Photoelectric Sensor with Built-in Amplifier for Detecting Clear, Plastic Bottles

E3Z-B

CSM_E3Z-B_DS_E_6_1

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

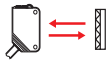
- Uses OMRON's unique optical system ("Inner View") that can detect various shapes of clear, plastic bottles.
- Detects a wide range of bottles from 500-ml bottles to 2-l bottles, and from single bottles to sets of stocked bottles.
- Provides a high degree of protection (IP67), mutual interference prevention,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

⚠ 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) *2	500 mm (80 mm) *3	E3Z-B61 2M *4	E3Z-B81 2M
		Connector (M8, 4 pins)		E3Z-B66	E3Z-B86
		Pre-wired (2 m) *2	2 m (500 mm) *3 *5	E3Z-B62 2M *4	E3Z-B82 2M
		Connector (M8, 4 pins)		E3Z-B67	E3Z-B87

*1. The Reflector is sold separately.
*2. 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).
*3. 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.
*4. The following table shows the model numbers of e-CON Pre-wired Connectors that are available. Specify "-ECON" and the cable length (0.3 m, 0.5 m, or 2 m) at the end of the model number. Example: E3Z-B61-ECON 0.3M
*5. Install the Sensor so that plastic bottles are at least 500 mm from the Sensor when they pass.

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

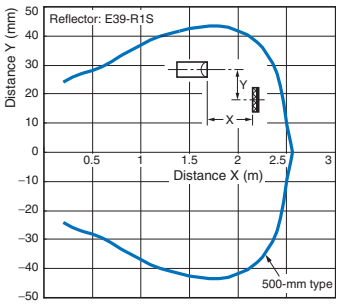
Item	Model				
Sensing method		Retro-reflective (without MSR function)			
	NPN output	E3Z-B61	E3Z-B66	E3Z-B62	E3Z-B67
	PNP output	E3Z-B81	E3Z-B86	E3Z-B82	E3Z-B87
Sensing distance		500 mm (80 mm) *1 (using E39-R1S)		2 m (500 mm) *1 *2 (using E39-R1S)	
Standard sensing object		500-ml (65-mm dia.) transparent round plastic bottles			
Light source (wavelength)		Red LED (680 mm)			
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.

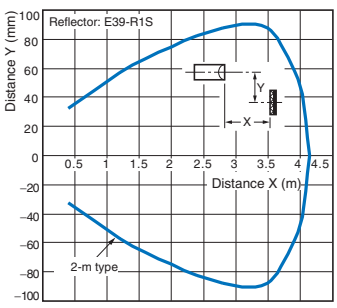
Engineering Data (Typical)

Parallel Operating Range

E3Z-B□1/B□6 + E39-R1S Reflector (Order Separately)

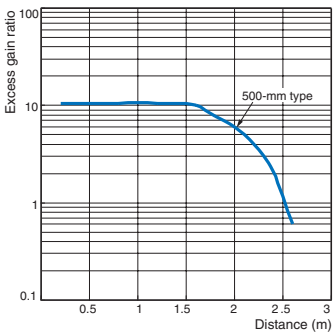


E3Z-B□2/B□7 + E39-R1S Reflector (Order Separately)

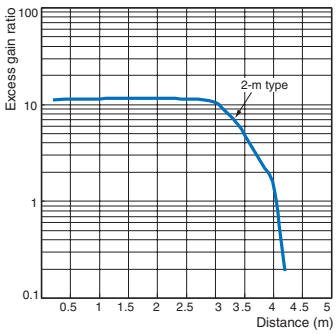


Excess Gain vs. Set Distance

E3Z-B□1/B□6 + E39-R1S Reflector (Order Separately)

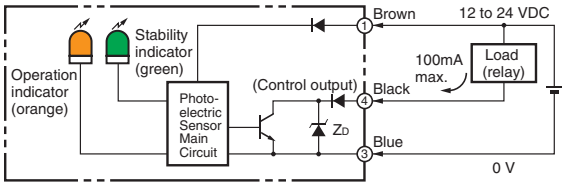
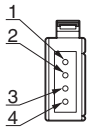


E3Z-B□2/B□7 + E39-R1S Reflector (Order Separately)

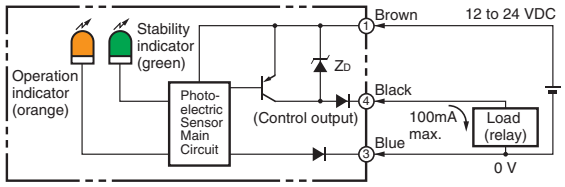


I/O Circuit Diagrams

NPN Output

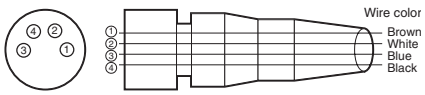
Model	Operation mode	Timing charts	Operation selector	Output circuit
E3Z-B61 E3Z-B62 E3Z-B66 E3Z-B67	Light-ON	Incident light No incident light Operation indicator (orange) ON OFF Output transistor ON OFF Load (e.g., relay) Operate Reset (Between brown and black leads)	L side (LIGHT ON)	Retro-reflective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

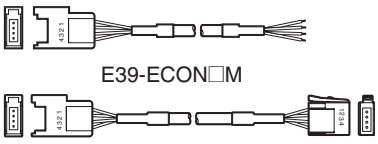
Plugs (Sensor I/O Connectors)

M8 connector



XS3F-M421-402-A
XS3F-M421-405-A
XS3F-M422-402-A
XS3F-M422-405-A

e-CON connector



E39-ECON□M

E39-ECONW□M

Pin arrangement

Classification	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

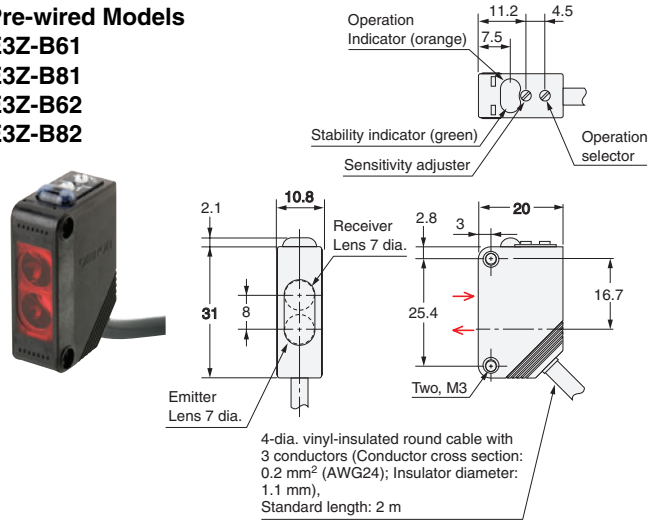
(Unit: mm)

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

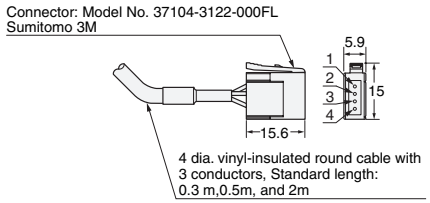
Sensors

Retro-reflective Models

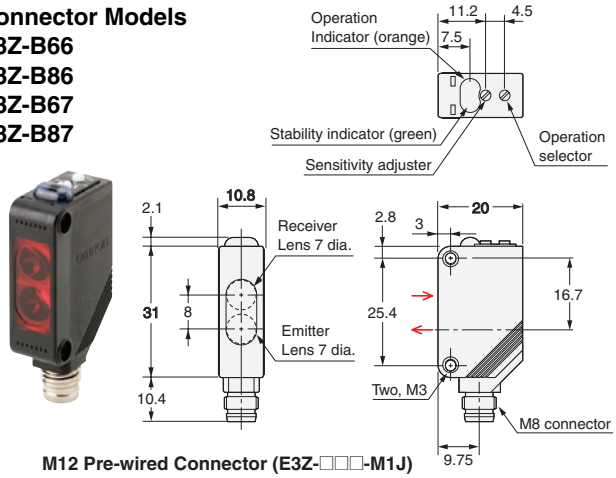
Pre-wired Models
E3Z-B61
E3Z-B81
E3Z-B62
E3Z-B82



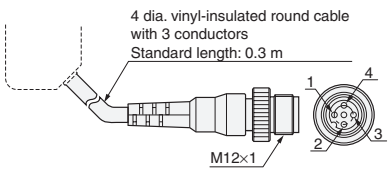
e-CON Pre-wired Connector Model



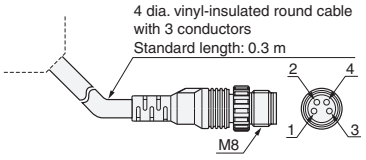
Connector Models
E3Z-B66
E3Z-B86
E3Z-B67
E3Z-B87



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, XS3F and E3Z (E39-ECON□)* for details.

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.

Warranty and Limitations of Liability

WARRANTY

OMRON's exclusive warranty is that the products are free from defects in materials and workmanship for a period of one year (or other period if specified) from date of sale by OMRON.

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Application Considerations

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The following are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible uses of the products, nor is it intended to imply that the uses listed may be suitable for the products:

- Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this catalog.
- Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
- Systems, machines, and equipment that could present a risk to life or property.

Please know and observe all prohibitions of use applicable to the products.

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCTS ARE PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

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OMRON shall not be responsible for the user's programming of a programmable product, or any consequence thereof.

Disclaimers

CHANGE IN SPECIFICATIONS

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It is our practice to change model numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the products may be changed without any notice. When in doubt, special model numbers may be assigned to fix or establish key specifications for your application on your request. Please consult with your OMRON representative at any time to confirm actual specifications of purchased products.

DIMENSIONS AND WEIGHTS

Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.

PERFORMANCE DATA

Performance data given in this catalog 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 users must correlate it to actual application requirements. Actual performance is subject to the OMRON Warranty and Limitations of Liability.

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2009.7

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