

E3Z-B

CSM_E3Z-B_DS_E_9_1

Reliable Detection of Transparent Objects, Including Thin-walled Clear, Plastic Bottles

- Uses OMRON's unique optical system ("Inner View") that can detect various shapes of clear, plastic bottles.
- Detects a wide range of bottles from 500-ml bottles to 2-l bottles, and from single bottles to sets of stocked bottles.
- Provides a high degree of protection (IP67), mutual interference prevention, and EN standard compliance.



CE



Be sure to read *Safety Precautions* on page 4.

Ordering Information

Sensors

Red light

| Sensing method | Appearance | Connection method | Sensing distance | Model | |
|---|------------|------------------------|-------------------|------------------|------------------|
| | | | | NPN output | PNP output |
| Retro-reflective (without MSR function) *1 | *1 | Pre-wired (2 m) | 500 mm (80 mm) *2 | E3Z-B61 2M *4 | E3Z-B81 2M *4 *5 |
| | | Connector (M8, 4 pins) | | E3Z-B66 | E3Z-B86 |
| | | Pre-wired (2 m) | 2 m (500 mm) *2 | E3Z-B62 2M *4 *5 | E3Z-B82 2M *4 *5 |
| | | Connector (M8, 4 pins) | | E3Z-B67 | E3Z-B87 |

*1. The Reflector is sold separately.

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

*3. Install the Sensor so that plastic bottles are at least 500 mm from the Sensor when they pass.

*4. Models with a 0.5-m cable are available. When ordering, specify the cable length by adding the code "0.5M" to the model number (e.g., E3Z-B61 0.5M).

*5. M12 Standard Pre-wired Connector Models are also available.

When ordering, add "-M1J 0.3M" to the end of the model number (e.g., E3Z-B62-M1J 0.3M).

The cable is 0.3 m long.

Accessories (Order Separately)

Reflectors

| Type | Model | Sensing distance (typical) | | Quantity | Remarks |
|------------------------|---------|-----------------------------------|---------------------------------|----------|---|
| | | E3Z-B□1/-B□6 | E3Z-B□2/-B□7 | | |
| Standard | E39-R1S | 500 mm (80 mm) * (rated value) | 2 m (500 mm) * (rated value) | 1 | The E3Z-B is not provided with a Reflector. |
| Fog Preventive Coating | E39-R1K | | | 1 | |

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

Mounting Brackets

Refer to E3Z for details.

Sensor I/O Connectors

Refer to E3Z for details.

Ratings and Specifications

| Sensing method | | Retro-reflective (without MSR function) | | | | |
|--------------------------------------|-----------------------|---|---|------------------------|--|------------------------|
| Item | Model | NPN output | E3Z-B61 | E3Z-B66 | E3Z-B62 | E3Z-B67 |
| | | PNP output | E3Z-B81 | E3Z-B86 | E3Z-B82 | E3Z-B87 |
| Sensing distance | | | 500 mm (80 mm) *1 (using E39-R1S) | | 2 m (500 mm) *1 *2 (using E39-R1S) | |
| Standard sensing object | | | 500-ml (65-mm dia.) transparent round plastic bottles | | | |
| Light source (wavelength) | | | Red LED (680 nm) | | | |
| Power supply voltage | | | 12 to 24 VDC±10%, ripple (p-p): 10% max. | | | |
| Current consumption | | | 30 mA max. | | | |
| Control output | | | Load power supply voltage: 26.4 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. Open collector output (NPN/PNP depending on model) Light-ON/Dark-ON selectable | | | |
| Protection circuits | | | Reversed power supply polarity protection, Output short-circuit protection, Mutual interference prevention, and Reversed output polarity protection | | | |
| Response time | | | 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/s ² 3 times each in X, Y, and Z directions | | | |
| Degree of protection | | | IP67 (IEC60529) | | | |
| Connection method | | | Pre-wired cable (standard length: 2 m and 0.5 m) | Connector (M8, 4 pins) | Pre-wired cable (standard length: 2 m and 0.5 m) | Connector (M8, 4 pins) |
| Indicator | | | Operation indicator (orange) Stability indicator (green) | | | |
| Weight (packed state) | Pre-wired cable (2 m) | | Approx. 65 g | | | |
| | Standard Connector | | Approx. 20 g | | | |
| Material | Case | | PBT (polybutylene terephthalate) | | | |
| | Lens | | Modified polyarylate | | | |
| Accessories | | | Instruction manual (The Reflector or Mounting Bracket are ordered separately.) | | | |

*1. Values in parentheses indicate the minimum required distances between the Sensors and Reflectors.

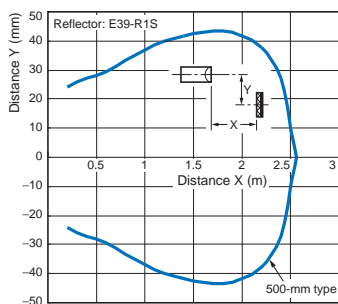
*2. Plastic bottles must pass with the minimum clearance of 500 mm.

Engineering Data (Typical)

Parallel Operating Range

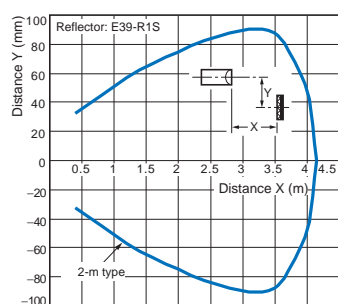
E3Z-B□1/B□6 + E39-R1S

Reflector (Order Separately)



E3Z-B□2/B□7 + E39-R1S

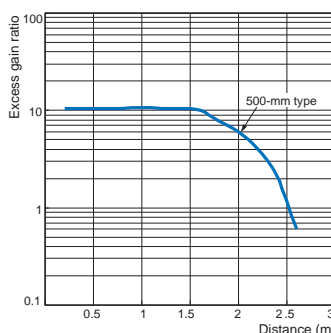
Reflector (Order Separately)



Excess Gain vs. Set Distance

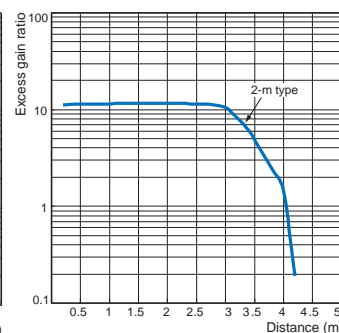
E3Z-B□1/B□6 + E39-R1S

Reflector (Order Separately)










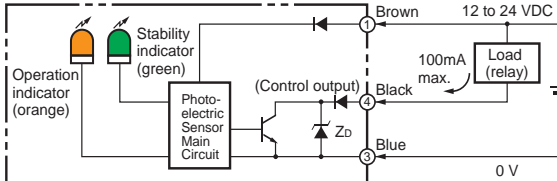








E3Z-B□2/B□7 + E39-R1S

Reflector (Order Separately)








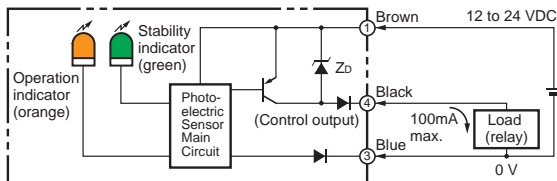










I/O Circuit Diagrams

NPN Output

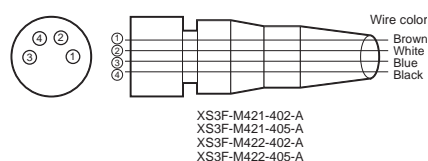
| Model | Operation mode | Timing charts | Operation selector | Output circuit |
|--|----------------|---|----------------------|---|
| E3Z-B61 E3Z-B62 E3Z-B66 E3Z-B67 | Light-ON | Incident light  No incident light  Operation indicator (orange) ON  OFF  Output transistor ON  OFF  Load Operate (e.g., relay) Reset  (Between brown and black leads) | L side (LIGHT ON) | Retro-reflective Model  Connector Pin Arrangement  Pin 2 is not used. |
| | Dark-ON | Incident light  No incident light  Operation indicator (orange) ON  OFF  Output transistor ON  OFF  Load Operate (e.g., relay) Reset  (Between brown and black leads) | D side (DARK ON) | |

PNP Output

| Model | Operation mode | Timing charts | Operation selector | Output circuit |
|--|----------------|--|----------------------|--|
| E3Z-B81 E3Z-B82 E3Z-B86 E3Z-B87 | Light-ON | Incident light  No incident light  Operation indicator (orange) ON  OFF  Output transistor ON  OFF  Load Operate (e.g., relay) Reset  (Between blue and black leads) | L side (LIGHT ON) | Retro-reflective Model  Connector Pin Arrangement  Pin 2 is not used. |
| | Dark-ON | Incident light  No incident light  Operation indicator (orange) ON  OFF  Output transistor ON  OFF  Load Operate (e.g., relay) Reset  (Between blue and black leads) | D side (DARK ON) | |

Plugs (Sensor I/O Connectors)

M8 connector



Pin arrangement

| Classifi- cation | Wire color | Connector pin No. | Application |
|---------------------|---------------|----------------------|-----------------------|
| DC | Brown | 1 | Power supply (+V) |
| | White | 2 | --- |
| | Blue | 3 | Power supply (0 V) |
| | Black | 4 | Output |

Note: Pin 2 is not used.

Safety Precautions

Refer to *Warranty and Limitations of Liability*.

**WARNING**

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



Precautions for Correct Use

Do not use the product in atmospheres or environments that exceed product ratings.

● Designing

Bottles

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

● Mounting

Sensor Mounting

If the Sensor fails to provide stable detection due to the shape of the bottles or the position in which the bottles pass, adjust the location and inclination of the Sensor.

Dimensions

(Unit: mm)

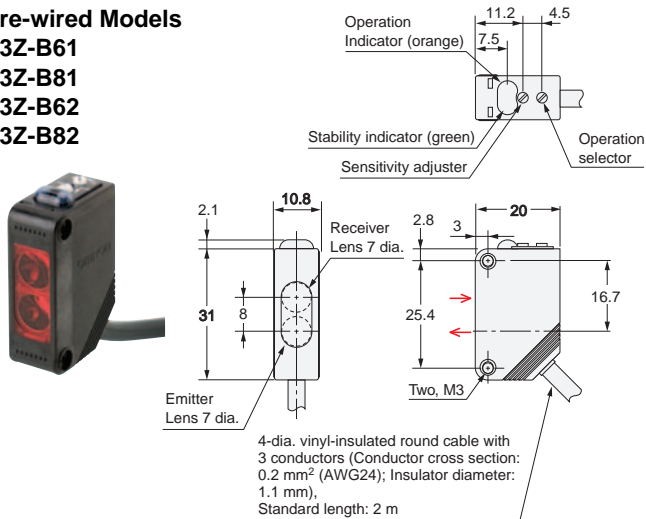
Tolerance class IT16 applies to dimensions in this datasheet unless otherwise specified.

Sensors

Retro-reflective Models

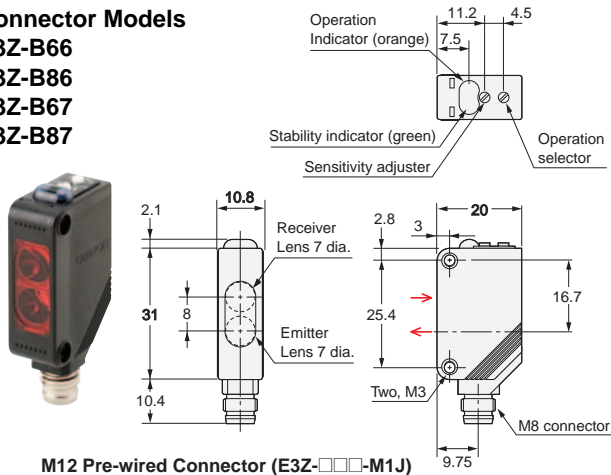
Pre-wired Models

- E3Z-B61
- E3Z-B81
- E3Z-B62
- E3Z-B82

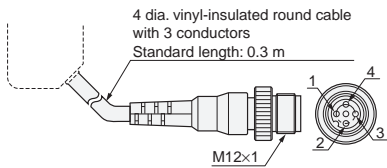


Connector Models

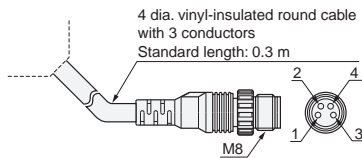
- E3Z-B66
- E3Z-B86
- E3Z-B67
- E3Z-B87



M12 Pre-wired Connector (E3Z-□□□-M1J)



M8 Pre-wired Connector (E3Z-T□□K-M3J)



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

Accessories (Order Separately)

Reflectors

Refer to *E39-R* for details.

Mounting Brackets

Refer to *E39-L* for details.

Sensor I/O Connectors

Refer to *XS2F* and *XS3F* for details.

Terms and Conditions Agreement

Read and understand this catalog.

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

Warranties.

(a) Exclusive Warranty. Omron's exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Omron (or such other period expressed in writing by Omron). Omron disclaims all other warranties, express or implied.

(b) Limitations. OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCTS. BUYER ACKNOWLEDGES THAT IT ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE.

Omron further disclaims all warranties and responsibility of any type for claims or expenses based on infringement by the Products or otherwise of any intellectual property right. (c) Buyer Remedy. Omron's sole obligation hereunder shall be, at Omron's election, to (i) replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product, (ii) repair the non-complying Product, or (iii) repay or credit Buyer an amount equal to the purchase price of the non-complying Product; provided that in no event shall Omron be responsible for warranty, repair, indemnity or any other claims or expenses regarding the Products unless Omron's analysis confirms that the Products were properly handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification. Return of any Products by Buyer must be approved in writing by Omron before shipment. Omron Companies shall not be liable for the suitability or unsuitability or the results from the use of Products in combination with any electrical or electronic components, circuits, system assemblies or any other materials or substances or environments. Any advice, recommendations or information given orally or in writing, are not to be construed as an amendment or addition to the above warranty.

See <http://www.omron.com/global/> or contact your Omron representative for published information.

Limitation on Liability; Etc.

OMRON COMPANIES SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE OR STRICT LIABILITY.

Further, in no event shall liability of Omron Companies exceed the individual price of the Product on which liability is asserted.

Suitability of Use.

Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases.

NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY OR IN LARGE QUANTITIES WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

Programmable Products.

Omron Companies shall not be responsible for the user's programming of a programmable Product, or any consequence thereof.

Performance Data.

Data presented in Omron Company websites, catalogs and other materials is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of Omron's test conditions, and the user must correlate it to actual application requirements. Actual performance is subject to the Omron's Warranty and Limitations of Liability.

Change in Specifications.

Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change part numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the Product may be changed without any notice. When in doubt, special part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Omron's representative at any time to confirm actual specifications of purchased Product.

Errors and Omissions.

Information presented by Omron Companies has been checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.