E3ZM

CSM_E3ZM_DS_E_5_2

Stainless Steel Housing Ideal for Food Industry PAT Pending

- 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.

Features

World's Strongest

Withstands Detergent and Disinfectant Spray

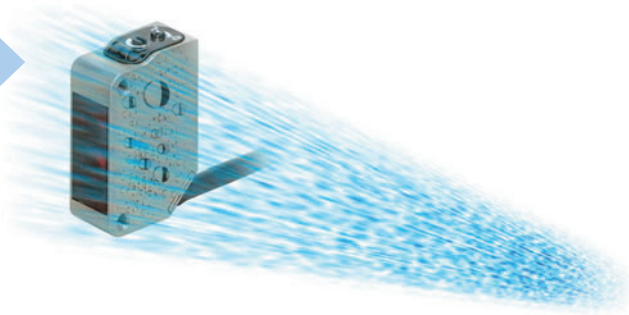
We used SUS316L for the case and the best material for all parts to achieve 200 times the durability of the E3Z (in 1.5% solution of sodium hydroxide at 70˚C) to make the E3ZM suitable for the cleaning conditions of food-processing machinery.

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.

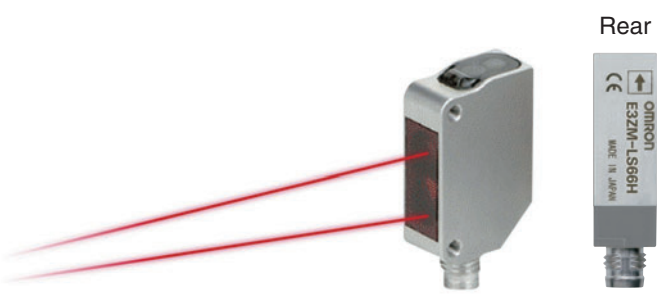
* Refer to the footnote on page 5 (ratings and specifications table).



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.



Structural Design That Provides Excellent Environment-resistance*

Indicator cover: Polyethersulfone (PES)

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.

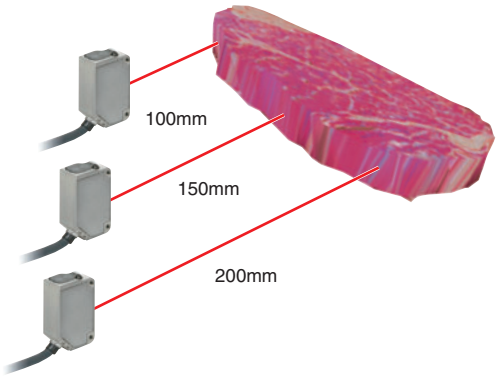
*Do not use the E3ZM in an oily environment.

Unique Members of the E3ZM Family

BGS Reflective Models

E3ZM-LS6□H/-LS8□H

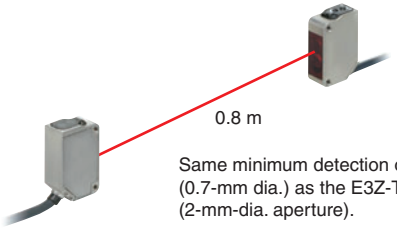
Three models with different fixed sensitivity (rated sensing distances) have been created. These models cover the sensing ranges of the E3Z-LS61.



Through-beam Inner Aperture Models

E3ZM-T63

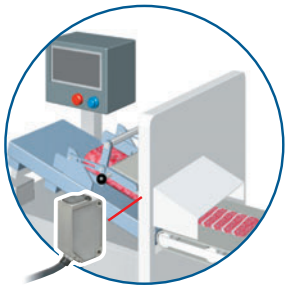
Fine beam without attaching an external aperture. This eliminates malfunctions from residual water drops, even immediately after washing.



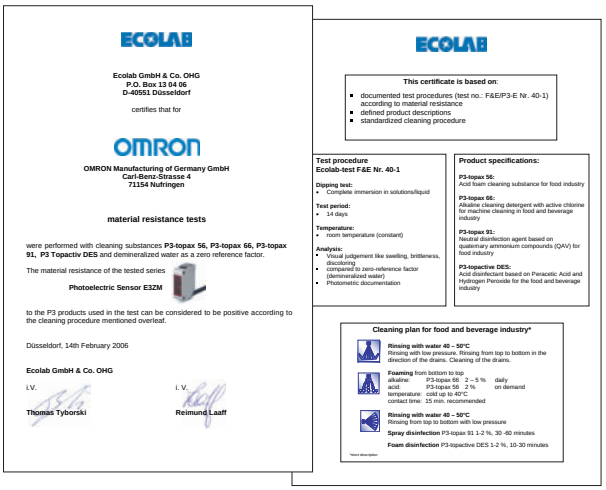
Same minimum detection object (0.7-mm dia.) as the E3Z-T61+E39-S65C (2-mm-dia. aperture).

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



ECOLAB

Ecolab GmbH & Co. OHG
P.O. Box 13 04 06
D-40551 Düsseldorf

certifies that for

OMRON

OMRON Manufacturing of Germany GmbH
Carl-Benz-Strasse 4
71154 Nufringen

material resistance tests

were performed with cleaning substances **P3-topax 56, P3-topax 66, P3-topax 91, P3 Topactiv DES** and demineralized water as a zero reference factor.

The material resistance of the tested series

Photoelectric Sensor E3ZM

to the P3 products used in the test can be considered to be positive according to the cleaning procedure mentioned overleaf.

Düsseldorf, 14th February 2006

Ecolab GmbH & Co. OHG

i.V. **Thomas Tyborski**

i. V. **Reimund Laaff**

ECOLAB

This certificate is based on:

- documented test procedures (test no.: F&E/P3-E Nr. 40-1) according to material resistance
- defined product descriptions
- standardized cleaning procedure

Test procedure
Ecolab-test F&E Nr. 40-1

Dipping test:
- Complete immersion in solutions/liquid

Test period:
- 14 days

Temperature:
- room temperature (constant)

Analysis:
- Visual judgement like swelling, brittleness, discoloring
- compared to zero-reference factor (demineralized water)
- Photometric documentation

Product specifications:

P3-topax 56:
Acid foam cleaning substance for food industry

P3-topax 66:
Alkaline cleaning detergent with active chlorine for machine cleaning in food and beverage industry

P3-topax 91:
Neutral disinfection agent based on quaternary ammonium compounds (QAV) for food industry

P3-topactive DES:
Acid disinfectant based on Peracetic Acid and Hydrogen Peroxide for the food and beverage industry

Cleaning plan for food and beverage industry*

Rinsing with water 40 – 50°C
Rinsing with low pressure. Rinsing from top to bottom in the direction of the drains. Cleaning of the drains.

Foaming from bottom to top
alkaline: P3-topax 66 2 – 5 % daily
acid: P3-topax 56 2 % on demand
temperature: cold up to 40°C
contact time: 15 min. recommended

Rinsing with water 40 – 50°C
Rinsing from top to bottom with low pressure

Spray disinfection P3-topax 91 1-2 %, 30 -60 minutes

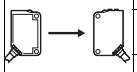
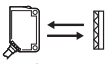
Foam disinfection P3-topactive DES 1-2 %, 10-30 minutes

*short description

Ordering Information

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

Red light Infrared light

Sensing method	Appearance	Connection method	Sensing distance	Model	
				NPN output	PNP output
Through-beam *4 (Emitter + Receiver) *5		Pre-wired (2 m) *3	15 m	**E3ZM-T61 2M**	**E3ZM-T81 2M**
		Connector (M8, 4 pins)		**E3ZM-T66**	**E3ZM-T86**
		Pre-wired (2 m) *3	0.8 m (apertures built in)	**E3ZM-T63 2M**	**E3ZM-T83 2M**
		Connector (M8, 4 pins)		**E3ZM-T68**	**E3ZM-T88**
Retro-reflective with MSR function	 *1	Pre-wired (2 m) *3	*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) *3	1 m	**E3ZM-D62 2M**	**E3ZM-D82 2M**
		Connector (M8, 4 pins)		**E3ZM-D67**	**E3ZM-D87**
BGS reflective (fixed distance)		Pre-wired (2 m) *3	10 to 100 mm	**E3ZM-LS61H 2M**	**E3ZM-LS81H 2M**
		Connector (M8, 4 pins)		**E3ZM-LS66H**	**E3ZM-LS86H**
		Pre-wired (2 m) *3	10 to 150 mm	**E3ZM-LS62H 2M**	**E3ZM-LS82H 2M**
		Connector (M8, 4 pins)		**E3ZM-LS67H**	**E3ZM-LS87H**
		Pre-wired (2 m) *3	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.
*3. Pre-wired Models with a 5-m cable are also available for these products. When ordering, specify the cable length by adding "5M" to the end of the model number (e.g., E3ZM-LT61 5M).
*4. 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-T61-G0).
*5. The model number of the Emitter is expressed by adding an "L" to the set model number in the table. Example: E3ZM-T61-L 2M
The model number of the receiver is expressed by adding a "D" to the set model number in the table. Example: E3ZM-T61-D 2M
Orders for individual Emitters and Receivers are accepted. (Modifications are required for some models.)

Accessories (Order Separately)

Reflectors (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 E*39-L/F39-L/E39-S/E39-R*.)

Name	E3ZM-R Sensing distance (typical) *	Model	Quantity	Remarks
Reflector	3 m (100 mm) (rated value)	**E39-R1**	1	• Reflectors are not provided with Retro-reflective models. • The MSR function is enabled.
	4 m (100 mm) (rated value)	**E39-R1S**	1	
	5 m (100 mm)	**E39-R2**	1	
	2.5 m (100 mm)	**E39-R9**	1	
	3.5 m (100 mm)	**E39-R10**	1	
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: When using a Reflector without a rated value, use 0.7 times typical value as a guideline for the sensing distance.
* 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	Mounting Brackets		**E39-L98 (SUS304)**	1	Metal Protective Cover Bracket *
	E39-L104 (SUS304)	1			**E39-L150 (SUS304)**	1 set	(Sensor adjuster)
	E39-L43 (SUS304)	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)	1	Horizontal Protective Cover Bracket *				
	E39-L44 (SUS304)	1	Rear Mounting Bracket		**E39-L144 (SUS304)**	1	Compact Protective Cover Bracket *

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.

Sensor I/O Connectors (Models for Connectors: A Connector is not provided with the Sensor. Be sure to order a Connector separately.)

(Refer to *Dimensions* on *XS3*.)

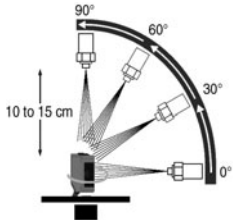
Size	Cable	Appearance		Cable type		Model
M8 (4 pins) *	Standard	Straight		2 m	4-wire	**XS3F-M421-402-A**
				5 m		**XS3F-M421-405-A**
		L-shaped		2 m		**XS3F-M422-402-A**
				5 m		**XS3F-M422-405-A**

Note: When using a Through-beam Sensor, order one Mounting Bracket for the Receiver and one for the Emitter.
* Cable specifications: Outer coating material: PVC, Nut material: Stainless steel, Degree of protection: IP67 (IEC 60529)

Ratings and Specifications

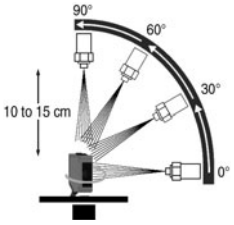
Item		Sensing method	Through-beam		Retro-reflective with MSR function	Diffuse-reflective Models
Model		NPN output	E3ZM-T61 E3ZM-T66	E3ZM-T63 E3ZM-T68	E3ZM-R61 E3ZM-R66	E3ZM-D62 E3ZM-D67
		PNP output	E3ZM-T81 E3ZM-T86	E3ZM-T83 E3ZM-T88	E3ZM-R81 E3ZM-R86	E3ZM-D82 E3ZM-D87
Sensing distance			15 m	0.8 m	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 (860 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/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) (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		PES (polyethersulfone)			
	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.



Item		Sensing method	BGS Reflective Models		
	Model	NPN output	E3ZM-LS61H E3ZM-LS66H	E3ZM-LS62H E3ZM-LS67H	E3ZM-LS64H E3ZM-LS69H
		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		PES (polyethersulfone)		
	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.

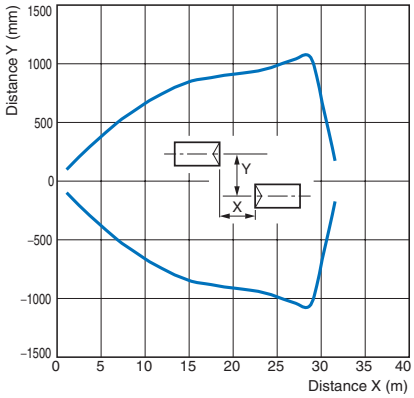


Engineering Data (Typical)

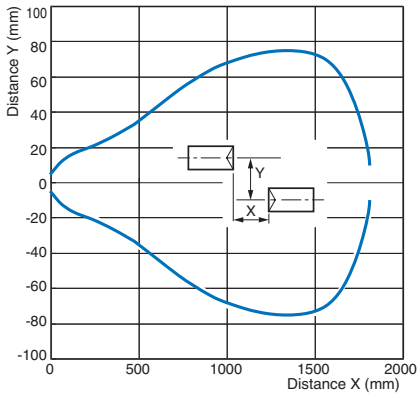
Parallel Operating Range

Through-beam Models

E3ZM-T□1(T□6)

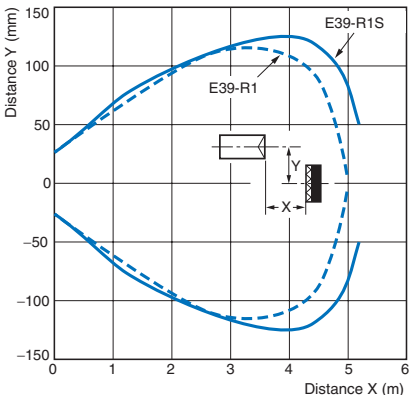


E3ZM-T□3(T□8)



Retro-reflective Models

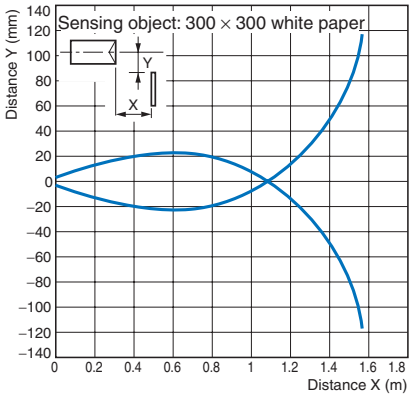
E3ZM-R□1(R□6)



Operating Range

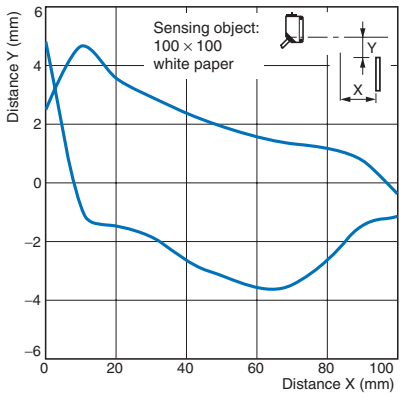
Diffuse-reflective Models

E3ZM-D□2(D□7)

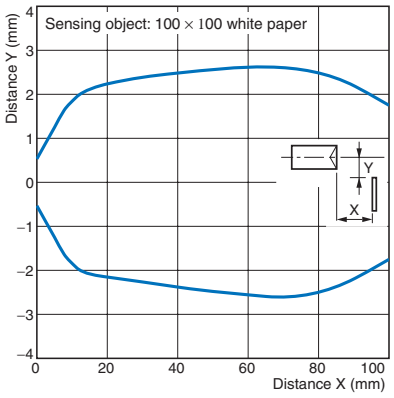


BGS Reflective Models

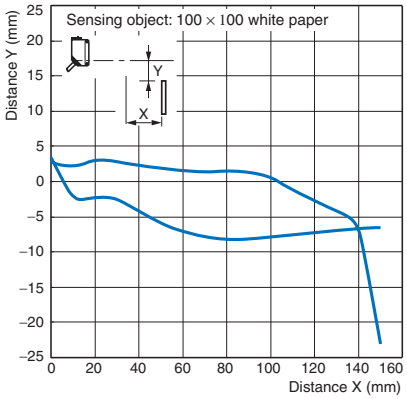
E3ZM-LS□1H(LS□6H), Top to Bottom



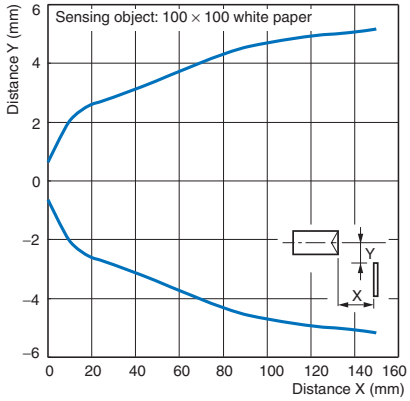
E3ZM-LS□1H(LS□6H), Left to Right



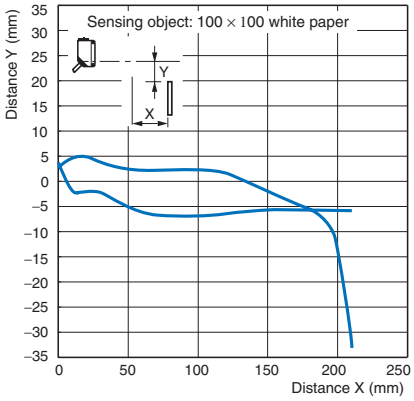
E3ZM-LS□2H(LS□7H), Top to Bottom



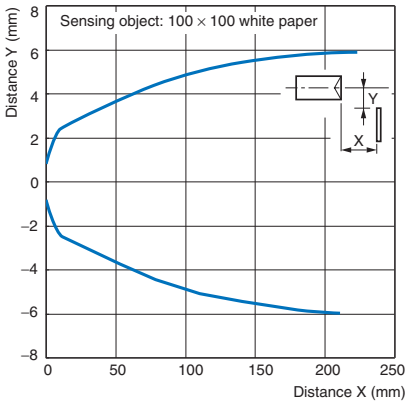
E3ZM-LS□2H(LS□7H), Left to Right



E3ZM-LS□4H(LS□9H), Top to Bottom



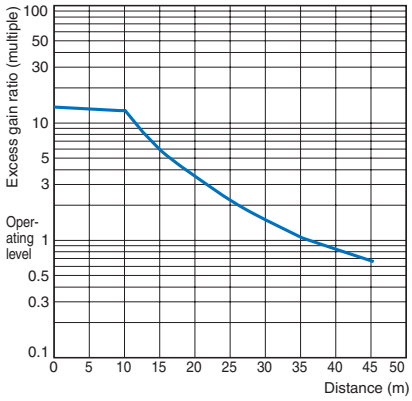
E3ZM-LS□4H(LS□9H), Left to Right



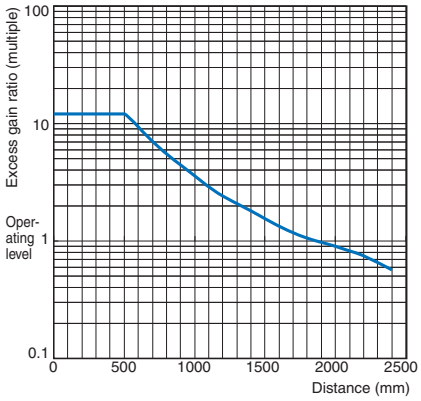
Excess Gain vs. Distance

Through-beam Models

E3ZM-T□1(T□6)

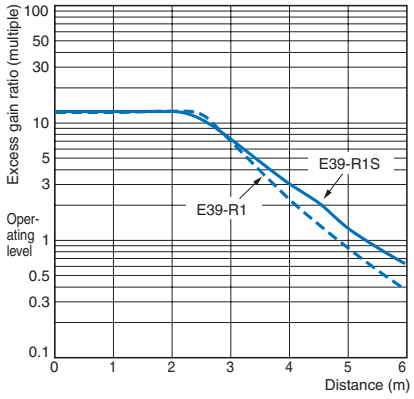


E3ZM-T□3(T□8)



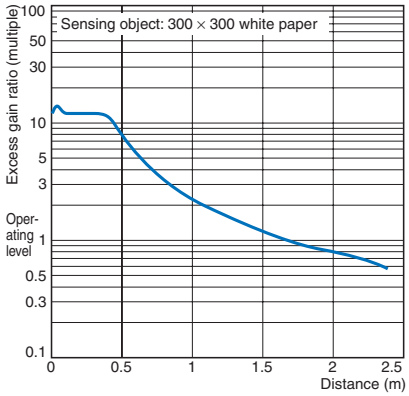
Retro-reflective Models

E3ZM-R□1(R□6)



Diffuse-reflective Models

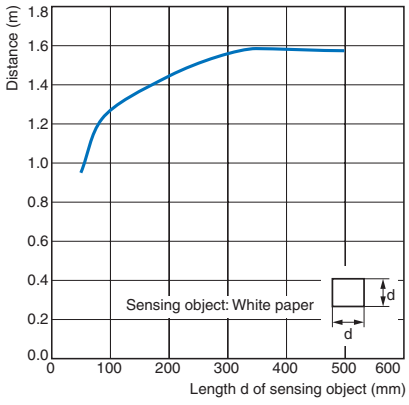
E3ZM-D□2(D□7)



Sensing Object Size vs. Distance

Diffuse-reflective Models

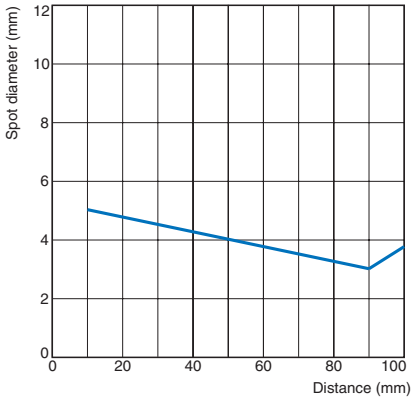
E3ZM-D□2(D□7)



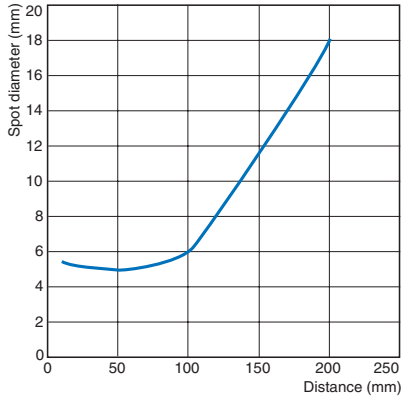
Spot Diameter vs. Distance

BGS Reflective Models

E3ZM-LS□1H(LS□6H)



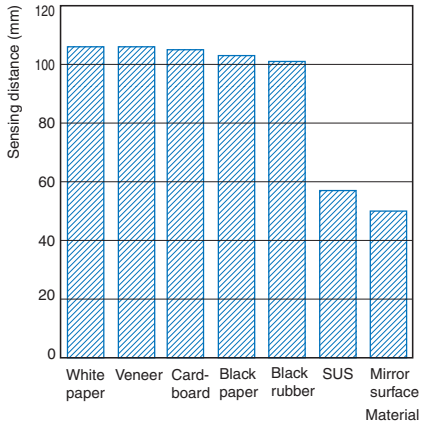
E3ZM-LS□2H/LS□4H(LS□7H/LS□9H)



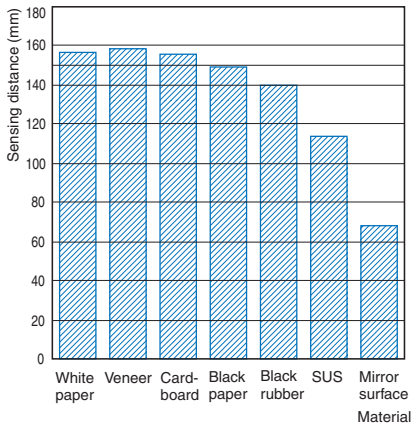
Sensing Distance vs. Sensing Object Material

BGS Reflective Models

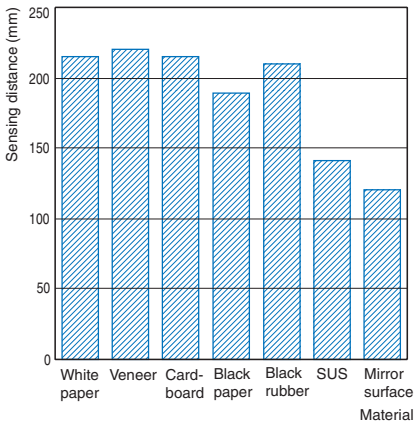
E3ZM-LS□1H(LS□6H)



E3ZM-LS□2H(LS□7H)



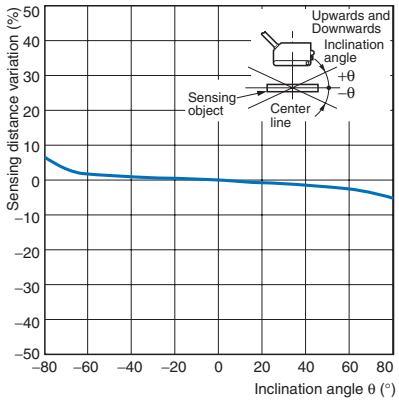
E3ZM-LS□4H(LS□9H)



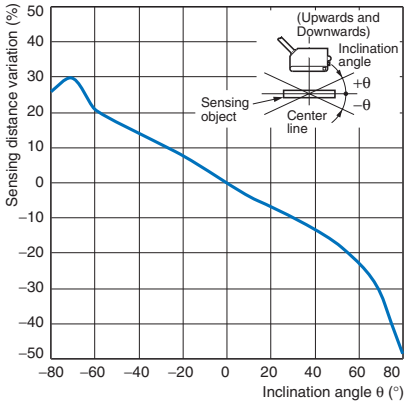
Inclination Characteristics (Vertical)

BGS Reflective Models

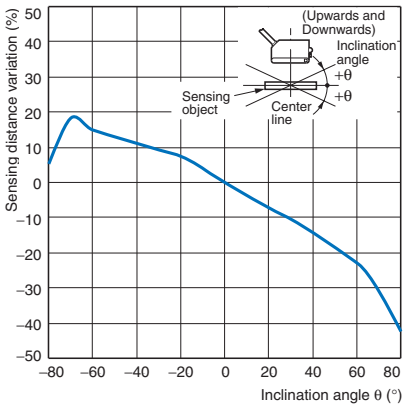
E3ZM-LS□1H(LS□6H)



E3ZM-LS□2H(LS□7H)



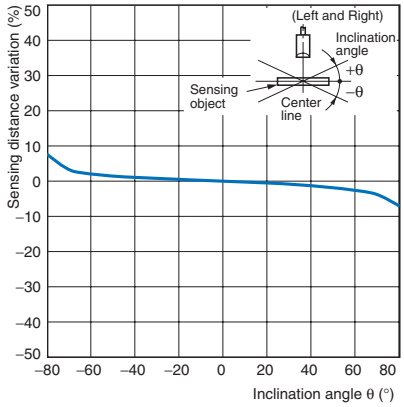
E3ZM-LS□4H(LS□9H)



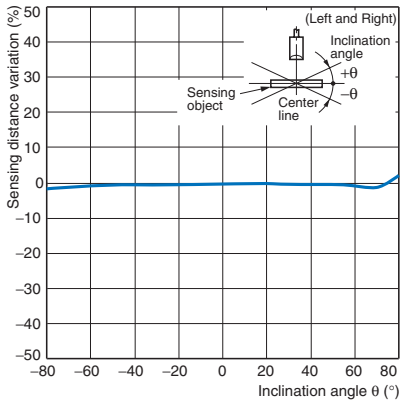
Inclination Characteristics (Horizontal)

BGS Reflective Models

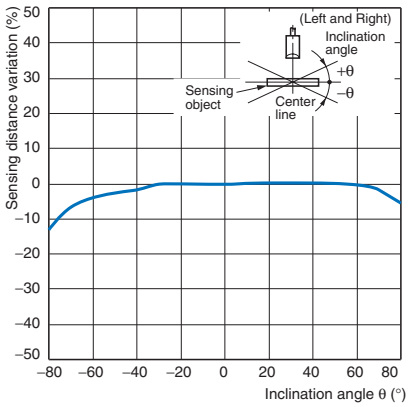
E3ZM-LS□1H(LS□6H)



E3ZM-LS□2H(LS□7H)

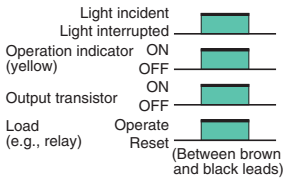
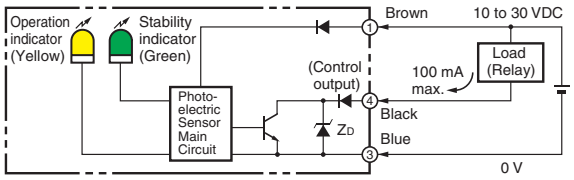


E3ZM-LS□4H(LS□9H)



I/O Circuit Diagrams

NPN Output

<table>
<tr><th>Model</th><th>Operation mode</th><th>Timing charts</th><th>Operation selector</th><th>Output circuit</th></tr>
<tr><td rowspan="3">E3ZM-T61
E3ZM-T63
E3ZM-T66
E3ZM-T68
E3ZM-R61
E3ZM-R66
E3ZM-D62
E3ZM-D67</td><td>Light-ON</td><td> 
</td><td>L side (LIGHT ON)</td><td rowspan="2">Through-beam Receivers, Retro-reflective Models, Diffuse-reflective Models
 
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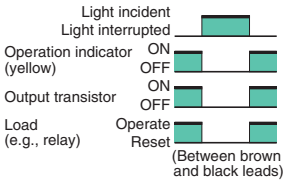
<tr><td>Dark-ON</td><td> 
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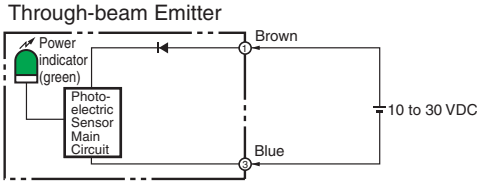
<tr><td colspan="4">Through-beam Emitter
 
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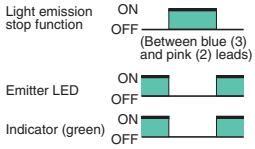
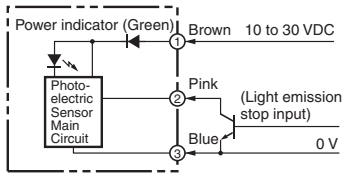
<tr><td>E3ZM-T61-G0
E3ZM-T63-G0
E3ZM-T66-G0
E3ZM-T68-G0</td><td>---</td><td> 
</td><td>---</td><td>Through-beam Emitter
 
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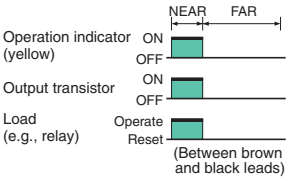
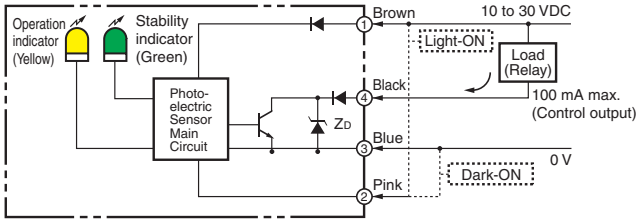
<tr><td rowspan="2">E3ZM-LS61H
E3ZM-LS66H
E3ZM-LS62H
E3ZM-LS67H
E3ZM-LS64H
E3ZM-LS69H</td><td>Light-ON</td><td> 
</td><td>Connect pink lead (2) to brown lead (1).</td><td rowspan="2"> 
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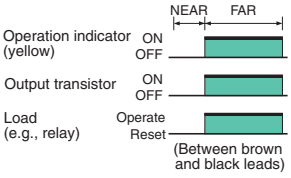
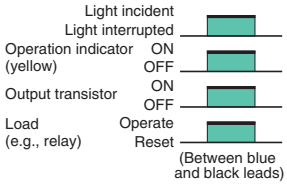
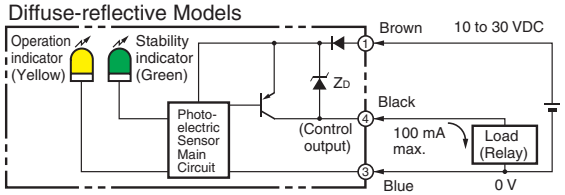
<tr><td>Dark-ON</td><td> 
</td><td>Connect pink lead (2) to blue lead (3) or leave open.</td></tr>
</table>

PNP Output

<table>
<tr><th>Model</th><th>Operation mode</th><th>Timing charts</th><th>Operation selector</th><th>Output circuit</th></tr>
<tr><td rowspan="2">E3ZM-T81
E3ZM-T83
E3ZM-T86
E3ZM-T88
E3ZM-R81
E3ZM-R86
E3ZM-D82
E3ZM-D87</td><td>Light-ON</td><td> 
</td><td>L side (LIGHT ON)</td><td rowspan="2">Through-beam Receivers, Retro-reflective Models, Diffuse-reflective Models
 
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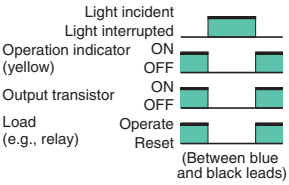
<tr><td>Dark-ON</td><td> 
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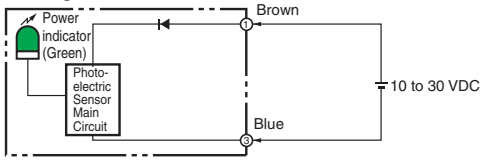
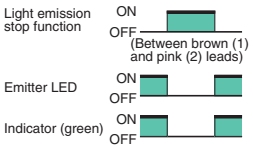
<tr><td></td><td colspan="3">Through-beam Emitter
 
</td></tr>
<tr><td>E3ZM-T81-G0
E3ZM-T83-G0
E3ZM-T86-G0
E3ZM-T88-G0</td><td>---</td><td> 
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 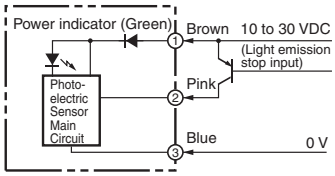
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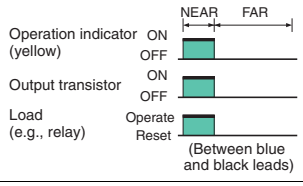
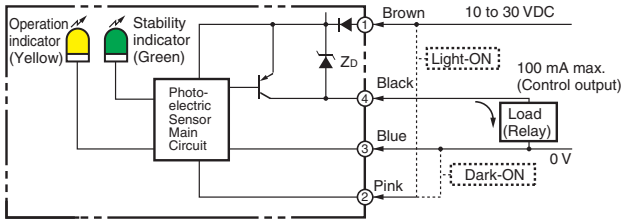
<tr><td rowspan="2">E3ZM-LS81H
E3ZM-LS86H
E3ZM-LS82H
E3ZM-LS87H
E3ZM-LS84H
E3ZM-LS89H</td><td>Light-ON</td><td> 
</td><td>Connect pink lead (2) to brown lead (1).</td><td rowspan="2"> 
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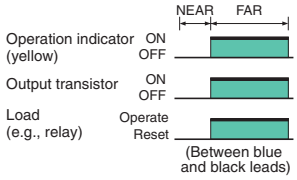
<tr><td>Dark-ON</td><td> 
</td><td>Connect pink lead (2) to blue lead (3) or leave open.</td></tr>
</table>

Connector Pin Arrangement

M8 Connector (-CN)/M8 Pre-wired Connector

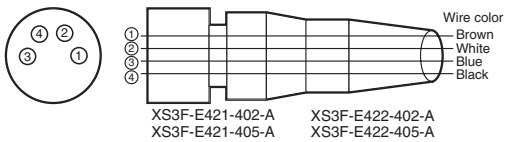
M8 4-pin Connector Pin Arrangement

M8 Pre-wired 3-pin Connector

M8 3-pin Connector Pin Arrangement

Plugs (Sensor I/O Connectors)

M8 4-pin Connectors



XS3F-E421-402-A
XS3F-E421-405-A

XS3F-E422-402-A
XS3F-E422-405-A

Nomenclature

Sensors with Sensitivity Adjustment and Mode Selector Switch

Through-beam Models

E3ZM-T□□-D (Receiver)

Retro-reflective Models

E3ZM-R□□

Diffuse-reflective Models

E3ZM-D□□

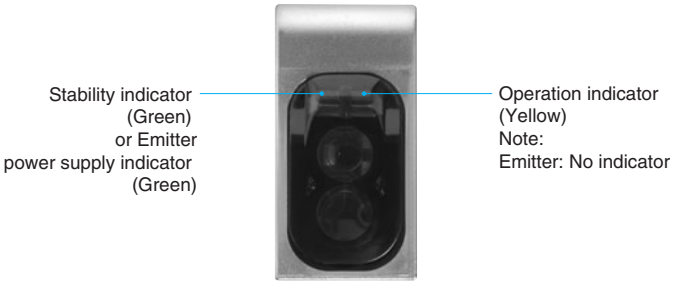
Infinite Adjustment Emitter

BGS Reflective Models

E3ZM-LS□□H

Through-beam Models

E3ZM-T□□-L (Emitter)



Safety Precautions

Refer to *Warranty and Limitations of Liability*.

⚠ WARNING

This product is not designed or rated for 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 concentrated 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.
If the XS3F is used, always tighten the connector cover by hand. Do not use pliers.
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 0.3 to 0.4 N·m.
If other commercially available connectors are used, follow the recommended connector application conditions and recommended tightening torque specifications.

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.

Oily Environments

Do not use the Sensor in oily environments.

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.

Washing

Do not use highly concentrated detergents. They may cause malfunction. Do not use high-pressure water spray in excess of the specifications.

Surface Temperature

Burn injury may occur. The Sensor surface temperature rises depending on application conditions, such as the surrounding temperature and the power supply voltage. Use caution when operating or washing the Sensor.

Precautions for Correct Use

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 mm^2 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

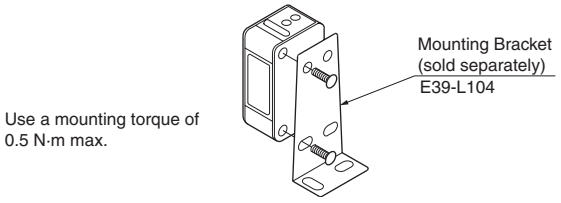
This Sensor is equipped with load short-circuit protection, but be sure to not short circuit the load. Be sure to not use an output current flow that exceeds the rated current. If a load short circuit occurs, the output will turn OFF, so check the wiring before turning ON the power supply again. The 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 C load, use an inrush current of 1.8 times the rated load current or higher.

Water Resistance

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

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

Mounting Diagram



Resistance to Detergents, Disinfectants, and Chemicals

- Performance is assured for typical detergents and disinfectants, but performance may not be maintained for some detergents and disinfectants. Refer to the following table when using these agents.
- The E3ZM passed testing for resistance to detergents and disinfectants performed using the items in the following table. Refer to this table when considering use of detergents and disinfectants.

Category	Product name	Concentration	Temperature	Time
Chemical	Sodium hydroxide (NaOH)	1.5%	70°C	240h
	Potassium hydroxide (KOH)	1.5%	70°C	240h
	Phosphoric acid (H_3PO_4)	2.5%	70°C	240h
	Sodium hypochlorite (NaClO)	0.3%	25°C	240h
	Hydrogen peroxide (H_2O_2)	6.5%	25°C	240h
Alkaline foam detergent	P3-topax-66s (Manufactured by Ecolab)	3.0%	70°C	240h
Acidic foam detergent	P3-topax-56 (Manufactured by Ecolab)	5.0%	70°C	240h
Disinfectant	P3-oxonia active 90 (Manufactured by Ecolab)	1.0%	25°C	240h
	TEK121 (Manufactured by ABC Compounding)	1.1%	25°C	240h

Note: The Sensor was immersed in the chemicals, detergents, and disinfectants listed above at the temperatures in the table for 240 hours and then passed an insulation resistance of 100 MΩ min.

Dimensions

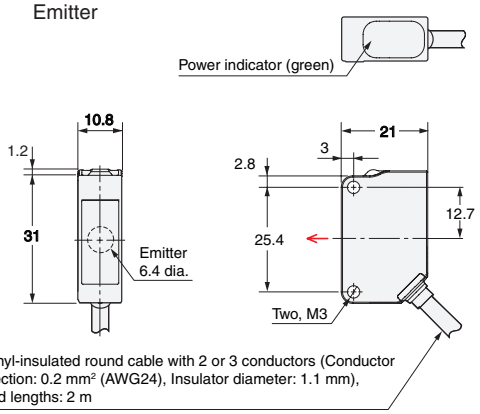
(Unit: mm)
Tolerance class IT16 applies to dimensions in this datasheet unless otherwise specified.

Sensors

Through-beam Models

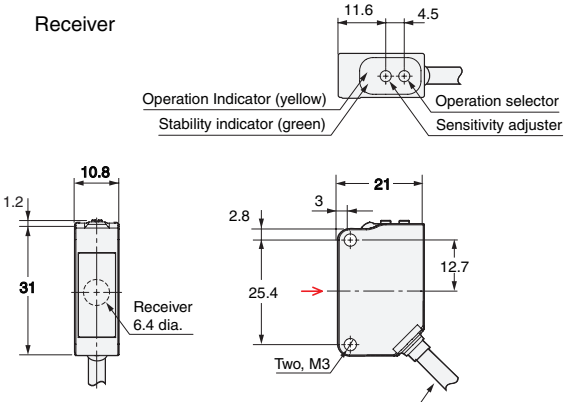
Pre-wired Models
E3ZM-T61(-G0)
E3ZM-T81(-G0)
E3ZM-T63(-G0)
E3ZM-T83(-G0)

Emitter



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

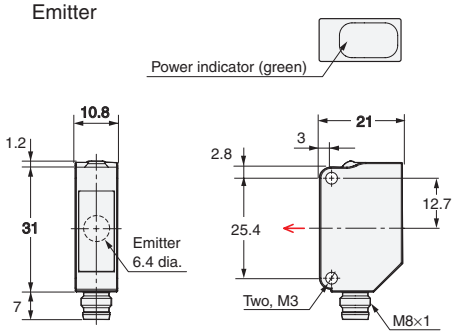


4 dia. vinyl-insulated round cable with 3 conductors (Conductor cross section:0.2 mm² (AWG24), Insulator diameter:1.1 mm), Standard length: 2 m

Through-beam Models

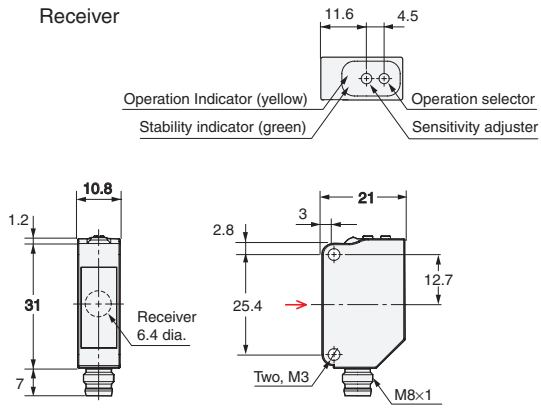
Standard Connector
E3ZM-T66(-G0)
E3ZM-T86(-G0)
E3ZM-T68(-G0)
E3ZM-T88(-G0)

Emitter



Terminal No.	Specifications
1	+V
2	Light emission stop input (-G0 only)
3	0 V
4	---

Receiver

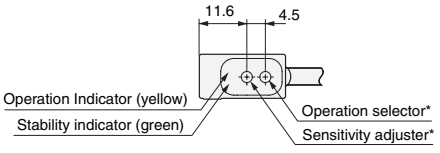


Terminal No.	Specifications
1	+V
2	---
3	0 V
4	Output

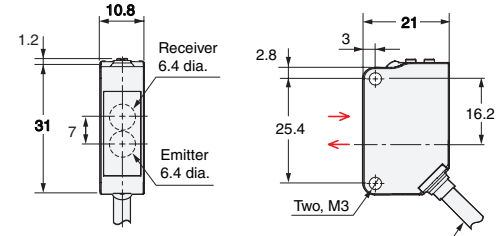
Retro-reflective Models
Pre-wired Models
E3ZM-R61
E3ZM-R81

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



*No sensitivity adjuster and operation selector with BGS reflective model

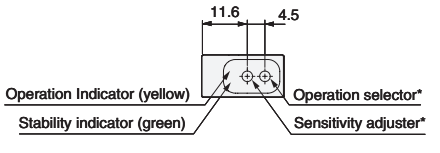


4 dia. vinyl-insulated round cable with 3 conductors (Conductor cross section:0.2 mm² (AWG24), Insulator diameter:1.1 mm), Standard length: 2 m

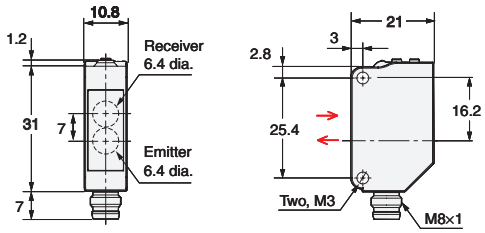
Retro-reflective Models
Standard Connector
E3ZM-R66
E3ZM-R86

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



*No sensitivity adjuster and operation selector with BGS reflective model



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

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2010.8

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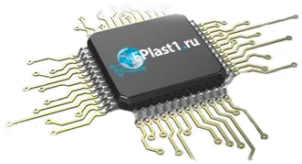
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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