IO-Link Photoelectric Sensor

E3Z-IL

IO-Link Makes Sensor Level Information Visible and Solves the Three Major Issues at Manufacturing Sites!

Standard Photoelectric Sensor.

• Downtime can be reduced.
  Notifies you of faulty parts and such phenomena in the Sensor in real time.
• The frequency of sudden failure can be decreased.
  The light incident level monitor prevents false detection before it happens.
• The efficiency of changeover can be improved.
  The batch check for individual sensor IDs significantly decreases commissioning time.
• Three types of sensing methods and three types of connection methods are available.

Ordering Information

IO-Link Model / Sensors [Refer to Dimensions on page 10.]

<table>
<thead>
<tr>
<th>Sensing method</th>
<th>Appearance</th>
<th>Connection method</th>
<th>Sensing distance</th>
<th>IO-Link baud rate</th>
<th>PNP Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Through-beam</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Emitter + Receiver)</td>
<td></td>
<td>Pre-wired (2 m)</td>
<td></td>
<td></td>
<td>E3Z-T81-IL2 2M</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pre-wired M12 connector</td>
<td></td>
<td></td>
<td>E3Z-T81-L-IL2-2M</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Standard M8 connector</td>
<td></td>
<td></td>
<td>E3Z-T81-D-IL2-2M</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pre-wired (2 m)</td>
<td></td>
<td></td>
<td>E3Z-T86-IL2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pre-wired M12 connector</td>
<td></td>
<td></td>
<td>E3Z-T86-L-IL2-2M</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Standard M8 connector</td>
<td></td>
<td></td>
<td>E3Z-T86-D-IL2-2M</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>15 m</td>
<td>COM2 (38.4 kbps)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retro-reflective with</td>
<td></td>
<td>Pre-wired (2 m)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSR function</td>
<td></td>
<td>Pre-wired M12 connector</td>
<td></td>
<td></td>
<td>E3Z-R81-IL3 2M</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Standard M8 connector</td>
<td></td>
<td></td>
<td>E3Z-R81-L-IL3-2M</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pre-wired (2 m)</td>
<td></td>
<td></td>
<td>E3Z-R81-D-IL3-2M</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pre-wired M12 connector</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Standard M8 connector</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4 m (100 mm)</td>
<td>COM2 (38.4 kbps)</td>
<td></td>
</tr>
</tbody>
</table>

Note: Please contact your OMRON sales representative regarding the IO-Link setup file (IODD file).
*1. The Reflector is sold separately. Select the Reflector model most suited to the application.
*2. The sensing distance specified is possible when the E39-R1S is used. Values in parentheses indicate the minimum required distance between the Sensor and Reflector.
*3. Through-beam Sensors are normally sold in sets that include both the Emitter and Receiver.

For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

Be sure to read Safety Precautions on page 9.
**Note:** Please contact your OMRON sales representative regarding the IO-Link setup file (IODD file).

**Accessories (Sold Separately)**

**Slit** (A Slit is not provided with Through-beam Sensors) Order a Slit separately if required.

<table>
<thead>
<tr>
<th>Slit width</th>
<th>Sensing distance</th>
<th>Minimum detectable object (Reference value)</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5-mm dia.</td>
<td>50 mm</td>
<td>0.2-mm dia.</td>
<td>E39-S65A</td>
</tr>
<tr>
<td>1-mm dia.</td>
<td>200 mm</td>
<td>0.4-mm dia.</td>
<td>E39-S65B</td>
</tr>
<tr>
<td>2-mm dia.</td>
<td>800 mm</td>
<td>0.7-mm dia.</td>
<td>E39-S65C</td>
</tr>
<tr>
<td>0.5 × 10 mm</td>
<td>1 m</td>
<td>0.2-mm dia.</td>
<td>E39-S65D</td>
</tr>
<tr>
<td>1 × 10 mm</td>
<td>2.2 m</td>
<td>0.5-mm dia.</td>
<td>E39-S65E</td>
</tr>
<tr>
<td>2 × 10 mm</td>
<td>5 m</td>
<td>0.8-mm dia.</td>
<td>E39-S65F</td>
</tr>
</tbody>
</table>

**Reflectors** (Reflector required for Retroreflective Sensors) A Reflector is not provided with the Sensor. Be sure to order a Reflector separately.

<table>
<thead>
<tr>
<th>Name</th>
<th>Sensing distance</th>
<th>Model</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reflector</td>
<td>3 m (100 mm)</td>
<td>E39-R1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>4 m (100 mm)</td>
<td>E39-R1S</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>---</td>
<td>E39-R2</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>---</td>
<td>E39-R9</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>---</td>
<td>E39-R10</td>
<td>1</td>
</tr>
<tr>
<td>Fog Preventive Coating</td>
<td>3 m (100 mm)</td>
<td>E39-R1K</td>
<td>1</td>
</tr>
<tr>
<td>Small Reflector</td>
<td>1.5 m (50 mm)</td>
<td>E39-R3</td>
<td>1</td>
</tr>
<tr>
<td>Tape Reflector</td>
<td>1.4 m (150 mm)</td>
<td>E39-RS3</td>
<td>1</td>
</tr>
</tbody>
</table>

**Note:**
1. If you use the Reflector at any distance other than the rated distance, make sure that the stability indicator lights properly when you install the Sensor.
3. * Values in parentheses indicate the minimum required distance between the Sensor and Reflector.
Mounting Brackets

A Mounting Bracket is not enclosed with the Sensor. Order a Mounting Bracket separately if required.

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Model (material)</th>
<th>Quantity</th>
<th>Remarks</th>
<th>Appearance</th>
<th>Model (material)</th>
<th>Quantity</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>E39-L153 (SUS304) *1</td>
<td>1</td>
<td>Mounting Brackets</td>
<td>E39-L98 (SUS304) *2</td>
<td>1</td>
<td>Metal Protective Cover Bracket</td>
<td></td>
</tr>
<tr>
<td></td>
<td>E39-L104 (SUS304) *1</td>
<td>1</td>
<td></td>
<td>E39-L150 (SUS304)</td>
<td>1</td>
<td>(Sensor adjuster)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>E39-L43 (SUS304) *2</td>
<td>1</td>
<td>Horizontal Mounting Brackets</td>
<td>E39-L151 (SUS304)</td>
<td>1</td>
<td>Easily mounted to the aluminum frame rails of conveyors and easily adjusted.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>E39-L142 (SUS304) *2</td>
<td>1</td>
<td>Horizontal Protective Cover Bracket</td>
<td></td>
<td></td>
<td>For left to right adjustment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>E39-L44 (SUS304)</td>
<td>1</td>
<td>Rear Mounting Bracket</td>
<td>E39-L144 (SUS304) *2</td>
<td>1</td>
<td>Compact Protective Cover Bracket (For E3Z only)</td>
<td></td>
</tr>
</tbody>
</table>

Note:
1. When using Through-beam models, order one bracket for the Receiver and one for the Emitter.

*1. Cannot be used for Standard Connector models with mounting surface on the bottom. In that case, use Pre-wired Connector models.
*2. Cannot be used for Standard Connector models.

Sensor I/O Connectors

(Models for Connectors and Pre-wired Connectors: A Connector is not provided with the Sensor. Be sure to order a Connector separately.)

<table>
<thead>
<tr>
<th>Size</th>
<th>Type</th>
<th>Appearance</th>
<th>Cable length</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>M12</td>
<td>Socket on one cable end</td>
<td>Smartclick connector Straight *2</td>
<td>2 m</td>
<td>XS5F-D421-D80-F</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5 m</td>
<td>XS5F-D421-G80-F</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Smartclick connector L-shape *2 *3</td>
<td>2 m</td>
<td>XS5F-D422-D80-F</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5 m</td>
<td>XS5F-D422-G80-F</td>
</tr>
<tr>
<td></td>
<td>Socket and plug on cable ends *1</td>
<td>Smartclick connector Straight/ Straight *2</td>
<td>2 m</td>
<td>XS5W-D421-D81-F</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5 m</td>
<td>XS5W-D421-G81-F</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Smartclick connector L-shape/L-shape *2 *3</td>
<td>2 m</td>
<td>XS5W-D422-D81-F</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5 m</td>
<td>XS5W-D422-G81-F</td>
</tr>
<tr>
<td>M8</td>
<td>Socket on one cable end</td>
<td>Straight *3</td>
<td>2 m</td>
<td>XS3F-M421-402-A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5 m</td>
<td>XS3F-M421-405-A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>L-shape *3 *4</td>
<td>2 m</td>
<td>XS3F-M422-402-A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5 m</td>
<td>XS3F-M422-405-A</td>
</tr>
<tr>
<td>M8 socket/ M12 plug</td>
<td>Socket and plug on cable ends</td>
<td>M8-M12 (Smartclick) conversion cable *2</td>
<td>0.2 m</td>
<td>XS3W-M42C-4C2-A</td>
</tr>
</tbody>
</table>

Note:
1. When using Through-beam models, order one connector for the Receiver and one for the Emitter.
2. Refer to Sensor I/O Connectors/Sensor Controllers on your OMRON website for details.

*1. Straight type/L-shape type combinations are also available.
*2. The connectors will not rotate after they are connected.
*3. The cable is fixed at an angle of 180° from the sensor emitter/receiver surface.
## Ratings and Specifications

### IO-Link Model

<table>
<thead>
<tr>
<th>Model Item</th>
<th>PNP output</th>
<th>Sensing method</th>
<th>Through-beam</th>
<th>Retro-reflective with MSR function</th>
<th>Diffuse-reflective</th>
<th>Narrow-beam Models</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>E3Z-T81-IL</td>
<td>E3Z-R81-IL</td>
<td>E3Z-D82-IL</td>
<td>E3Z-L81-IL</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>E3Z-T81-M1TJ-IL</td>
<td>E3Z-R81-M1TJ-IL</td>
<td>E3Z-D82-M1TJ-IL</td>
<td>E3Z-L81-M1TJ-IL</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>E3Z-T86-IL</td>
<td>E3Z-R86-IL</td>
<td>E3Z-D87-IL</td>
<td>E3Z-L86-IL</td>
</tr>
</tbody>
</table>

### Sensing distance

- **15 m**
- **4 m (100 mm)** *(when using E39-R1S)*
- **3 m (100 mm)** *(when using E39-R1)*
- **1 m** *(white paper: 300 × 300 mm)*
- **90 + 30 mm** *(white paper: 100 × 100 mm)*

### Spot diameter (reference value)

- **2.5 dia.**
- **2.5 dia. and sensing distance of 90 mm**

### Standard sensing object

- **Opaques: 12-mm dia. min.**
- **Opaque: 75-mm dia. min.**
- **0.1 mm (copper wire)**

### Minimum detectable object (reference value)

- **20%** max. of setting distance

### Directional angle

- Both emitter and receiver: 3 to 15°
- 2 to 10°

### Light source (wavelength)

- Infrared LED (870 nm)
- Red LED (660 nm)
- Infrared LED (860 nm)
- Red LED (650 nm)

### Power supply voltage

- 10 to 30 VDC (including 10% ripple (p-p))

### Current consumption

- 50 mA max. *(Emitter: 25 mA max., Receiver: 25 mA max.)*

### Control output

- Load power supply voltage: 30 VDC max., Load current: 100 mA max.
- Residual voltage: Load current of less than 10 mA: 1 V max.
- Load current of 10 to 100 mA: 2 V max.
- PNP open collector output
- Light-ON/Dark-ON selectable

### Indicators

- In the Standard I/O mode (SIO mode): Operation indicator (orange, lit) and stability indicator (green, lit)
- In the IO-Link Mode: Operation indicator (orange, lit) and communication indicator (green, blinking at 1 s intervals)

### Protection circuits

- Reversed power supply polarity protection, output short-circuit protection, and reversed output polarity protection
- Reversed power supply polarity protection, output short-circuit protection, reversed output polarity protection, and mutual interference prevention

### Response time

- Operate or reset: 1 ms max.

### Sensitivity adjustment

- Sensitivity adjuster / IO-Link communications

### Ambient illumination (Receiver side)

- Incandescent lamp: 3,000 lx max.
- Sunlight: 10,000 lx max.

### Ambient temperature range

- Operating: 25 to 55 °C (with no icing or condensation)
- 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

- 1,000 VAC, 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

### Shock resistance

- Destruction: 500 m/s² 3 times each in X, Y, and Z directions

### Degree of protection

- IEC 60529 IP67

### Connection method

- Pre-wired cable (standard cable length 2 m), M12 pre-wired connector (standard cable length 0.3 m), M8 connector

### Weight (packed state)

- Pre-wired cable (2 m): Approx. 120 g
- Pre-wired connector (M12): Approx. 65 g
- Connector (M8): Approx. 30 g

### Material

- Case: Polybutylene terephthalate (PBT)
- Display: Modified polarylate
- Lens: Modified polarylate, Methacrylate resin (PMMA), Modified polarylate

### Main IO-Link functions

- Operation mode switching between Light ON and Dark ON, setup of the instability detection level for light receiving and non-light receiving, timer function of the control output and timer time selecting, instability output (IO-Link mode) ON delay timer time selecting, setup of a teaching level and execution of teaching, setup of light receiving sensitivity level, monitor output, operating hours read-out, and initial reset

### Communication specifications

- IO-Link specification: Ver 1.1
- Baud rate: -IL3: COM3 (230.4 kbps), -IL2: COM2 (38.4 kbps)
- Data length: PD size: 2 bytes, OD size: 1 byte (M-sequence type: TYPE_2_2)
- Minimum cycle time: IL3 (COM3): 1 ms, -IL2 (COM2): 2.3 ms

### Accessories

- Instruction manual (Neither Reflectors nor Mounting Brackets are provided with any of the above models.)

* Values in parentheses indicate the minimum required distance between the Sensor and Reflector.
Engineering Data (Reference Value)

Parallel Operating Range
Through-beam Models
E3Z-T8-IL and Slit
(A Slit is mounted to the Emitter and Receiver.)

Through-beam Models
E3Z-T8-IL and E3Z-R8-IL and Reflector

Retro-reflective Models
E3Z-R8-IL and E3Z-R1 Reflector

Operating Range
Diffuse-reflective Models
E3Z-D8-IL

Narrow-beam Reflective Models
E3Z-L8-IL

Monitor Output vs. Sensing Distance
Through-beam Models
E3Z-T8-IL

Retro-reflective Models
E3Z-R8-IL and E39-R1 Reflector
### Output Circuit Diagrams

<table>
<thead>
<tr>
<th>Output mode</th>
<th>Operation mode</th>
<th>Stable operation zone</th>
<th>Unstable operation zone</th>
<th>Stable operation zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>L ON</td>
<td>ON</td>
<td>Stability indicator (green)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OFF</td>
<td>Operation indicator (orange)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OFF</td>
<td>Control output 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OFF</td>
<td>Control output 2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*1. The operation mode can be changed by the IO-Link communications.
*2. The timer function can be set up using the IO-Link communications for control output 1 and 2 separately. (It is able to select ON delay, OFF delay, or one-shot function and select a timer time of 1 to 4000 ms (T).)
*3. In the IO-Link mode, if the ON/OFF speed of the sensor is slow, high-speed response of 1 ms or less can be realized using control output 2 as a sensor.
*4. The judgment time for the instability detection diagnosis can be selected using the IO-Link communications. (For the ON delay timer function to detect instability, the setting can be selected from 0 (invalid), 10, 50, 100, 300, 500, or 1000 ms.

#### Timing Chart

**IO-Link mode**

**Communication indicator (green)**

**ON**

- Control output 1 (Byte1_bit0) "1"
- Control output 2 "1" *3*
- Instability detection (Light receiving) (Byte1_bit4) *4*5
- Instability detection (Non-light receiving) (Byte1_bit13/4) *5*

**OFF**

- ON-delay
  - Sensing object present: ON 1
  - Sensing object not present: OFF 0

- OFF-delay
  - Sensing object present: ON 1
  - Sensing object not present: OFF 0

- One shot
  - Sensing object present: ON 1
  - Sensing object not present: OFF 0

#### Connector Pin Arrangement

**Pre-wired M12 connector**

- E3Z-B1-M17-J-LIL
- E3Z-B2-M17-J-LIL
- E3Z-T81-D-M17-J-LIL

**Standard M8 connector**

- E3Z-B16-LIL
- E3Z-B7-LIL
- E3Z-T86-D-LIL

#### Note:

- Pins 2 is not used.
### Plugs (Sensor I/O Connectors)

#### M8 connector

![M8 connector diagram](image1)

#### M12 connector

![M12 connector diagram](image2)

#### M8-M12 (Smartclick) conversion cable

![M8-M12 conversion cable diagram](image3)

### Nomenclature

- **Through-beam Models (Emitter)**
  - E3Z-T8-IL
  - E3Z-R8-IL
  - E3Z-D8-IL
  - E3Z-L8-IL

- **Through-beam Models (Receiver)**
  - E3Z-T8-IL
  - E3Z-R8-IL
  - E3Z-D8-IL
  - E3Z-L8-IL

### Through-beam Models (Emitter)

#### Pin arrangement

<table>
<thead>
<tr>
<th>Classification</th>
<th>Wire color</th>
<th>Connector pin No.</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC</td>
<td>Brown</td>
<td>1</td>
<td>Power supply (+V)</td>
</tr>
<tr>
<td></td>
<td>White</td>
<td>2</td>
<td>Output DO</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 C/Q</td>
</tr>
</tbody>
</table>

**Note:** Pins 2 is not used.

### Through-beam Models (Receiver)

#### Retro-reflective Models

- E3Z-T8-IL
- E3Z-R8-IL
- E3Z-D8-IL
- E3Z-L8-IL

#### Diffuse-reflective Models

- E3Z-T8-IL
- E3Z-R8-IL
- E3Z-D8-IL
- E3Z-L8-IL

In the Standard I/O mode (SIO mode):
- Stability indicator (green)
- Sensitivity adjuster

In the IO-Link mode:
- IO-Link communication indicator (green)
- Operation indicator (orange)
- Operation selector
Safety Precautions

Be sure to read the precautions for all models in the website at: http://www.ia.omron.com/.

Warning Indications

<table>
<thead>
<tr>
<th>Warning level</th>
<th>Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury, or may result in serious injury or death. Additionally there may be significant property damage.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precautions for Safe Use</td>
<td>Supplementary comments on what to do or avoid doing, to use the product safely.</td>
</tr>
<tr>
<td>Precautions for Correct Use</td>
<td>Supplementary comments on what to do or avoid doing, to prevent failure to operate, malfunction or undesirable effect on product performance.</td>
</tr>
</tbody>
</table>

Meaning of Product Safety Symbols

<table>
<thead>
<tr>
<th>Symbol</th>
<th>General prohibition</th>
<th>Indicates the instructions of unspecified prohibited action.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Caution, explosion</td>
<td>Indicates the possibility of explosion under specific conditions.</td>
</tr>
<tr>
<td></td>
<td>Caution, fire</td>
<td>Indicates the possibility of fires under specific conditions.</td>
</tr>
</tbody>
</table>

**WARNING**

This product is not designed or rated for ensuring safety of persons either directly or indirectly. Do not use it for such purposes.

The maximum power supply voltage is 30 VDC. Before turning the power ON, make sure that the power supply voltage does not exceed the maximum voltage.

Never use the product with an AC power supply. Otherwise, explosion may result.

Do not use the product with voltage in excess of the rated voltage. Excess voltage may result in malfunction or fire.

Do not use the product above rated load.

**Precautions for Safe Use**

Be sure to follow the safety precautions below for added safety.

1. Do not use the sensor under the environment with explosive or ignition gas.
2. Never disassemble, repair nor tamper with the product.

**Precautions for Correct Use**

1. Do not use the product under the following conditions.
   (1) In the place exposed to the direct sunlight.
   (2) In the place where humidity is high and condensation may occur.
   (3) In the place where vibration or shock is directly transmitted to the product.

2. Connection and Mounting
   (1) If the sensor wiring is placed in the same conduits or ducts as high-voltage or high-power lines, inductive noise may cause malfunction or damage. Wire the cables separately or use a shielded cable.
   (2) Use an extension cable less than 100 m long for Standard I/O mode and less than 20 m for IO-Link mode.
   (3) Do not exceed the following force values applied to the cable. Tensile: 80 N max., torque: 0.1 Nm max., pressure: 20 N max., flexure: 3 kg max.
   **M8 metal connectors**
   (4) Fasten a fixed implement by hand. If you use pliers, it may cause malfunction or damage to it.

3. Cleaning
   Do not use thinner, alcohol, or other organic solvents. Otherwise, the optical properties and degree of protection may be degraded.

4. Power supply
   When using a commercially available switching regulator, be sure to ground the FG (Frame Ground) terminals.

5. Power supply reset time
   The photoelectric sensor will begin sensing no later than 100 ms after the power is turned on. If the load and the photoelectric sensor is connected to different power supply, the photoelectric sensor must be always turned on first.

6. Turning off the power supply
   When turning off the power, output pulse may be generated. We recommend turning off the power supply of the load or load line first.

7. Water resistance
   Though this is type IP67, do not use in the water, rain or outdoors.

8. Please process it as industrial waste.
**Dimensions**

**Sensors**

**Through-beam Models**

**Pre-wired Models**

E3Z-T81-IL

```
Dimensions
Sensors
* Models numbers for Through-beam Sensors (E3Z-T@@) are for sets that include both the Emitter and Receiver.
The model number of the Emitter is expressed by adding "-L" to the set model number (example: E3Z-T81-IL-2M), the model number of the Receiver, by adding "-D" (example: E3Z-T81-IL-D 2M.) Refer to Ordering Information to confirm model numbers for Emitter and Receivers.
```

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<table>
<thead>
<tr>
<th>Terminal No.</th>
<th>Specifications</th>
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<tbody>
<tr>
<td>1</td>
<td>+V</td>
</tr>
<tr>
<td>2</td>
<td>—</td>
</tr>
<tr>
<td>3</td>
<td>0V</td>
</tr>
<tr>
<td>4</td>
<td>Output C/Q</td>
</tr>
</tbody>
</table>
```

4 dia. vinyl-insulated round cable with 3 conductors (Conductor cross section: 0.2 mm² (AWG24), Insulator diameter: 1.1 mm), Standard length: 2 m.

**Pre-wired M12 connector**

(E3Z-T@@-M1TJ)

```
<table>
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<tr>
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<td>0V</td>
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<tr>
<td>4</td>
<td>Output C/Q</td>
</tr>
</tbody>
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4 dia. vinyl-insulated round cable (Standard length: 0.3 m)

**Connector Models**

E3Z-T86-IL

```
<table>
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</tr>
<tr>
<td>4</td>
<td>Output C/Q</td>
</tr>
</tbody>
</table>
```

2.8

4 dia. vinyl-insulated round cable with 4 conductors (Conductor cross section: 0.2 mm² (AWG24), Insulator diameter: 1.1 mm), Standard length: 2 m.

* Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.
Note: The lens for the E3Z-D@2/D@7 is black.

Retro-reflective Models
Pre-wired Models
E3Z-R81-IL
E3Z-D82-IL
E3Z-L81-IL

Retro-reflective Models
Connector Models
E3Z-R86-IL
E3Z-D87-IL
E3Z-L86-IL

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<td>0V</td>
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<tr>
<td>4</td>
<td>Output C/Q</td>
</tr>
</tbody>
</table>

Pre-wired M12 connector (E3Z-@-IL-M1TJ)
4 dia. vinyl-insulated round cable Standard length: 0.3 m

Note: The lens for the E3Z-D@2/D@7 is black.
Accessories (Order Separately)

**Slits**
E39-S65A
E39-S65B
E39-S65C

**Model** | **Size A** | **Material**
--- | --- | ---
E39-S65A | 0.5 dia. | SUS301 stainless steel
E39-S65B | 1.0 dia. | SUS301 stainless steel
E39-S65C | 2.0 dia. | SUS301 stainless steel

**Slits**
E39-S65D
E39-S65E
E39-S65F

**Model** | **Size A** | **Material**
--- | --- | ---
E39-S65D | 0.5 | SUS301 stainless steel
E39-S65E | 1.0 | SUS301 stainless steel
E39-S65F | 2.0 | SUS301 stainless steel

**Mounting Bracket**
E39-L44

(Mounting dimensions)

**Mounting Bracket**
E39-L104

(Mounting dimensions)

**Reflectors**
Refer to E39-R on your OMRON website for details.

**Sensor I/O Connectors**
Refer to XS3 or XS5 on your OMRON website for details.
Read and understand this catalog.

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