Long-distance Photoelectric Sensor

E3G

Advanced Design with Automatic Teach Function

- Retroreflective models have a sensing distance of 10 m
- Teach function up to 2 m diffuse
- Zone mode for precise sensing
- M12 connector and pre-leaded models
- IEC IP67
- Light-ON/Dark-ON operation, NPN/PNP output are switch selectable
- Relay or transistor output models

Ordering Information

**SENSORS**

<table>
<thead>
<tr>
<th>Type</th>
<th>Supply voltage</th>
<th>Output</th>
<th>Connection</th>
<th>Sensing range</th>
<th>Standard target</th>
<th>Timer function</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polarized retroreflective</td>
<td>10-30 VDC</td>
<td>NPN/PNP</td>
<td>Pre-leaded</td>
<td>500 mm to 10 m with E39-R2 reflector</td>
<td>80 mm dia.</td>
<td>—</td>
<td>E3G-R13</td>
</tr>
<tr>
<td></td>
<td>12-240 VDC, 24-240 VAC</td>
<td>Relay</td>
<td>Terminal block</td>
<td>(included)</td>
<td></td>
<td>ON or OFF delay 0-5s, adjustable</td>
<td>E3G-R17</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Connector</td>
<td></td>
<td></td>
<td></td>
<td>E3G-MR19-USB</td>
</tr>
<tr>
<td>Diffuse reflective</td>
<td>10-30 VDC</td>
<td>NPN/PNP</td>
<td>Pre-leaded</td>
<td>200 mm to 2 m</td>
<td>300 x 300 mm Kodak 90% white card</td>
<td>—</td>
<td>E3G-L73</td>
</tr>
<tr>
<td></td>
<td>12-240 VDC, 24-240 VAC</td>
<td>Relay</td>
<td>Terminal block</td>
<td></td>
<td></td>
<td>ON or OFF delay 0-5s, adjustable</td>
<td>E3G-L77</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Connector</td>
<td></td>
<td></td>
<td></td>
<td>E3G-ML79-9S-US</td>
</tr>
</tbody>
</table>

**CONNECTOR CORDSETS**

Connector Cables

<table>
<thead>
<tr>
<th>Shape</th>
<th>Length</th>
<th>Conductors</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Straight</td>
<td>2 m</td>
<td>Three</td>
<td>XS2F-D421-DC0-A</td>
</tr>
<tr>
<td></td>
<td>5 m</td>
<td></td>
<td>XS2F-D421-GC0-A</td>
</tr>
<tr>
<td>Right angle</td>
<td>2 m</td>
<td></td>
<td>XS2F-D422-DC0-A</td>
</tr>
<tr>
<td></td>
<td>5 m</td>
<td></td>
<td>XS2F-D422-GC0-A</td>
</tr>
</tbody>
</table>
## ACCESSORIES (ORDER SEPARATELY)

### Reflectors

<table>
<thead>
<tr>
<th>Shape</th>
<th>Sensing distance (typical)</th>
<th>Remarks</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Image" /></td>
<td>500 mm to 10 m</td>
<td>Included with E3G-R and E3G-M</td>
<td>E39-R2</td>
</tr>
<tr>
<td><img src="image" alt="Image" /></td>
<td>100 mm to 6 m</td>
<td></td>
<td>E39-R1</td>
</tr>
</tbody>
</table>

### Terminal Protection Cover for Side-pullout Cable (required when side-exit is desired for cable)

<table>
<thead>
<tr>
<th>Shape</th>
<th>Applicable model</th>
<th>Remarks</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Image" /></td>
<td>E3G-MR19 (T), ML79 (T)</td>
<td>Provided with rubber bushing and cap for pullout prevention in vertical direction</td>
<td>E39-L129</td>
</tr>
</tbody>
</table>

### Mounting Brackets (not included, order separately)

<table>
<thead>
<tr>
<th>Shape</th>
<th>Applicable model</th>
<th>Remarks</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Image" /></td>
<td>E3G-R1, E3G-L7</td>
<td>---</td>
<td>E39-L131</td>
</tr>
<tr>
<td><img src="image" alt="Image" /></td>
<td></td>
<td>Rear-mounting use</td>
<td>E39-L132</td>
</tr>
<tr>
<td><img src="image" alt="Image" /></td>
<td>Terminal block models</td>
<td></td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Image" /></td>
<td>E3G-MR19 (T), E3G-ML79 (T)</td>
<td>Cable pulled out in the downward direction</td>
<td>E39-L135</td>
</tr>
<tr>
<td><img src="image" alt="Image" /></td>
<td>E3G-MR19 (T), E3G-ML79 (T)</td>
<td>---</td>
<td>E39-L136</td>
</tr>
</tbody>
</table>
### Specifications

<table>
<thead>
<tr>
<th>Sensing method</th>
<th>Retroreflective (polarized)</th>
<th>Diffuse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensing distance</td>
<td>0.5 to 10 m (1.64 to 32.8 ft) using E39-R2</td>
<td>0.2 to 2 m (0.66 to 6.56 ft)</td>
</tr>
<tr>
<td>Setting distance</td>
<td>---</td>
<td>0.5 to 2 m (1.64 to 6.56 ft)</td>
</tr>
<tr>
<td>Standard sensing object</td>
<td>Opaque: 80 dia. min.</td>
<td>Kodak 90% white card 300 x 300 mm</td>
</tr>
<tr>
<td>Hysteresis (typical)</td>
<td>---</td>
<td>10% of setting distance</td>
</tr>
<tr>
<td>Directional angle</td>
<td>Sensor: 1° to 5°</td>
<td>---</td>
</tr>
<tr>
<td>Reflectivity characteristics (black/white error)</td>
<td>---</td>
<td>±10% max. (at 1-m sensing distance)</td>
</tr>
<tr>
<td>Light source (wavelength)</td>
<td>Red LED (700 nm)</td>
<td>Infrared LED (860 nm)</td>
</tr>
<tr>
<td>Spot size</td>
<td>---</td>
<td>70 dia. max. at 1-m sensing distance</td>
</tr>
<tr>
<td><strong>Supply voltage</strong></td>
<td>10 to 30 VDC including 10% (p-p) ripple</td>
<td>12 to 240 VDC ±10% including 10% (p-p) max. ripple 24 to 240 VAC ±10% at 50/60 Hz</td>
</tr>
<tr>
<td>Current consumption</td>
<td>50 mA max.</td>
<td>2 W max.</td>
</tr>
<tr>
<td>Output</td>
<td>30 VDC max.</td>
<td>Relay output: SPDT, 3 A (cos φ = 1) max. at 250 VAC or 3 A max. at 30 VDC</td>
</tr>
<tr>
<td>Life expectancy (relay output)</td>
<td>Mechanical: 50,000,000 operations min. (switching frequency: 18,000 operations/h)</td>
<td>Electrical: 100,000 operations min. (switching frequency: 1,800 operations/h)</td>
</tr>
<tr>
<td>Circuit protection</td>
<td>Protection from reversed power supply connection, load short-circuit, and mutual interference</td>
<td>Protection from mutual interference</td>
</tr>
</tbody>
</table>

(This table continues on the next page.)
### Specifications Table - continued from previous page

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sensing method</strong></td>
<td>Retroreflective (polarized)</td>
<td>Diffuse</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Response time</strong></td>
<td>1 ms</td>
<td>30 ms max.</td>
<td>5 ms</td>
<td>30 ms max.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sensitivity adjustment</strong></td>
<td>One-turn potentiometer</td>
<td>Teaching (in NORMAL or ZONE mode)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ambient illumination</strong></td>
<td>Incandescent lamp: 3,000 lx max.</td>
<td>Sunlight: 10,000 lx max.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ambient temperature</strong></td>
<td>Operating: -25°C to 55°C (-13 to 131°F)</td>
<td>Storage: -30°C to 70°C (-22 to 158°F) with no icing or condensation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Relative humidity</strong></td>
<td>Operating: 35% to 85%</td>
<td>Storage: 35% to 95% with no condensation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Insulation resistance</strong></td>
<td>20 MΩ min. at 500 VDC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dielectric strength</strong></td>
<td>1,000 VAC, 50/60 Hz for 1 min</td>
<td>2,000 VAC, 50/60 Hz for 1 min</td>
<td>1,000 VAC, 50/60 Hz for 1 min</td>
<td>2,000 VAC, 50/60 Hz for 1 min</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Vibration resistance</strong></td>
<td>10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z axes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Shock resistance</strong></td>
<td>500 m/s² 3 times each in X, Y, and Z axes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Degree of protection</strong></td>
<td>IP67</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Connection method</strong></td>
<td>2 m cable M12 connector Terminal block</td>
<td>2 m cable M12 connector Terminal block</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Weight (packed state)</strong></td>
<td>Approx. 150 g</td>
<td>Approx. 50 g</td>
<td>Approx. 150 g</td>
<td>Approx. 50 g</td>
<td>Approx. 150 g</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Material</strong></td>
<td>Case: PBT (polybutylene terephthalate)</td>
<td>Lens: Acrylic (PMMA)</td>
<td>Mounting bracket: Stainless steel (SUS304), order separately</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

### Engineering Data

#### RETROREFLECTIVE MODELS, E3G-R/MR

**Lateral Movement**

![Graph showing lateral movement](image)

**Excess Gain**

![Graph showing excess gain](image)

5
DIFFUSE MODELS, E3G-L/ML

Spot Diameter vs. Sensing Distance

Sensing Zone in NORMAL Mode

Sensing Zone in ZONE Mode

Sensing Object Size vs. Setting Distance

Sensing Object Angle Characteristics (Up and Down)

Sensing Object Angle (Left and Right)

Sensing Distance vs. Sensing Object Material (at 1-m Setting Distance)

Sensing Distance vs. Sensing Object Material (at 500-mm Setting Distance)

Close-range Characteristics
## OUTPUT CIRCUITS

### NPN/PNP Selectable

<table>
<thead>
<tr>
<th>Part number</th>
<th>E3G-R13</th>
<th>E3G-R17</th>
<th>E3G-L73</th>
<th>E3G-L77</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output transistor status</td>
<td>Light ON</td>
<td>Dark ON</td>
<td>Light ON</td>
<td>Dark ON</td>
</tr>
<tr>
<td>Timing chart</td>
<td>Received</td>
<td>Not received</td>
<td>Incident</td>
<td>Interrupted</td>
</tr>
<tr>
<td>Operation indicator (orange)</td>
<td>ON</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>Output transistor</td>
<td>ON</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>Load (relay)</td>
<td>Operate</td>
<td>Reset</td>
<td>Operate</td>
<td>Reset</td>
</tr>
<tr>
<td>(Between blue and black)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output configuration</td>
<td>NPN</td>
<td>PNP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output circuit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Connector Pin Arrangement**

- **NPN**
  - Pin 2 is open.
  - Brown 10 to 30 VDC, 100 mA max.

- **PNP**
  - Pin 2 is open.
  - Brown 10 to 30 VDC

Note: Set the NPN or PNP selector to PNP.
## Relay Output

<table>
<thead>
<tr>
<th>Timer function</th>
<th>...</th>
</tr>
</thead>
</table>
| Part number    | E3G-MR19  
                | E3G-ML79 |
| Timing chart   | ![Timing chart](image1)  
                | ![Timing chart](image2) |
| Mode selector  | Light-ON (L/ON)  
                | Dark-ON (D/ON) |
| Timer function | ON or OFF delay  
                | 0 to 5 s (adjustable) |
| Part number    | E3G-MR19T  
                | E3G-ML79T |
| Timing chart   | ![Timing chart](image3)  
                | ![Timing chart](image4) |
| Mode selector  | Light-ON (L/ON)  
                | Dark-ON (D/ON) |

### Output circuit

- Main circuit
- Power supply
- Output

- 24 to 240 VAC or 12 to 240 VDC (no polarity order restricted)

**Note:** Td1, Td2: Delay time (0 to 5 s)

- T₁: A period longer than the delay time.
- T₂: A period shorter than the delay time.

For ON- and OFF-delay timers, Td1 and Td2 are independently variable.

## CONNECTOR

### Pin No. 

- Y96E-43:
- Connector cordsets

### Wire colors

- Brown
- Blue
- Black

### Classification

<table>
<thead>
<tr>
<th>Classification</th>
<th>Wire color</th>
<th>Connector pin No.</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC</td>
<td>Brown</td>
<td>1</td>
<td>Power supply (+V)</td>
</tr>
<tr>
<td></td>
<td>---</td>
<td>2</td>
<td>Not used</td>
</tr>
<tr>
<td></td>
<td>Blue</td>
<td>3</td>
<td>Power supply (0 V)</td>
</tr>
<tr>
<td></td>
<td>Black</td>
<td>4</td>
<td>Output</td>
</tr>
</tbody>
</table>
Nomenclature

CONTROL PANELS

Retroreflective
E3G-R13 (Pre-leaded Model)
E3G-R17 (Connector Model)

Stability indicator (Green)
Operation indicator (Orange)
Sensitivity adjuster
PNP/NPN selector
L.ON/D.ON selector

E3G-MR19 (Terminal Block Model)
E3G-MR19T (Terminal Block Model with Timer)

Operation indicator (Orange)
Sensitivity adjuster
ON-delay adjuster (see note)
OFF-delay adjuster (see note)
Stability indicator (Green)
L.ON/D.ON selector

Note: The ON- or OFF-delay adjuster is not available with the E3G-MR19.

Diffuse
E3G-L73 (Pre-leaded Model)
E3G-L77 (Connector Model)

Stability indicator (Green)
Teaching indicator (Red and green)
PNP/NPN selector
NORMAL/ZONE selector
Operation indicator (Orange)
Mode selector: TEACH, RUN (D-ON), RUN (L-ON) TEACH button

E3G-ML79 (Terminal Block Model)
E3G-ML79T (Terminal Block Model with Timer)

Stability indicator (Green)
Teaching indicator (Red and green)
Operation indicator (Orange)
TEACH button
ON-delay adjuster (see note)
OFF-delay adjuster (see note)
NORMAL/ZONE selector

Note: The ON- or OFF-delay adjuster is not available with the E3G-ML79.
Installation

■ POWER SUPPLY

A power supply with full-wave rectification can be connected to the E3G-MR19(T).

■ WIRING

The tensile strength of the cable during operation should not exceed the values shown below.

<table>
<thead>
<tr>
<th>Part number</th>
<th>Tensile strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>E3G-R13, E3G-MR19(T)</td>
<td>50 N max.</td>
</tr>
<tr>
<td>E3G-R17</td>
<td>10 N max.</td>
</tr>
</tbody>
</table>

■ ADJUSTMENTS

Indicators

The following illustration indicates the operation levels of the E3G.

Set the E3G so that it will work within the stable operation range.

Note: If the operation level is set to the stable operation range, the E3G will operate with the highest reliability and without being influenced by temperature change, voltage fluctuation, dust, or setting change. If the operation level cannot be set to the stable operation range, pay close attention to environmental changes while operating the E3G.

■ MOUNTING DIFFUSE MODELS

Mounting Directions

Make sure that the sensing side of the Sensor is parallel with the surface of each sensing object. Do not tilt the Sensor towards the sensing object.

If the sensing object has a glossy surface, tilt the Sensor by 5° to 10° as shown below, provided that the Sensor is not influenced by any background objects.
If there is a mirror-like object below the Sensor, the Sensor may not be in stable operation. Therefore, tilt the Sensor or keep the Sensor a distance away from the mirror-like object as shown below.

Make sure not to install the Sensor in the incorrect direction. Refer to the following.

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

**OTHERS**

If a teaching data error occurs with the operation indicator flashing due to a power failure or static noise, perform the teaching operation of the Sensor again.

---

**ADJUSTMENTS FOR DIFFUSE MODELS**

**Adjustment Steps**

1. Install, wire, and turn ON the Sensor.
2. Perform sensitivity adjustments (teaching). Refer to *Distance Setting (Teaching)* below.
3. Check that the mode selector is set to RUN.
**DISTANCE SETTING (TEACHING)**

Select the most appropriate teaching method in reference to the following descriptions.

<table>
<thead>
<tr>
<th>Application</th>
<th>Teaching without sensing objects (i.e., teaching the background).</th>
<th>Setting a threshold in the middle between the background and sensing object for operation.</th>
<th>Detection of glossy objects in front of the background.</th>
<th>Setting the maximum sensing distance of the Sensor.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching</td>
<td>Normal one-point teaching</td>
<td>Normal two-point teaching</td>
<td>Zone teaching</td>
<td>Maximum distance setting (in normal mode)</td>
</tr>
<tr>
<td>Setting method</td>
<td>Press the TEACH button with the background object.</td>
<td>Press the TEACH button with the background object and with the sensing object.</td>
<td>Press the TEACH button with the background object (conveyor, etc.).</td>
<td>Press the TEACH button for longer than three seconds.</td>
</tr>
<tr>
<td>Set threshold</td>
<td>Threshold (a) is set to a distance in front of the background of 20% of the background distance.</td>
<td>Threshold (a) is set approximately in the middle between the background and sensing object.</td>
<td>Thresholds (a and b) are set in the sensing distance on condition that the difference between these thresholds are approximately 10% of the whole sensing distance.</td>
<td>The threshold is set so that the stability indicator will turn ON at approximately 2 m if the sensing object is white paper.</td>
</tr>
<tr>
<td>Output ON range</td>
<td>The output is ON between the Sensor and La.</td>
<td>The output is ON between the Sensor and La.</td>
<td>The output is ON between La and Lb.</td>
<td>The output is ON whenever the sensing object is located between the Sensor and at a distance of 2.2 m.</td>
</tr>
</tbody>
</table>

La: Distance equivalent to threshold (a)  
Lb: Distance equivalent to threshold (b)

---

**NORMAL MODE**

**1. Normal One-point Teaching**

**2. Normal Two-point Teaching**

**Zone Teaching**

**Maximum Distance Setting (in Normal Mode)**

---

**Note:** Perform normal one-point teaching with the background.

**Procedure**

1. Set the mode selector to TEACH.  
2. Set the NORMAL/ZONE mode selector to NORMAL.  
3. Press the TEACH button without any sensing object (i.e., teach the background). The teaching indicator (red) will turn ON.  
4. Set the mode selector to RUN. (Set to L-ON or D-ON mode.)

**Normal One-point Teaching**

**Normal Two-point Teaching**

**Zone Teaching**

**Maximum Distance Setting (in Normal Mode)**

---

**Note:** Perform zone teaching with the background.

**Procedure**

1. Set the mode selector to TEACH.  
2. Set the NORMAL/ZONE mode selector to ZONE.  
3. Press the TEACH button with the background.  
4. Set the mode selector to RUN. (Set to L-ON or D-ON mode.)

**Note:** Perform zone teaching with the background.

**Procedure**

1. Set the mode selector to TEACH.  
2. Set the NORMAL/ZONE mode selector to NORMAL.  
3. Press the TEACH button for 3 s or more.  
4. If the teaching is successful, set the mode selector to RUN to complete the teaching operation. (Set to L-ON or D-ON mode.)
**TERMINAL BLOCK MODELS**

**E3G-MR**, **E3G-ML**

**Wiring**

The cable with an external diameter of 6 to 8 mm is recommended.

Be sure to attach the cover with screws securely in order to maintain the water- and dust-resistant properties of the product.

**Terminal Cover**

Do not tighten the terminal protection cover with wires pinched between the Sensor and the cover in order to maintain the water- and dust-resistant properties of the product.

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**CHANGING CABLE EXIT**

**Procedure**

1. Remove the present cover. (Item 1 below)
3. Remove the clamping nut, washer, and rubber bushing of the E3G. These are used for the side-pullout cable.
4. Attach the rubber bushing and cap provided with the E39-L129 to the E3G as replacements.

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![Diagram of terminal block models and changing cable exit procedure](image-url)

**Recommended Example**

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**Note:** *Provided with the E39-L129.*
Dimensions

Unit: mm (inch)

**SENORS**

**E3G-R13 and E3G-L73**
Pre-leaded Models

- Operation indicator (orange)
- Operation mode selector
- Sensitivity adjuster
- M2.6
- Two, 4.5-dia. mounting holes

**Mounting holes**

**E3G-R17 and E3G-L77**
Connector Models

- Note: All dimensions other than the ones specified below are the same as the corresponding dimensions of E3G-R13.

Terminal Block Models

- Operation indicator (orange)
- Operation mode selector
- Sensitivity adjuster
- OFF-delay adjuster
- ON-delay adjuster

**Mounting holes**

- Clamping nut 22 mm
- Applicable cable: 6 to 8 dia.

Clamp nut 22 mm
Applicable cable: 6 to 8 dia.
■ ACCESSORIES (ORDER SEPARATELY)

**Reflectors**

E39-R2

Material
Surface: Acrylic resin
Backside: ABS resin

**Note:** Supplied with E3G-R□□, E3G-MR□□, and E3G-MR□□-US.

E39-R1

Material
Surface: Acrylic resin
Backside: ABS resin

**Terminal Protection Cover for Side-pullout Cable**

E39-L129

**Note:**
1. The cover is provided with a rubber bushing and cap to prevent the cable from being pulled out vertically.
2. Refer to page 13 for the mounting method of the product.

■ MOUNTING BRACKETS (NOT INCLUDED, ORDER SEPARATELY)

E39-L131

Material: Stainless steel (SUS304)

E39-L132

Material: Stainless steel (SUS304)
CONNECTOR CORDSETS

Straight
XS2F-D421-DC0-A (L=2 m)
XS2F-D421-GC0-A (L=5 m)

Right angle
XS2F-D422-DC0-A (L=2 m)
XS2F-D422-GC0-A (L=5 m)
Precautions

Do not ignore the following items that are essential for securing safety during Sensor operation.

- Do not use the Sensor in locations with explosive or flammable gas.
- Do not use the Sensor in the water or electrically conductive solutions.
- Do not disassemble, repair, or modify the product.
- Make sure that the power supply specifications, such as AC or DC, are correct.
- Do not apply voltage or current exceeding the rated ranges.
- Do not make mistakes in wiring, such as mistakes in polarity.
- Be sure to connect the load correctly.
- Do not short-circuit the load terminals.

■ DESIGNING

Load Relay Contact
If E3G is connected to an inductive load with contacts that spark when the load is turned OFF (e.g., a contactor or valve), the normally-closed side may be turned ON before the normally-open side is turned OFF or vice-versa. If both normally-open output and normally-closed output are used simultaneously, apply an surge suppressor to the load.

Stabilization on Power-up
The Sensor needs 100 ms to be ready to operate after it is turned ON. The devices connected to E3G wait until the Sensor is ready to operate. If the Sensor and load are connected to separate power supplies, be sure to turn ON the Sensor first.

Power OFF
A single pulse signal may be output from the Sensor immediately after it is turned OFF. This will occur more frequently if a timer or counter is connected to the Sensor and power is supplied to the timer or counter independently. Be sure to supply power to the timer or counter from the built-in power supply of the Sensor.

Power Supply
If a standard switching regulator is used, be sure to ground the FG (frame ground) and G (ground) terminals, otherwise the Sensor may malfunction due to the switching noise of the regulator.

Repeated Cable Bending
Do not bend the sensor cable repeatedly.

High-tension Lines
Do not wire power lines or high-tension lines alongside the lines of the Sensor in the same conduit, otherwise the Sensor may be damaged or may malfunction due to induction. Be sure to wire the lines of the Sensor separated from power lines or high-tension lines or laid in an exclusive, shielded conduit.

■ WIRING

The E3G has a built-in function to protect the Sensor from load short-circuiting. If load short-circuiting results, the output will be turned OFF. In that case, check the wiring and turn ON the E3G again so that the short-circuit protection circuit will be reset. This function will operate if the output current flow is at least 2.0 times the rated load current. If an inductive load is connected to the E3G, make sure that the inrush current does not exceed 1.2 times the rated load current.

The cable can be extended up to a total length of 100 m, on condition that the thickness of the wire is at least 0.3 mm.

■ MOUNTING

Mounting Conditions
If Sensors are mounted face-to-face, make sure that no optical axes cross each other. Otherwise, mutual interference may result.

Be sure to install the Sensor carefully so that the directional angle range of the Sensor will not 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 M4 screws to mount the Sensor.

When mounting the case, make sure that the tightening torque applied to each screw does not exceed 1.2 N • m.

M12 Connector
Be sure to connect or disconnect the M12 connector after turning OFF the Sensor.

Be sure to hold the connector cover when connecting or disconnecting the M12 connector.

The M12 connector must be only hand-tightened.

If the M12 connector is not connected securely, the proper degree of protection of the Sensor may not be maintained or the connector may be disconnected due to vibration.

Water Resistance
Do not use the product in water, in rain, or outdoors.

Tighten the operation cover screws and terminal block cover screws to a torque of 0.3 to 0.5 N • m in order to ensure water resistivity.

■ MAINTENANCE AND INSPECTION

Cleaning
Use only water and mild detergent. Do not use harsh chemicals or solvents.

■ OPERATING ENVIRONMENT

Do not install the E3G in locations with the following conditions.

- Excessive dust.
- Corrosive gases.
- Directly exposed to sprays of water, oil, or chemicals.
- Directly exposed to vibration or shock.