

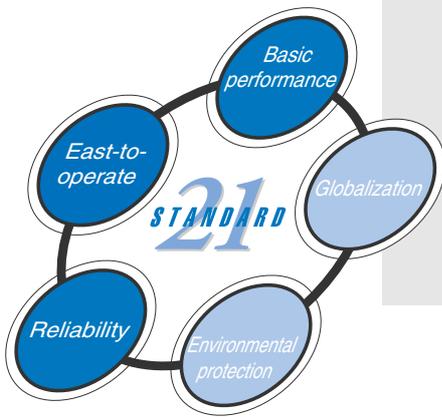
Photoelectric Sensor with Built-in Amplifier

E3Z

For almost all binary-detection applications, you can make selection from the E3Z



CE

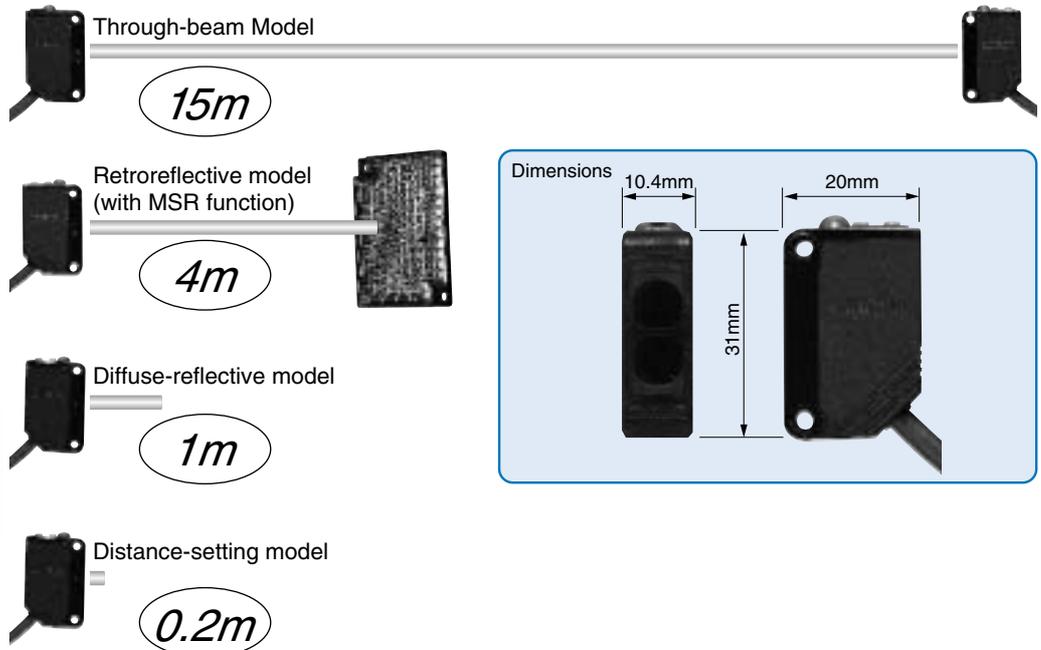


Features

Basic performance

Photoelectric Sensor with built-in amplifier is applicable to a wide variety of lines and ensures a longer sensing distance than any other model.

Lineup of models corresponding to applications (thin beam, transparent, grooved)



Globalization

Meets a variety of international standards, thus allowing use in any country.



Global network with 191 offices in 38 countries. M8-connector, PNP output types that meet international standards are available.

Easy-to-operate

User-friendly Photoelectric Sensor takes all installation and on-site conditions into consideration.

A general-purpose connector ensures easy on-site installation!



The compact and space-saving model can be installed in any location.



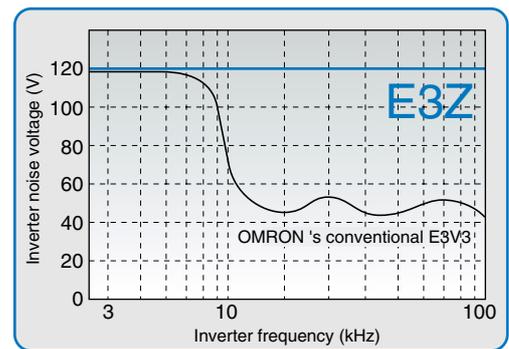
Reliability

Eliminates the influence of installation and on-site conditions, thus increasing the reliability of the line.

Highly water and dust-resistant and ensures easy installation in any location.



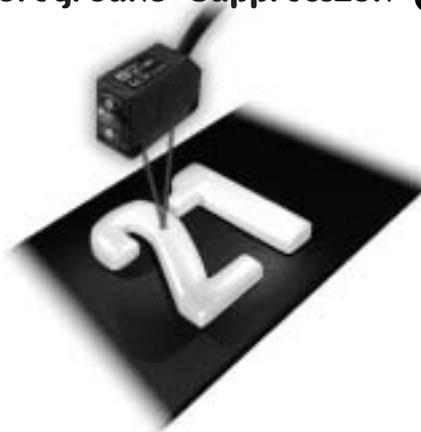
Resists common-mode noise generated by inverters.



Stability

E3Z-series reliability covers a wide range of object/background combinations, and ensure stable detection regardless of work-piece color or glossiness.

Foreground Suppression & Background Suppression

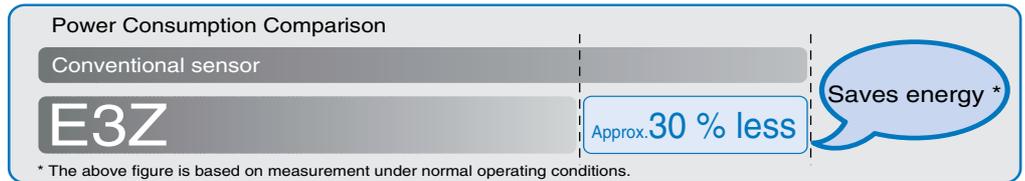


Environmental protection

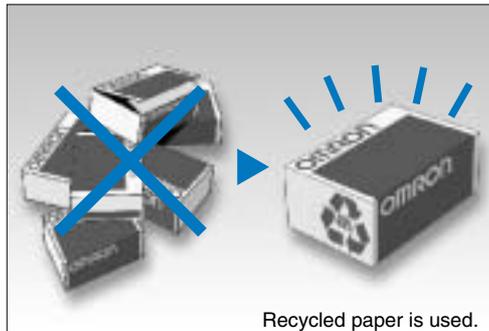
Photoelectric Sensor with Built-in Amplifier



Earth-friendly energy-saving type.



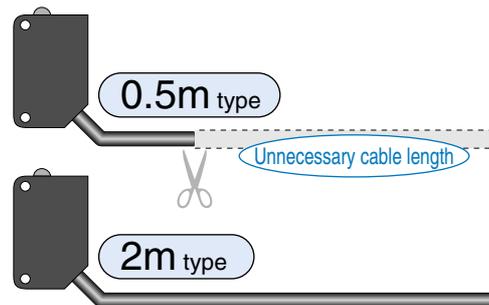
10-quantity packing reduces waste cartons.



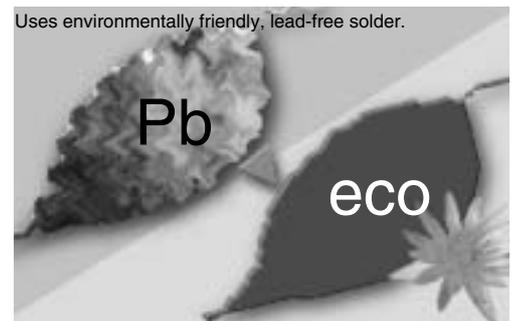
Packed in "combustible" polyethylene bags free of Styrofoam. *



Standard models provided with a 0.5-m cable are available for the elimination of unnecessary cable length.



On-going elimination of materials containing lead.



Narrow Beam model

Ideal for detecting small objects with a small spot:

- Tiny objects as little as 0.1 mm in diameter can be detected with a 2.5-mm dia. spot.
- A thin beam enables detection through a gap or small hole.
- The small spot of light enables visual checking of sensing spot position.



Transparent PET bottles

Stable detection of thin-wall PET bottles adequate for recycling
Standard-size transparent object sensor

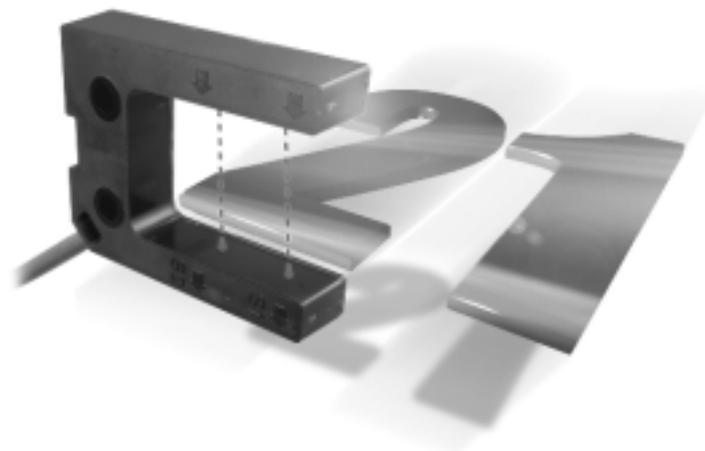
- Uses OMRON's unique optical system ("Inner View") that can detect various shapes of PET bottles and transparent objects.
- Detects a wide range of bottles from 500-ml bottles to 2-l bottles, and from single bottles to sets of stocked bottles.



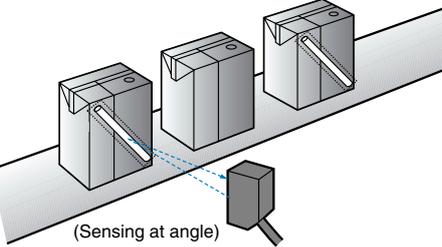
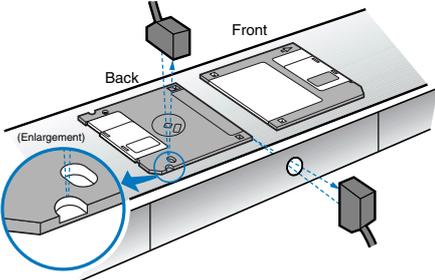
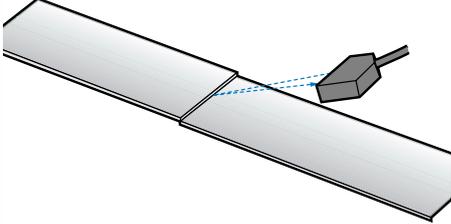
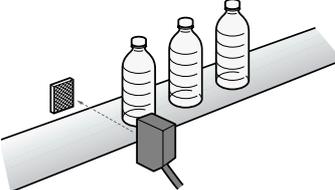
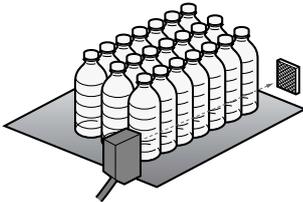
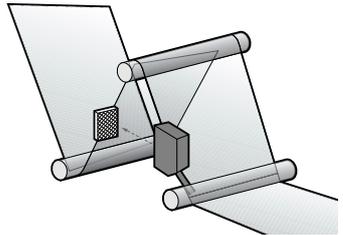
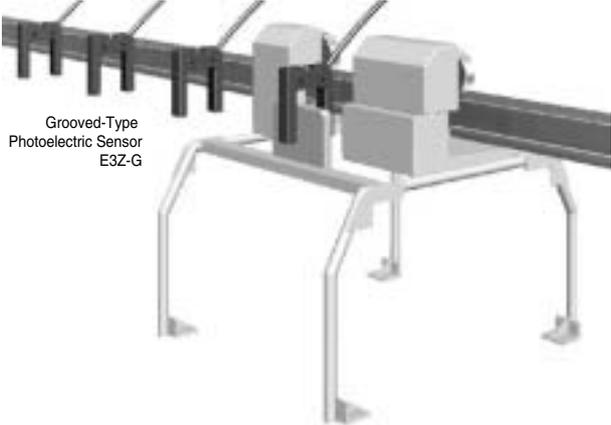
Reduced adjustment

Grooved design eliminates the need for optical axis adjustment.

- Two-axis models also available..



Applications

| | | |
|--|--|--|
| <p>E3Z-LS background and foreground suppression models</p> | | |
| <p>Detecting covers on cosmetic products</p>  | <p>Detecting pastries on conveyor belts</p>  | <p>Detecting packaged chewing gum or candy</p>  |
| <p>E3Z-L narrow beam models</p> | | |
| <p>Checking for straws</p>  | <p>Determining front/back or orientation of floppy disks</p>  | <p>Detecting uneven joints</p>  |
| <p>E3Z-B transparent object model</p> | | |
| <p>Transparent PET Bottle-related Detection - One bottle</p>  | <p>Transparent PET Bottle related Detection - Multiple bottles (Stocker)</p>  | <p>Detection of films and glass plates</p>  |
| <p>E3Z-G grooved type model</p> | | |
| <p>Crane and automated warehouse conveyor table passage inspection and positioning.</p>  <p>Grooved-Type Photoelectric Sensor E3Z-G</p> | | |

Ordering Information

Sensors

Red light Infrared light

| Sensor type | Shape | Connection method | Sensing distance | Model | |
|--|-------|------------------------------|------------------|-------------|-------------|
| | | | | NPN output | PNP output |
| Through-beam | | Pre-wired models (2 m)*3 | | E3Z-T61 | E3Z-T81 |
| | | Connector type | | E3Z-T66 | E3Z-T86 |
| | | Pre-wired models (2 m)*3 | | E3Z-T61A | E3Z-T81A |
| | | Connector type | | E3Z-T66A | E3Z-T86A |
| Retroreflective model (with M.S.R. function) | *1 | Pre-wired (2 m)*3 | | *2 E3Z-R61 | E3Z-R81 |
| | | Connector type | | E3Z-R66 | E3Z-R86 |
| Diffuse-reflective | | Pre-wired models (2 m)*3 | | E3Z-D61 | E3Z-D81 |
| | | Connector type | | E3Z-D66 | E3Z-D86 |
| | | Pre-wired models (2 m)*3, *4 | | E3Z-D62 | E3Z-D82 |
| | | Connector type | | E3Z-D67 | E3Z-D87 |
| Thin beam type reflective model | | Pre-wired models (2 m)*3 | | E3Z-L61 | E3Z-L81 |
| | | Connector type | | E3Z-L66 | E3Z-L86 |
| Distance-settable | | Pre-wired models (2 m)*3 | | E3Z-LS61 | E3Z-LS81 |
| | | Connector type | | E3Z-LS66 | E3Z-LS86 |
| Transparent PET bottle type Retro-reflective model (without M.S.R. function) | *1 | Pre-wired (2 m)*3 | | *2 E3Z-B61 | E3Z-B81 |
| | | Connector type | | E3Z-B66 | E3Z-B86 |
| | | Pre-wired models (2 m)*3 | | *2 E3Z-B62 | E3Z-B82 |
| | | Connector type | | E3Z-B67 | E3Z-B87 |
| Grooved type through-beam model | | 1 Pre-wired models (2 m)*3 | | E3Z-G61 | E3Z-G81 |
| | | 2 | | E3Z-G62 | E3Z-G82 |
| | | 1 Junction connector | | E3Z-G61-M3J | E3Z-G81-M3J |
| | | 2 | | E3Z-G62-M3J | E3Z-G82-M3J |

*1. Not attached. Please purchase the optional reflector (9 types) according to your application.

*2. The sensing distance specified is possible when the E39-R1S used. Figure in parentheses indicate the minimum required distance between the Sensor and Reflector.

*3. Models provided with a 0.5-m cable are available. When ordering, specify the cable length by adding the code "0.5M" to the model number (e.g., E3Z-T61 0.5M).

*4. The connector joint type is available M12. Its model ends with -M1. (Example: E3Z-T61-M1J)

Accessories (Order Separately)

Slits

| Slit width | Sensing distance (typical) | | Minimum sensing object (typical) | Model | Quantity |
|-------------|----------------------------|----------|----------------------------------|----------|--|
| | E3Z-T□□ | E3Z-T□□A | | | |
| 0.5 mm dia. | 50 mm | 35 mm | 0.2 mm dia. | E39-S65A | One set (contains slits for both the emitter and receiver) |
| 1-mm dia. | 200 mm | 150 mm | 0.4 mm dia. | E39-S65B | |
| 2-mm dia. | 800 mm | 550 mm | 0.7 mm dia. | E39-S65C | |
| 0.5 x 10 mm | 1 m | 700 mm | 0.2 mm dia. | E39-S65D | |
| 1 x 10 mm | 2.2 m | 1.5 m | 0.5 mm dia. | E39-S65E | |
| 2 x 10 mm | 5 m | 3.5 m | 0.8 mm dia. | E39-S65F | |

Sensor I/O Connectors

| Size | Cable type | Shape | Cable length | Model | | |
|----------------|----------------|----------------|--------------|-------------|-----------------|-----------------|
| M8 | Standard cable | Straight | 2 m | 4-wire type | XS3F-M421-402-A | |
| | | | 5 m | | XS3F-M421-405-A | |
| | | L-shaped | 2 m | 4-wire type | XS3F-M422-402-A | |
| | | | 5 m | | XS3F-M422-405-A | |
| M12 (for -M1J) | | Standard cable | Straight | 2 m | 3-wire type | XS2F-D421-DC0-A |
| | | | | 5 m | | XS2F-D421-GC0-A |
| | | | L-shaped | 2 m | 3-wire type | XS2F-D422-DC0-A |
| | | | | 5 m | | XS2F-D422-GC0-A |

Reflectors

Not provided with retroreflective models

| Name | Sensing distance (typical) * | Model | Quantity | Remarks |
|-----------------|------------------------------|---------|----------|--------------------------------|
| Reflectors | 3 m [100 mm] (Rated value) | E39-R1 | 1 | for E3Z-B□1/6 for E3Z-B□2/7 |
| | 4 m [100 mm] (Rated value) | E39-R1S | 1 | |
| | 500 mm [80 mm] | E39-R1S | 1 | |
| | 2 m [100 mm] | | | |
| | 5 m [100 mm] | E39-R2 | 1 | |
| | 2.5 m [100 mm] | E39-R9 | 1 | |
| 3.5 m [100 mm] | E39-R10 | 1 | | |
| Fog preventing | 500 mm [80 mm] | E39-R1K | 1 | for E3Z-B□1/6 |
| | 2 m [100 mm] | | | for E3Z-B□2/7 |
| Small reflector | 1.5 m [50 mm] | E39-R3 | 1 | |
| Tape Reflector | 700 mm [150 mm] | E39-RS1 | 1 | |
| | 1.1 m [150 mm] | E39-RS2 | 1 | |
| | 1.4 m [150 mm] | E39-RS3 | 1 | |

* Values in parentheses indicate the minimum required distance between the sensor and reflector.

Note: 1. When using the reflector of other than the rated value, set the sensing distance to about 0.7 times of the typical example as a guideline.
2. For details, refer to the "Reflector list".

Mutual interference prevention filter

| Sensing distance | Shape/dimensions | Model | Quantity | Remarks |
|------------------|------------------|---------|--|---|
| 3 m | | E39-E11 | 2 sets each for emitters and receivers (total of 4 pcs.) | Can be used with the through-beam E3Z-T□□A. The arrow represents the polarizing direction. Changing the polarizing direction of the two adjacent emitters and receivers prevents mutual interference. |

Mounting Brackets

| Shape | Model | Quantity | Remarks | Shape | Model | Quantity | Remarks |
|-------|----------|----------|--|-------|----------|----------|--|
| | E39-L153 | 1 | Mounting Brackets | | E39-L150 | One set | Sensor adjuster Easy mounting to aluminum frame/rail of conveyor or like, easy adjustment. For left-to-right adjustment |
| | E39-L104 | 1 | | | | | |
| | E39-L43 | 1 | Horizontal type mounting bracket | | E39-L151 | One set | |
| | E39-L142 | 1 | Horizontal type protective cover bracket | | E39-L93 | One set | Sensor adjuster Easy mounting to aluminum frame/rail of conveyor or like, easy adjustment. For vertical angle adjustment |
| | E39-L44 | 1 | Rear mounting bracket | | | | |
| | E39-L98 | 1 | Protective cover bracket | | E39-L144 | 1 | Vertical protective cover bracket |

Note: 1. If a through-beam model is used, order two Mounting Brackets for the emitter and receiver respectively.
2. For details, refer to the "Mounting bracket list".

Rating/performance

| Sensor type | | Through-beam | | Retroreflective model (with M.S.R. function) | Diffuse-reflective | | |
|-----------------------------|-------|--|-------------------------------------|--|-----------------------------------|--------------------------------|-------------|
| | | | | | wide-beam | | |
| Item | Model | NPN output | E3Z-T61/T66 | E3Z-T61A/T66A | E3Z-R61/R66 | E3Z-D61/D66 | E3Z-D62/D67 |
| | | PNP output | E3Z-T81/T86 | E3Z-T81A/T86A | E3Z-R81/R86 | E3Z-D81/D86 | E3Z-D82/D87 |
| Sensing distance | | 15 m | 10 m | 4 m (100 mm) * (When using the E39-R1S) 3 m (100 mm) * (When using the E39-R1) | 100 mm (White paper 100 x 100 mm) | 1 m (White paper 300 x 300 mm) | |
| Setting range | | --- | | | | | |
| Reflectivity characteristic | | --- | | | | | |
| Spot Diameter | | --- | | | | | |
| Standard sensing object | | Opaque: 12-mm dia. min. | | Opaque: 75-mm dia. min. | --- | | |
| Min. sensing object | | --- | | | | | |
| Differential distance | | --- | | | | 20% max. of sensing distance | |
| Directional angle | | Both emitter and receiver: 3° to 15° | Both emitter and receiver: 3° to 5° | 2° to 10° | | --- | |
| Light source (wave length) | | Infrared LED (860 nm) | Red LED (700 nm) | Red LED (680 nm) | Infrared LED (860 nm) | | |
| Power supply voltage | | 12 to 24 VDC ±10%, ripple (p-p) : 10% max. | | | | | |
| Current consumption | | emitter: 15 mA receiver: 20 mA | | 30 mA max. | | | |
| Control output | | Load power supply voltage 26.4 VDC max., load current 100 mA max. (residual voltage 1 V max.) Open collector output type (depends on the NPN/PNP output format) Light-ON/Dark-ON switch selectable | | | | | |
| BGS / FGS selection | | --- | | | | | |
| Protective circuits | | Protection from load short-circuit and reversed power supply connection | | Reverse polarity protection, output short-circuit protection, mutual interference prevention | | | |
| Response time | | Operation or reset: 1 ms max. | | | | | |
| Sensitivity adjustment | | Single-turn adjustment | | | | | |
| Ambient illuminance | | Incandescent lamp: 3,000 lux max. Sunlight 10,000 lux max. | | | | | |
| Ambient temperature | | Operating: -25°C to 55°C, Storage: -40°C to 70°C (with no icing or condensation) | | | | | |
| Ambient humidity | | Operating: 35% to 85% RH, Storage: 35% to 95% RH (with no icing or condensation) | | | | | |
| Insulation resistance | | 20 MΩ min. at 500 VDC | | | | | |
| Dielectric strength | | 1,000 VAC at 50/60 Hz for 1 minute | | | | | |

* Values in parentheses indicate the minimum required distance between the sensor and reflector.

Rating/performance

| Diffuse-reflective narrow-beam | Distance-settable | Retro-reflective for PET bottles (without MSR function) | | Grooved-type | |
|---|---|--|---|---|------------|
| | | | wide-beam | | |
| E3Z-L61/66 | E3Z-LS61/66 | E3Z-B61/66 | E3Z-B62/67 | E3Z-G61 | E3Z-G62 |
| E3Z-L81/86 | E3Z-LS81/86 | E3Z-B81/86 | E3Z-B82/87 | E3Z-G81 | E3Z-G82 |
| 90 ± 30 mm (White paper 100 x 100 mm) | BGS: White or black paper (100 x 100 mm): 20 mm to set distance FGS: White paper (100 x 100 mm): Set distance to 200 mm min. Black paper (100 x 100 mm): Set distance to 160 mm min. | 500 mm (80 mm) * (When using the E39-R1S) | 2 m (100 mm) * (When using the E39-R1S) | 25 mm 1 optical axis 2 optical axis | |
| --- | White paper (100 x 100 mm): 40 to 200 mm Black paper (100 x 100 mm): 40 to 160 mm | --- | | | |
| Refer to the diagram „Hysteresis Difference vs. Sensing Distance“ | Black/white-error: 10% of set distance max. | --- | | | |
| 2.5 mm dia. (when sensing distance is 90 mm) | --- | | | | |
| --- | Transparent round PET bottle 500 ml (65 mm dia.) | | --- | | |
| 0.1 mm dia. (copper wire) | | | | | |
| --- | | | | | |
| --- | | | | | |
| Red LED (660 nm) | Red LED (680 nm) | Red LED (680 nm) | | Infrared LED (860 nm) | |
| 12 to 24 VDC ±10%, ripple (p-p) : 10% max. | | | | | |
| 30 mA max | | | | 25 mA max. | 40 mA max. |
| Load power supply voltage 26.4 VDC max., load current 100 mA max. (residual voltage 1 V max.) Open collector output type (depends on the NPN/PNP output format) Light-ON/Dark-ON switch selectable | | | | | |
| --- | BGS: Open or connected to GND FGS: Connected to Vcc | | --- | | |
| Reverse polarity protection, output short-circuit protection, mutual interference prevention | | | | | |
| Operation or reset: 1 ms max. | | | | | |
| Single-turn adjustment | five-turn endless adjuster | | Single-turn adjustment | | --- |
| Incandescent lamp: 3,000 lux max. Sunlight 10,000 lux max. | | | | | |
| Operating: -25°C to 55°C, Storage: -40°C to 70°C (with no icing or condensation) | | | | | |
| Operating: 35% to 85% RH, Storage: 35% to 95% RH (with no icing or condensation) | | | | | |
| 20 MΩ min. at 500 VDC | | | | | |
| 1,000 VAC at 50/60 Hz for 1 minute | | | | | |

Rating/performance

| Sensor type | | Through-beam | | Retroreflective model (with M.S.R. function) | Diffuse-reflective | | |
|-----------------------|-----------------------------------|---|-------------|--|--------------------|-------------|-------------|
| | | | | | wide-beam | | |
| Item | Model | NPN output | E3Z-T61/T66 | E3Z-T61A/T66A | E3Z-R61/R66 | E3Z-D61/D66 | E3Z-D62/D67 |
| | | PNP output | E3Z-T81/T86 | E3Z-T81A/T86A | E3Z-R81/R86 | E3Z-D81/D86 | E3Z-D82/D87 |
| Vibration resistance | | 10 to 55 Hz, 1.5-mm or 300m/s ² double amplitude for 2 hours each in X, Y, and Z directions | | | | | |
| Shock resistance | | Destruction: 500 m/s ² for 3 times each in X, Y, and Z directions | | | | | |
| Protective structure | | IEC 60529 IP67 | | | | | |
| Connection method | | Pre-wired (standard length: 2 m/500 mm)/M8 connector | | | | | |
| Indicator lamp | | Operation indicator (orange), stability indicator (green) [Note that the emitter has the power indicator (orange) only] | | | | | |
| Weight (Packed state) | Pre-wired models (with 2-m cable) | Approx. 120 g | | | 65 g | | |
| | Connector type | 30 g | | | Approx. 20 g | | |
| Material | Case | PBT (polybutylene terephthalate) | | | | | |
| | Lens | Methacrylate resin | | | | | |
| Accessories | | Instruction manual (The Reflector or Mounting Bracket is not provided with any of the above models.) | | | | | |

Rating/performance

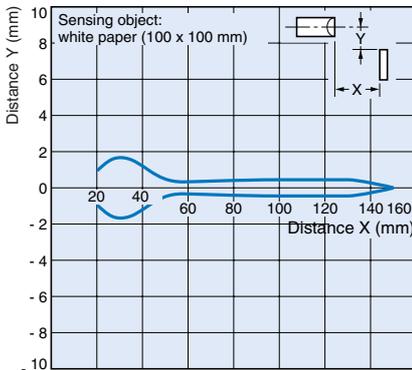
| Diffuse-reflective narrow-beam | Distance-settable | Retro-reflective for PET bottles (without MSR function) | | Grooved-type | |
|--|--------------------------|--|--------------------|--|---------|
| | | | wide-beam | | |
| E3Z-L61/66 | E3Z-LS61/66 | E3Z-B61/66 | E3Z-B62/67 | E3Z-G61 | E3Z-G62 |
| E3Z-L81/86 | E3Z-LS81/86 | E3Z-B81/86 | E3Z-B82/87 | E3Z-G81 | E3Z-G82 |
| 10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions | | | | | |
| Destruction: 500 m/s ² for 3 times each in X, Y, and Z directions | | | | | |
| IEC 60529 IP67 | | | | IEC 60529 IP64 | |
| Pre-wired (standard length: 2 m/500 mm)/M8 connector | | | | Pull-out cable type (standard cable length: 2 m/500 mm) / connector relay type (standard cable length: 300 mm) | |
| Operation indicator (orange), stability indicator (green) | | | | Operation indicator (orange) | |
| Approx. 65 g | | 65 g | | | |
| Approx. 20 g | | | | 30 g | |
| PBT (polybutylene terephthalate) | | | | ABS | |
| Methacrylate resin | Denaturated polyallylate | | Methacrylate resin | | |
| Instruction manual (The Reflector or Mounting Bracket is not provided with any of the above models.) | | | | | |

Characteristic data (typical)

Operating Range

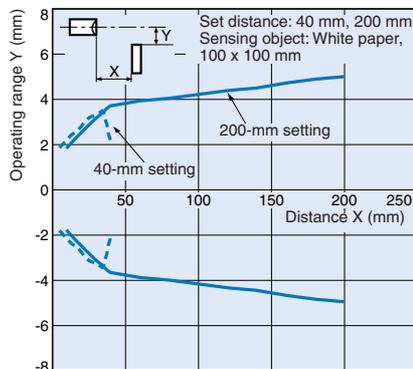
Narrow-beam

E3Z-L



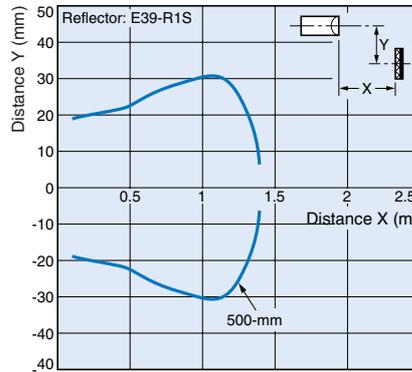
Distance-setting

E3Z-LS [BGS]

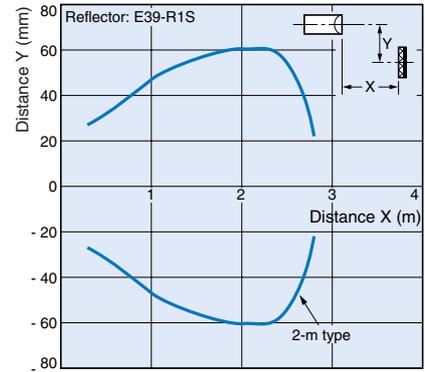


Retroreflective Models for transparent objects

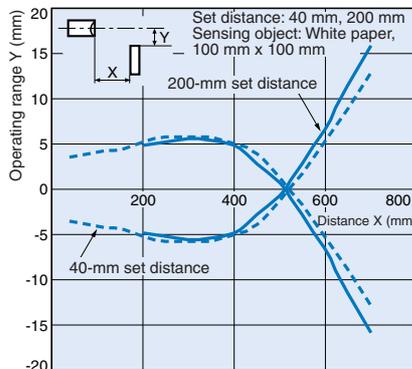
E3Z-B□1/B□6 + E39-R1S (optional reflector)



E3Z-B□2/B□7 + E39-R1S (optional reflector)



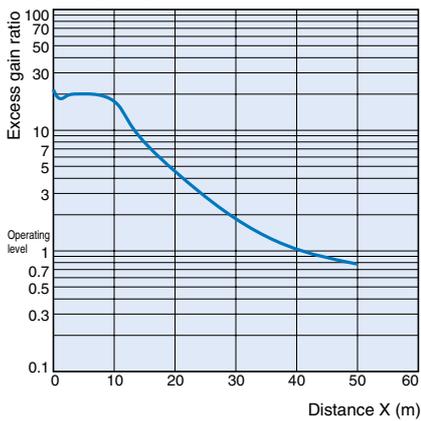
E3Z-LS [FGS]



Excess Gain vs. Distance

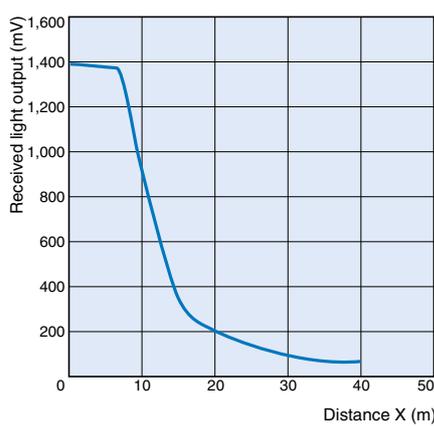
Through-beam

E3Z-T□1(T□6)



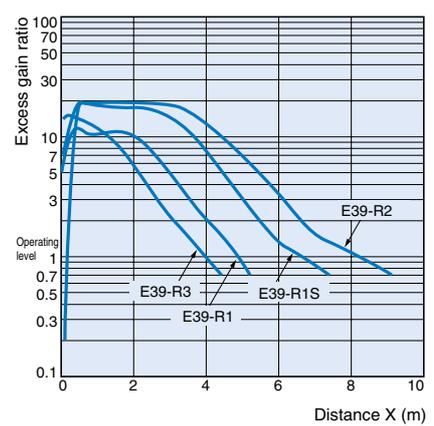
Through-beam

E3Z-T□A

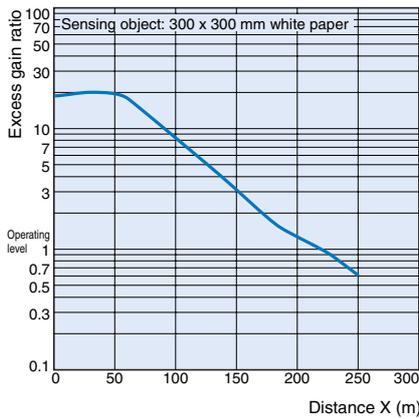


Retroreflective Models

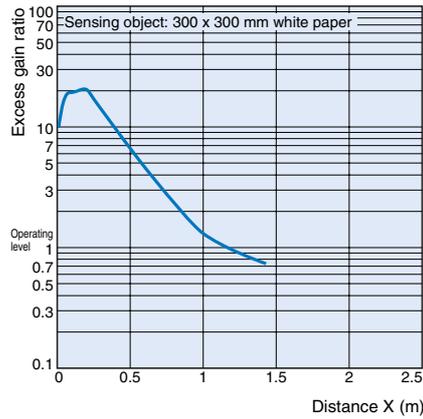
E3Z-R□1(R□6) + Reflectors



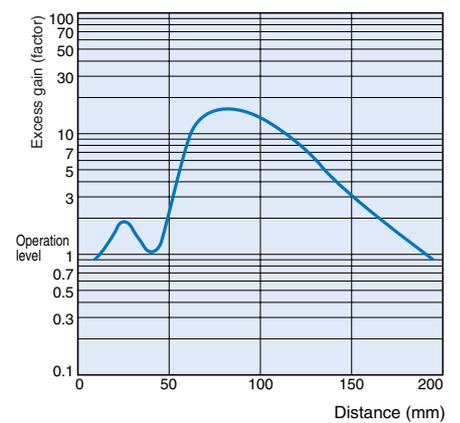
Diffuse-reflective
E3Z-D□1(D□6)



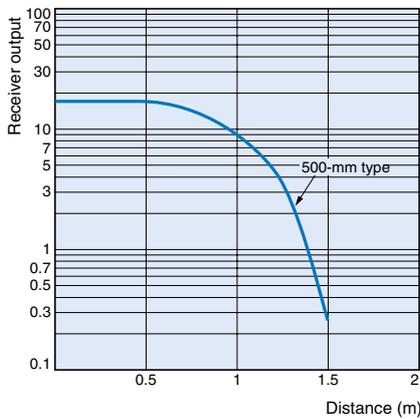
Diffuse-reflective
E3Z-D□2(D□7)



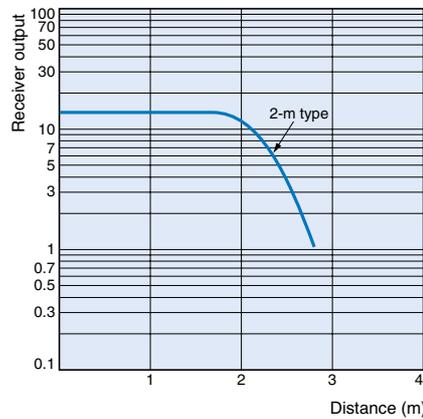
Narrow-beam
E3Z-L



Retro-reflective for transparent objects
E3Z-B□1/B□6 + E39-R1S
(optional reflector)

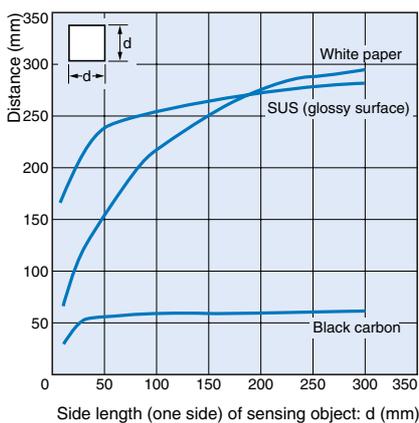


Retro-reflective for transparent objects
E3Z-B□2/B□7 + E39-R1S
(optional reflector)

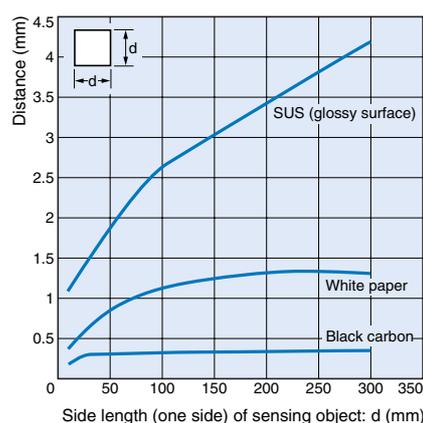


Distance vs. Size

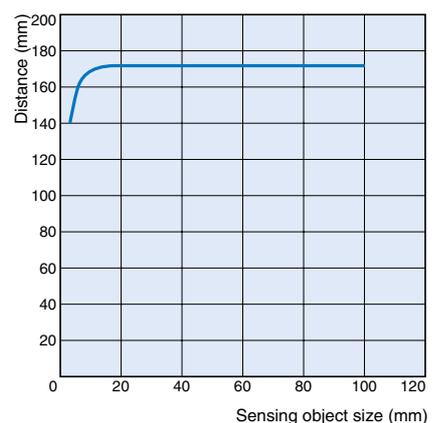
Diffuse-reflective
E3Z-D□1(D□6)



Diffuse-reflective
E3Z-D□2(D□7)



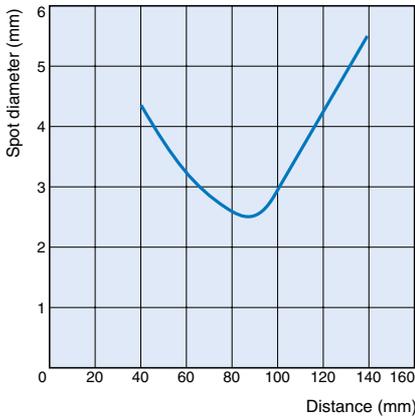
Narrow-beam
E3Z-L



Spot diameter vs. Distance

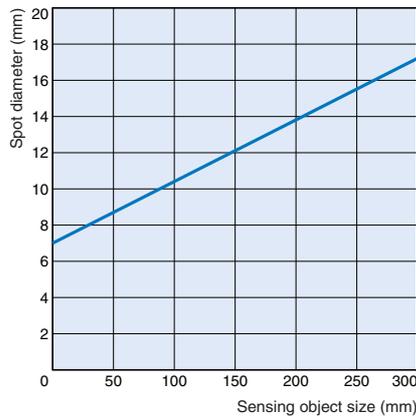
Narrow-beam

E3Z-L



Distance setting

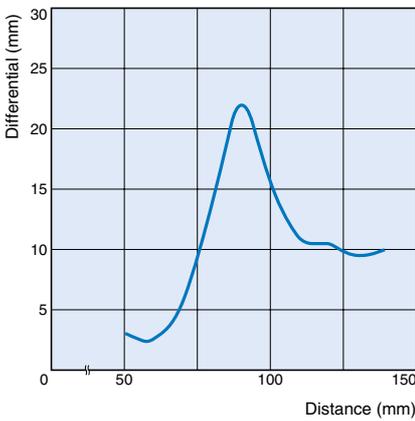
E3Z-LS



Differential travel / Hysteresis vs. Distance

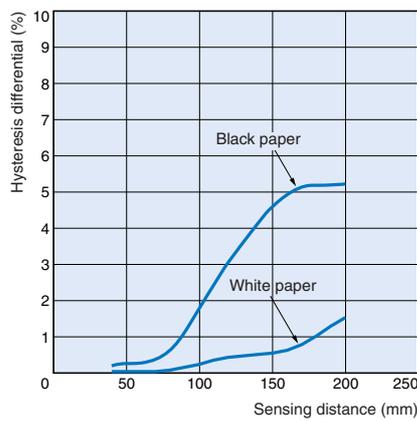
Narrow-beam

E3Z-L



Distance setting

E3Z-LS

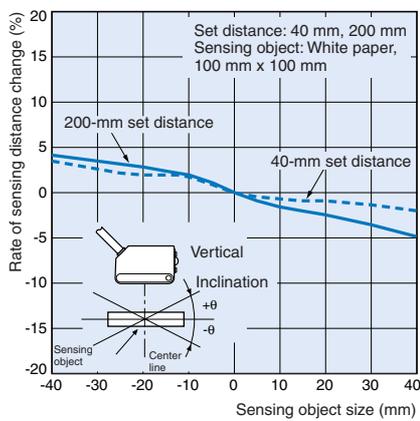


Inclination Characteristics

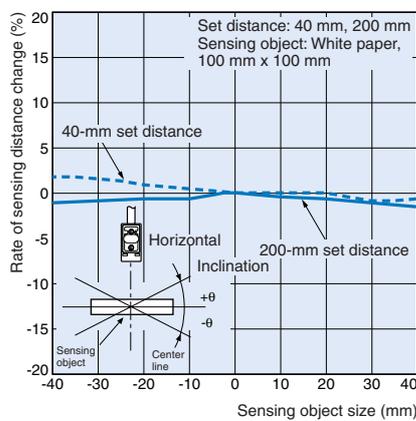
Distance setting

E3Z-LS

Vertical



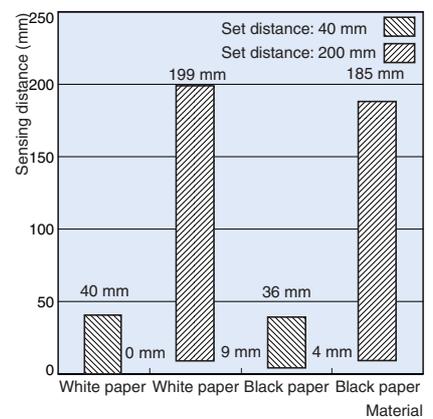
Horizontal



Short-distance Characteristics

Distance setting

E3Z-LS

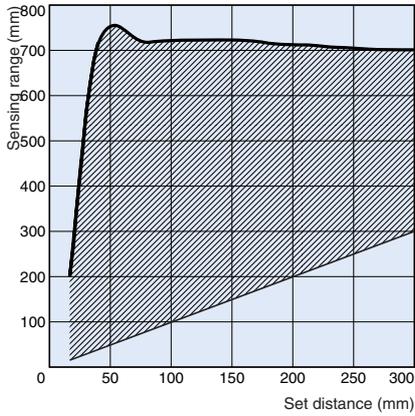


FGS Mode Set Distance vs. Sensing Range

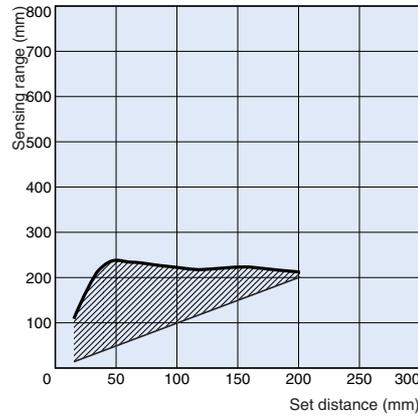
Distance setting

E3Z-LS

White Paper



Black Paper

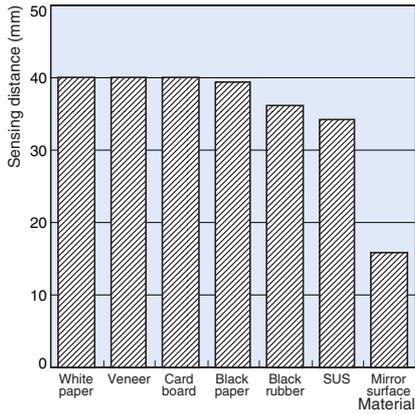


Sensing Distance vs. Material

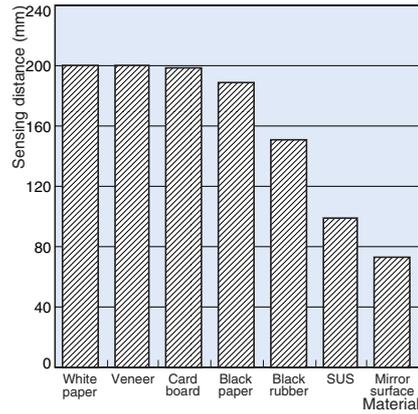
Distance setting

E3Z-LS

At Set Distance of 40 mm



At Set Distance of 200 mm



Output Circuit Diagram

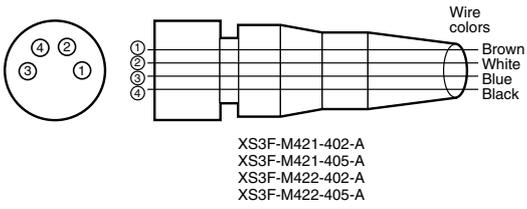
NPN output

| Model | Output transistor Status | Timing chart | Mode selection switch | Output circuit |
|---|--------------------------|--|-----------------------|---|
| E3Z-T61 E3Z-T66 E3Z-T61A E3Z-T66A E3Z-R61 E3Z-R66 E3Z-D61 E3Z-D66 E3Z-D62 E3Z-D67 E3Z-L61 E3Z-L66 E3Z-B61 E3Z-B62 E3Z-B66 E3Z-B67 E3Z-G61 | Light ON | Incident Interrupted Operation indicator (orange) ON OFF Output transistor ON OFF Load (Relay) Operate Reset (Between brown and black) | L•ON (LIGHT ON) | Through-beam receiver Retroreflective model Diffuse-reflective model <p>Connector Pin Arrangement</p> <p>Note: Terminal 2 is not used.</p> |
| | Dark ON | Incident Interrupted Operation indicator (orange) ON OFF Output transistor ON OFF Load (Relay) Operate Reset (Between brown and black) | D•ON (DARK ON) | Through-beam emitter <p>Connector Pin Arrangement</p> <p>Note: Terminal 2 and 4 are not used.</p> |
| E3Z-LS61 E3Z-LS66 | Light ON | Operation indicator (orange) ON OFF Output transistor ON OFF Load (e.g. ON relay) ON OFF (Between brown and black) | L•ON (LIGHT ON) | <p>Connector Pin Arrangement</p> <p>BGS: Either leave the pink wire (2) open or connect it to the blue wire (3). FGS: Connect the pink wire (2) to the brown wire (1).</p> |
| | Dark ON | Operation indicator (orange) ON OFF Output transistor ON OFF Load (e.g. ON relay) ON OFF (Between brown and black) | D•ON (DARK ON) | |
| | Light ON | Operation indicator (orange) ON OFF Output transistor ON OFF Load (e.g. ON relay) ON OFF (Between brown and black) | L•ON (LIGHT ON) | |
| | Dark ON | Operation indicator (orange) ON OFF Output transistor ON OFF Load (e.g. ON relay) ON OFF (Between brown and black) | D•ON (DARK ON) | |
| E3Z-G62 | Light ON | Incident Interrupted Operation indicator (orange) ON OFF Control output ON OFF Output transistor ON OFF Load (Relay) Operate Reset (Between brown and black (white)) | L•ON (LIGHT ON) | <p>Connector Pin arrangement</p> |
| | Dark ON | Incident Interrupted Operation indicator (orange) ON OFF Control output ON OFF Output transistor ON OFF Load (Relay) Operate Reset (Between brown and black (white)) | D•ON (DARK ON) | |

PNP output

| Model | Output transistor Status | Timing chart | Mode selection switch | Output circuit |
|---|--------------------------|--------------|-----------------------|---|
| E3Z-T81 E3Z-T86 E3Z-T81A E3Z-T86A E3Z-R81 E3Z-R86 E3Z-D81 E3Z-D86 E3Z-D82 E3Z-D87 E3Z-L81 E3Z-L86 E3Z-B81 E3Z-B82 E3Z-B86 E3Z-B87 E3Z-G81 | Light ON | | L•ON (LIGHT ON) | |
| | Dark ON | | D•ON (DARK ON) | <p>Connector Pin Arrangement</p> <p>Note: Terminal 2 is not used.</p> |
| E3Z-L81 E3Z-L86 E3Z-B81 E3Z-B82 E3Z-B86 E3Z-B87 E3Z-G81 | Light ON | | L•ON (LIGHT ON) | |
| | Dark ON | | D•ON (DARK ON) | <p>Connector Pin Arrangement</p> <p>Note: Terminal 2 and 4 are not used.</p> |
| E3Z-LS81 E3Z-LS86 | Light ON | | L•ON (LIGHT ON) | <p>Connector Pin Arrangement</p> <p>BGS: Either leave the pink wire (2) open or connect it to the blue wire (3). FGS: Connect the pink wire (2) to the brown wire (1).</p> |
| | Dark ON | | D•ON (DARK ON) | |
| | Light ON | | L•ON (LIGHT ON) | |
| | Dark ON | | D•ON (DARK ON) | |
| E3Z-G82 | Light ON | | L•ON (LIGHT ON) | <p>Connector Pin arrangement</p> |
| | Dark ON | | D•ON (DARK ON) | |

Connectors (Sensor I/O connectors)



| Class | Wire, outer jacket color | Connector pin No. | Application | | |
|--------|--------------------------|-------------------|--------------------|---------------------|---------------|
| | | | Standard | E3Z-LS | E3Z-G62/82 |
| For DC | Brown | ① | Power supply (+V) | | |
| | White | ② | --- | BGS / FGS selection | Output 2 (S2) |
| | Blue | ③ | Power supply (0 V) | | |
| | Black | ④ | Output | Output 1 (S1) | |

Nomenclature:

Through-beam

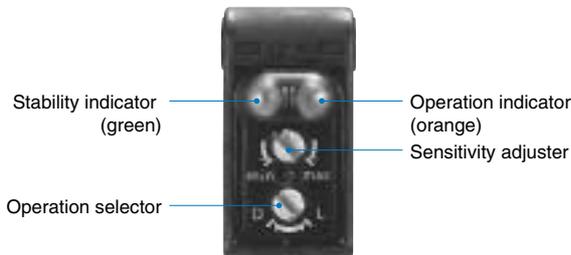
E3Z-T□□ Receiver
E3Z-T□□A Receiver

Retroreflective Models

E3Z-R□□
E3Z-B□□

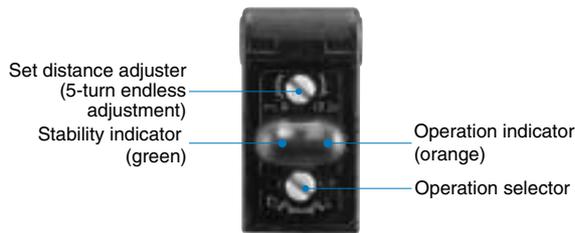
Diffuse-reflective

E3Z-D□□
E3Z-L□□



Distance-setting

E3Z-LS□□



Operation

Slit for through-beam model (Optional accessory: E39-S65A/B/C/D/E/F)

Mounting method

- Hook the upper protruding portions of the Slit to the upper indented mounting portion of the Sensor and adjust the position of the Slit so that the Slit will be parallel to the lens surface.
- Press the lower protruding portion of the Slit onto the indented mounting portion of the Sensor until the Slit snaps in.

Mounting condition

Side view Front view

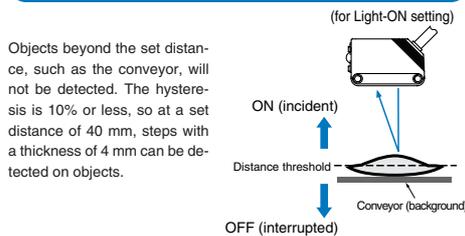
Demounting method

- Press the upper portion of the Slit.
- Disconnect the lower protruding portion of the Slit from the Sensor and remove the Slit.

BGS / FGS Application for distance setting E3Z-LS

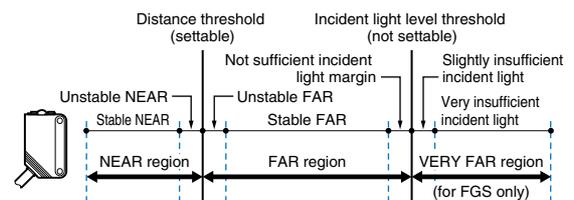
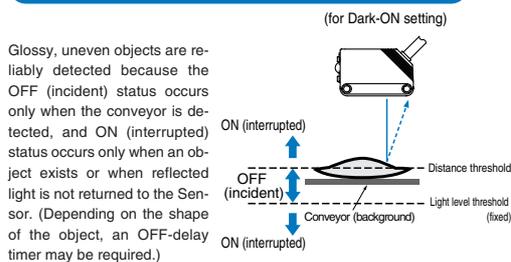
Simple Detection of Glossy, Uneven Objects

BGS (Background Suppression)



Selectable by Changing Cable Connection

FGS (Foreground Suppression)



| | | ON | OFF |
|------------|--------------------|----|-----|
| L/ON | Stability (green) | ON | OFF |
| | Operation (orange) | ON | OFF |
| D/ON | Stability (green) | ON | OFF |
| | Operation (orange) | ON | OFF |
| FGS | | | |
| L/ON | Stability (green) | ON | OFF |
| | Operation (orange) | ON | OFF |
| D/ON | Stability (green) | ON | OFF |
| | Operation (orange) | ON | OFF |

Precautions

Caution

Do not connect an AC power supply to the Sensor. If AC power (100 VAC or more) is supplied to the Sensor, it may explode or burn.

Be sure to abide by the following precautions for the safe operation of the Sensor.

Wiring

Power Supply Voltage and Output Load Power Supply Voltage

Make sure that the power supply to the Sensor is within the rated voltage range. If a voltage exceeding the rated voltage range is supplied to the Sensor, it may explode or burn.

Load Short-circuiting

Do not short-circuit the load, otherwise the Sensor may be damaged.

Connection without Load

Do not connect the power supply to the Sensor with no load connected, otherwise the internal elements may explode or burn.

Operating Environment

Do not use the Sensor in locations with explosive or flammable gas.

Correct Use

Design

Power Reset Time

The Sensor is ready to operate 100 ms after the Sensor is turned ON. If the load and Sensor are connected to independent power supplies respectively, be sure to turn ON the Sensor before supplying power to the load.

Wiring

Avoiding Malfunctions

If using the Photoelectric Sensor with an inverter or servomotor, always ground the FG (frame ground) and G (ground) terminals, otherwise the Sensor may malfunction.

Mounting

Mounting the Sensor

- If Sensors are mounted face-to-face, make sure that the optical axes are not in opposition to each other. Otherwise, mutual interference may result.
- Always install the Sensor carefully so that the aperture angle range of the Sensor will not cause it to be directly exposed to intensive light, such as sunlight, fluorescent light, or incandescent light.

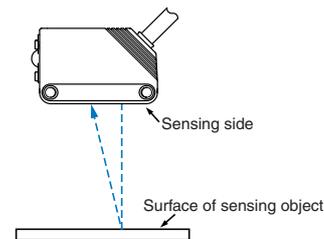
- Do not strike the Photoelectric Sensor with a hammer or any other tool during the installation of the Sensor, or the Sensor will lose its water-resistive properties.
- Use M3 screws to mount the Sensor.
- When mounting the case, make sure that the tightening torque applied to each screw does not exceed 0.54 Nm.

M8 Connector

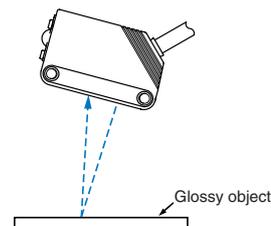
- Always turn OFF the power supply to the Sensor before connecting or disconnecting the metal connector.
- Hold the connector cover to connect or disconnect it.
- Secure the connector cover by hand. Do not use pliers, otherwise the connector may be damaged.
- If the connector is not connected securely, it may be disconnected by vibration or the proper degree of protection of the Sensor may not be maintained.

Distance setting models E3Z-LS

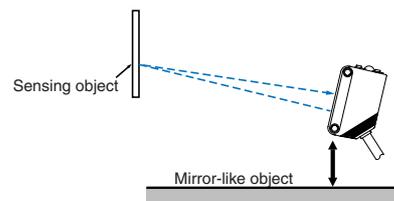
- Make sure that the sensing side of the Sensor is parallel with the surface of the sensing objects. Normally, do not incline the Sensor towards the sensing object.



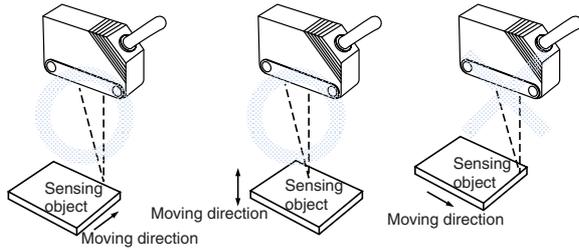
If the sensing object has a glossy surface, however, incline the Sensor by 5° to 10° as shown in the illustration, provided that the Sensor is not influenced by background objects.



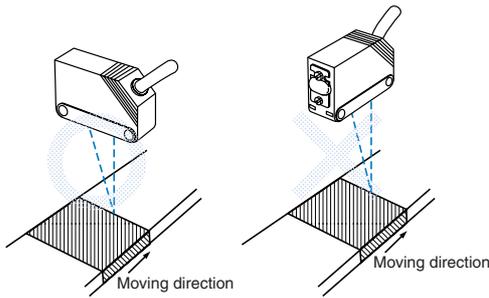
- If there is a mirror-like object below the Sensor, the Sensor may not operate stably. Therefore, incline the Sensor or separate the Sensor from the mirror-like object as shown below.



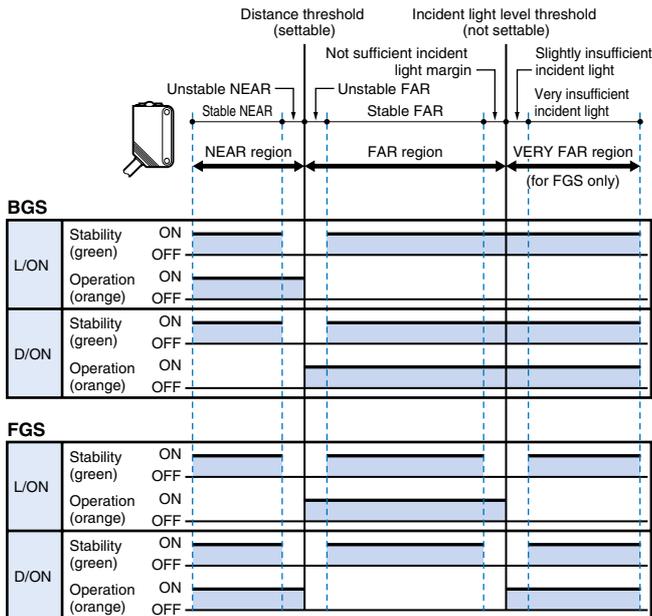
- Do not install the Sensor in the wrong direction. Refer to the following illustration.



Install the Sensor as shown in the following illustration if each sensing object greatly differs in color or material.



Adjustments-indicator operation



- Note: 1. If the stability indicator is lit, the detection/no detection status is stable within the rated ambient operating temperature (-25 to 55°C).
2. The VERY FAR region is supported only for FGS. The incident light threshold is fixed and cannot be set. The distance to the incident light threshold depends on the color and gloss of the sensing object's surface.

Retro-reflective for transparent objects E3Z-B

Design

Bottles

The Sensor may be unable to achieve stable detection depending on the shape of bottles. Be sure to verify stable detection before using the Sensor.

Mounting

Sensor Mounting

If the Sensor fails to provide stable detection due to the shape of bottles, adjust the location and inclination of the Sensor.

Inspection and Maintenance

Cleaning

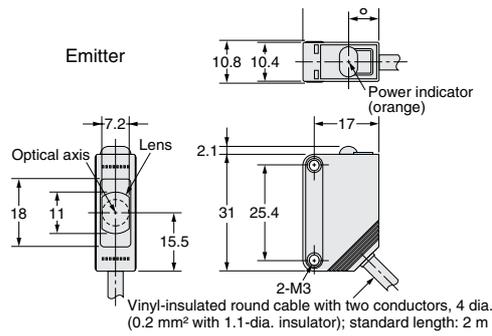
Never use paint thinners or other organic solvents to clean the surface of the product.

Dimensions (Unit: mm)

Sensors

Through-beam

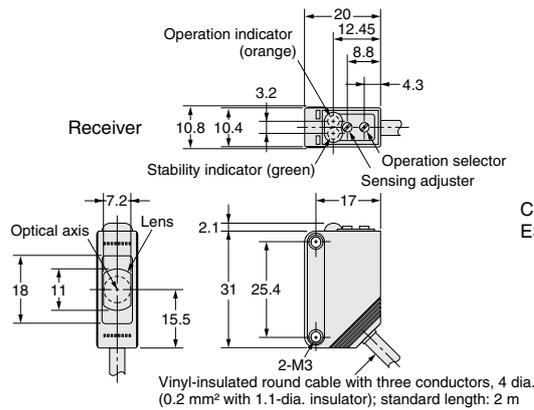
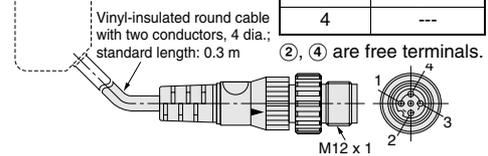
Pre-wired
E3Z-T61
E3Z-T81
E3Z-T61A



| Model | CAD file |
|------------------------|----------|
| E3Z-T61-L E3Z-T81-L | E3Z_01 |

| Terminal No. | Specifications |
|--------------|----------------|
| 1 | +V |
| 2 | --- |
| 3 | 0V |
| 4 | --- |

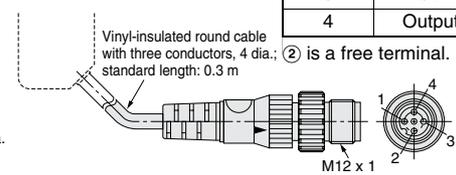
Connector relay models
E3Z-T61-M1J



| Model | CAD file |
|------------------------|----------|
| E3Z-T61-L E3Z-T81-L | E3Z_02 |

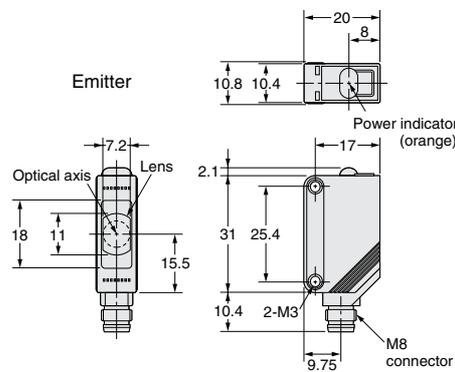
| Terminal No. | Specifications |
|--------------|----------------|
| 1 | +V |
| 2 | --- |
| 3 | 0V |
| 4 | Output |

Connector relay models
E3Z-T61-M1J

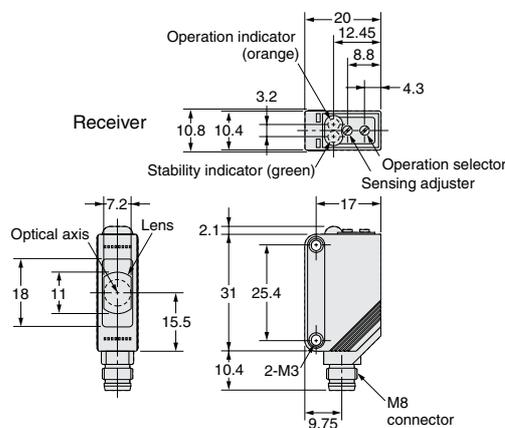


Through-beam

Connector type
E3Z-T66
E3Z-T86
E3Z-T66A



| Model | CAD file |
|------------------------|----------|
| E3Z-T66-L E3Z-T86-L | E3Z_04 |



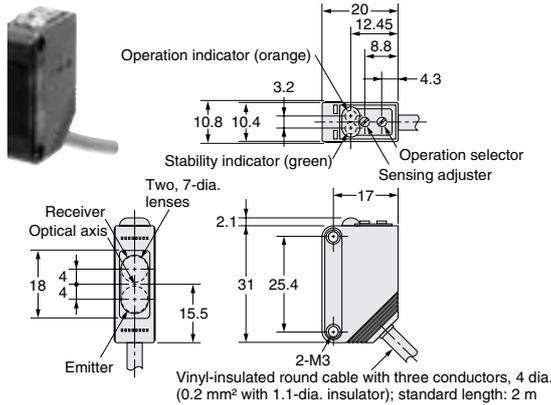
| Model | CAD file |
|------------------------|----------|
| E3Z-T66-D E3Z-T86-D | E3Z_05 |

Retroreflective Models

Pre-wired

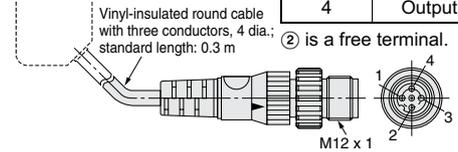
- E3Z-B61
- E3Z-B62
- E3Z-B81
- E3Z-B82
- E3Z-R61
- E3Z-R81

CAD file E3Z_03



| Terminal No. | Specifications |
|--------------|----------------|
| 1 | +V |
| 2 | --- |
| 3 | 0V |
| 4 | Output |

Connector relay models (E3Z-□□-M1J)



Diffuse-reflective

Pre-wired

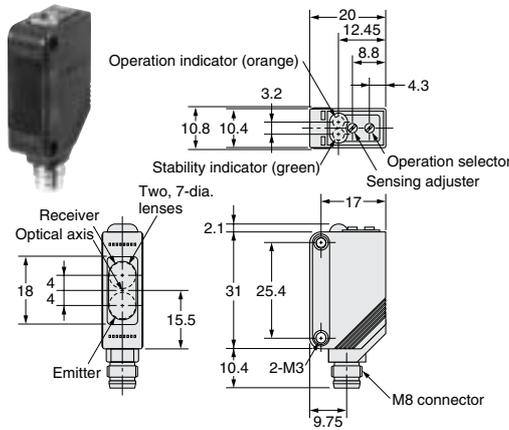
- E3Z-D61
- E3Z-D81
- E3Z-D62
- E3Z-D82
- E3Z-L61
- E3Z-L81

Retroreflective Models

Connector type

- E3Z-B66
- E3Z-B67
- E3Z-B86
- E3Z-B87
- E3Z-R66
- E3Z-R86

CAD file E3Z_06



Diffuse-reflective

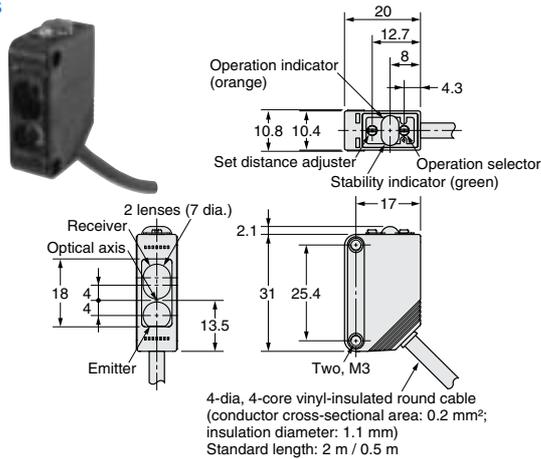
Connector type

- E3Z-D66
- E3Z-D86
- E3Z-D67
- E3Z-D87
- E3Z-L66
- E3Z-L86

Distance-settable Models

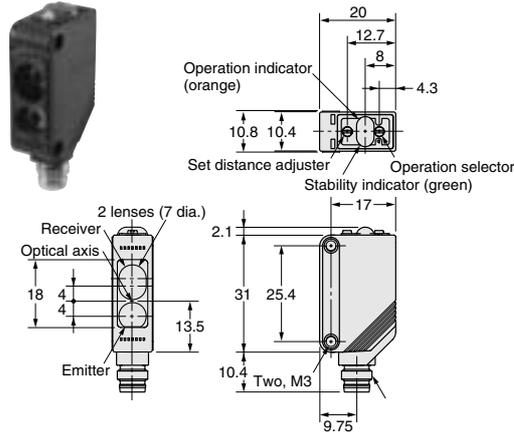
Pre-wired models

- E3Z-LS61
- E3Z-LS81



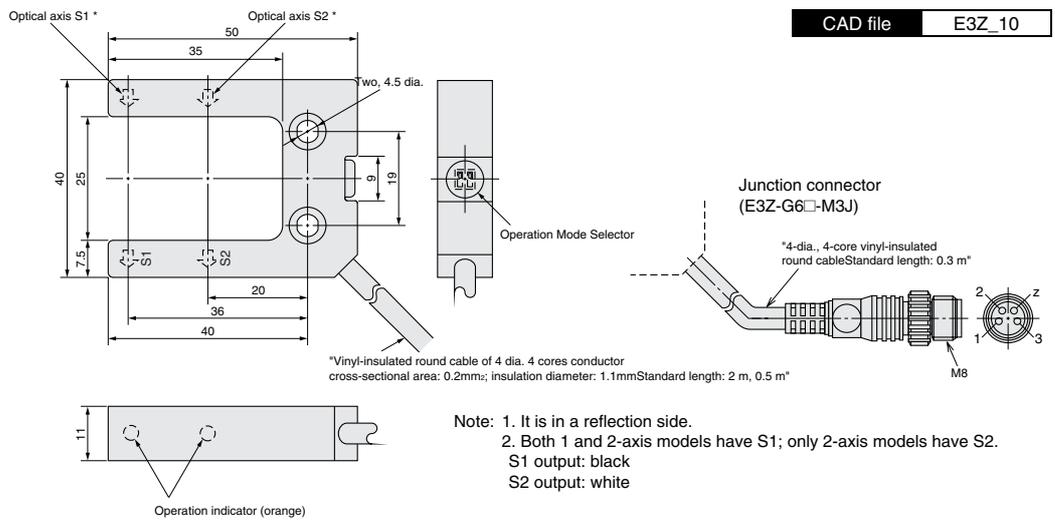
Distance-settable Models

Connector type
E3Z-LS66
E3Z-LS86



Grooved-type Models

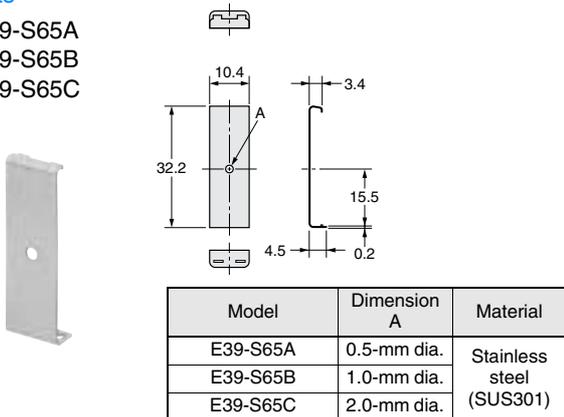
E3Z-G



Accessories (Order Separately)

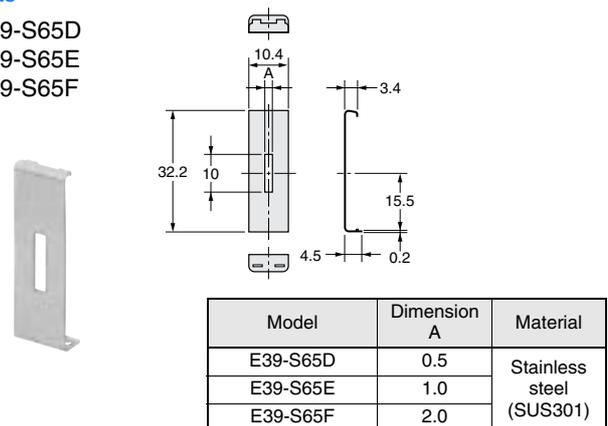
Slits

E39-S65A
E39-S65B
E39-S65C



Slits

E39-S65D
E39-S65E
E39-S65F



Cat. No. E701-E2-01

In the interest of product improvement, specifications are subject to change without notice.

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