E3ZM

Stainless Steel Housing Ideal for Food Industry PAT Pending

CE

- Strong resistance against detergents, disinfectants, and jet liquid flow.
- Product lineup includes BGS Reflective Models and Through-beam Models with built-in slits.
- Certified by Ecolab Europe.
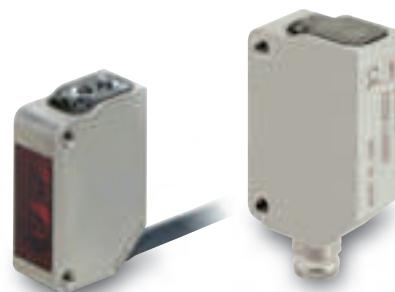
⚠ Be sure to read *Safety Precautions* on page 13.

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

Features

World's Strongest

Withstands Detergent and Disinfectant Spray

We used SUS316L for the case and the best material for all parts to achieve 200 times the durability of the E3Z (in 1.5% solution of sodium hydroxide at 70˚C) to make the E3ZM suitable for the cleaning conditions of food-processing machinery.

World's First

Superior Protective Structure

The first IP69K* (DIN 40050-9) protective structure in the world for a square metal photoelectric sensor. Suitable for high-temperature, high-pressure jet water spray cleaning applications.
* Refer to the footnote on page 5 (ratings and specifications table).

Industry's Best
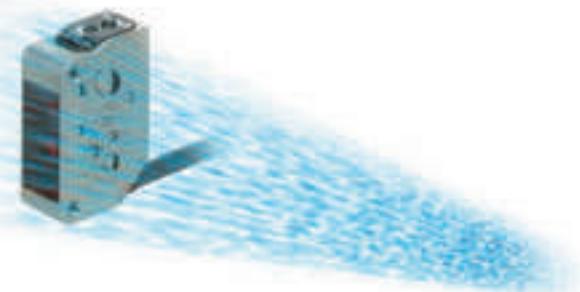
Shape and Markings Designed for Greater Hygiene

Few indentations in the shape means less dust and water can collect, making the E3ZM more hygienic. No labels have been used in order to prevent foreign matter contaminating food products. The E3ZM model and lot numbers are imprinted using a laser marker.

Rear

OMRON

1
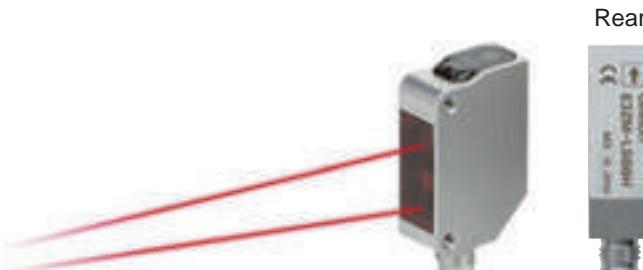
Structural Design That Provides Excellent Environment-resistance*

Indicator cover: Polyetherimide (PEI)

Excellent resistance to detergents and disinfectants.

Waterproofing ring: Fluorine rubber

Excellent resistance to detergents and disinfectants.

Sensitivity adjustment and mode selector switch: Polyetheretherketone (PEEK)

Excellent resistance to detergents and disinfectants. Also has excellent abrasion resistance.

Optical plate: Polymethylmethacrylate (PMMA)

Excellent resistance to detergents and disinfectants. High transparency and other qualities give PMMA excellent optical characteristics.

Case: SUS316L

Excellent corrosion resistance to many chemical reagents.

Seal

The seal provides the durability to high-temperature and high-pressure water that complies with IP69K.

Cable: Polyvinylchloride

Excellent resistance to detergents and disinfectants.

*Do not use the E3ZM in an oily environment.

Unique Members of the E3ZM Family

BGS Reflective Models

E3ZM-LS6☐H/-LS8☐H

Three models with different fixed sensitivity (rated sensing distances) have been created. These models cover the sensing ranges of the E3Z-LS61.

100mm

150mm

200mm
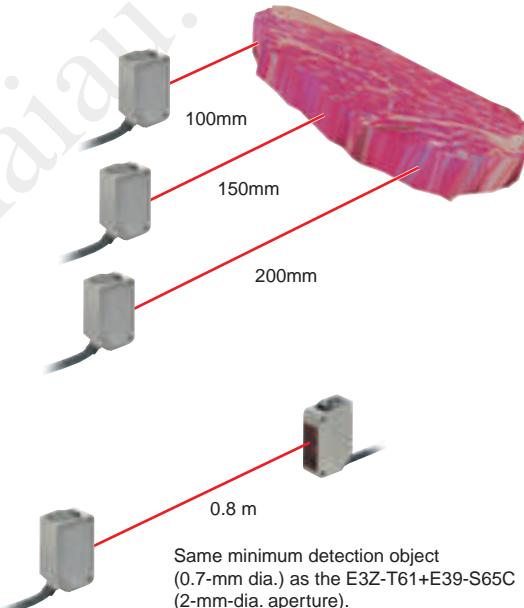
Through-beam Inner Aperture Models

E3ZM-T63

Fine beam without attaching an external aperture. This eliminates malfunctions from residual water drops, even immediately after washing.

0.8 m

Same minimum detection object (0.7-mm dia.) as the E3Z-T61+E39-S65C (2-mm-dia. aperture).

A Better Fit for the Application

The E3ZM can be used in those harsh cleaning environments in which the E3Z was difficult to use. E3ZM passed the material resistance tests and is certified by Ecolab.

Processing and wrapping of meat or raw food products
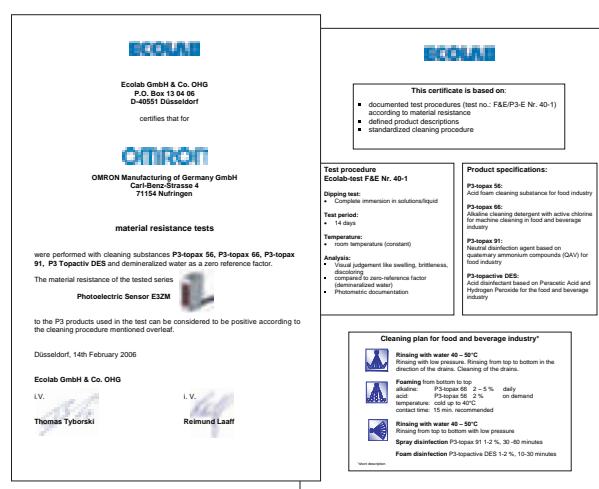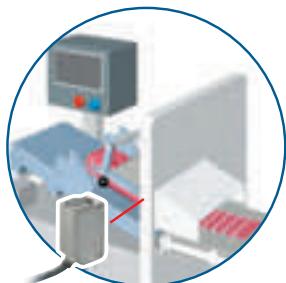
Ordering Information

Sensors (Refer to *Dimensions* on page 15.)

■ Red light □ Infrared light

Sensing method	Appear-ance	Connection method	Sensing distance	Model	
				NPN output	**PNP output**
Through-beam (Emitter + Receiver)		Pre-wired (2 m)	15 m	**E3ZM-T61 2M** Emitter E3ZM-T61-L 2M Receiver E3ZM-T61-D 2M	**E3ZM-T81 2M** Emitter E3ZM-T81-L 2M Receiver E3ZM-T81-D 2M
		Connector (M8, 4 pins)		**E3ZM-T66** Emitter E3ZM-T66-L Receiver E3ZM-T66-D	**E3ZM-T86** Emitter E3ZM-T86-L Receiver E3ZM-T86-D
		Pre-wired (2 m)	0.8 m (apertures built in)	**E3ZM-T63 2M** Emitter E3ZM-T63-L 2M Receiver E3ZM-T63-D 2M	**E3ZM-T83 2M** Emitter E3ZM-T83-L 2M Receiver E3ZM-T83-D 2M
		Connector (M8, 4 pins)		**E3ZM-T68** Emitter E3ZM-T68-L Receiver E3ZM-T68-D	**E3ZM-T88** Emitter E3ZM-T88-L Receiver E3ZM-T88-D
Retro-reflective with MSR function	*1	Pre-wired (2 m)	*2 4 m (100 mm) (Using E39-R1S)	**E3ZM-R61 2M**	**E3ZM-R81 2M**
		Connector (M8, 4 pins)		**E3ZM-R66**	**E3ZM-R86**
Diffuse-reflective		Pre-wired (2 m)	1 m	**E3ZM-D62 2M**	**E3ZM-D82 2M**
		Connector (M8, 4 pins)		**E3ZM-D67**	**E3ZM-D87**
BGS reflective (fixed distance)		Pre-wired (2 m)	10 to 100 mm	**E3ZM-LS61H 2M**	**E3ZM-LS81H 2M**
		Connector (M8, 4 pins)		**E3ZM-LS66H**	**E3ZM-LS86H**
		Pre-wired (2 m)	10 to 150 mm	**E3ZM-LS62H 2M**	**E3ZM-LS82H 2M**
		Connector (M8, 4 pins)		**E3ZM-LS67H**	**E3ZM-LS87H**
		Pre-wired (2 m)	10 to 200 mm	**E3ZM-LS64H 2M**	**E3ZM-LS84H 2M**
		Connector (M8, 4 pins)		**E3ZM-LS69H**	**E3ZM-LS89H**
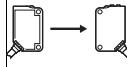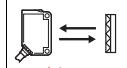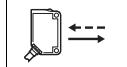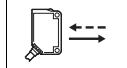
*1. The Reflector is sold separately. Select the Reflector model most suited to the application.
*2. Values in parentheses indicate the minimum required distance between the Sensor and Reflector.

Accessories (Order Separately)

Reflectors (A Reflector is required for each Retro-reflective Sensor: A Reflector is not provided with the Sensor. Be sure to order a Reflector.)
(Refer to *Dimensions* on E*39-L/E39-S/E39-R.*)

Name	E3ZM-R Sensing distance *		Model	Quantity	Remarks
	Rated value	**Reference value**			
Reflector	3 m (100 mm)	---	**E39-R1**	1	
	4 m (100 mm)	---	**E39-R1S**	1	
	---	5 m (100 mm)	**E39-R2**	1	
	---	2.5 m (100 mm)	**E39-R9**	1	• Reflectors are not provided with Retro-reflective models.
	---	3.5 m (100 mm)	**E39-R10**	1	• The MSR function is enabled.
Fog Preventive Coating	---	3 m (100 mm)	**E39-R1K**	1	
Small Reflector	---	1.5 m (50 mm)	**E39-R3**	1	
Tape Reflector	---	700 mm (150 mm)	**E39-RS1**	1	
	---	1.1 m (150 mm)	**E39-RS2**	1	
	---	1.4 m (150 mm)	**E39-RS3**	1	

Note: 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.
* 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.
(Refer to *Dimensions* on *E39-L/F39-L/E39-S/E39-R*.)

Appearance	Model (Material)	Quantity	Remarks	Appearance	Model (Material)	Quantity	Remarks
	E39-L153 (SUS304) *1	1	Mounting Brackets		E39-L98 (SUS304) *2	1	Metal Protective Cover Bracket
	E39-L104 (SUS304) *1	1			E39-L150 (SUS304)	1 set	(Sensor adjuster)
	E39-L43 (SUS304) *2	1	Horizontal Mounting Bracket		E39-L151 (SUS304)	1 set	Easily mounted to the aluminum frame rails of conveyors and easily adjusted. For left to right adjustment
	E39-L142 (SUS304) *2	1	Horizontal Protective Cover Bracket				
	E39-L44 (SUS304)	1	Rear Mounting Bracket		E39-L144 (SUS304) *2	1	Compact Protective Cover Bracket

Note: When using a Through-beam Sensor, order one Mounting 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 (Sockets on One Cable End)

(Models for Connectors: A Connector is not provided with the Sensor. Be sure to order a Connector separately.)
 (Refer to *Dimensions* on *XS3*.)

Size	Cable	Appearance		Cable type	Model
M8 (4 pins) *1	Standard	Straight *2	2 m	4-wire	XS3F-E421-402-A
			5 m		XS3F-E421-405-A
		L-shaped *2 *3	2 m		XS3F-E422-402-A
			5 m		XS3F-E422-405-A

Note: When using a Through-beam Sensor, order one Mounting Bracket for the Receiver and one for the Emitter.
*1. Cable specifications: Outer coating material: PVC, Nut material: Stainless steel, Degree of protection: IP67 (IEC 60529)
*2. The connector will not rotate after connecting.
*3. The cable is fixed at an angle of 180° from the sensor emitter/receiver surface.

Ratings and Specifications

|	Sensing method	Through-beam		Retro-reflective with MSR function	Diffuse-reflective Models
Model	NPN output	E3ZM-T61 E3ZM-T66	E3ZM-T63 E3ZM-T68	E3ZM-R61 E3ZM-R66	E3ZM-D62 E3ZM-D67
Item	PNP output	E3ZM-T81 E3ZM-T86	E3ZM-T83 E3ZM-T88	E3ZM-R81 E3ZM-R86	E3ZM-D82 E3ZM-D87
Sensing distance		15 m	0.8 m	4 m [100 mm] (Using E39-R1S) 3 m [100 mm] (Using E39-R1)	1 m (White paper 300 × 300 mm)
Spot diameter (typical)		---			
Standard sensing object		Opaque: 12-mm dia. min.	Opaque: 2-mm dia. min.	Opaque: 75-mm dia. min.	---
Differential travel		---			20% of sensing distance max.
Black/white error		---			
Directional angle		Emitter, Receiver: 3° to 15°		Sensor: 3° to 10° Reflector: 30°	---
Light source (wavelength)		Infrared LED (870 nm)		Red LED (660 nm)	Infrared LED (870 nm)
Power supply voltage		10 to 30 VDC, including 10% ripple (p-p)			
Current consumption		40 mA max. (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, and Reversed output polarity protection		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/s² 3 times each in X, Y, and Z directions			
Degree of protection *		IEC: IP67, DIN 40050-9: IP69K			
Connection method		Pre-wired cable (standard length: 2 m) M8 4-pin Connector			
Indicator		Operation indicator (yellow), Stability indicator (green) (Emitter has only power supply indicator (green).)			
Weight (packed state)	Pre-wired models (with 2-m cable)	Approx. 150 g		Approx. 90 g	
	Connector models	Approx. 60 g		Approx. 40 g	
Materials	Case	SUS316L			
	Lens	PMMA (polymethylmethacrylate)			
	Display	PEI (Polyetherimide)			
	Sensitivity adjustment and mode selector switch	PEEK (polyetheretherketone)			
	Seals	Fluoro rubber			
Accessories		Instruction sheet (Note: Reflectors and Mounting Brackets are sold separately.)			

* IP69K Degree of Protection Specifications
IP69K is a protection specification stipulated by DIN 40050 Part 9 of the German standards.
The test item is sprayed with 80°C water from a nozzle of a specified shape at a water pressure of 80 to 100 bar. The amount of water is 14 to 16 liters per minute.
The distance between the test item and the nozzle is 10 to 15 cm. The water is discharged at angles of 0°, 30°, 60°, and 90° from the horizontal plane for 30 seconds at each angle while the test item is rotated horizontally.

Sensing method		BGS Reflective Models		
Model	**NPN output**	E3ZM-LS61H E3ZM-LS66H	E3ZM-LS62H E3ZM-LS67H	E3ZM-LS64H E3ZM-LS69H
Item	**PNP output**	E3ZM-LS81H E3ZM-LS86H	E3ZM-LS82H E3ZM-LS87H	E3ZM-LS84H E3ZM-LS89H
Sensing distance		10 to 100 mm (White paper 100 × 100 mm)	10 to 150 mm (White paper 100 × 100 mm)	10 to 200 mm (White paper 100 × 100 mm)
Spot diameter (typical)		4-mmdia. at sensing distance of 100 mm	12-mmdia. at sensing distance of 150 mm	18-mmdia. 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.
Black/white error		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)		
Current consumption		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 (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 *		IEC: IP67, DIN 40050-9: IP69K		
Connection method		Pre-wired cable (standard length: 2 m) M8 4-pin Connector		
Indicator		Operation indicator (yellow), Stability indicator (green)		
Weight (packed state)	Pre-wired models (with 2-m cable)	Approx. 90 g		
	Connector models	Approx. 40 g		
Materials	Case	SUS316L		
	Lens	PMMA (polymethylmethacrylate)		
	Display	PEI (Polyetherimide)		
	Seals	Fluoro rubber		
Accessories		Instruction sheet (Note: Mounting Brackets are sold separately.)		

* IP69K Degree of Protection Specifications
 IP69K is a protection specification stipulated by DIN 40050 Part 9 of the German standards.
 The test item is sprayed with 80°C water from a nozzle of a specified shape at a water pressure of 80 to 100 bar. The amount of water is 14 to 16 liters per minute.
 The distance between the test item and the nozzle is 10 to 15 cm. The water is discharged at angles of 0°, 30°, 60°, and 90° from the horizontal plane for 30 seconds at each angle while the test item is rotated horizontally.

Dimensions

Sensors

Through-beam Models*
Pre-wired Models
E3ZM-T61
E3ZM-T81
E3ZM-T63
E3ZM-T83

Emitter

Power indicator (green)

10.8

1.2

31

Emitter 6.4 dia.

2.8

3

21

12.7

25.4

Two, M3

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

Receiver

11.6   4.5

Operation Indicator (yellow)
Stability indicator (green)
Operation selector
Sensitivity adjuster

10.8

1.2

31

Receiver 6.4 dia.

2.8

3

21

12.7

25.4

Two, M3

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

Through-beam Models*
Standard Connector
E3ZM-T66
E3ZM-T86
E3ZM-T68
E3ZM-T88

Emitter

Power indicator (green)

10.8

1.2

31

7

Emitter 6.4 dia.

2.8

3

21

12.7

25.4

Two, M3

M8×1
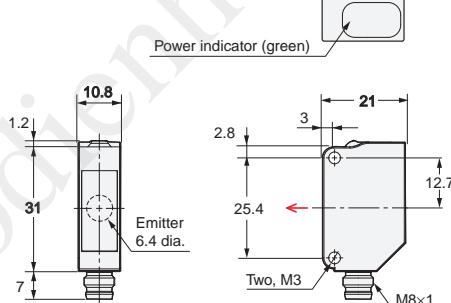
Terminal No.	Specifications
1	+V
2	---
3	0 V
4	---

Receiver

11.6   4.5

Operation Indicator (yellow)
Stability indicator (green)
Operation selector
Sensitivity adjuster

10.8

1.2

31

7

Receiver 6.4 dia.

2.8

3

21

12.7

25.4

Two, M3

M8×1
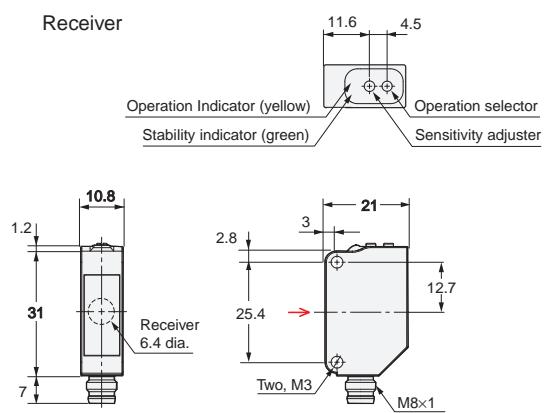
Terminal No.	Specifications
1	+V
2	---
3	0 V
4	Output

* Models numbers for Through-beam Sensors (E3ZM-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: E3ZM-T61-L 2M), the model number of the Receiver, by adding "-D" (example: E3ZM-T61-D 2M.) Refer to Ordering Information to confirm model numbers for Emitter and Receivers.

Retro-reflective Models
Pre-wired Models
E3ZM-R61
E3ZM-R81

Diffuse-reflective Models
Standard Connector
E3ZM-D62
E3ZM-D82

BGS Reflective Models
Pre-wired Models
E3ZM-LS61H
E3ZM-LS62H
E3ZM-LS64H
E3ZM-LS81H
E3ZM-LS82H
E3ZM-LS84H
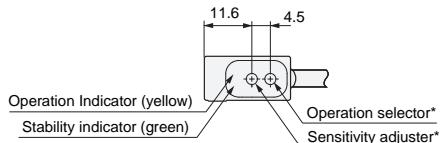
11.6 4.5

Operation Indicator (yellow)
Stability indicator (green)
Operation selector*
Sensitivity adjuster*

*No sensitivity adjuster and operation
selector with BGS reflective model

10.8
1.2
31
7
Receiver 6.4 dia.
Emitter 6.4 dia.

2.8
3
21
25.4
16.2
Two, M3

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
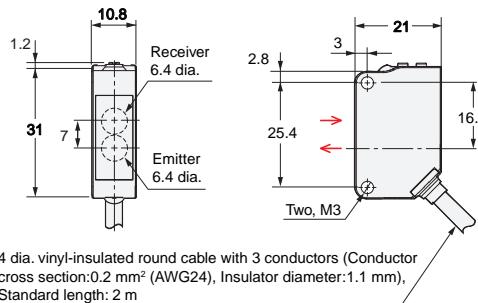
Retro-reflective Models
Standard Connector
E3ZM-R66
E3ZM-R86
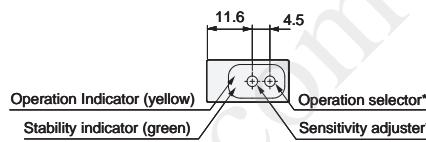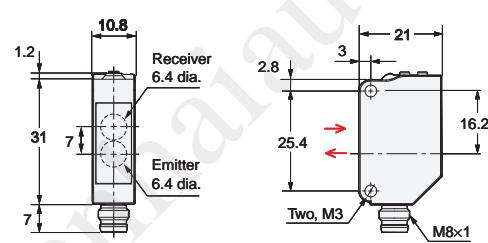
Diffuse-reflective Models
Standard Connector
E3ZM-D67
E3ZM-D87

BGS Reflective Models
Standard Connector
E3ZM-LS66H
E3ZM-LS67H
E3ZM-LS69H
E3ZM-LS86H
E3ZM-LS87H
E3ZM-LS89H

11.6 4.5

Operation Indicator (yellow)
Stability indicator (green)
Operation selector*
Sensitivity adjuster*

*No sensitivity adjuster and operation
selector with BGS reflective model

10.8
1.2
31
7
Receiver 6.4 dia.
Emitter 6.4 dia.
7

2.8
3
21
25.4
16.2
Two, M3
M8×1

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