Transparent Bottle Sensor

E3S-CR62/67

CSM_E3S-CR62_67_DS_E_3_1

Ideal for Detecting Transparent Glass and Plastic Containers

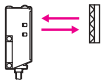
- Reliably detects narrow 5-mm gaps between bottles (When using the E39-R6).
- Significantly higher S/N ratio makes detection more reliable for various transparent containers.

⚠ Be sure to read *Safety Precautions* on page 5.

Ordering Information

Sensors (Refer to *Dimensions* on page 6.)

Red light

Sensing method	Appearance	Connection method	Sensing distance		Model
			Reflector E39-R6	Reflector E39-R1	
Retro-reflective		Pre-wired (2M)	250 mm	1 m [250 mm] *	E3S-CR62 2M
		Standard M12 Connector			E3S-CR67

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

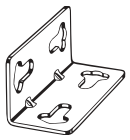
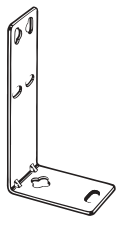
Accessories (Order Separately)

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

Name	Sensing distance	Model	Quantity	Remarks
Reflectors	250 mm	**E39-R6**	1	Supplied with the product.
	1 m [250 mm] *	**E39-R1**	1	---

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

Mounting Brackets (Refer to *Dimensions* on *E39-L/F39-L/E39-S/E39-R.*)

Appearance	Model	Quantity	Remarks
	**E39-L103**	1	Supplied with the product.
	**E39-L87**	1	---

Note: Refer to *Mounting Brackets* on *E39-L/F39-L/E39-S/E39-R* for details.

Sensor I/O Connectors (M12) (Refer to *Dimensions* on XS2)

Cable	Appearance	Cable type		Model
Standard cable	Straight 	2 m	3-wire	**XS2F-D421-DC0-A**
		5 m		**XS2F-D421-GC0-A**
	L-shape 	2 m		**XS2F-D422-DC0-A**
		5 m		**XS2F-D422-GC0-A**

Note: For details on Sensor I/O Connectors and cables such as vibration-proof robot cables, refer to *Introduction to Sensor I/O Connectors*.

Ratings and Specifications

Item \ Sensor type / Model		Retro-reflective Models (M.S.R. function)	
		E3S-CR62	**E3S-CR67**
Sensing distance		250 mm (When using the E39-R6), 1 m (250 mm)*1 (When using the E39-R1)	
Standard sensing object		30-mm dia. × 150 mm glass tube (thickness: 1.8 mm)	
Directional angle		2 to 6°	
Light source (wavelength)		Red LED (650 nm)	
Power supply voltage		10 to 30 VDC, ripple (p-p): 10% max.	
Current consumption		40 mA max.	
Control output		Load power supply voltage: 30 VDC max., Load current: 100 mA max. (Residual voltage: NPN output 1.2 V max., PNP output 2 V max.), Open collector model (NPN/PNP selectable), Light-ON / Dark-ON selectable	
Protection circuits		Load short-circuit protection, Reverse polarity protection, Mutual interference prevention	
Response time		Operate or reset: 1 ms max.	
Sensitivity adjustment		2-turn endless adjuster (with indicator)	
Ambient illuminance (Receiver side)		Incandescent lamp: 5,000 lx max., Sunlight: 10,000 lx max.	
Ambient temperature range		Operating: –25°C to 55°C, Storage: –40°C 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 at 50/60 Hz for 1 minute	
Vibration resistance		Destruction: 10 to 2,000 Hz,1.5-mm double amplitude or 300 m/s^2 for 0.5 hrs each in X, Y, and Z directions	
Shock resistance		Destruction: 1000 m/s^2 3 times each in X, Y, and Z directions	
Degree of protection		IEC 529 IP67 (in-house standards: oil-resistant) NEMA 6P (restricted to indoor use) *2	IEC 529 IP67 NEMA 6P (restricted to indoor use) *2
Connection method		Pre-wired (standard length: 2 m)	Standard connector
Weight (packed state)		Approx. 115 g	Approx. 80 g
Material	**Case**	Zinc die-cast	
	Lens	Methacrylic resin	
	Display operation panel	Polyethyl sulfon	
	Mounting Brackets	Stainless steel (SUS304)	
Accessories		Clamps (with screws), Adjustment driver, Instruction manual, Reflective Plate	

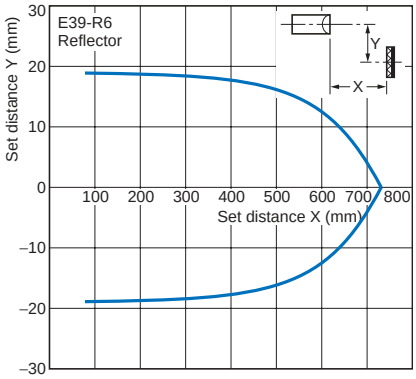
*1. Values in parentheses indicate the minimum required distance between the Sensor and Reflector.
*2. NEMA (National Electrical Manufacturers Association) Standard

Engineering Data (Typical)

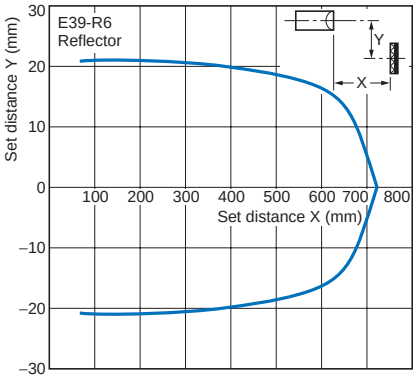
Parallel Operating Range

E3S-CR62/67 + E39-R6 (Supplied Reflector)

(Vertical Direction)

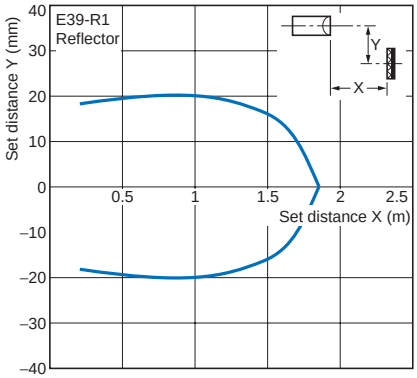


(Horizontal Direction)

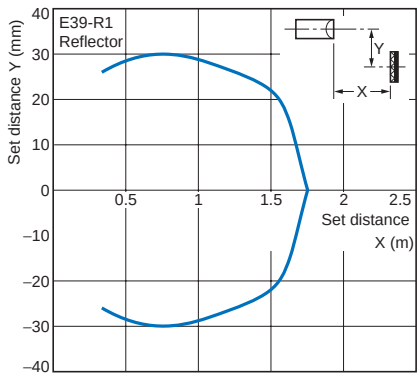


E3S-CR62/67 + E39-R1

(Vertical Direction)

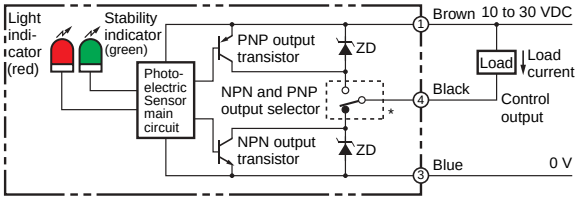


(Horizontal Direction)

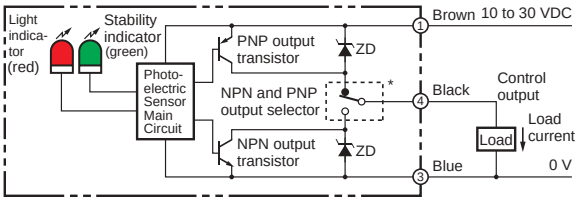


I/O Circuit Diagrams

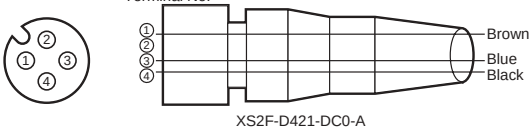
NPN Output

Model	Operation mode	Timing charts	Operation selector	Output circuit
E3S-CR62 E3S-CR67	Light-ON	Incident light No incident light Light indicator (red) ON OFF Output transistor ON OFF Load (e.g., relay) Operate Reset (Between brown and black leads)	L side (LIGHT ON)	 * Set the selector switch to the NPN side. Connector Pin Arrangement  Note: Pin 2 is not used.
	Dark-ON	Incident light No incident light Light indicator (red) 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
E3S-CR62 E3S-CR67	Light-ON	Incident light No incident light Light indicator (red) ON OFF Output transistor ON OFF Load (e.g., relay) Operate Reset (Between blue and black leads)	L side (LIGHT ON)	 * Set the selector switch to the PNP side. Connector Pin Arrangement  Note: Pin 2 is not used.
	Dark-ON	Incident light No incident light Light indicator (red) ON OFF Output transistor ON OFF Load (e.g., relay) Operate Reset (Between blue and black leads)	D side (DARK ON)	

Plug (Sensor I/O Connector)

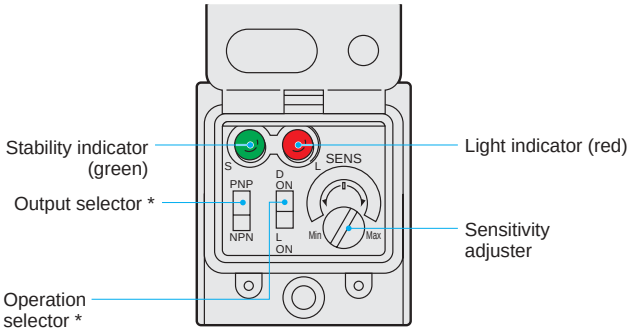


XS2F-D421-DC0-A

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

Note: Pin 2 is not used.
Refer to *Introduction to Sensor I/O connectors* for details.

Nomenclature



* Use the output selector to select the type of output transistor, NPN or PNP.

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.

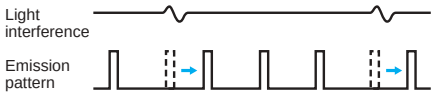
● Designing

Fuzzy Mutual Interference Prevention Function

- If reflective Photoelectric Sensors are installed side by side, each reflective Photoelectric Sensor may be influenced by the light emitted from the other Photoelectric Sensors.
- The fuzzy mutual interference prevention function of the E3S-CR62/67 enables the E3S-CR62/67 to monitor any light interference for a certain period before the E3S-CR62/67 starts emitting light so that the E3S-CR62/67 can retrieve the intensity and frequency of the light interference as data.
  Using this data, the E3S-CR62/67 estimates with fuzzy inference the risk of the malfunctioning of the E3S-CR62/67 and controls the timing of the E3S-CR62/67's light emission.

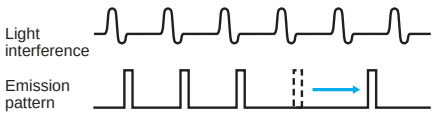
When the risk is low:

- The E3S-CR62/67 waits until there is no light interference and emits light.



When the risk is high:

- The E3S-CR62/67 emits light between each light interference moment.



Bottles

In some cases, factors such as the shape of a bottle prevent stable detection. Please confirm that detection takes place correctly before use.

● Wiring

Cable

- The E3S-CR62/67 uses an oil-resistive cable to ensure oil resistivity. Avoid repeated bending of the cable.
- Do not allow the cable to be bent to a radius of less than 25 mm.

Avoiding Malfunctions

When using a photoelectric sensor with an inverter or sub-motor, be sure to connect FG (frame ground terminal) and G (ground terminal). If not connected, errors may result.

● Mounting

Mounting the Sensor

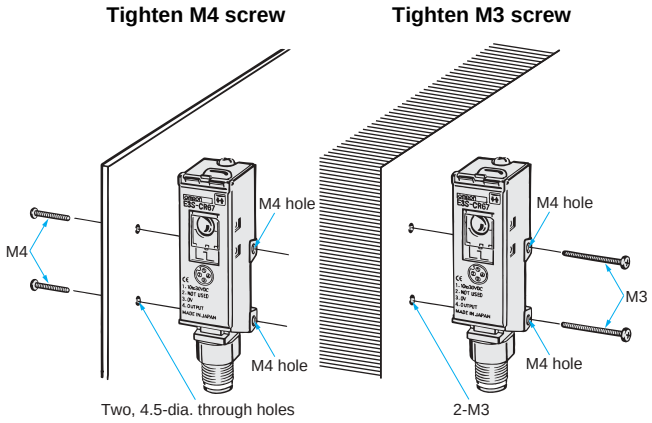
- When mounting the E3S-CR62/67, do not hit the E3S-CR62/67 with a hammer, or the E3S-CR62/67 will loose watertightness.
- Use M4 screws to mount the E3S-CR62/67. The tightening torque of each screw must be 1.18 N·m maximum.

(When using the mounting bracket)

- To set the sensor on the mechanical axis, use the optical axis locking holes.
- When it is not possible to mount on the mechanical shift, move the photoelectric switch vertically or horizontally so that it is located in the center of the area illuminated by the incident light indicator lamp. Verify that the stability indicator lamp is on.

(Direct mounting)

Install the photoelectric sensor as shown in the following diagram.



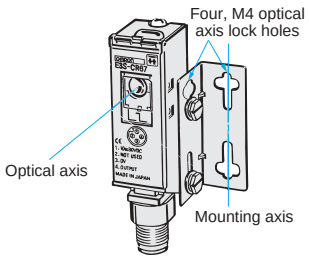
● Adjusting

Optical axis adjustment

Adjust the optical axis of the clamp to the direction of sensing object approach. The optical axis of the photoelectric sensor is the same as the mounting axis of the clamp, enabling easy adjustment.

About the optical axis locking hole

By fitting screws into the optical axis locking holes, the mounting bracket is set onto the mounting shaft of the mounting bracket.



Dimensions

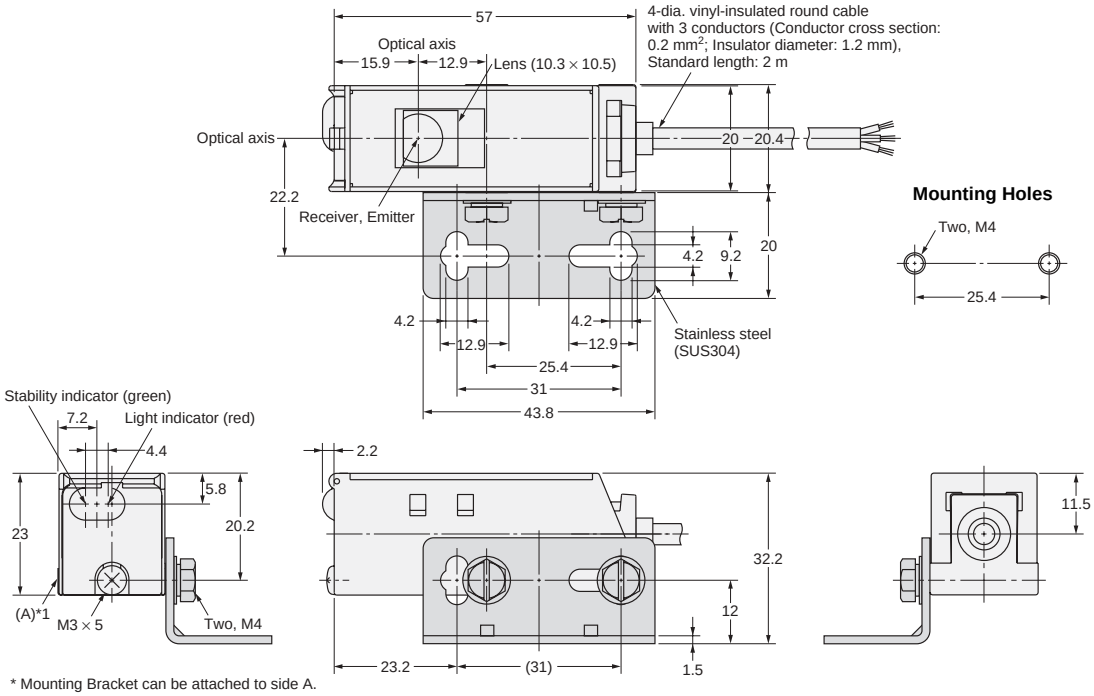
(Unit: mm)
Tolerance class IT16 applies to dimensions in this datasheet unless otherwise specified.

Sensors

Retro-reflective Models

Pre-wired
E3S-CR62

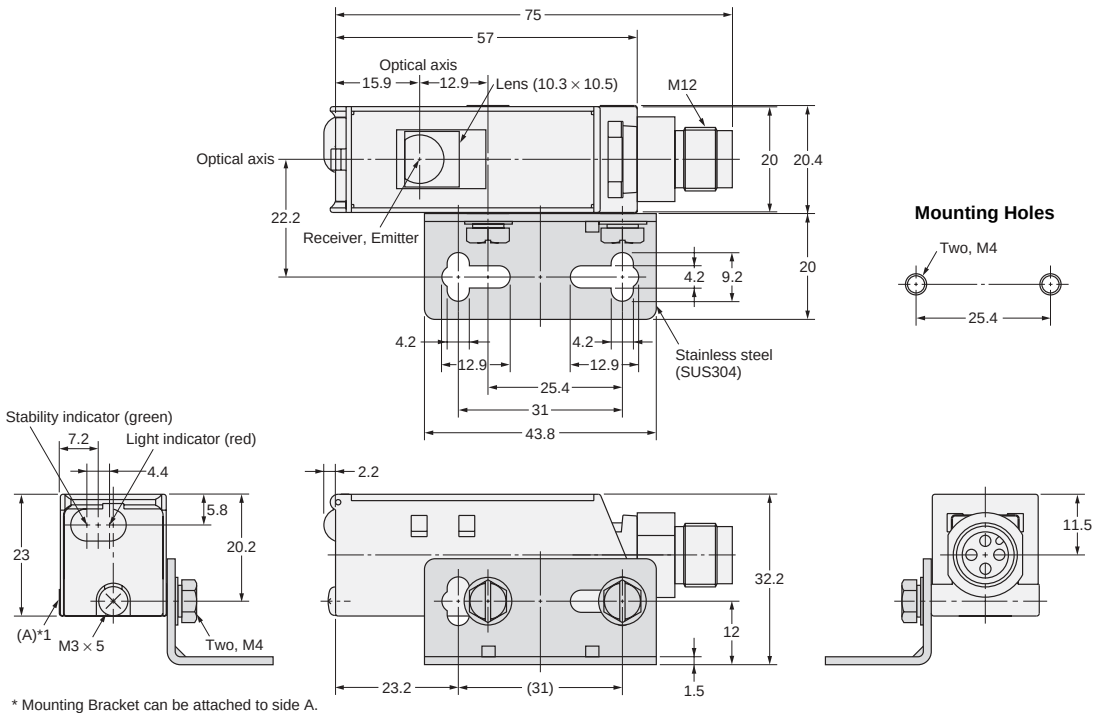
With Mounting Bracket Attached



* Mounting Bracket can be attached to side A.

Standard Connector
E3S-CR67

With Mounting Bracket Attached



* Mounting Bracket can be attached to side A.

Accessories (Order Separately)

Reflectors

Refer to *Dimensions* on *E39-L/F39-L/E39-S/E39-R*.

Mounting Brackets

Refer to *DImensions* on *E39-L/F39-L/E39-S/E39-R*.

Sensor I/O Connectors

Refer to *Introduction to Sensor I/O connectors* for details.

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2008.11

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