Oil-resistant, Robust, Compact Photoelectric Sensor

**E3ZM-C**

Photoelectric Sensor for the Automotive and Machine Tool Industries

- Oil-resistant, rugged body made of stainless steel.
- Spot visibility improved to as far as 1 m away.
- Product lineup includes Through-beam Models with Orange Spot.
- Product lineup includes M12 Smartclick pre-wired connector models.

⚠️ Refer to Safety Precautions on page 11.

### Features

**Industry Top** A Sensor with Stainless Steel Housing That’s Strong, Compact, and Easy to Use!

**Resists Oils and Coolants**

The E3ZM-C features a simple shape and structure, and yet provides IP67 protection and oil resistance (oil resistant to OMRON in-house standard). This performance exceeds any previous models from OMRON.

The protective structure eliminates the need for screws to hold a cover, so there are no worries about loose screws leading to liquid penetration.

And the model number is laser-marked on the housing so it’s always readable when the time comes to order maintenance parts.

The compact, easy-to-use E3ZM-C with built-in amplifier is ideal for oily environments.

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**Comparison Example for Oil Resistance (Test Oil: Gryton 1700D)**

<table>
<thead>
<tr>
<th>Immersion time (h)</th>
<th>Insulation resistance (MΩ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1,000</td>
</tr>
<tr>
<td>50</td>
<td>500</td>
</tr>
<tr>
<td>100</td>
<td>250</td>
</tr>
<tr>
<td>1,000</td>
<td>50</td>
</tr>
</tbody>
</table>

- **E3ZM-C**
- **Previous metal sensor**

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**E3ZM-C Laser Marking**
**Visible Beam. Long-distance Operation Even in Dusty, Dirty Environments**

The E3ZM-CT\[2\]B uses a bright orange LED to generate a spot that's visible 1 m away. And the sensing distance of 20 m provides more leeway in detection (response time: 2 ms). It all adds up to a more visible, more dependable worksite.

**World's Smallest, and Yet Robust**

The E3ZM-C is the same compact size as the E3Z, making it the smallest square metal photoelectric sensor in the world (according to OMRON investigation).

The SUS316L housing makes it robust, and removes all worries of the coating coming off.

**Simple, Yet Dependable M12 Twist-and-Click Pre-wired Connectors**

These Connectors match the XS5 Connectors released from August 2006, which reduce wiring work. They eliminate the troublesome need to control torque when tightening connectors, and remove worries about screws loosening due to vibration.

**Unique Miniaturization and Modularization Technologies**

- **Sensing Module**
  - The optical system and signal processing are all contained in one module, providing all the main functions required of a Photoelectric Sensor.

- **Optical System**
  - Maximizes manufacturing technology, including sophisticated inline optical axis adjustment.

- **Signal Processing**
  - Leading-edge technology for stabilization and miniaturization is obvious in the photo IC, which includes an external light interference prevention algorithm, CSP* mounting, and other components.

  *Chip Scale Package

**Application Precaution** Use the E3ZM-T/-R/-D/-LS in food processing or beverage filling applications where cleaners or disinfectants are present.
## Ordering Information

### Sensors (Refer to Dimensions on page 13.)

<table>
<thead>
<tr>
<th>Sensing method</th>
<th>Appearance</th>
<th>Connection method</th>
<th>Sensing distance</th>
<th>Model</th>
<th>NPN output</th>
<th>PNP output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Through-beam (Emitter + Receiver)*1</td>
<td><img src="image1.png" alt="Image" /></td>
<td>Pre-wired (2 m)</td>
<td></td>
<td>E3ZM-CT61 2M</td>
<td>E3ZM-CTB1 2M</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Emitter E3ZM-CT61-L 2M</td>
<td>Emitter E3ZM-CTB1-L 2M</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Receiver E3ZM-CT61-D 2M</td>
<td>Receiver E3ZM-CTB1-D 2M</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pre-wired (5 m)</td>
<td>15 m</td>
<td>E3ZM-CT61 5M</td>
<td>E3ZM-CTB1 5M</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Emitter E3ZM-CT61-L 5M</td>
<td>Emitter E3ZM-CTB1-L 5M</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Receiver E3ZM-CT61-D 5M</td>
<td>Receiver E3ZM-CTB1-D 5M</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>M12 twist-and-click pre-wired connector (0.3 m)</td>
<td></td>
<td>E3ZM-CT61-M1TJ 0.3M</td>
<td>E3ZM-CTB1-M1TJ 0.3M</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Emitter E3ZM-CT61-L-M1TJ 0.3M</td>
<td>Emitter E3ZM-CTB1-L-M1TJ 0.3M</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Receiver E3ZM-CT61-D-M1TJ 0.3M</td>
<td>Receiver E3ZM-CTB1-D-M1TJ 0.3M</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pre-wired (2 m)</td>
<td>20 m</td>
<td>E3ZM-CT62B 2M</td>
<td>E3ZM-CTB2B 2M</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Emitter E3ZM-CT62B-L 2M</td>
<td>Emitter E3ZM-CTB2B-L 2M</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Receiver E3ZM-CT62B-D 2M</td>
<td>Receiver E3ZM-CTB2B-D 2M</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pre-wired (5 m)</td>
<td></td>
<td>E3ZM-CT62B 5M</td>
<td>E3ZM-CTB2B 5M</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Emitter E3ZM-CT62B-L 5M</td>
<td>Emitter E3ZM-CTB2B-L 5M</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Receiver E3ZM-CT62B-D 5M</td>
<td>Receiver E3ZM-CTB2B-D 5M</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>M12 twist-and-click pre-wired connector (0.3 m)</td>
<td></td>
<td>E3ZM-CT62B-M1TJ 0.3M</td>
<td>E3ZM-CTB2B-M1TJ 0.3M</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Emitter E3ZM-CT62B-L-M1TJ 0.3M</td>
<td>Emitter E3ZM-CTB2B-L-M1TJ 0.3M</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Receiver E3ZM-CT62B-D-M1TJ 0.3M</td>
<td>Receiver E3ZM-CTB2B-D-M1TJ 0.3M</td>
<td></td>
</tr>
<tr>
<td>Retro-reflective</td>
<td><img src="image2.png" alt="Image" /></td>
<td>Pre-wired (2 m)</td>
<td>4 m *2</td>
<td>E3ZM-CR61 2M</td>
<td>E3ZM-CRB1 2M</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(100 mm)</td>
<td>E3ZM-CR61-M1TJ 0.3M</td>
<td>E3ZM-CRB1-M1TJ 0.3M</td>
<td></td>
</tr>
<tr>
<td>Diffuse-reflective</td>
<td><img src="image3.png" alt="Image" /></td>
<td>Pre-wired (2 m)</td>
<td>1 m</td>
<td>E3ZM-CD62 2M</td>
<td>E3ZM-CD82 2M</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>E3ZM-CD62-M1TJ 0.3M</td>
<td>E3ZM-CD82-M1TJ 0.3M</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>M12 twist-and-click pre-wired connector (0.3 m)</td>
<td></td>
<td>E3ZM-CL61H 2M</td>
<td>E3ZM-CLB1H 2M</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>E3ZM-CL61H-M1TJ 0.3M</td>
<td>E3ZM-CLB1H-M1TJ 0.3M</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pre-wired (2 m)</td>
<td>10 to 100 mm</td>
<td>E3ZM-CL62H 2M</td>
<td>E3ZM-CLB2H 2M</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>E3ZM-CL62H-M1TJ 0.3M</td>
<td>E3ZM-CLB2H-M1TJ 0.3M</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>M12 twist-and-click pre-wired connector (0.3 m)</td>
<td></td>
<td>E3ZM-CL64H 2M</td>
<td>E3ZM-CLB4H 2M</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>E3ZM-CL64H-M1TJ 0.3M</td>
<td>E3ZM-CLB4H-M1TJ 0.3M</td>
<td></td>
</tr>
</tbody>
</table>

*1. Through-beam Sensors are normally sold in sets that include both the Emitter and Receiver.
*2. Set the distance between the Sensor and the Reflector so that it is at least the value in parentheses.

**We Can Manufacture Other Models to Meet Your Requirements**

1. Retro-reflective, Diffuse-reflective, and BGS-reflective Models are also available with a 5-m pre-wired cable. When ordering, add the cable length to the end of the model number (e.g., E3ZM-CD62-5M).
2. Models with no moving parts (i.e., without a sensitivity adjustor or mode selection switch) are also available, as are models with built-in slits (through-beam, 0.8 m) (e.g., E3ZM-CT83H 2M for no sensitivity adjustment, wire-connection selection of operation mode, and built-in slit).
3. Through-beam Models are also available with a light emission stop function. When ordering, add “-G0” to the end of the model number (e.g., E3ZM-CT61-G0-2M).

Ask your OMRON representative for information on models, specifications, delivery, and whether there are any new modifications.
Accessories

Sensor I/O Connectors (Models with Pre-wired Connectors: A Connector is not provided with the Sensor. Be sure to order a Connector separately.) (Refer to Dimensions on XS5.)

<table>
<thead>
<tr>
<th>Size</th>
<th>Cable specifications</th>
<th>Appearance</th>
<th>Cable</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>M12 (For -M1TJ models)</td>
<td>Standard</td>
<td>Straight</td>
<td>2 m</td>
<td>XS5F-D421-D80-A</td>
</tr>
<tr>
<td></td>
<td>oil-resistant cable (polyurethane)</td>
<td></td>
<td>5 m</td>
<td>XS5F-D421-G80-A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2 m</td>
<td>XS5F-D421-D80-P</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5 m</td>
<td>XS5F-D421-G80-P</td>
</tr>
</tbody>
</table>

Note 1. When using a Through-beam Sensor, order one Connector for the Receiver and one for the Emitter.
2. Ask your OMRON representative about connectors with other specifications.

Mounting Brackets A Mounting Bracket is not provided with the Sensor. Order a Mounting Bracket separately if required. (Refer to Dimensions on E39-L/F39-L/E39-S/E39-R.)

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

Note: When using a Through-beam Sensor, order one Mounting Bracket for the Receiver and one for the Emitter.
*Cannot be used for Standard Connector models.

Reflector (A Reflector is required for Retro-reflective Sensors: A Reflector is not provided with the Sensor. Be sure to order a Reflector.) (Refer to Dimensions on E39-L/F39-L/E39-S/E39-R.)

<table>
<thead>
<tr>
<th>Name</th>
<th>E3ZM-CR sensing distance (typical) *</th>
<th>Model</th>
<th>Quantity</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reflector</td>
<td>3 m (100 mm) (rated value)</td>
<td>E39-R1</td>
<td>1</td>
<td>- Reflectors are not provided with Retroreflective models. - The MSR function is enabled.</td>
</tr>
<tr>
<td></td>
<td>4 m (100 mm) (rated value)</td>
<td>E39-R1S</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 m (100 mm)</td>
<td>E39-R2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.5 m (100 mm)</td>
<td>E39-R9</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.5 m (100 mm)</td>
<td>E39-R10</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Small Reflector</td>
<td>1.5 m (50 mm)</td>
<td>E39-R3</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Note: When using a Reflector without a rated value, use 0.7 times typical value as a guideline for the sensing distance.
*Set the distance between the Sensor and the Reflector so that it is at least the value in parentheses.
### Ratings and Specifications

<table>
<thead>
<tr>
<th>Sensing method</th>
<th>Through-beam</th>
<th>Retro-reflective with MSR function</th>
<th>Diffuse-reflective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td></td>
<td>E3ZM-CT61 (-M1TJ)</td>
<td>E3ZM-CD62 (-M1TJ)</td>
</tr>
<tr>
<td>Item</td>
<td>NPN output</td>
<td>E3ZM-CT62B (-M1TJ)</td>
<td>E3ZM-CD62 (-M1TJ)</td>
</tr>
<tr>
<td>Sensing distance</td>
<td>15 m</td>
<td>20 m</td>
<td>4 m [100 mm] *1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3 m [100 mm] *1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Using E39-R15)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 m</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(White paper 300 x 300 mm)</td>
</tr>
</tbody>
</table>

### Spot diameter

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### Standard sensing object

Opaque: 12-mm dia. min.

Opaque: 75-mm dia. min.

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### Differential travel

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### Reflectivity characteristic (black/white error)

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### Directional angle

Emitter, Receiver: 3° to 15°

(Distance between emitter and receiver. Rated sensing distance)

Sensor: 3° to 10°

(Reflector: 30° (Distance to Reflector. Rated sensing distance))

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### Light source (wavelength)

Infrared LED (870 nm)

Orange LED (615 nm)

Red LED (660 nm)

Infrared LED (860 nm)

### Power supply voltage

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

### Current consumption

40 mA (Emitter 20 mA max., Receiver 20 mA max.)

25 mA max.

### Control output

Load power supply voltage: 30 VDC max., Load current: 100 mA max. (Residual voltage: 2 V max.)

Open-collector output (NPN/PNP output depending on model)

Light ON/Dark ON switch selectable

### Protection circuits

Reversed power supply polarity protection, Output short-circuit protection, Reversed output polarity protection

Reversed power supply polarity protection, Output short-circuit protection, Reversed output polarity protection, Mutual interference prevention

### Response time

Operate or reset: 1 ms max.

Operate or reset: 2 ms max.

Operate or reset: 1 ms max.

### Sensitivity adjustment

One-turn adjuster

### Ambient illumination (Receiver side)

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

### Ambient temperature range

Operating: −25 to 55°C, Storage: −40 to 70°C (with no icing or condensation)

### Ambient humidity range

Operating: 35% to 85%, Storage: 35% to 95% (with no condensation)

### Insulation resistance

20 MΩ min. at 500 VDC

### Dielectric strength

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 *2

IEC IP67 (oil resistance to OMRON in-house standard), DIN 40050-9: IP69K

### Connection method

Pre-wired (standard length: 2 m), -M1TJ: Pre-wired connector (standard length: 300 mm)

### Indicators

Operation indicator (yellow), Stability indicator (green) (Emitter has only power supply indicator (green)).

### Weight

Pre-wired models:

Approx. 150 g

Approx. 90 g

### Housing material

SUS316L

### Cable material

Oil-resistant vinyl chloride

### Lens material

PMMA (polymethylmethacrylate)

### Indicator material

PES (polyethersulfone)

### Sensitivity adjustment and mode selector switch

PEEK (polyetheretherketone)

### Seal material

Fluoro rubber

### Accessories

Instruction sheet (Note: Reflectors and Mounting Brackets are sold separately.)

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

2. IP69K Degree of Protection Specification

IP69K is a protection standard against high temperature and high-pressure water defined in the German standard DIN 40050, Part 9.

The test piece is sprayed with water at 80°C at a water pressure of 80 to 100 BAR using a specified nozzle shape at a rate of 14 to 16 liters/min. The distance between the test piece and nozzle is 10 to 15 cm, and water is sprayed horizontally for 30 seconds each at 0°, 30°, 60° and 90° while rotating the test piece on a horizontal plane.
**E3ZM-C**

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**IP69K Degree of Protection Specification**

IP69K is a protection standard against high temperature and high-pressure water defined in the German standard DIN 40050, Part 9. The test piece is sprayed with water at 80 °C at a water pressure of 60 to 100 BAR using a specified nozzle shape at a rate of 14 to 16 liters/min. The distance between the test piece and nozzle is 10 to 15 cm, and water is sprayed horizontally for 30 seconds each at 0°, 30°, 60°, and 90° while rotating the test piece on a horizontal plane.

---

### Sensing method

<table>
<thead>
<tr>
<th>Model</th>
<th>NPN output</th>
<th>PNP output</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>E3ZM-CL61H (-M1TJ)</strong></td>
<td><strong>E3ZM-CL62H (-M1TJ)</strong></td>
<td><strong>E3ZM-CL64H (-M1TJ)</strong></td>
</tr>
<tr>
<td><strong>Sensing distance</strong></td>
<td>10 to 100 mm</td>
<td>10 to 150 mm</td>
</tr>
<tr>
<td>(White paper 100 × 100 mm)</td>
<td>(White paper 100 × 100 mm)</td>
<td>(White paper 100 × 100 mm)</td>
</tr>
<tr>
<td><strong>Spot diameter</strong></td>
<td>4-mm dia. at sensing distance of 100 mm</td>
<td>12-mm dia. at sensing distance of 150 mm</td>
</tr>
<tr>
<td><strong>Standard sensing object</strong></td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>Differential travel</strong></td>
<td>3% of sensing distance max.</td>
<td>15% of sensing distance max.</td>
</tr>
<tr>
<td><strong>Reflectivity characteristics</strong></td>
<td>(black/white error)</td>
<td>5% of sensing distance max.</td>
</tr>
<tr>
<td><strong>Directional angle</strong></td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>Light source (wavelength)</strong></td>
<td>Red LED (650 nm)</td>
<td>Red LED (660 nm)</td>
</tr>
<tr>
<td><strong>Power supply voltage</strong></td>
<td>10 to 30 VDC, including 10% ripple (p-p)</td>
<td>---</td>
</tr>
<tr>
<td><strong>Current consumption</strong></td>
<td>25 mA max.</td>
<td>---</td>
</tr>
</tbody>
</table>

**Sensing method**

**BGS Reflective**

**Sensing distance**

- **E3ZM-CL61H (-M1TJ)**: 10 to 100 mm (White paper 100 × 100 mm)
- **E3ZM-CL62H (-M1TJ)**: 10 to 150 mm (White paper 100 × 100 mm)
- **E3ZM-CL64H (-M1TJ)**: 10 to 200 mm (White paper 100 × 100 mm)

**Spot diameter**

- **E3ZM-CL61H (-M1TJ)**: 4-mm dia. at sensing distance of 100 mm
- **E3ZM-CL62H (-M1TJ)**: 12-mm dia. at sensing distance of 150 mm
- **E3ZM-CL64H (-M1TJ)**: 18-mm dia. at sensing distance of 200 mm

**Standard sensing object**

---

**Differential travel**

- 3% of sensing distance max.
- 15% of sensing distance max.
- 20% of sensing distance max.

**Reflectivity characteristics**

- 5% of sensing distance max.
- 10% of sensing distance max.
- 20% of sensing distance max.

**Directional angle**

---

**Light source (wavelength)**

- Red LED (650 nm)
- Red LED (660 nm)

**Power supply voltage**

- 10 to 30 VDC, including 10% ripple (p-p)
- 25 mA max.

**Control output**

- Load power supply voltage: 30 VDC max., Load current: 100 mA max. (Residual voltage: 2 V max.)
- Open-collector output (NPN/PNP output depending on model)
- Light ON/Dark ON cable connection selectable

**Protection circuits**

- Reversed power supply polarity protection
- Output short-circuit protection
- Reversed output polarity protection
- Mutual interference protection

**Response time**

- Operate or reset: 1 ms max.

**Sensitivity adjustment**

---

**Ambient illumination**

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

**Ambient temperature range**

- Operating: –25 to 55°C, Storage: –40 to 70°C (with no icing or condensation)

**Ambient humidity range**

- Operating: 35% to 85%, Storage: 35% to 95% (with no condensation)

**Insulation resistance**

- 20 MΩ min. at 500 VDC

**Dielectric strength**

- 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 IP67 (oil resistance to OMRON standards), DIN 40050-9: IP69K

**Connection method**

- Pre-wired (standard length: 2 m), -M1TJ: Pre-wired connector (standard length: 300-mm)

**Indicators**

- Operation indicator (yellow), Stability indicator (green)

**Weight**

- Pre-wired models: Approx. 90 g

**Housing material**

- SUS316L

**Cable material**

- Oil-resistant vinyl cable

**Lens material**

- PMMA (polymethylmethacrylate)

**Indicator material**

- PES (polyethersulfone)

**Seal material**

- Fluoro rubber

**Accessories**

- Instruction sheet (Note: Mounting Brackets are sold separately.)

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Engineering Data (Typical)

Parallel Operating Range
Through-beam Models
E3ZM-CT

Retro-reflective Models
E3ZM-CR

Operating Range
Diffuse-reflective Models
E3ZM-CD

BGS Reflective Models
E3ZM-CL

E3ZM-CT2

E3ZM-CT2B

E3ZM-CR1

E3ZM-CL2H (Vertical)

E3ZM-CL2H (Horizontal)

E3ZM-CL4H (Vertical)

Sensing object: 300 × 300 mm white paper

Sensing object: 100 × 100 mm white paper

Sensing object: 100 × 100 mm white paper

Sensing object: 100 × 100 mm white paper

Sensing object: 100 × 100 mm white paper

Distance Y (mm)
Distance X (m)
**Excess Gain vs. Distance**

Through-beam Models
E3ZM-CT

Retro-reflective Models
E3ZM-CR

**Sensing Object Size vs. Distance**

Diffuse-reflective Models
E3ZM-CD

**Spot Diameter vs. Distance**

BGS Reflective Models
E3ZM-CL

**Sensing Distance vs. Sensing Object Material**

BGS Reflective Models
E3ZM-CL
### I/O Circuit Diagrams

#### NPN Output

<table>
<thead>
<tr>
<th>Model</th>
<th>Operation mode</th>
<th>Timing charts</th>
<th>Operation selector switch</th>
<th>Output circuit</th>
</tr>
</thead>
<tbody>
<tr>
<td>E3ZM-CT61*</td>
<td>Light ON</td>
<td>Incident light</td>
<td>L side (LIGHT ON)</td>
<td>Through-beam Receivers, Retro-reflective Models</td>
</tr>
<tr>
<td>E3ZM-CT62B*</td>
<td></td>
<td>No incident light</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E3ZM-CR61</td>
<td>Dark ON</td>
<td>Operation indicator</td>
<td>D side (DARK ON)</td>
<td>Load (e.g., relay)</td>
</tr>
<tr>
<td>E3ZM-CD62</td>
<td></td>
<td>On</td>
<td>(Between brown and black leads)</td>
<td></td>
</tr>
</tbody>
</table>

#### PNP Output

<table>
<thead>
<tr>
<th>Model</th>
<th>Operation mode</th>
<th>Timing charts</th>
<th>Operation selector switch</th>
<th>Output circuit</th>
</tr>
</thead>
<tbody>
<tr>
<td>E3ZM-CT81*</td>
<td>Light ON</td>
<td>Incident light</td>
<td>L side (LIGHT ON)</td>
<td>Through-beam Receivers, Retro-reflective Models</td>
</tr>
<tr>
<td>E3ZM-CT82B*</td>
<td></td>
<td>No incident light</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E3ZM-CR81</td>
<td>Dark ON</td>
<td>Operation indicator</td>
<td>D side (DARK ON)</td>
<td>Load (e.g., relay)</td>
</tr>
<tr>
<td>E3ZM-CD82</td>
<td></td>
<td>On</td>
<td>(Between blue and black leads)</td>
<td></td>
</tr>
</tbody>
</table>

#### Emitter (Either NPN or PNP Output)

<table>
<thead>
<tr>
<th>Model*</th>
<th>Circuit</th>
</tr>
</thead>
<tbody>
<tr>
<td>E3ZM-CT61</td>
<td><img src="image1" alt="Emitter Diagram" /></td>
</tr>
<tr>
<td>E3ZM-CT62B</td>
<td></td>
</tr>
<tr>
<td>E3ZM-CR81</td>
<td></td>
</tr>
<tr>
<td>E3ZM-CD82</td>
<td></td>
</tr>
</tbody>
</table>

*Models numbers for Through-beam Sensors (E3ZM-CT...-M11J) 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: E3ZM-CT61-L 2M), the model number of the Receiver, by adding “-D” (example: E3ZM-CT61-D 2M). Refer to Ordering Information to confirm model numbers for Emitter and Receivers.
Connector Pin Arrangement
M12 Pre-wired Connector
M12 Connector Pin Arrangement

Plugs (Sensor I/O Connectors)
M12 Smartclick Connector

Nomenclature

Sensors with Sensitivity Adjuster and Operation Selector
Through-beam Models
E3ZM-CT□□ (Receiver)
Retro-reflective Models
E3ZM-CR□□
Diffuse-reflective Models
E3ZM-CD□□

Non-adjustable Emitter
BGS Reflective Models
E3ZM-CL□□H
Through-beam Models
E3ZM-CT□□ (Emitter)

Stability indicator (green)
Operation indicator (yellow)
Sensitivity adjuster
Stability indicator (green) or Emitter power supply indicator (green)
Operation indicator (yellow)
Note: Emitter: No indicator

Operation selector switch
Safety Precautions

Refer to Warranty and Limitations of Liability.

![WARNING]
This product is not designed or rated for directly or indirectly ensuring safety of persons. Do not use it for such a purpose.

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

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

When cleaning the product, do not apply a high-pressure spray of water to one part of the product. Otherwise, parts may become damaged and the degree of protection may be degraded.

High-temperature environments may result in burn injury.

![Precautions for Safe Use]
The following precautions must be observed to ensure safe operation of the Sensor.

**Operating Environment**
Do not use the Sensor in an environment where explosive or flammable gas is present.

**Connecting Connectors**
Be sure to hold the connector cover when inserting or removing the connector. Be sure to tighten the connector lock by hand; do not use pliers or other tools. If the tightening is insufficient, the degree of protection will not be maintained and the Sensor may become loose due to vibration. The appropriate tightening torque is 0.39 to 0.49 N·m for M12 metal connectors and 0.3 to 0.4 N·m for M8 metal connectors.

**Load**
Do not use a load that exceeds the rated load.

**Low-temperature Environments**
Do not touch the metal surface with your bare hands when the temperature is low. Touching the surface may result in a cold burn.

**Rotation Torque for Sensitivity Adjustment and Selector Switch**
Adjust with a torque of 0.06 N·m or less.

**Environments with Cleaners and Disinfectants (e.g., Food Processing Lines)**
Do not use the Sensor in environments subject to cleaners and disinfectants. They may reduce the degree of protection.

**Modifications**
Do not attempt to disassemble, repair, or modify the Sensor.

**Outdoor Use**
Do not use the Sensor in locations subject to direct sunlight.

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

**Surface Temperature**
Burn injury may occur. The Sensor surface temperature rises depending on application conditions, such as the ambient temperature and the power supply voltage. Use caution when operating or performing maintenance on the Sensor.
Precautions for Correct Use
Do not use the Sensor in any atmosphere or environment that exceeds the ratings.
**Do not install the Sensor in the following locations.**
1. Locations subject to direct sunlight
2. Locations subject to condensation due to high humidity
3. Locations subject to corrosive gas
4. Locations where the Sensor may receive direct vibration or shock

**Connecting and Mounting**
1. 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.
2. Laying Sensor wiring in the same conduit or duct as high-voltage wires or power lines may result in malfunction or damage due to induction. As a general rule, wire the Sensor in a separate conduit or use shielded cable.
3. Use an extension cable with a minimum thickness of 0.3 mm² and less than 100 m long.
4. Do not pull on the cable with excessive force.
5. Pounding the Photoelectric Sensor with a hammer or other tool during mounting will impair water resistance. Also, use M3 screws.
6. Mount the Sensor either using the bracket (sold separately) or on a flat surface.
7. Be sure to turn OFF the power supply before inserting or removing the connector.

**Cleaning**
Never use thinner or other solvents. Otherwise, the Sensor surface may be dissolved.

**Power Supply**
If a commercial switching regulator is used, ground the FG (frame ground) terminal.

**Power Supply Reset Time**
The Sensor will be able to detect objects 100 ms after the power supply is tuned ON. Start using the Sensor 100 ms or more after turning ON the power supply. If the load and the Sensor are connected to separate power supplies, be sure to turn ON the Sensor first.

**Turning OFF the Power Supply**
Output pulses may be generated even when the power supply is OFF. Therefore, it is recommended to first turn OFF the power supply for the load or the load line.

**Load Short-circuit Protection**
This Sensor is equipped with load short-circuit protection, but be sure to not short circuit the load. Be sure to not use an output current flow that exceeds the rated current. If a load short circuit occurs, the output will turn OFF, so check the wiring before turning ON the power supply again. The short-circuit protection circuit will be reset. The load short-circuit protection will operate when the current flow reaches 1.8 times the rated load current. When using a capacitive load, use an inrush current of 1.8 times the rated load current or lower.

**Water Resistance**
Do not use the Sensor in water, rainfall, or outdoors.

**When disposing of the Sensor, treat it as industrial waste.**

**Mounting Diagram**

![Mounting Bracket (order separately)](E39-L104)

**Oil Resistance**
The Sensor has passed oil resistance testing for the oils listed in the following table. Use this table as a guide when considering lubricants and cutting oils.

<table>
<thead>
<tr>
<th>Test oil type</th>
<th>Product name</th>
<th>Kinetic viscosity at 40°C (mm²/s)</th>
<th>pH (dilution rate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lubricants</td>
<td>Velocity Oil No. 3</td>
<td>2.02</td>
<td>---</td>
</tr>
<tr>
<td>Non-water-soluble cutting oils</td>
<td>Yushiroken Oil No.2 AC</td>
<td>Less than 10</td>
<td>---</td>
</tr>
<tr>
<td>Water-soluble cutting oils</td>
<td>Yushiroken EC50T3</td>
<td>10.1 (&lt;30)</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>Yushiroken EC50T5</td>
<td>9.9 (&lt;30)</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>Yushiroken S46D</td>
<td>9.9 (&lt;50)</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>Yushiroken S50N</td>
<td>8.6 (&lt;50)</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>Yushiroken Lubric HWC68</td>
<td>9.1 (&lt;30)</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>Yushiroken Synthetic #770TG</td>
<td>9.9 (&lt;20)</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>Emulcut FA-900ST</td>
<td>9.7 (&lt;30)</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>Multicool CSF-9000</td>
<td>9.7 (&lt;20)</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>Sugcut CS-68JS-1</td>
<td>9.6 (&lt;20)</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>Toyocool 3A-666</td>
<td>9.6 (&lt;20)</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>Gryton 1700</td>
<td>9.1 (&lt;10)</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>Gryton 1700D</td>
<td>9.3 (&lt;3)</td>
<td>---</td>
</tr>
</tbody>
</table>

Note 1. The Sensor was immersed in the above oils for 240 h at 55°C and then passed an insulation resistance test at 100 MΩ.
2. Use the kinetic viscosities and pHs in the above table as a guide when using the Sensor in environments containing oils not listed in the table. Additives in the oil may also affect performance. Always test applicability in advance.
For models with M8 connectors, refer to the dimensions of models with the same sensing method in Dimensions in the E3ZM Datasheet. The dimensions of the E3ZM-C and E3ZM are the same.

**Sensors**

**Through-beam Models**

- **Pre-wired Models**
  - E3ZM-CT61
  - E3ZM-CT81
  - E3ZM-CT62B
  - E3ZM-CT82B

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Emitter</th>
<th>Power indicator (green)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emitter</td>
<td>6.4 dia.</td>
<td></td>
</tr>
<tr>
<td>Emitter</td>
<td>6.4 dia.</td>
<td></td>
</tr>
<tr>
<td>Emitter</td>
<td>2.8</td>
<td></td>
</tr>
<tr>
<td>Emitter</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Emitter</td>
<td>25.4</td>
<td></td>
</tr>
<tr>
<td>Emitter</td>
<td>10.8</td>
<td></td>
</tr>
</tbody>
</table>

**M12 Pre-wired Connector**

- **E3ZM-(-M1TJ)**

<table>
<thead>
<tr>
<th>Terminal No.</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+V</td>
</tr>
<tr>
<td>2</td>
<td>---</td>
</tr>
<tr>
<td>3</td>
<td>0 V</td>
</tr>
<tr>
<td>4</td>
<td>---</td>
</tr>
</tbody>
</table>

**Receiver**

- **Operation Indicator (yellow)**
- **Stability indicator (green)**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Emitter</th>
<th>Power indicator (green)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receiver</td>
<td>6.4 dia.</td>
<td></td>
</tr>
<tr>
<td>Receiver</td>
<td>6.4 dia.</td>
<td></td>
</tr>
<tr>
<td>Receiver</td>
<td>2.8</td>
<td></td>
</tr>
<tr>
<td>Receiver</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Receiver</td>
<td>25.4</td>
<td></td>
</tr>
<tr>
<td>Receiver</td>
<td>10.8</td>
<td></td>
</tr>
</tbody>
</table>

**M12 Pre-wired Connector**

- **E3ZM-(-M1TJ)**

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

**Retro-reflective Models**

- **Pre-wired Models**
  - E3ZM-CR61
  - E3ZM-CR81

**Diffuse-reflective Models**

- **Pre-wired Models**
  - E3ZM-CD62
  - E3ZM-CD82

**BGS Reflective Models**

- **Pre-wired Models**
  - E3ZM-CL61H
  - E3ZM-CL62H
  - E3ZM-CL64H
  - E3ZM-CL81H
  - E3ZM-CL82H
  - E3ZM-CL84H

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

*Models numbers for Through-beam Sensors (E3ZM-CT-(-M1TJ)) 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: E3ZM-CT61-L 2M), the model number of the Receiver, by adding "-D"(example: E3ZM-CT61-D 2M.) Refer to Ordering Information to confirm model numbers for Emitter and Receivers.
Terms and Conditions of Sale

1. Offer, Acceptance. These terms and conditions (these “Terms”) are deemed part of the quotation, sales orders, purchase orders, contracts, catalogs, manuals, brochures and other documents, whether electronic or in written form, issued by Omron Electronics LLC and its subsidiaries (Omron”). Omron objects to any terms or conditions proposed in Buyer’s purchase order or other documents which are inconsistent with, or in addition to, these Terms.

2. Prices; Payment Terms. All prices stated are current, subject to change without notice, and Buyer reserves the right to increase or decrease prices on any unshipped portions of outstanding orders. Payments for Products are due net 30 days unless otherwise stated in the invoice.

3. Deliveries and Claims. If any shipment will be delivered by a carrier, Buyer may inspect the Products at the carrier’s premises, and may reject any Products if the invoice is paid according to Omron’s payment terms and (ii) Buyer has not paid due amounts.

4. Interest. Omron, at its option, may charge Buyer 1-1/2% interest per month or any other maximum interest rate allowed by law, on all unpaid accounts.

5. Cancellation; Etc. Buyer shall have no right to set off any amounts due to Omron in the condition claimed. To receive any credit, Buyer must notify Omron within 30 days of receipt of shipment and include the original transaction number or invoice number on the bill of returns.

6. Taxes. Data presented in Omron Company websites, catalogs, and other printed materials are not to be construed as an amendment or addition to the above warranty. See http://www.omron247.com or contact your Omron representative for published information.

7. Warranties. Except as otherwise stated in writing by Omron, all Omron products sold by Omron (whether designated “New,” “Refurbished,” “Reconditioned,” or the like) are sold “AS IS” and “WITH ALL FAULTS.” Buyer acknowledges and agrees that Omron makes no warranty of merchantability, warranty of fitness for any particular purpose, warranty of non-infringement, warranty of freedom from defects or errors in the Products, warranty of title, or any other warranty, expressed or implied, whether oral or written.

8. Limitation on Liability; Etc. Further, in no event shall liability of Omron Companies exceed the individual amount paid by Buyer for the Product, or (iii) repay or credit Buyer an amount equal to the purchase price of the non-complying Product; provided that in no event shall Omron be responsible for any warranty, repair, interchange, or other returns or exchanges with respect to the Products unless Omron’s analysis confirms that the Products were properly handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification. Return of any Products by Buyer must be approved in writing by Omron before shipment. Omron Compa-

9. Cancellation; Etc. Buyer shall have no right to set off any amounts due to Omron in the condition claimed. To receive any credit, Buyer must notify Omron within 30 days of receipt of shipment and include the original transaction number or invoice number on the bill of returns.

10. Export Control. Buyer shall comply with all applicable laws, regulations and licences regarding (i) export of products or information; (ii) sale of products to “forbidden” or other proscribed persons; and (ii) disclosure to non-citizens of controlled technology or information.

11. Product Liability. Except as otherwise stated in writing by Omron, Omron makes no warranty of merchantability, warranty of fitness for any particular purpose, warranty of non-infringement, warranty of freedom from defects or errors in the Products, warranty of title, or any other warranty, expressed or implied, whether oral or written.

12. Governing Law and Venue. Any suit or action brought against any Omron Company to the extent based on a claim of infringement of any intellectual property right. (c) Buyer Remedy. Buyer may not assign its rights hereunder without Omron’s written consent. (d) Law. These Terms are governed by the laws of the jurisdiction of the home office of the Omron company from which Buyer is purchasing the Product (without regard to any conflict of law or venue selection provisions). (e) Amendment. These Terms constitute the entire agreement between Buyer and Omron relating to the combination of the Product with any other product, service, or system. (f) Severability. If any provision hereof is rendered ineffective or invalid, such provision shall not invalidate any other provision. (g) Notice. Buyer shall give notice of any claim, demand, or dispute against the amount owing in respect of this invoice, (h) Definitions. As used herein, “including” means including, but not limited to, and any other period not otherwise specified.

13. Performance Data. Buyer may not use any data presented in Omron Company websites, catalogs, and other printed materials for any purpose without the written permission of Omron. Notwithstanding any charges to Buyer for engineering or testing, all engineering and testing shall remain the exclusive property of Omron, and Buyer shall give notice of any claim, demand, or dispute against the amount owing in respect of this invoice, and Buyer shall limit distribution thereof to its trusted employees and strictly prevent disclosure to any third party.

14. Miscellaneous. (a) Waiver. No failure or delay by Omron in exercising any right and no course of dealing between Buyer and Omron shall operate as a waiver of rights by Omron. (b) Assignment. Buyer may not assign its rights hereunder without Omron’s written consent. (c) Law. These Terms are governed by the laws of the jurisdiction of the home office of the Omron company from which Buyer is purchasing the Product (without regard to any conflict of law or venue selection provisions). (d) Amendment. These Terms constitute the entire agreement between Buyer and Omron relating to the combination of the Product with any other product, service, or system. (f) Severability. If any provision hereof is rendered ineffective or invalid, such provision shall not invalidate any other provision. (g) Notice. Buyer shall give notice of any claim, demand, or dispute against the amount owing in respect of this invoice, (h) Definitions. As used herein, “including” means including, but not limited to, and any other period not otherwise specified.

15. Indemnities. Buyer shall indemnify and hold harmless Omron Companies and their employees from any claim, demand, or suit by any Person, regardless of whether such claim, demand, or suit arises from (i) the Products, or (ii) use of the Products in combination with any electrical or electronic components, circuits, system assemblies or any other materials or substances or environments. Any advice, recommendations or information given orally or in writing, are not to be construed as an amendment or addition to the above warranty.

16. Property; Confidentiality. (a) Title. All sales and shipments of Products shall be FOB shipping point (unless otherwise agreed in writing by Omron), and title to the Products shall pass from Omron to Buyer; provided that Omron shall retain a security inter-

17. Serial Numbers. All serial numbers and other identifying information of the Products shall be the property of Omron and shall be marked or imprinted on the Products with a permanent marking method in a manner that will not impair the mechanical or electrical integrity or usability or the results from the use of the Products in combination with any electrical or electronic components, circuits, system assemblies or any other materials or substances or environments. Any advice, recommendations or information given orally or in writing, are not to be construed as an amendment or addition to the above warranty.

18. Miscellaneous. (a) Waiver. No failure or delay by Omron in exercising any right and no course of dealing between Buyer and Omron shall operate as a waiver of rights by Omron. (b) Assignment. Buyer may not assign its rights hereunder without Omron’s written consent. (c) Law. These Terms are governed by the laws of the jurisdiction of the home office of the Omron company from which Buyer is purchasing the Product (without regard to any conflict of law or venue selection provisions). (d) Amendment. These Terms constitute the entire agreement between Buyer and Omron relating to the combination of the Product with any other product, service, or system. (f) Severability. If any provision hereof is rendered ineffective or invalid, such provision shall not invalidate any other provision. (g) Notice. Buyer shall give notice of any claim, demand, or dispute against the amount owing in respect of this invoice, (h) Definitions. As used herein, “including” means including, but not limited to, and any other period not otherwise specified.

19. Exclusivity. Buyer agrees that Omron shall have the exclusive property of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying any third party with whom it has permits, licenses or other rights to use the Product. These permits, licenses or other rights are not to be construed as an amendment or addition to the above warranty. See http://www.omron247.com or contact your Omron representative for published information.

20. Programmed Products. Omron Companies shall not be liable for any damages or liabilities resulting from the use of the Product, or any other product, or system, or any other application or use.” Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer’s application, product or system. Buyer acknowledges that application responsibility is in all cases, the following is a non-exhaustive list of applications for which particular attention must be given: (i) outdoor use; (ii) radiation sensitive equipment; (iii) high energy (ionizing) radiation; (iv) high energy charged particle radiation; (v) potential chemical contamination or electrical interference, or conditions or uses not described in this document.

21. Use in consumer products or any use in significant quantities. (ii) environmental considerations. (iii) Productivity. The Products are designed and manufactured for industrial, commercial, and automotive applications, and are not approved for use in any system, apparatus, or equipment that could present a risk to life or prop-

22. Property; Confidentiality. (a) Title. All sales and shipments of Products shall be FOB shipping point (unless otherwise agreed in writing by Omron), and title to the Products shall pass from Omron to Buyer; provided that Omron shall retain a security inter-

23. Performance Data. Data presented in Omron Company websites, catalogs, and other printed materials are not to be construed as an amendment or addition to the above warranty. See http://www.omron247.com or contact your Omron representative for published information.

24. Change in Specifications. Product specifications and accessories may be changed at any time based on improvements and other reasons. It is prac-

25. Exclusions and Omissions. Information in this document has been checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.

Certain Precautions on Specifications and Use

1. Suitability of Use. Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer’s application or use of the Product. At Buyer’s request, Omron will provide applicable third party certification documents identifying any third party with whom it has permits, licenses or other rights to use the Product. These permits, licenses or other rights are not to be construed as an amendment or addition to the above warranty. See http://www.omron247.com or contact your Omron representative for published information.

2. Programmed Products. Omron Companies shall not be responsible for the PROGRAMMED USE OF THE PRODUCT. This intent is the sole purpose of setting the Product to a specific application. It is not intended to be a limitation of liability.

3. Performance Data. Data presented in Omron Company websites, catalogs, and other printed materials are not to be construed as an amendment or addition to the above warranty. See http://www.omron247.com or contact your Omron representative for published information.

4. Change in Specifications. Product specifications and accessories may be changed at any time based on improvements and other reasons. It is prac-

5. Exclusions and Omissions. Information in this document has been checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.