-FT13F 2M |
| | | Dark-ON | E3T-FT12F 2M | E3T-FT14F 2M | |
| Retro-reflective |  | Using the E39-R4 Reflector, provided 200 mm [30 mm] ^{*2} | 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 Reflector, provided 100 mm [10 mm] ^{*2} | 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-FD11 2M | E3T-FD13 2M |
| | | | Dark-ON | E3T-FD12 2M | E3T-FD14 2M |
| Limited-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 |

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) ^{*1} |  |  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 |
| | |  1 m | Light-ON | E3T-ST11MF 2M | E3T-ST13MF 2M |
| | | | Dark-ON | E3T-ST12MF 2M | E3T-ST14MF 2M |
| | |  300 mm | Light-ON | E3T-ST21MF 2M | E3T-ST23MF 2M |
| | | | Dark-ON | E3T-ST22MF 2M | E3T-ST24MF 2M |
| Diffuse-reflective |  |  5 to 30 mm | Light-ON | E3T-FD11M 2M | E3T-FD13M 2M |
| | | | Dark-ON | E3T-FD12M 2M | E3T-FD14M 2M |
| Limited-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
 *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

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 | --- | --- |

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□□ | 2 (One each for Emitter and Receiver; common with Slit widths of 1 dia. and 0.5 dia.) | 21 | 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 | 21 | 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 with Red Light | E3T-ST3□ | E39-E10 | 1 | 21 | Sensing distance (reference value) 1,200 to 1,800 mm |
| | E3T-ST1□ | | | | Sensing distance (reference value) 300 to 800 mm |
| Mounting Brackets for Side-view Sensors *1 | E3T-S□□□□ | E39-L116 | 1 | 22 | Nut plate provided |
| | | E39-L117 | | | |
| | | E39-L118 | | | |
| Mounting Brackets for Flat Sensors *1 | E3T-F□□□□ | E39-L119 | 1 | 23 | --- |
| | | E39-L120 | | | |
| Screw Set for Side-view Sensors *2*3 | 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 *2*3 | E3T-F□□□□ | E39-L165 | 2 for each | | Material: Iron (Same type as provided with the Sensor.) Contents: Set screws (M2×8), Hexagonal nuts |
| SUS Screw Set for Flat Sensors *2 | E3T-F□□□□ | E39-L172 | 2 | | Material: SUS304 Contents: Bolt with hexagonal hole (M2×6) |
| SUS Screw Set for Side-view Sensors *2 | E3T-S□□□□ | E39-L173 | 2 for each | | Material: SUS304 Contents: Bolt with hexagonal hole (M2×12), Hexagonal nuts, Spring washers, Flat washers |

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

*2. 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.

*3. 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) | 21 | 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 | 24 | 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 *2*3 | 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 lose the screws. Do not use this Screw Set to mount the Mounting Bracket to the equipment.

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

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 lose 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 | 20 | 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 | | 21 | 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 | | | | | | | | | |
|---|-----------------|--|-----------------------|------------------------|-------------------------|-----------------------|-------------------------|---|-----------------------|------------------|-----------------------|
| | | Rectangular type (Side-view) | | | | | | Rectangular type (Flat) | | | |
| Item | |  | | | | | |  | | | |
| | | | | | | | | | | | |
| NPN output | Light-ON | E3T-ST31 | E3T-ST31F | E3T-ST11 E3T-ST11M | E3T-ST11F E3T-ST11MF | E3T-ST21 E3T-ST21M | E3T-ST21F E3T-ST21MF | E3T-FT11 | E3T-FT11F | E3T-FT21 | E3T-FT21F |
| | Dark-ON | E3T-ST32 | E3T-ST32F | E3T-ST12 E3T-ST12M | E3T-ST12F E3T-ST12MF | E3T-ST22 E3T-ST22M | E3T-ST22F E3T-ST22MF | E3T-FT12 | E3T-FT12F | E3T-FT22 | E3T-FT22F |
| PNP output | Light-ON | E3T-ST33 | E3T-ST33F | E3T-ST13 E3T-ST13M | E3T-ST13F E3T-ST13MF | E3T-ST23 E3T-ST23M | E3T-ST23F E3T-ST23MF | E3T-FT13 | E3T-FT13F | E3T-FT23 | E3T-FT23F |
| | Dark-ON | E3T-ST34 | E3T-ST34F | E3T-ST14 E3T-ST14M | E3T-ST14F E3T-ST14MF | E3T-ST24 E3T-ST24M | E3T-ST24F E3T-ST24MF | E3T-FT14 | E3T-FT14F | E3T-FT24 | E3T-FT24F |
| Sensing distance | | 2 m | | 1 m | | 300 mm | | 500 mm | | 300 mm | |
| Standard sensing object | | Opaque, 3-mm dia. min. | | Opaque, 2-mm dia. min. | | | | Opaque, 1.3-mm dia. min. | | | |
| Minimum detectable object (reference value) | | Opaque, 3-mm dia. | | Opaque, 2-mm dia. | | | | Opaque, 1.3-mm dia. | | | |
| Hysteresis (white paper) | | --- | | | | | | | | | |
| Black/white error | | --- | | | | | | | | | |
| Directional angle | | Emitter: 2° to 20° Receiver: 2° to 70° | | | | | | Emitter: 3° to 25° Receiver: 3° min. | | | |
| Light source (wavelength) | | Red LED (650 nm) | Infrared LED (860 nm) | Red LED (650 nm) | Infrared LED (860 nm) | Red LED (650 nm) | Infrared LED (860 nm) | Red LED (650 nm) | Infrared LED (860 nm) | Red LED (650 nm) | Infrared LED (860 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.) | | | | | | | | | |
| 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 | | | | | | | | | |
| Protection circuits | | Power supply and control output reverse polarity protection, Output short-circuit protection | | | | | | | | | |
| Response time | | Operate or reset: 1 ms max. | | | | | | | | | |
| Ambient illumination | | 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) | | | | | | | | | |
| Ambient humidity range | | 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. | | | | | | | | | |
| 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 | | | | | | | | | |
| Shock resistance (destruction) | | 1,000 m/s ² 3 times each in X, Y, and Z directions | | | | | | | | | |
| Degree of protection | | IP67 (IEC 60529) | | | | | | | | | |
| Connection method | | Pre-wired (standard length: 2 m) | | | | | | | | | |
| Weight (packed state) | | Approx. 40 g | | | | | | | | | |
| Materials | Case | PBT (polybutylene terephthalate) | | | | | | | | | |
| | Display window | Denatured polyarylate | | | | | | | | | |
| | Lens | Denatured polyarylate | | | | | | | | | |
| | Hexagonal nuts | --- | | | | | | | | | |
| | Toothed washers | --- | | | | | | | | | |
| Accessories * | | Instruction manual, Set screws for mounting (Side-view Sensors: M2 × 14, Flat Sensors: M2 × 8), Nuts | | | | | | | | | |

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

| Sensing method Appearance | | Through-beam | | Retro-reflective (without M.S.R. function) |
|---|-----------------|--|---|--|
| | | Cylindrical type (Top-view) | Cylindrical type (Side-view) | Rectangular type (Side-view) |
| Item | |  |  |  |
| NPN output | Light-ON | --- | --- | E3T-SR41 |
| | Dark-ON | E3T-CT12 | E3T-CT22S | E3T-SR42 |
| PNP output | Light-ON | --- | --- | E3T-SR43 |
| | Dark-ON | E3T-CT14 | E3T-CT24S | E3T-SR44 |
| Sensing distance | | 1 m | 500 mm | 200 mm [30 mm] * (Using the E39-R4) 100 mm [10 mm] * (Using the E39-R37-CA) |
| Standard sensing object | | Opaque, 4-mm dia. min. | Opaque, 5-mm dia. min. | Opaque, 27-mm dia. min. |
| Minimum detectable object (reference value) | | --- | --- | 2-mm dia. (Sensing distance 100 mm) |
| Hysteresis (white paper) | | --- | --- | --- |
| Black/white error | | --- | --- | --- |
| Directional angle | | Receiver: 2° | Receiver: 10° | 2° to 20° |
| Light source (wavelength) | | 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 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 | | 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 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: 0.5 ms max. | | Operate or reset: 1 ms max. |
| Ambient illumination | | 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: -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 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 | | AC500V, 50/60 Hz for 1 min. | | AC1,000V, 50/60 Hz for 1 min. |
| Vibration resistance (destruction) | | 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) | | 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 | | IP65 (IEC 60529) | | IP67 (IEC 60529) |
| Connection method | | Pre-wired (standard length: 2 m) | | |
| Weight (packed state) | | Approx. 60 g | | Approx. 20 g |
| Materials | Case | SUS303 | | PBT (polybutylene terephthalate) |
| | Display window | Polysulfone | | Denatured polyarylate |
| | Lens | Polysulfone | | Methacrylic resin |
| | Hexagonal nuts | SUS303 | | --- |
| | Toothed washers | SUS303 | | --- |
| Accessories | | 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) |

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

| Sensing method Appearance | | Diffuse-reflective | | Limited-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.

E3T

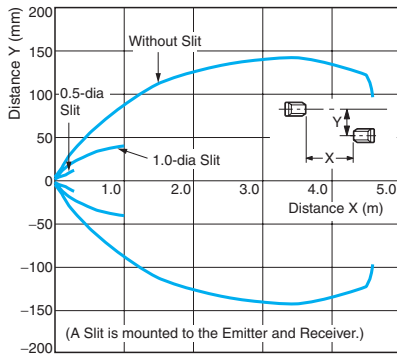
Engineering Data (Reference Value)

M2-mounting and M3-mounting Sensors

Parallel Operating Range

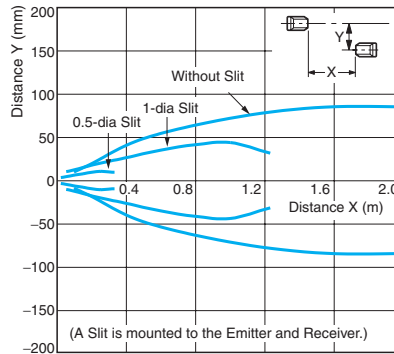
Through-beam

E3T-ST3□ + E39-S63



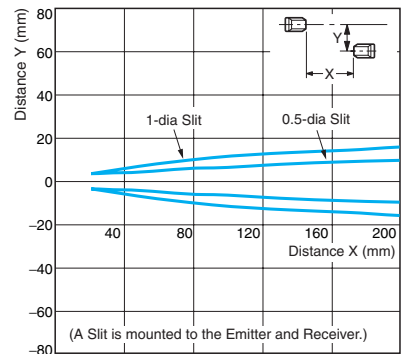
E3T-ST1□ + E39-S63

E3T-ST1□M + E39-S76A/S76B (Overall Diagram)



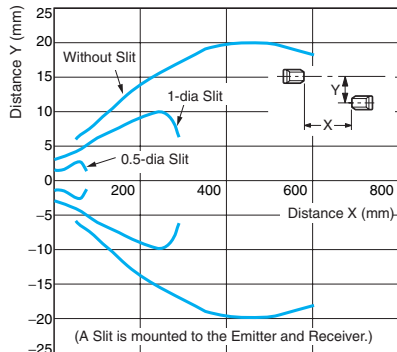
E3T-ST1□ + E39-S63

E3T-ST1□M + E39-S76A/S76B (Enlarged Diagram)

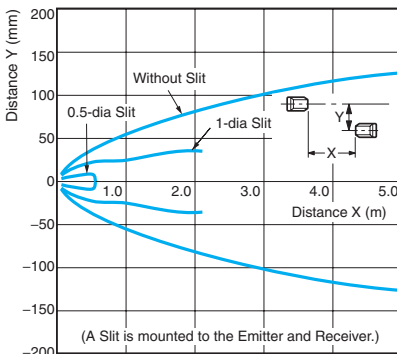


E3T-ST2□ + E39-S63

E3T-ST2□M + E39-S76A/S76B

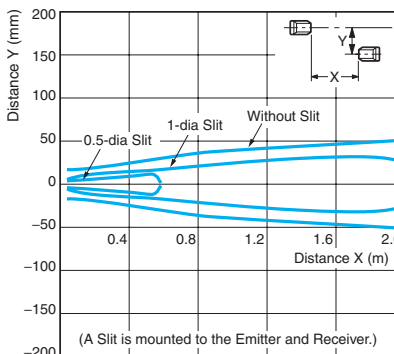


E3T-ST3□F + E39-S63



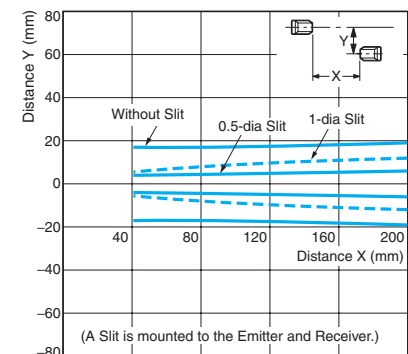
E3T-ST1□F + E39-S63

E3T-ST1□MF + E39-S76A/S76B (Overall Diagram)



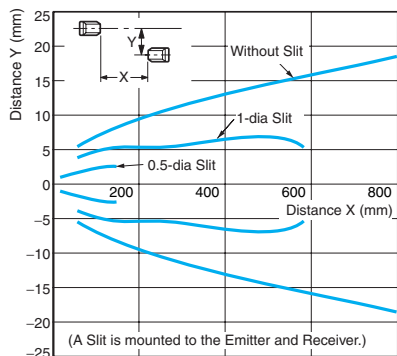
E3T-ST1□F + E39-S63

E3T-ST1□MF + E39-S76A/S76B (Enlarged Diagram)

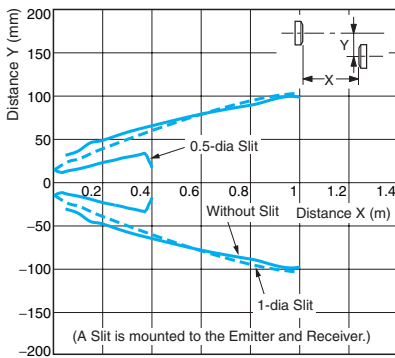


E3T-ST2□F + E39-S63

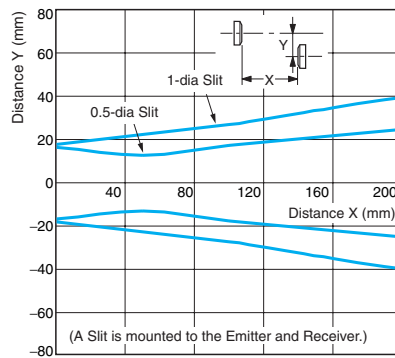
E3T-ST2□MF + E39-S76A/S76B



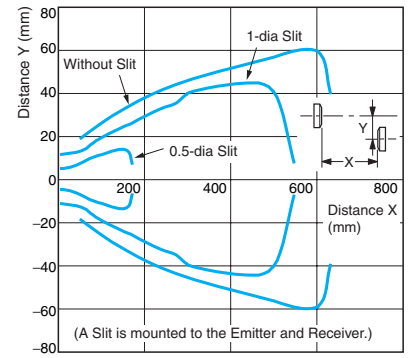
E3T-FT1□ + E39-S64 (Overall Diagram)



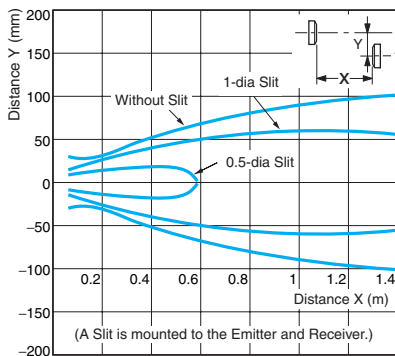
E3T-FT1□ + E39-S64 (Enlarged Diagram)



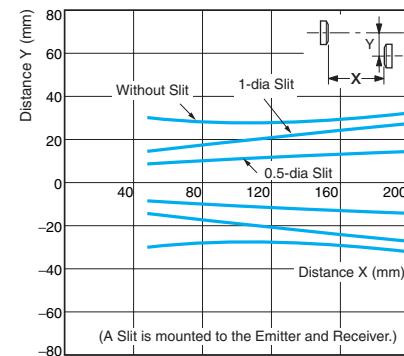
E3T-FT2□ + E39-S64



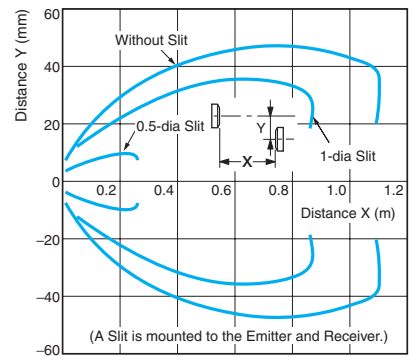
E3T-FT1□F + E39-S64 (Overall Diagram)



E3T-FT1□F + E39-S64 (Enlarged Diagram)

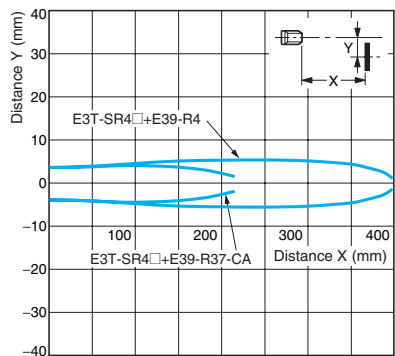


E3T-FT2□F + E39-S64



Retro-reflective

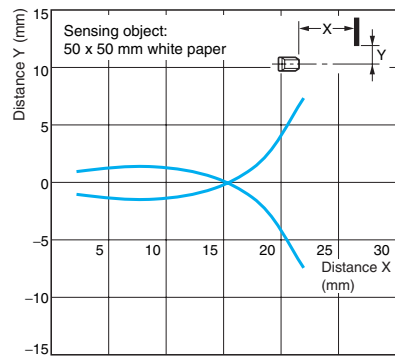
E3T-SR4□



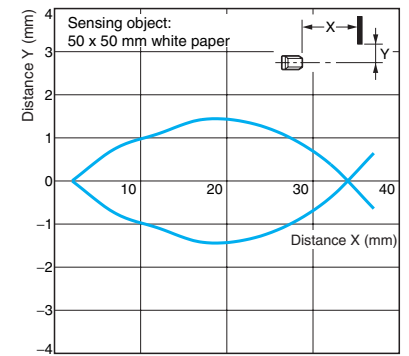
Operating Range

Limited-reflective

E3T-SL1□(M)

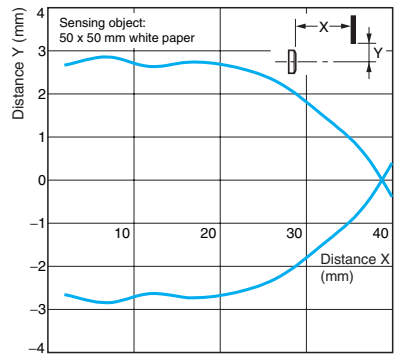


E3T-SL2□(M)



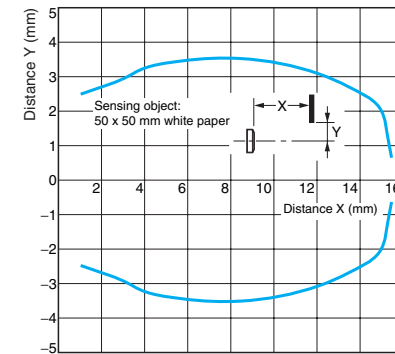
Diffuse-reflective

E3T-FD1□(M)

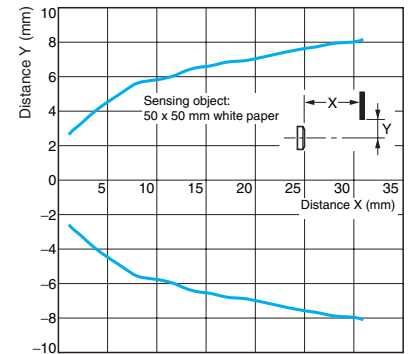


BGS-reflective

E3T-FL1□



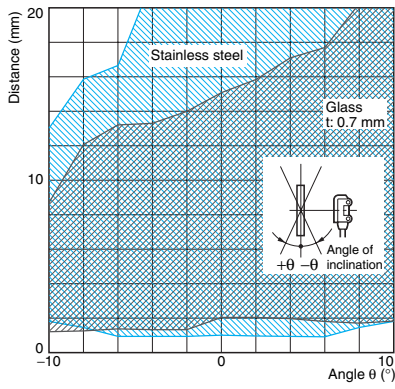
E3T-FL2□



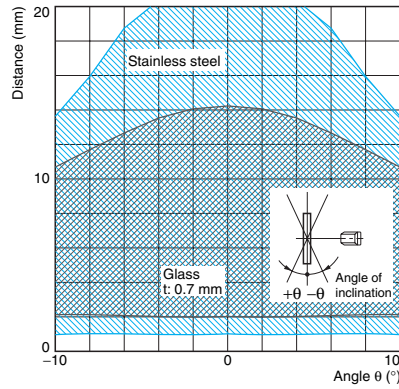
Inclination Detection Area Characteristic

Limited-reflective

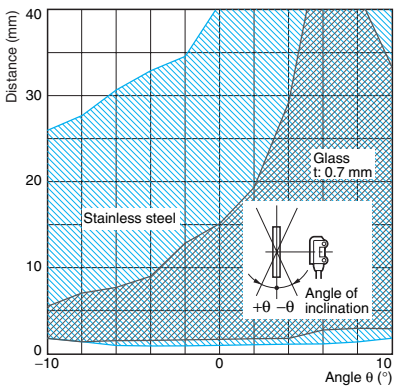
E3T-SL1□(M) (Top to Bottom)



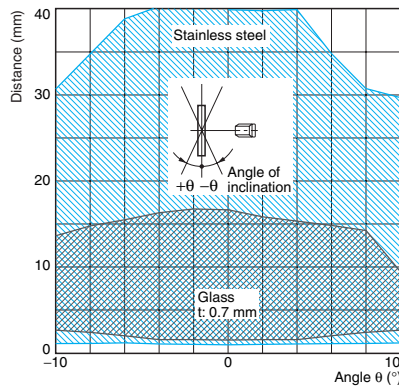
E3T-SL1□(M) (Right to Left)



E3T-SL2□(M) (Top to Bottom)

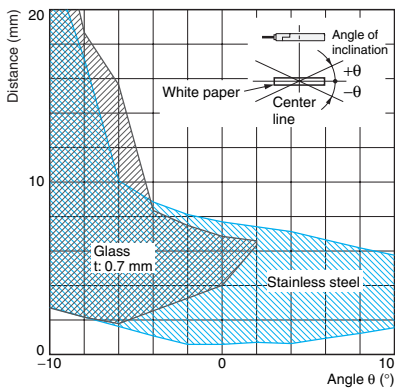


E3T-SL2□(M) (Right to Left)

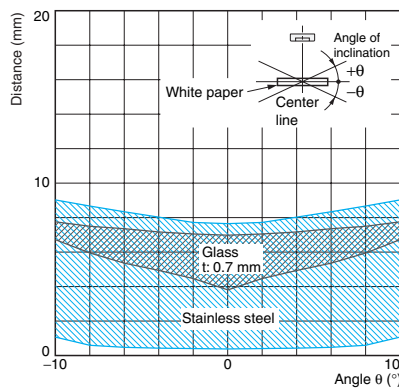


BGS-reflective

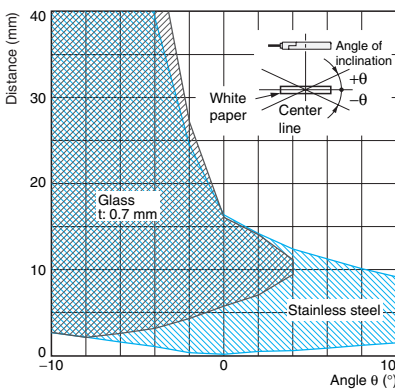
E3T-FL1□ (Top to Bottom)



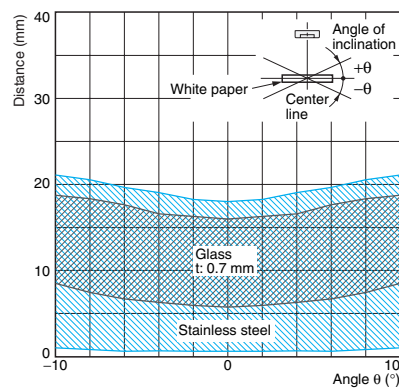
E3T-FL1□ (Right to Left)



E3T-FL2□ (Top to Bottom)



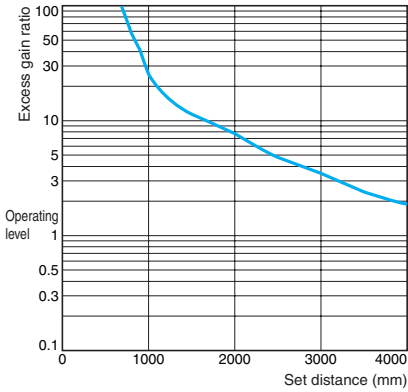
E3T-FL2□ (Right to Left)



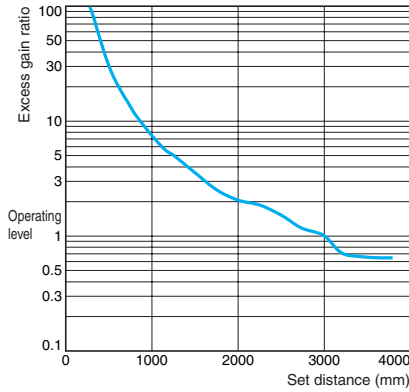
Excess Gain vs. Set Distance

Through-beam

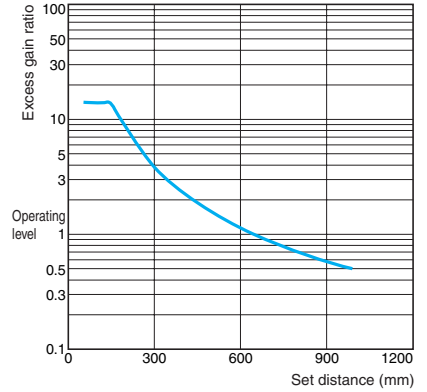
E3T-ST3



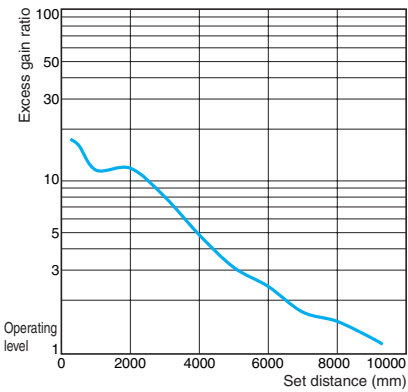
E3T-ST1(M)



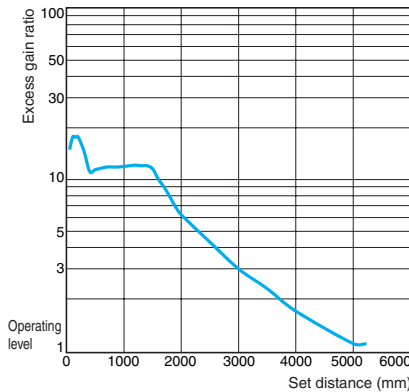
E3T-ST2(M)



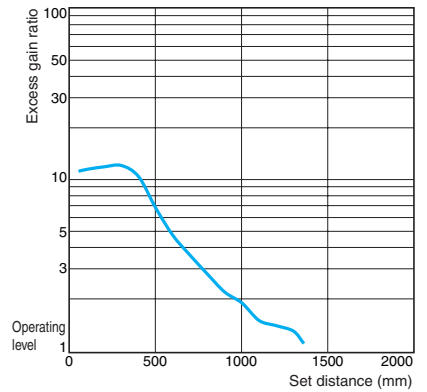
E3T-ST3(F)



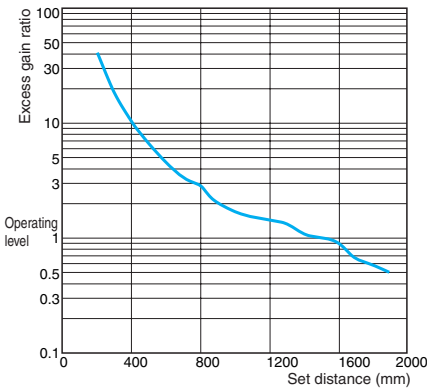
E3T-ST1(F)



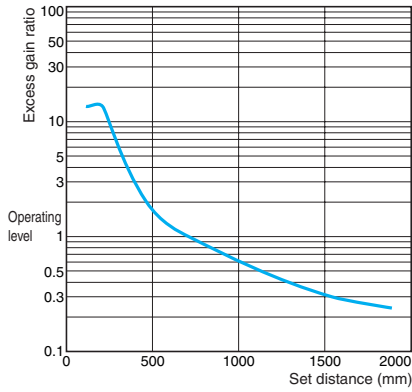
E3T-ST2(F)



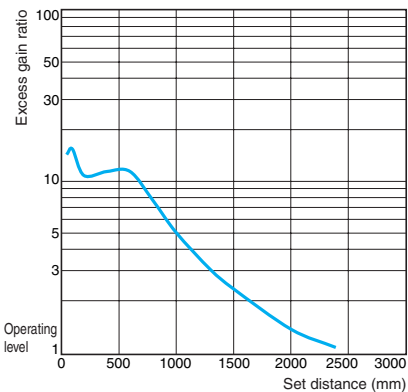
E3T-FT1



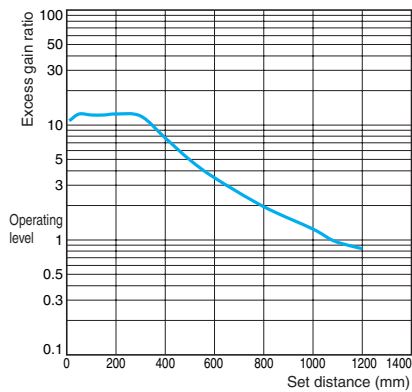
E3T-FT2



E3T-FT1(F)

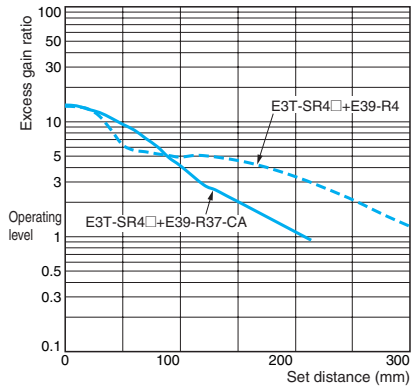


E3T-FT2(F)



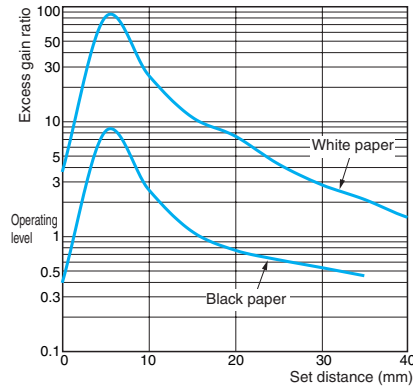
Retro-reflective

E3T-SR4□



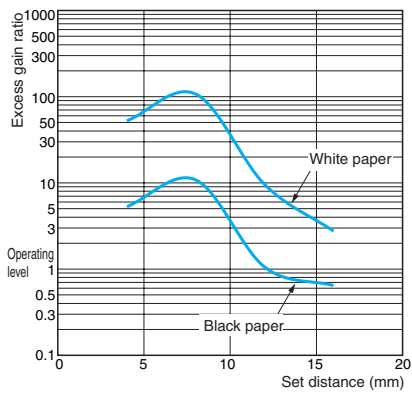
Diffuse-reflective

E3T-FD1□(M)

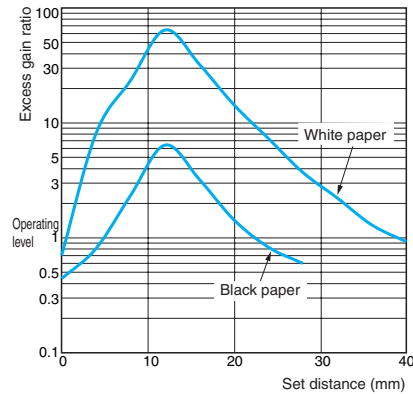


Limited-reflective

E3T-SL1□(M)



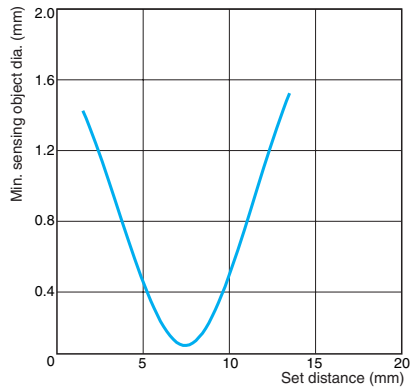
E3T-SL2□(M)



Sensing Object Size vs. Sensing Distance

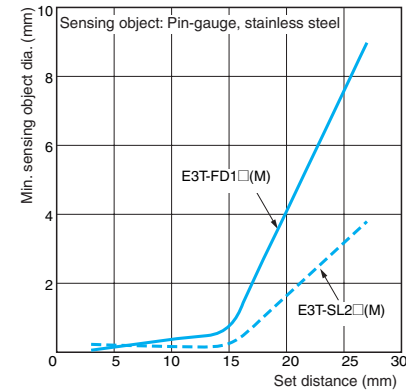
Limited-reflective

E3T-SL1□(M)



Diffuse/Limited-reflective

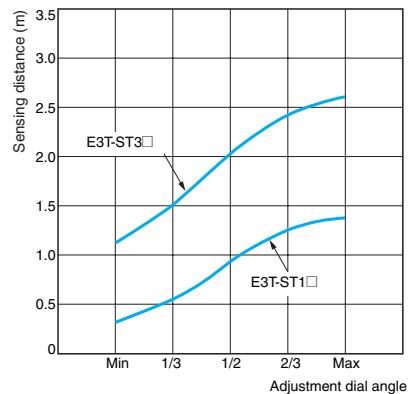
E3T-FD1□(M)/E3T-SL2□(M)



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

E3T-ST1□ + E39-E10 Sensitivity Adjustment Unit

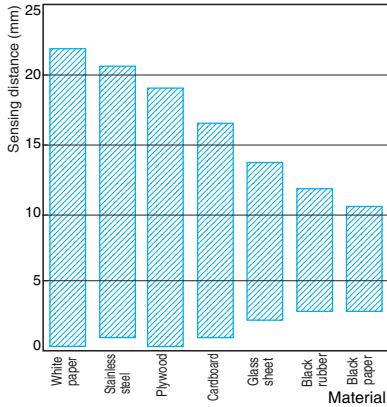
E3T-ST3□ + E39-E10 Sensitivity Adjustment Unit



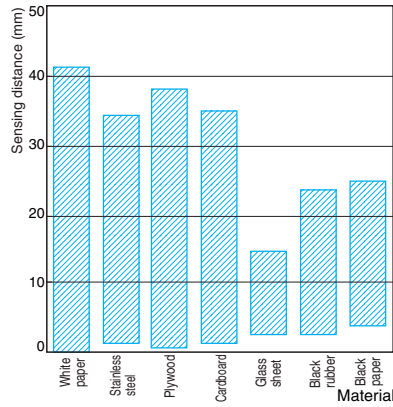
Sensing Distance vs. Material

Limited-reflective

E3T-SL1□(M)

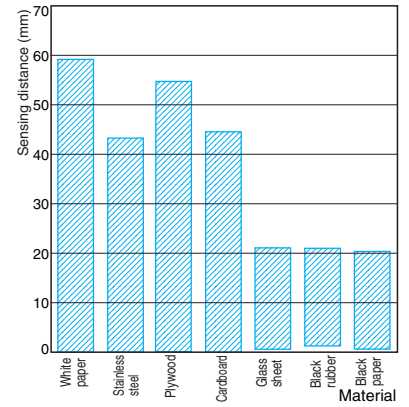


E3T-SL2□(M)



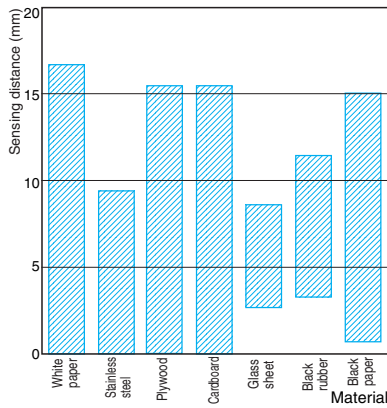
Diffuse-reflective

E3T-FD1□(M)

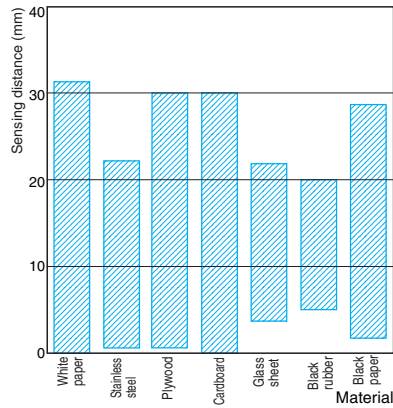


BGS-reflective

E3T-FL1□



E3T-FL2□

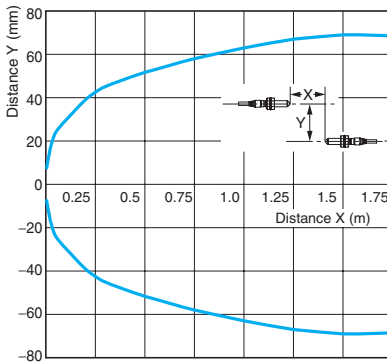


Small Cylindrical Sensors

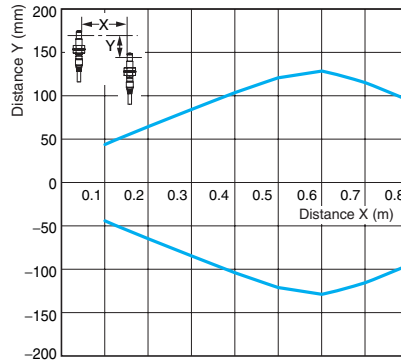
Parallel Operating Range

Through-beam

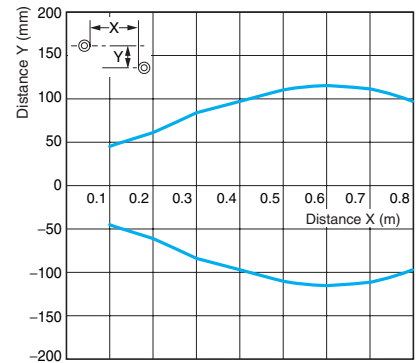
E3T-CT1□



E3T-CT2□S (Top to Bottom)



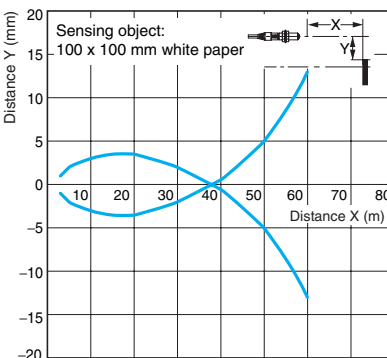
E3T-CT2□S (Right to Left)



Operating Range

Diffuse-reflective

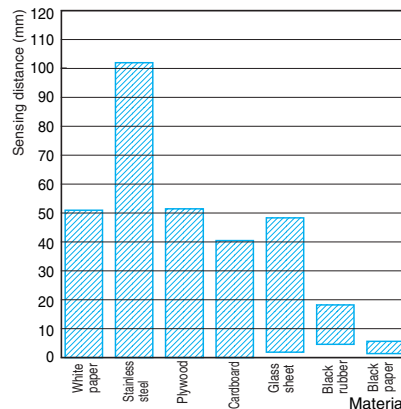
E3T-CD1□



Sensing Distance vs. Material

Diffuse-reflective

E3T-CD1□



E3T

I/O Circuit Diagrams

NPN Output

| Model | Operation mode | Timing charts | Output circuit |
|--|----------------|---|---|
| E3T-□□□1(F) E3T-□□□1M(F) | Light-ON | <p>Light incident Light interrupted</p> <p>Operation indicator (orange) ON OFF</p> <p>Output transistor ON OFF</p> <p>Load (e.g., relay) Operate Reset</p> <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(F) E3T-□□□2M(F) E3T-□□□2S | Dark-ON | <p>Light incident Light interrupted</p> <p>Operation indicator (orange) ON OFF</p> <p>Output transistor ON OFF</p> <p>Load (e.g., relay) Operate Reset</p> <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(F) E3T-□□□3M(F) | Light-ON | <p>Light incident Light interrupted</p> <p>Operation indicator (orange) ON OFF</p> <p>Output transistor ON OFF</p> <p>Load (e.g., relay) Operate Reset</p> <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(F) E3T-□□□4M(F) E3T-□□□4S | Dark-ON | <p>Light incident Light interrupted</p> <p>Operation indicator (orange) ON OFF</p> <p>Output transistor ON OFF</p> <p>Load (e.g., relay) Operate Reset</p> <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> |

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 is 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

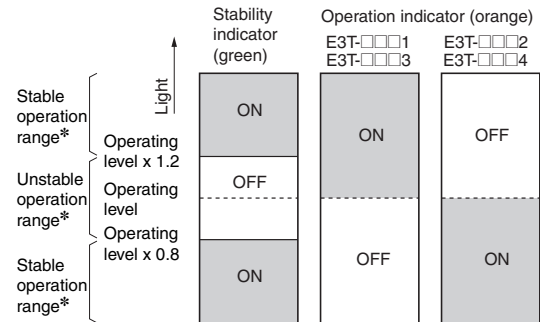
Attachment to Moving Parts

To mount the Photoelectric Sensor to a moving part, such as a robot hand, consider using a Sensor that uses a bending-resistant cable (robot cable).

● Adjusting

Indicators

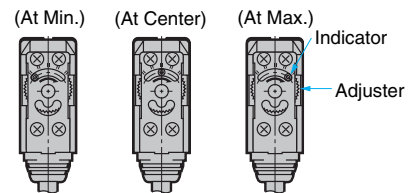
- The following graphs indicate the status of each operating level.
- Be sure to use the E3T within the stable operating range.



* If the E3T's 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·cm when turning the adjuster.

● Others

Do not use the product under the following conditions.

- In the place exposed to the direct sunlight.
- In the place where humidity is high and condensation may occur.
- In the place where corrosive gas exists.
- In the place where vibration or shock is directly transmitted to the product.

E3T

Dimensions

(Unit: mm)

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

Sensors

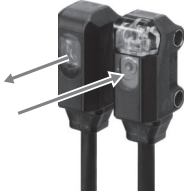
M2-mounting Sensors

Through-beam Side-view Sensors

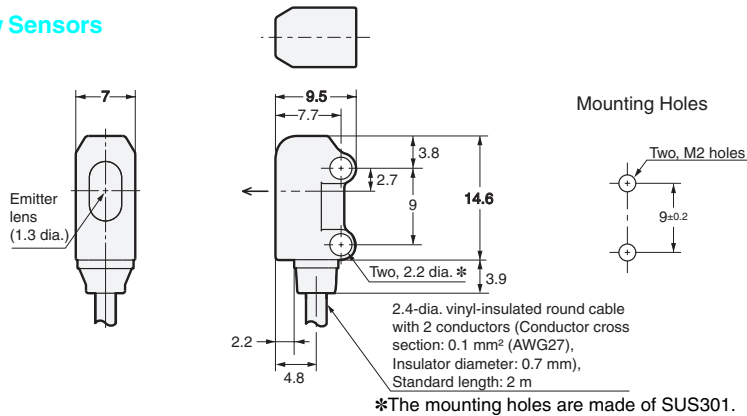
E3T-ST1□(F) (Emitter)

E3T-ST2□(F) (Emitter)

E3T-ST3□(F) (Emitter)



Emitter: E3T-ST□□(F)-L
Receiver: E3T-ST□□(F)-D



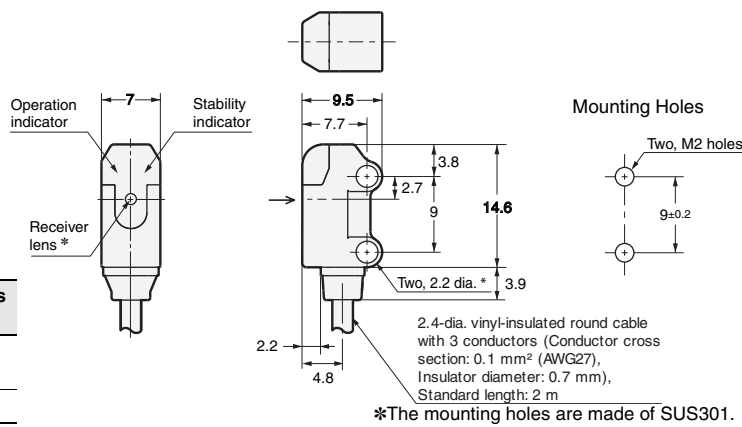
E3T-ST1□(F) (Receiver)

E3T-ST2□(F) (Receiver)

E3T-ST3□(F) (Receiver)

*The receiver lens diameters are given below.

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



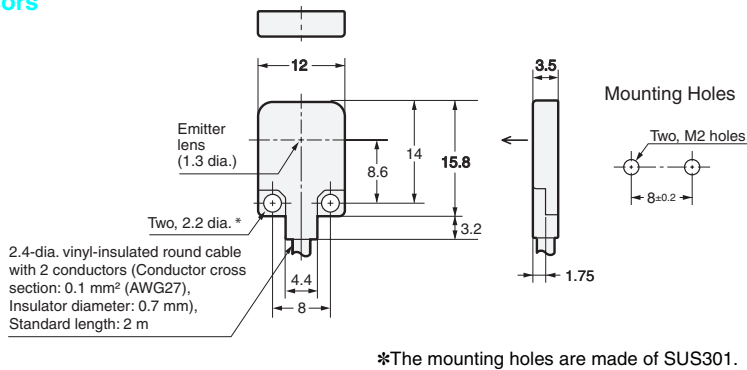
Through-beam Flat Sensors

E3T-FT1□(F) (Emitter)

E3T-FT2□(F) (Emitter)

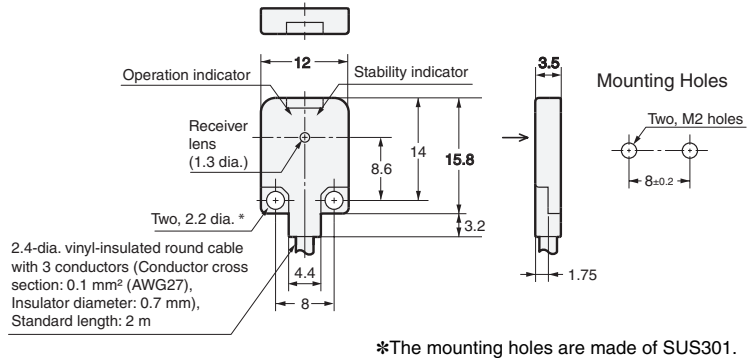


Emitter: E3T-FT□□(F)-L
Receiver: E3T-FT□□(F)-D



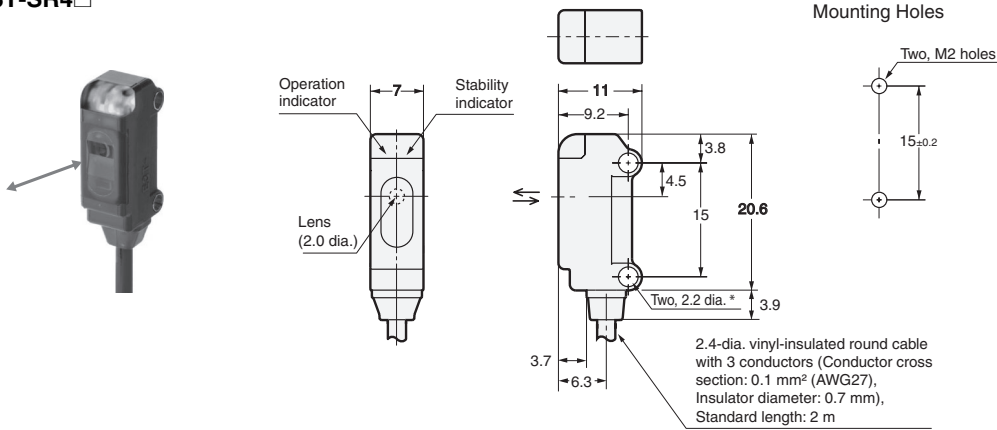
E3T-FT1□(F) (Receiver)

E3T-FT2□(F) (Receiver)



Retro-reflective Side-view Sensors

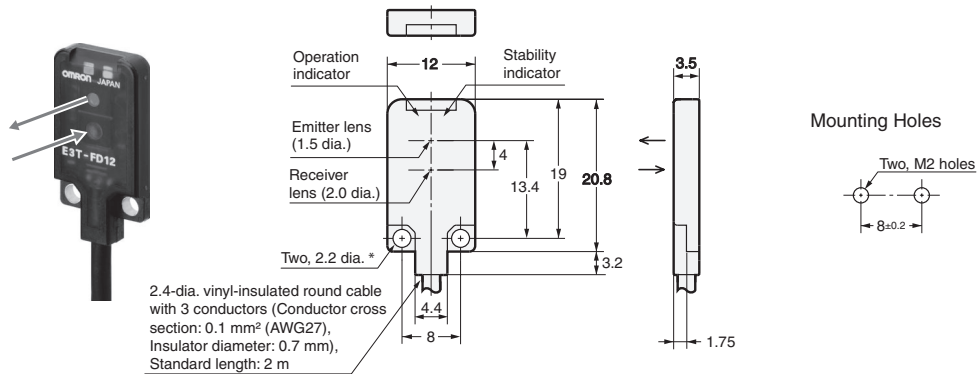
E3T-SR4□



*The mounting holes are made of SUS301.

Diffuse-reflective Flat Sensors

E3T-FD1□

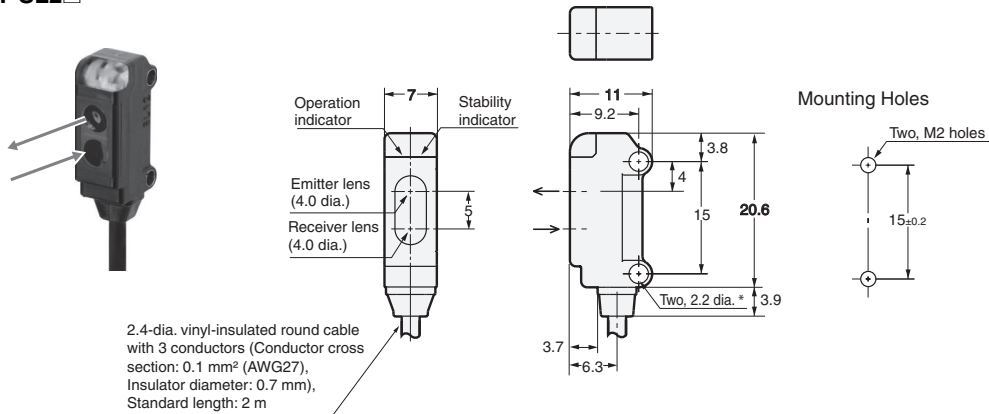


*The mounting holes are made of SUS301.

Limited-reflective Side-view Sensors

E3T-SL1□

E3T-SL2□

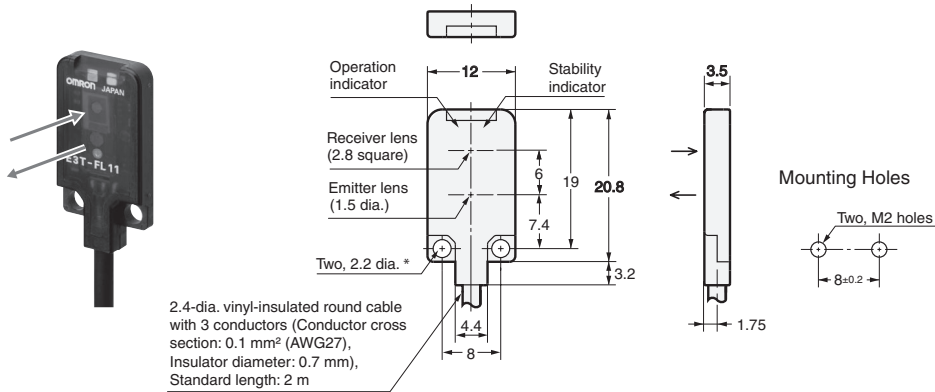


*The mounting holes are made of SUS301.

BGS-reflective Flat Sensors

E3T-FL1□

E3T-FL2□



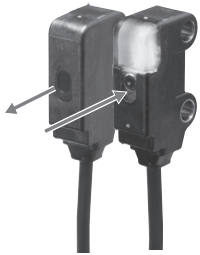
*The mounting holes are made of SUS301.

M3-mounting Sensors

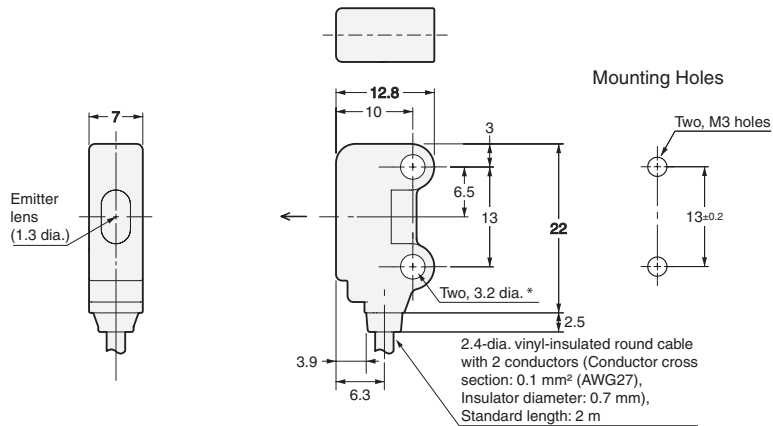
Through-beam Side-view Sensors

E3T-ST1□M(F) (Emitter)

E3T-ST2□M(F) (Emitter)



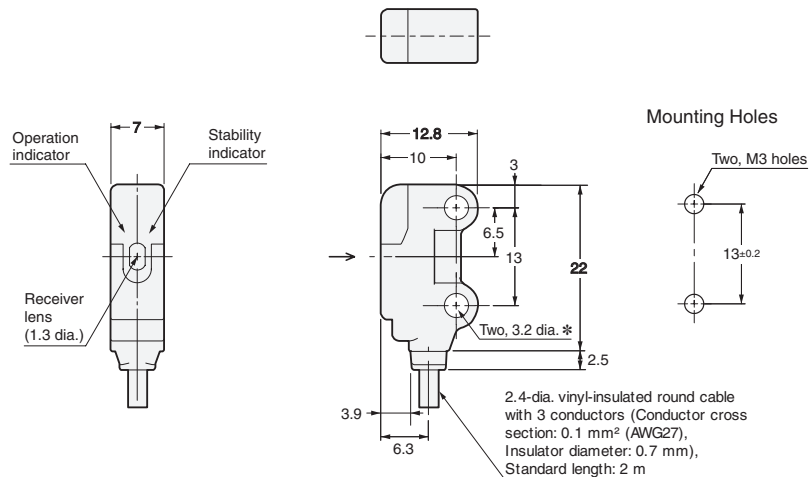
Emitter: E3T-ST□□(F)M-L
Receiver: E3T-ST□□(F)M-D



*The mounting holes are made of SUS304.

E3T-ST1□M(F) (Receiver)

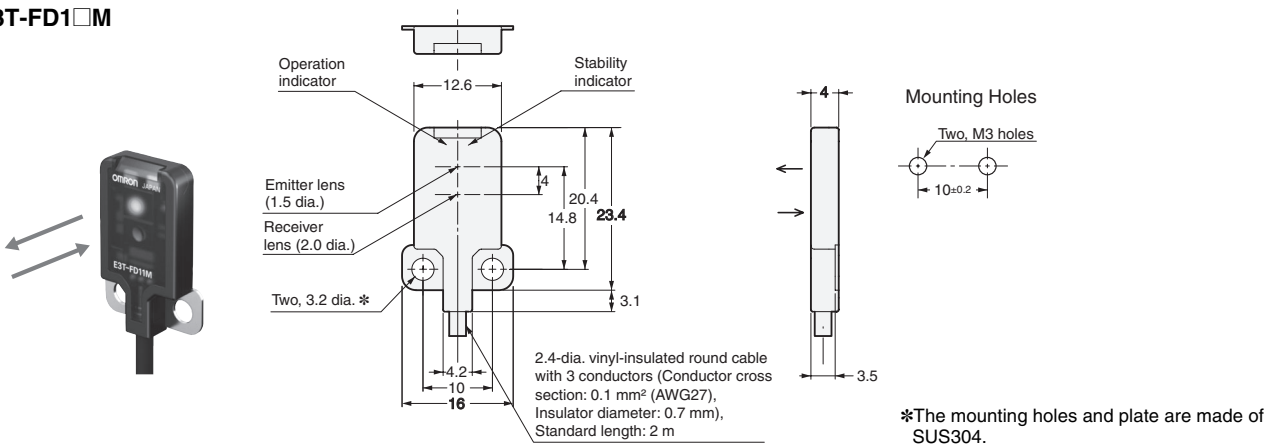
E3T-ST2□M(F) (Receiver)



*The mounting holes are made of SUS304.

Diffuse-reflective Flat Sensors

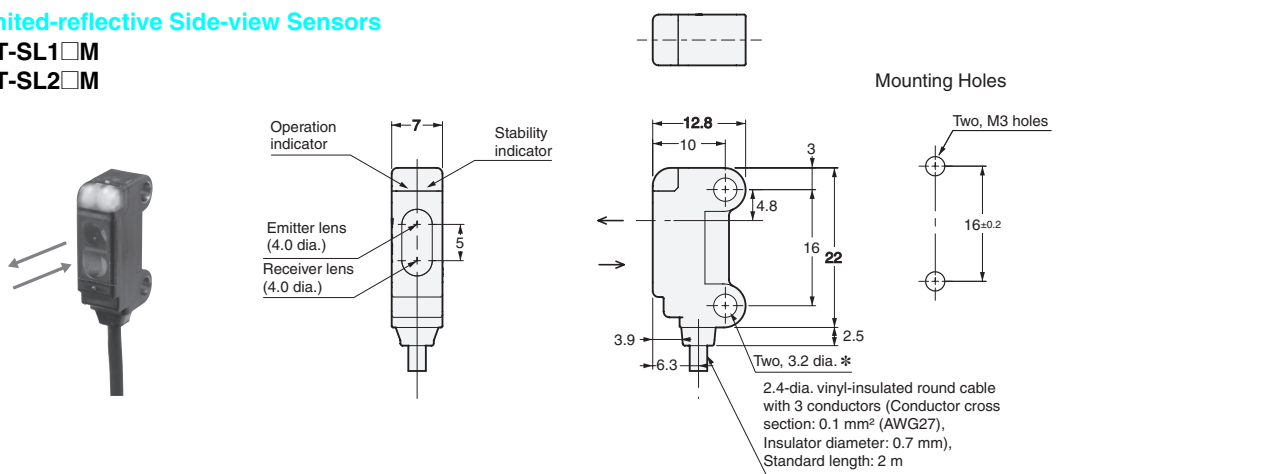
E3T-FD1□M



Limited-reflective Side-view Sensors

E3T-SL1□M

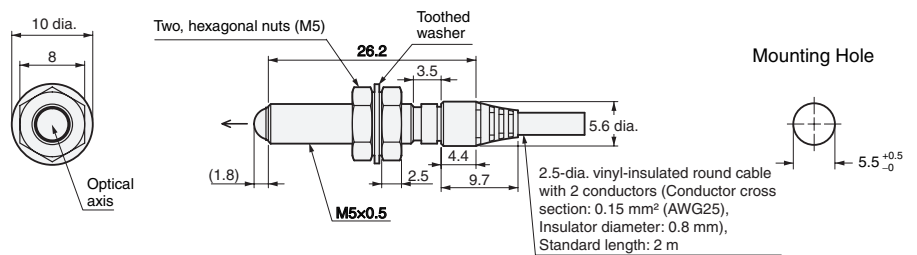
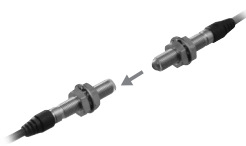
E3T-SL2□M



Small Cylindrical Sensors

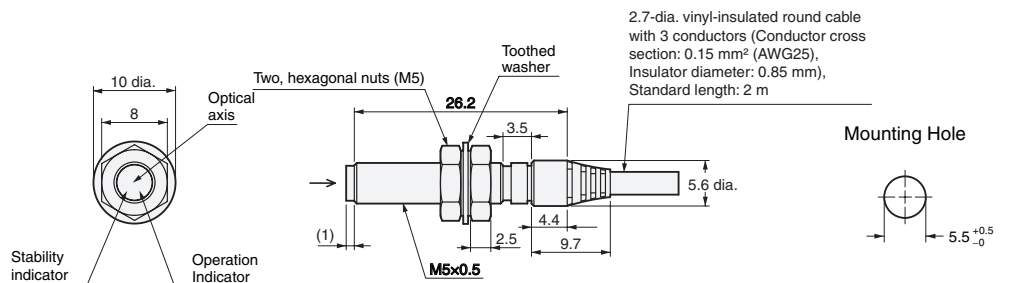
Through-beam Top-view Sensors

E3T-CT1□ (Emitter)



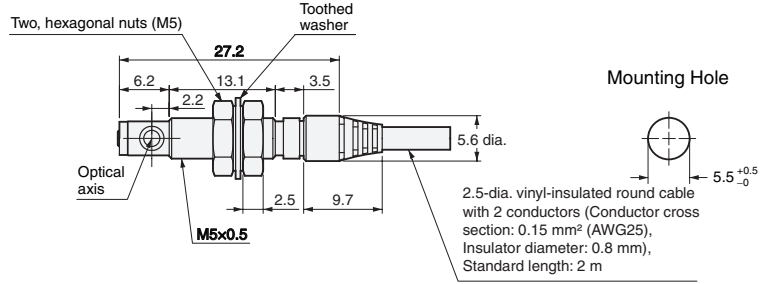
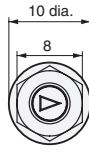
Emitter: E3T-CT1□-L
Receiver: E3T-CT1□-D

E3T-CT1□ (Receiver)



Through-beam Side-view Sensors

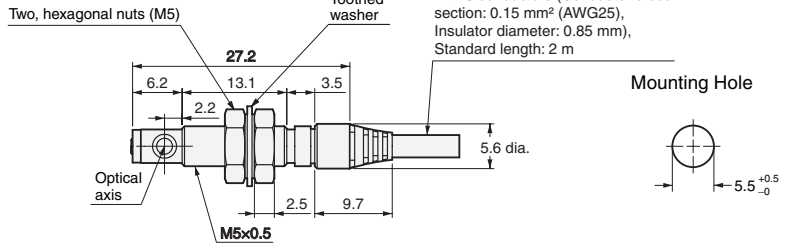
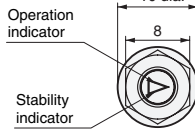
E3T-CT2□S (Emitter)



Mounting Hole

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

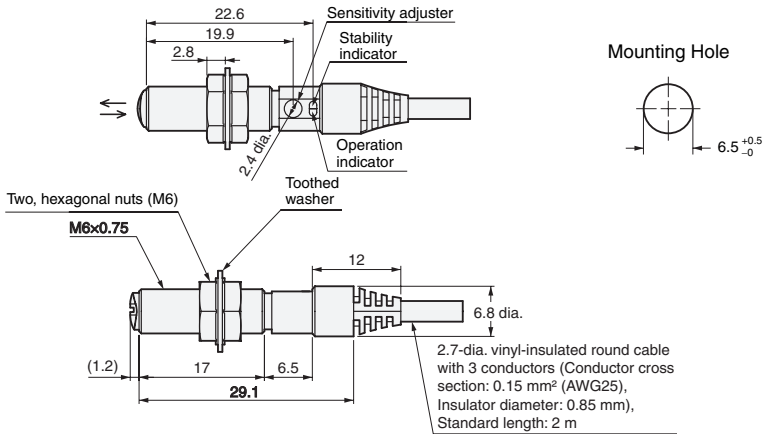
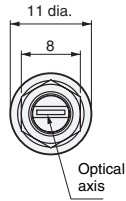
E3T-CT2□S (Receiver)



Mounting Hole

Diffuse-reflective Top-view Sensors

E3T-CD1□

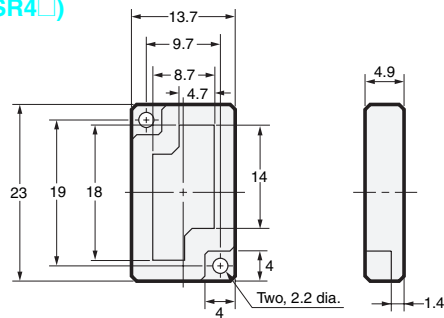


Mounting Hole

Accessories

Reflector (Provided with E3T-SR4□)

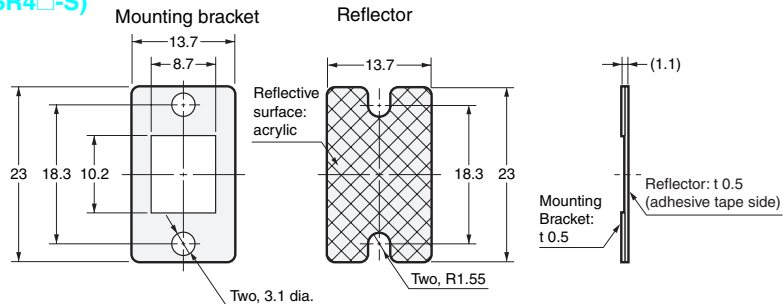
E39-R4



Material, reflective surface: acrylic
Rear surface: ABS

Reflector (Provided with E3T-SR4□-S)

E39-R37-CA

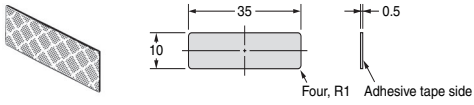


Material: Mounting plate: stainless steel (SUS301)
Reflective surface: acrylic

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

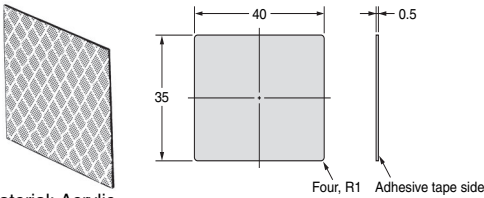
Accessories (Order Separately)

Tape Reflectors
E39-RS1-CA



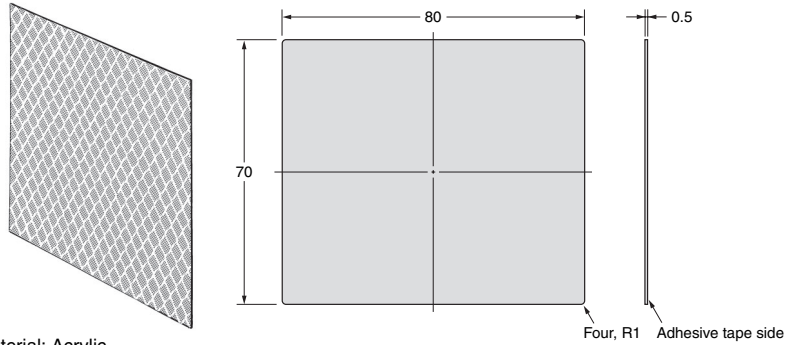
Material: Acrylic

E39-RS2-CA



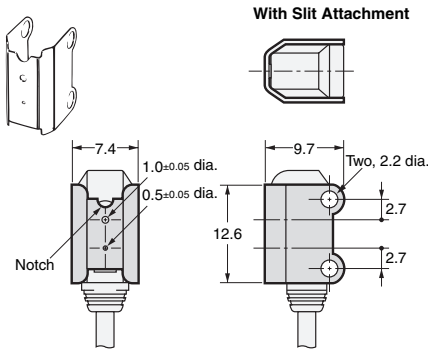
Material: Acrylic

E39-RS3-CA



Material: Acrylic

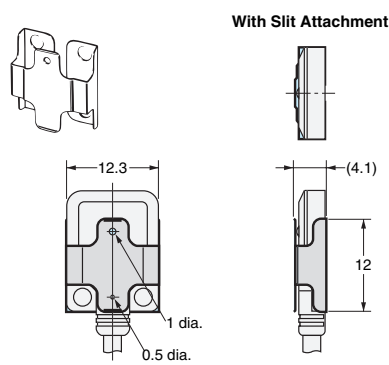
Slit for E3T-ST□□(F) Through-beam Sensors
E39-S63



Material: 0.2-mm thick stainless steel (SUS301)

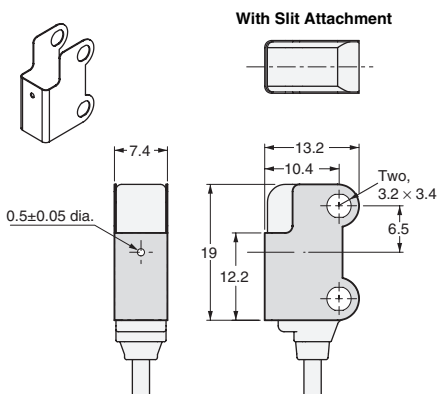
Note: Align the notch direction of the Slit when installing on the Emitter and Receiver.

Slit for E3T-FT□□(F) Through-beam Sensors
E39-S64



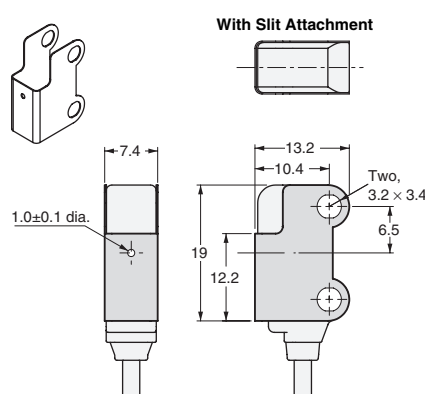
Material: 0.1-mm thick stainless steel (SUS301)

0.5-dia Slit for E3T-ST□□M(F) Through-beam Sensors
E39-S76A



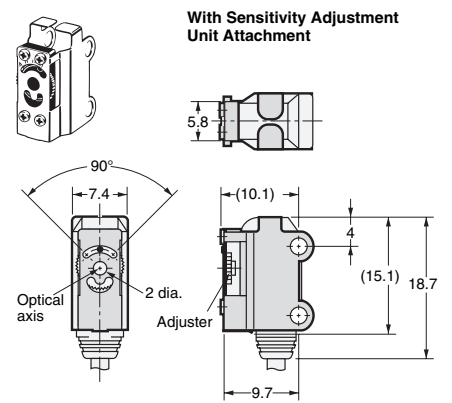
Material: 0.2-mm thick stainless steel (SUS301)

1-dia Slit for E3T-ST□□M(F) 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



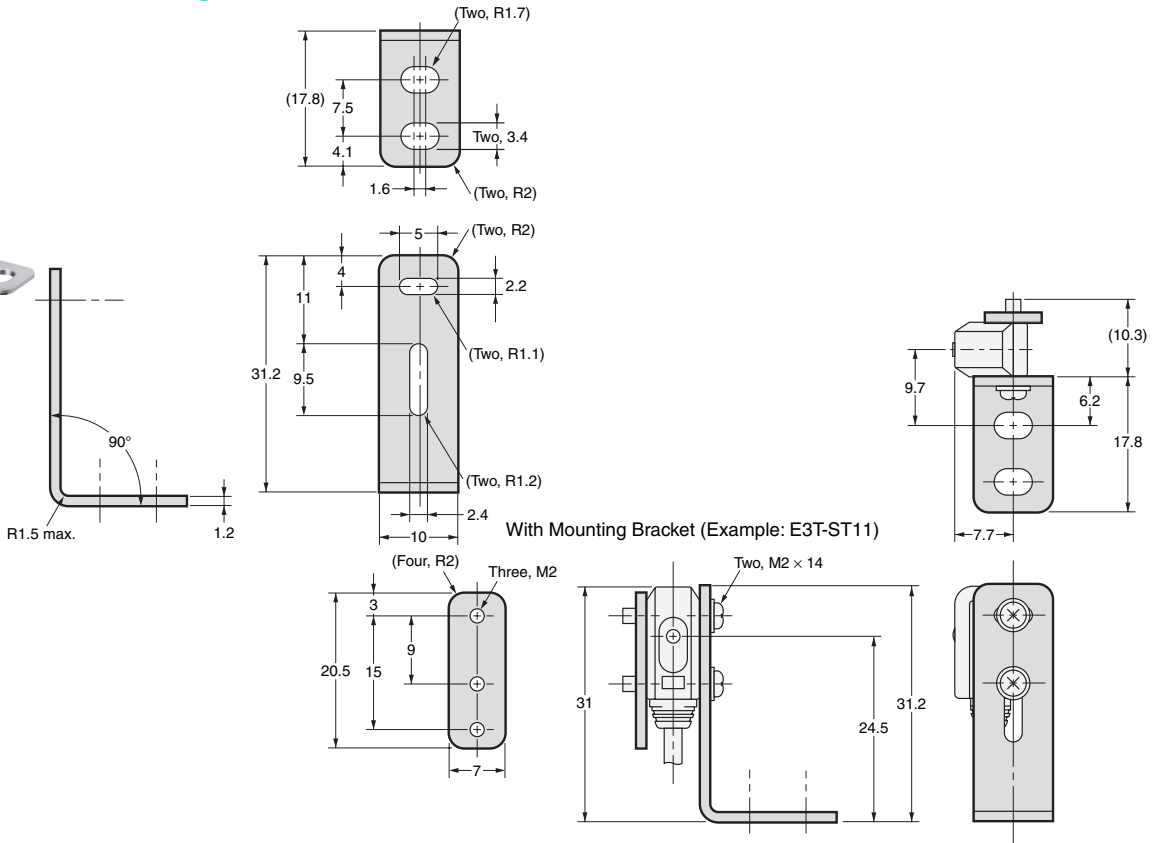
Material: stainless steel (SUS301)

Mounting Bracket for M2-mounting Side-view Sensors

E39-L116



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

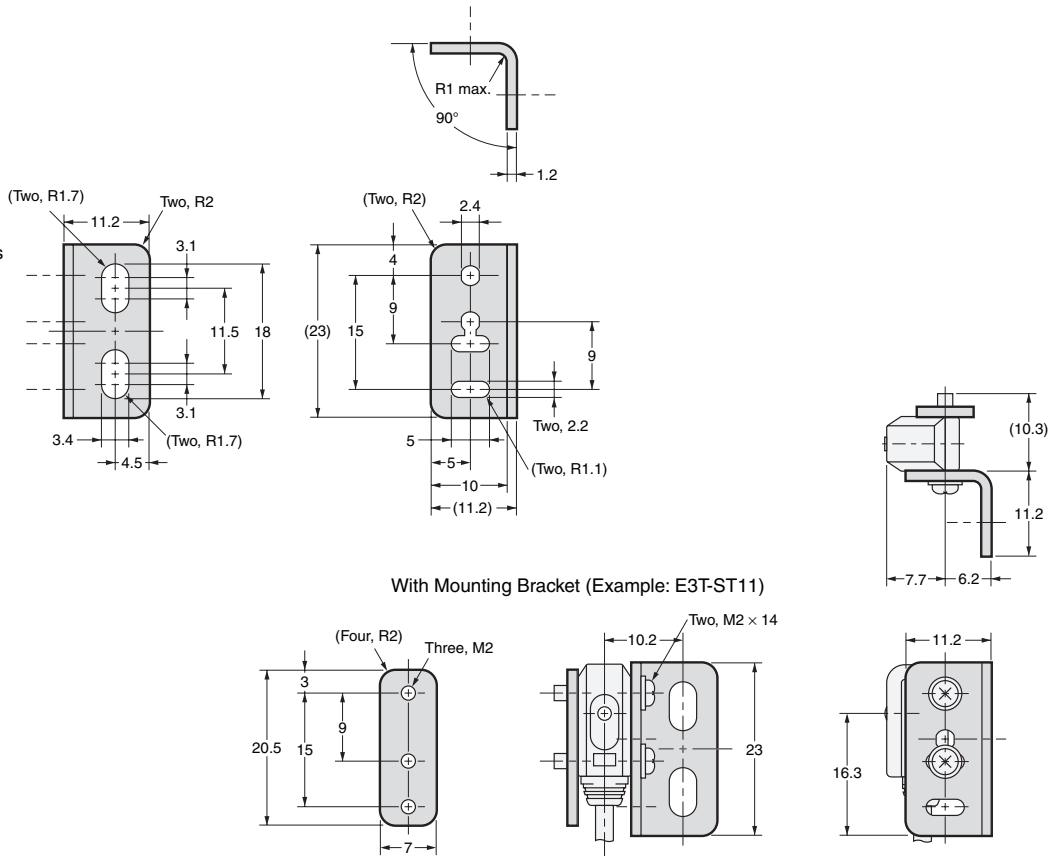


Mounting Bracket for M2-mounting Side-view Sensors

E39-L117



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

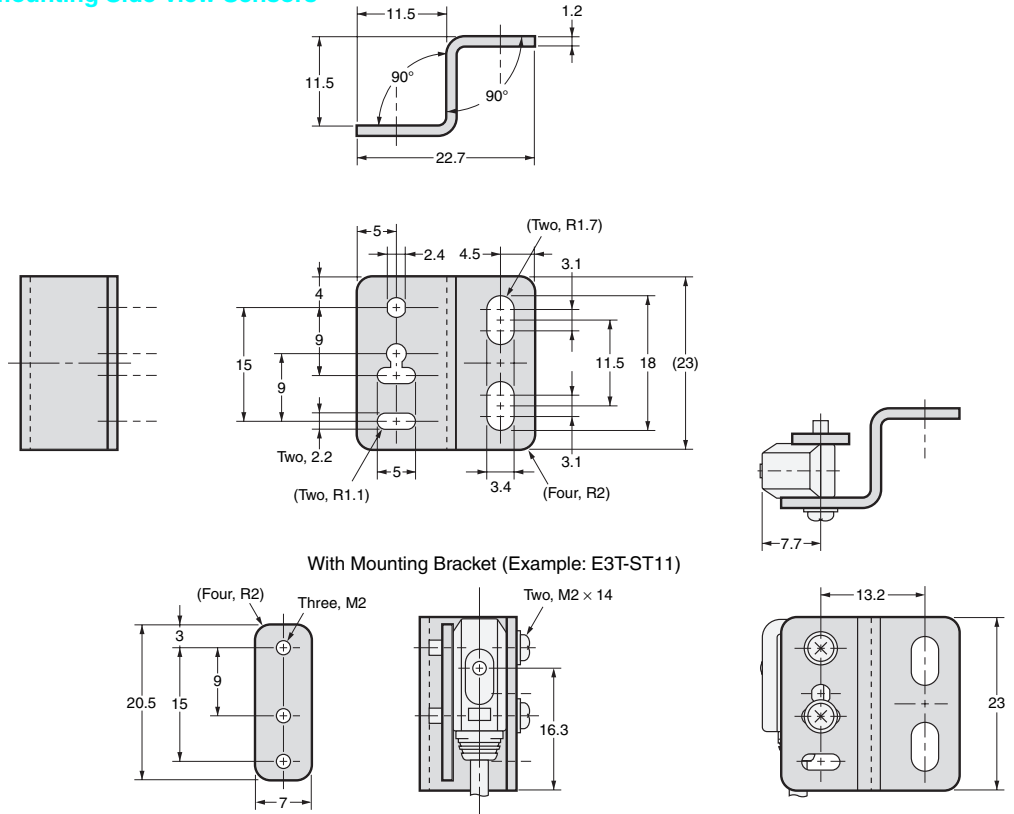


Mounting Bracket for M2-mounting Side-view Sensors

E39-L118



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

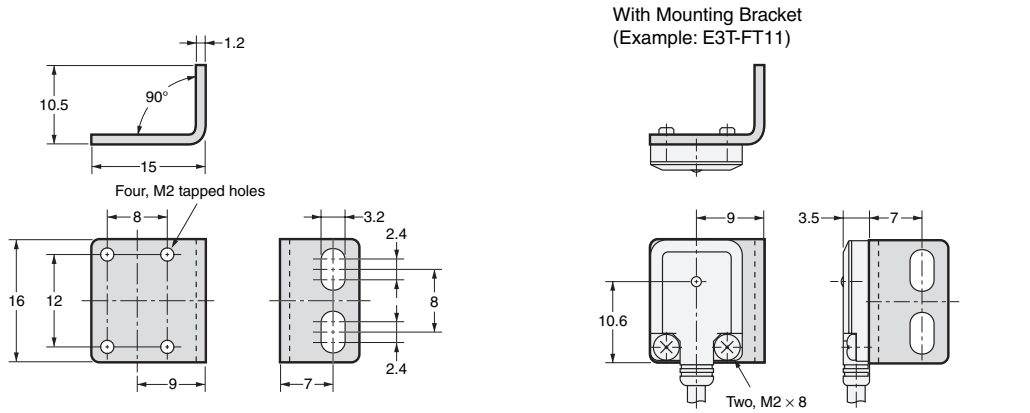


Mounting Bracket for M2-mounting Flat Sensors

E39-L119



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

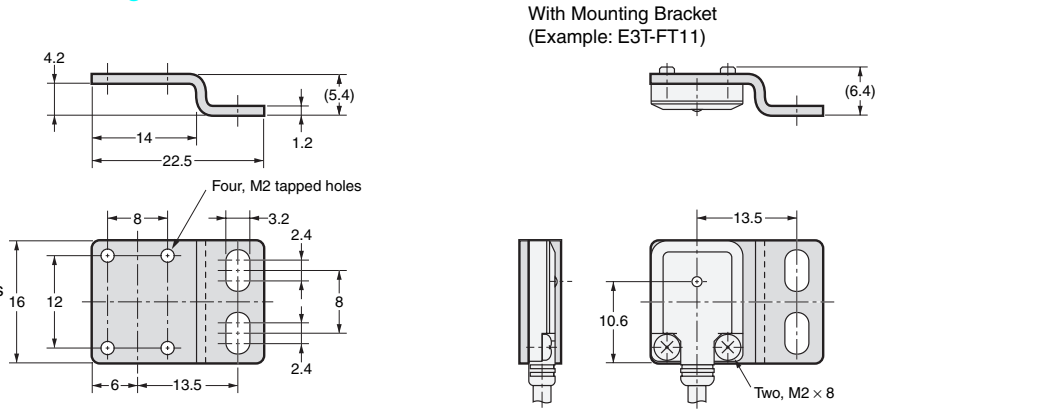


Mounting Bracket for M2-mounting Flat Sensors

E39-L120



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

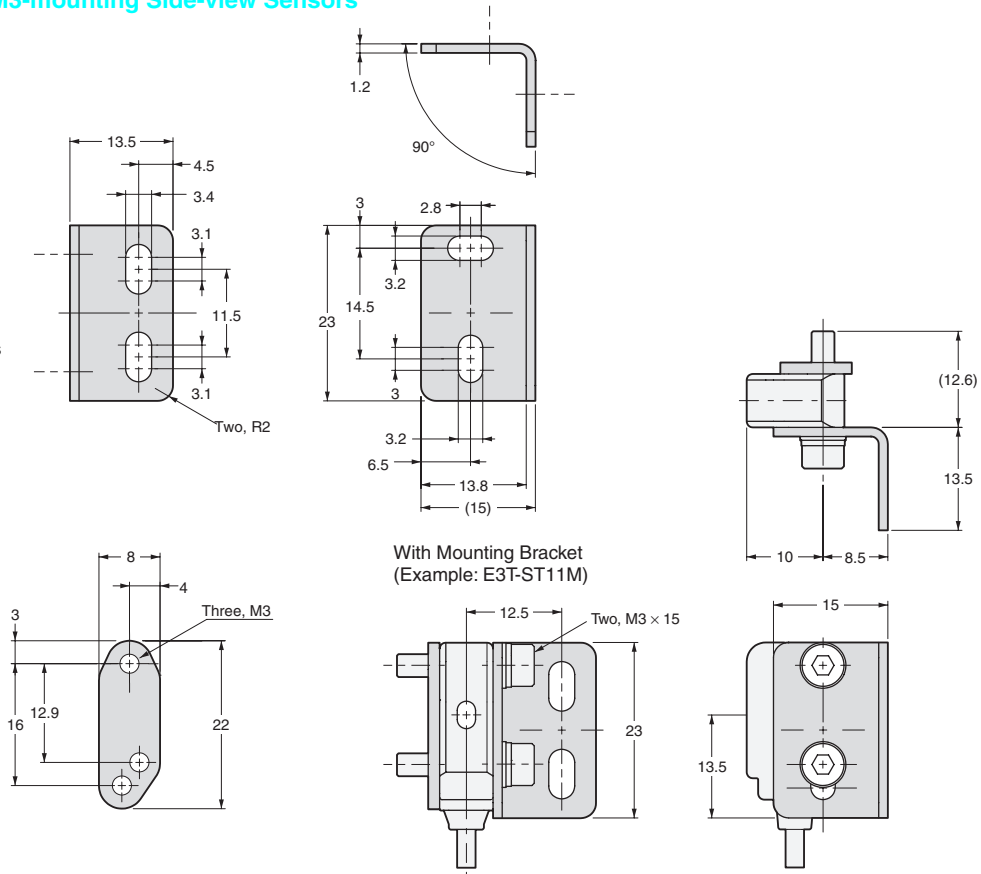


Mounting Bracket for M3-mounting Side-view Sensors

E39-L166



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

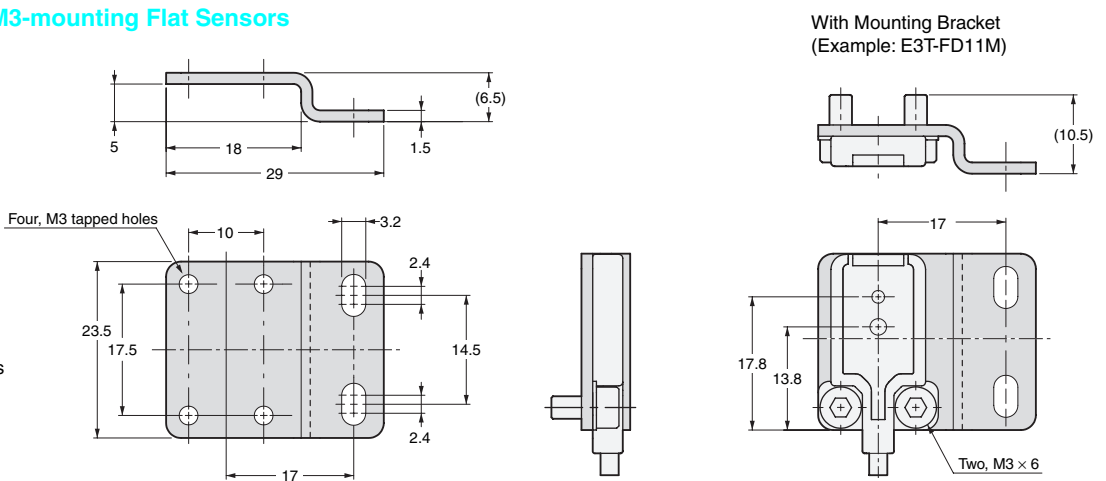


Mounting Bracket for M3-mounting Flat Sensors

E39-L167

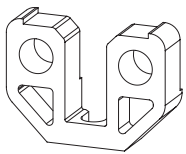


Material: 1.5-mm-thick stainless steel (SUS304)

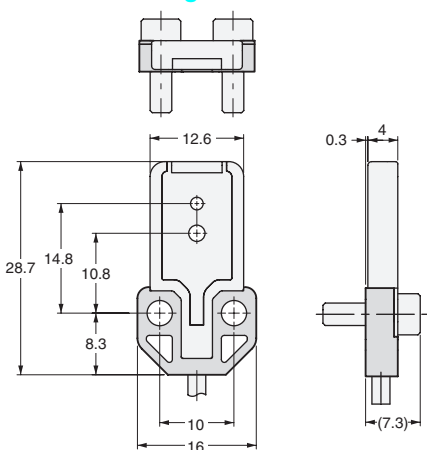


Back-mounting Spacer for M3-mounting Flat Sensors

E39-L168



Material: PBT (polybutylene terephthalate)



Note: Use this Spacer when mounting the Sensor from the back.

Terms and Conditions of Sale

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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3. **Discounts.** Cash discounts, if any, will apply only on the net amount of invoices sent to Buyer after deducting transportation charges, taxes and duties, and will be allowed only if (i) the invoice is paid according to Omron's payment terms and (ii) Buyer has no past due amounts.
4. **Interest.** Omron, at its option, may charge Buyer 1-1/2% interest per month or the maximum legal rate, whichever is less, on any balance not paid within the stated terms.
5. **Orders.** Omron will accept no order less than \$200 net billing.
6. **Governmental Approvals.** Buyer shall be responsible for, and shall bear all costs involved in, obtaining any government approvals required for the importation or sale of the Products.
7. **Taxes.** All taxes, duties and other governmental charges (other than general real property and income taxes), including any interest or penalties thereon, imposed directly or indirectly on Omron or required to be collected directly or indirectly by Omron for the manufacture, production, sale, delivery, importation, consumption or use of the Products sold hereunder (including customs duties and sales, excise, use, turnover and license taxes) shall be charged to and remitted by Buyer to Omron.
8. **Financial.** If the financial position of Buyer at any time becomes unsatisfactory to Omron, Omron reserves the right to stop shipments or require satisfactory security or payment in advance. If Buyer fails to make payment or otherwise comply with these Terms or any related agreement, Omron may (without liability and in addition to other remedies) cancel any unshipped portion of Products sold hereunder and stop any Products in transit until Buyer pays all amounts, including amounts payable hereunder, whether or not then due, which are owing to it by Buyer. Buyer shall in any event remain liable for all unpaid accounts.
9. **Cancellation; Etc.** Orders are not subject to rescheduling or cancellation unless Buyer indemnifies Omron against all related costs or expenses.
10. **Force Majeure.** Omron shall not be liable for any delay or failure in delivery resulting from causes beyond its control, including earthquakes, fires, floods, strikes or other labor disputes, shortage of labor or materials, accidents to machinery, acts of sabotage, riots, delay in or lack of transportation or the requirements of any government authority.
11. **Shipping; Delivery.** Unless otherwise expressly agreed in writing by Omron:
 - a. Shipments shall be by a carrier selected by Omron; Omron will not drop ship except in "break down" situations.
 - b. Such carrier shall act as the agent of Buyer and delivery to such carrier shall constitute delivery to Buyer;
 - c. All sales and shipments of Products shall be FOB shipping point (unless otherwise stated in writing by Omron), at which point title and risk of loss shall pass from Omron to Buyer; provided that Omron shall retain a security interest in the Products until the full purchase price is paid;
 - 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.
13. **Warranties.** (a) **Exclusive Warranty.** Omron's exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Omron (or such other period expressed in writing by Omron). Omron disclaims all other warranties, express or implied. (b) **Limitations.** OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCTS. BUYER ACKNOWLEDGES THAT IT ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. Omron further disclaims all warranties and responsibility of any type for claims or expenses based on infringement by the Products or otherwise of any intellectual property right. (c) **Buyer Remedy.** Omron's sole obligation hereunder shall be, at Omron's election, to (i) replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product, (ii) repair the non-complying Product, or (iii) repay or credit Buyer an amount equal to the purchase price of the non-complying Product; provided that in no event shall Omron be responsible for warranty, repair, indemnity or any other claims or expenses regarding the Products unless Omron's analysis confirms that the Products were properly handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification. Return of any Products by Buyer must be approved in writing by Omron before shipment. Omron Companies shall not be liable for the suitability or unsuitability or the results from the use of Products in combination with any electrical or electronic components, circuits, system assemblies or any other materials or substances or environments. Any advice, recommendations or information given orally or in writing, are not to be construed as an amendment or addition to the above warranty. See <http://www.omron247.com> or contact your Omron representative for published information.
14. **Limitation on Liability; Etc.** OMRON COMPANIES SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE OR STRICT LIABILITY. Further, in no event shall liability of Omron Companies exceed the individual price of the Product on which liability is asserted.
15. **Indemnities.** Buyer shall indemnify and hold harmless Omron Companies and their employees from and against all liabilities, losses, claims, costs and expenses (including attorney's fees and expenses) related to any claim, investigation, litigation or proceeding (whether or not Omron is a party) which arises or is alleged to arise from Buyer's acts or omissions under these Terms or in any way with respect to the Products. Without limiting the foregoing, Buyer (at its own expense) shall indemnify and hold harmless Omron and defend or settle any action brought against such Companies to the extent based on a claim that any Product made to Buyer specifications infringed intellectual property rights of another party.
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.