Transparent bottle sensor

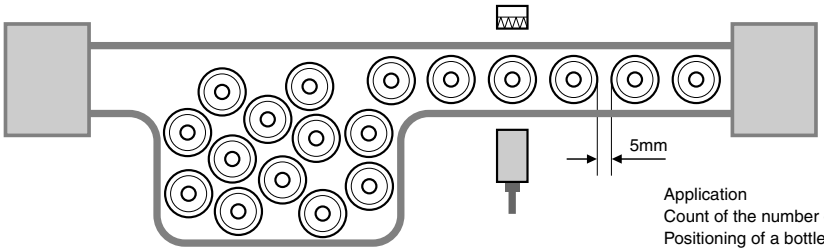
E3S-CR62/67

Ideal for detecting transparent glass and plastic containers

Features

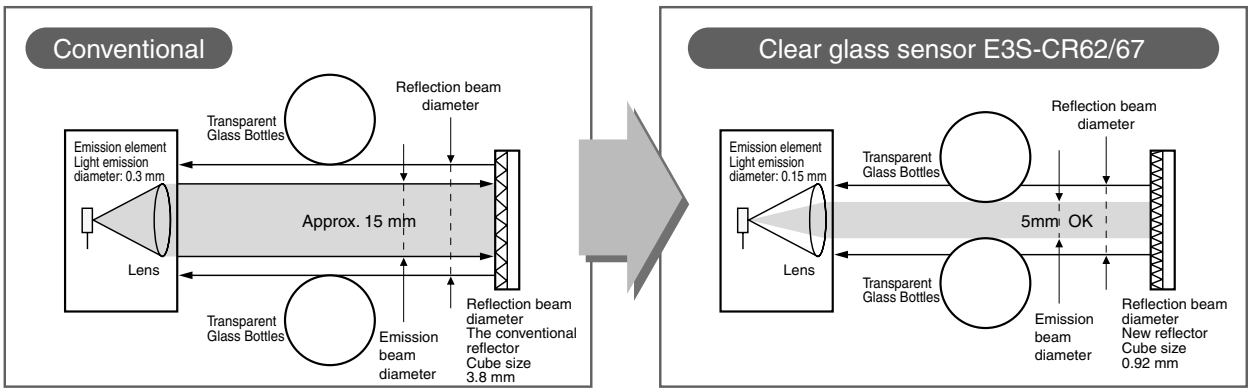
Stable operation even if container interval is shortened for higher productivity.

Stable detection of 5 mm gaps that previous regression reflection models were unable to detect because of a speed increase for higher productivity.



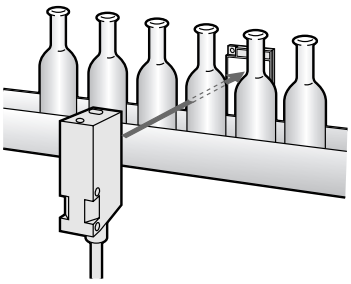
Application
Count of the number of bottles
Positioning of a bottle, and stopping

Bottle detection seen from the upper side

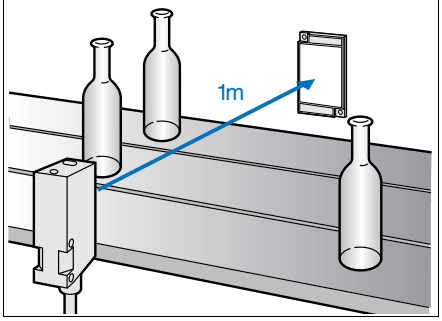


Application

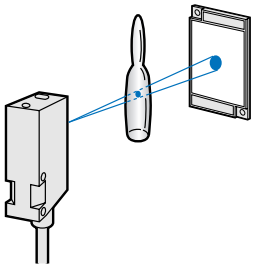
Narrow pin interval detection
Stable detection of 5 mm gaps that are not detectable by previous regression reflection models.



Wide detection range. Stable detection even at long distances.
Use of hyper-point LED as light source (1/2 light emission diameter of previous models) enables stable long-distance detection.

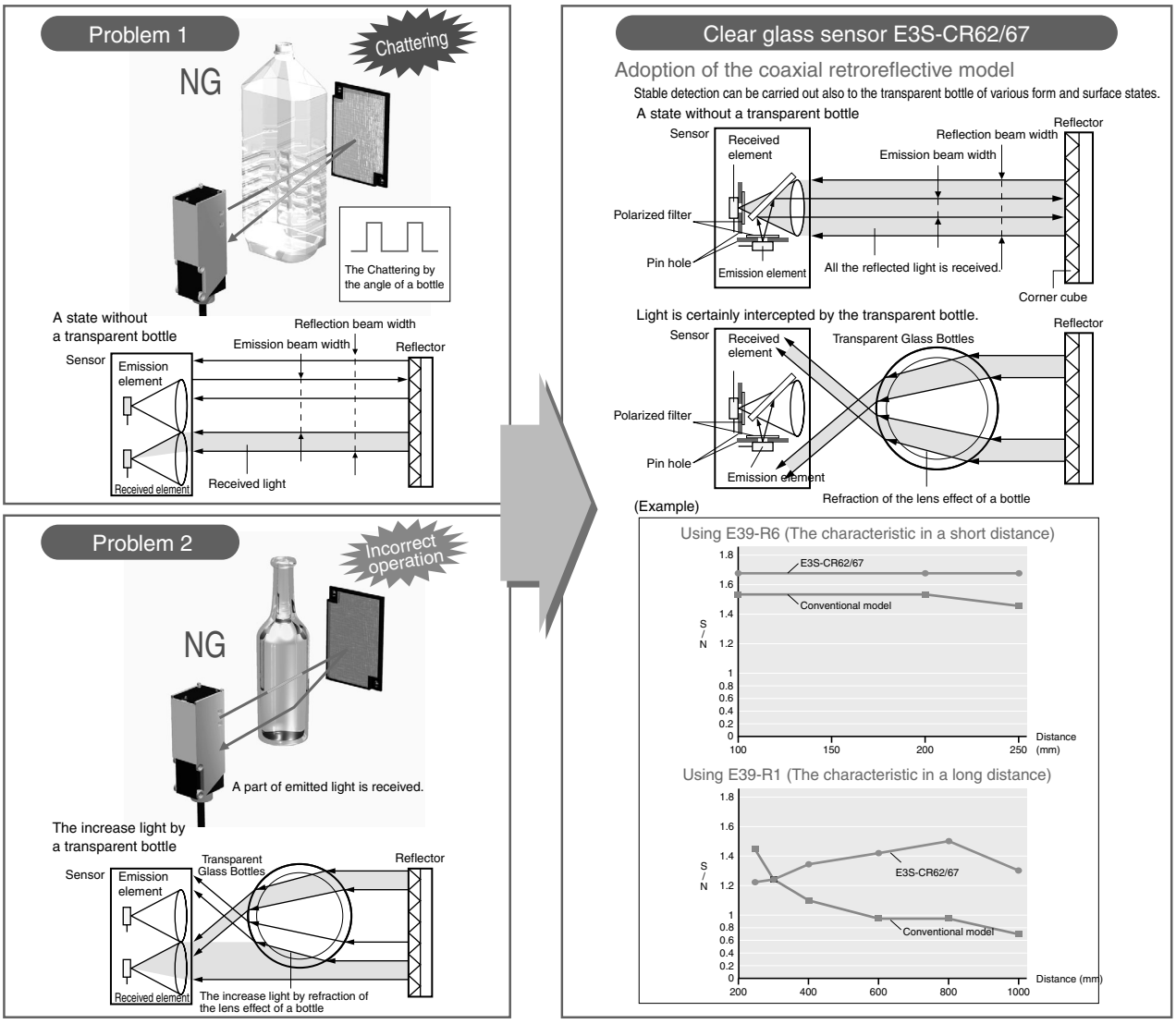


Stable detection of ampules and other small containers.
Visible spotlight for easy adjustment.



Features

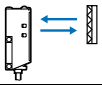
We significantly increased the S/N ratio to enable a stable detection of PET bottles and various other transparent containers



Ordering Information

Sensors

Red light

Sensor type	Shape	Connection method	Sensing distance		Model
			Reflector E39-R6	Reflector E39-R1	
Retroreflective Models		Pre-wired type	250mm	1m [250mm] *	E3S-CR62-C
		Connector type			E3S-CR67-C

* Values in parentheses indicate the minimum required distance between the sensor and reflector.

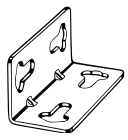
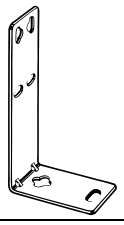
Accessories (Order Separately)

Reflectors

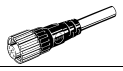
Name	Sensing distance	Model	Quantity	Remarks
Reflectors	250 mm	E39-R6	1	---
	1 m (250 mm) *	E39-R1	1	

* Values in parentheses indicate the minimum required distance between the sensor and reflector.

Mounting Brackets

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

Sensor I/O Connectors

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

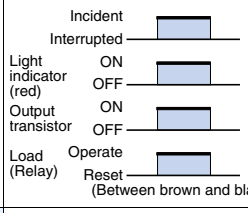
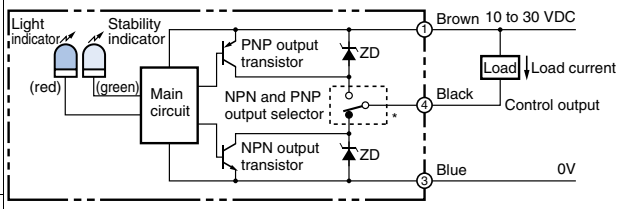
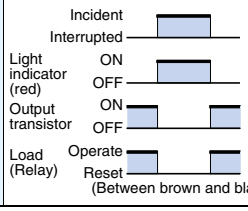
Rating/performance

Item \ Sensor type / Model		Retroreflective Models (M.S.R. function)	
		E3S-CR62-C	E3S-CR67-C
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. X 150 mm glass tube (thickness: 1.8 mm)	
Directional angle		2 to 6°	
Light source (wave length)		Red LED (660 nm)	
Power supply voltage		10 to 30 VDC, ripple (p-p) : 10 % max.	
Current consumption		40 mA max.	
Control output		Load supply voltage: 30 VDC or less; load current 100 mA or less (residual voltage: NPN output 1.2 V or less, PNP output 2 V or less); open collector model (NPN/PNP output switching) light ON / dark ON switching	
Protective circuits		Load short protection, reverse connection protection, mutual interference protection function	
Response time		Operation or reset: 1 ms max.	
Sensitivity adjustment		2-turn endless adjuster (with indicator)	
Ambient illuminance		Incandescent lamp: 5,000 lux max. Sunlight 10,000 lux max.	
Ambient temperature		Operating: -25°C to 55°C, Storage: -40°C to 70°C (with no icing or condensation)	
Ambient humidity		Operating: 35% to 85% RH, Storage: 35% to 95% RH (with no icing or condensation)	
Insulation resistance		20 M 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 (approx. 30G) for 0.5 hrs each in x, y, and Z directions	
Shock resistance		1000 m/s^2 (approx. l00G) 3 times each in X, Y, and Z directions	
Protective structure		IEC Standard IP67 NEMA 6P (restricted to indoor use) *2	IEC Standard IP67 NEMA 6P (restricted to indoor use)
Connection method		Pre-wired models (standard length: 2 m)	Connector type
Weight (Packed state)		Approx. 115 g	Approx. 80 g
Mate-rial	Case	Zinc diecast	
	Lens	Acrylics	
	Display opera-tion panel	Polyethyl sulfon	
	Mounting Brackets	Stainless steel (SUS304)	
Accessories		Brackets (with screws), adjustment driver, operation manual	

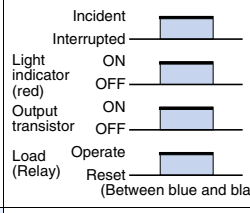
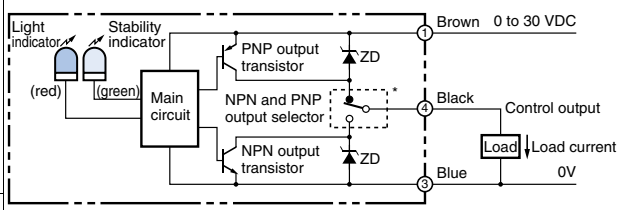
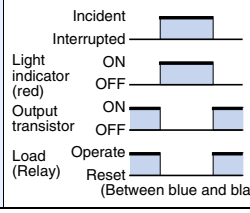
*1. Values in parentheses indicate the minimum required distance between the sensor and reflector.
*2. NEMA (National Electrical Manufacturers Association) Standard

Output Circuit Diagram

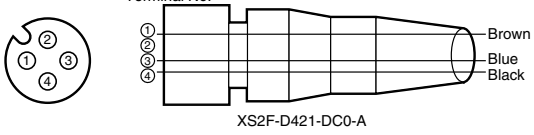
NPN output

Model	Operating status of output transistor	Timing chart	Mode selection switch	Output circuit
E3S-CR62-C E3S-CR67-C	Light ON		L ON (LIGHT ON)	 * Please make a changeover switch into the NPN side. Connector Pin arrangement  Note: Pin 2 is not used.
	Dark ON		D ON (DARK ON)	

PNP output

Model	Operating status of output transistor	Timing chart	Mode selection switch	Output circuit
E3S-CR62-C E3S-CR67-C	Light ON		L ON (LIGHT ON)	 * Please make a changeover switch into the NPN side. Connector Pin arrangement  Note: Pin 2 is not used.
	Dark ON		D ON (DARK ON)	

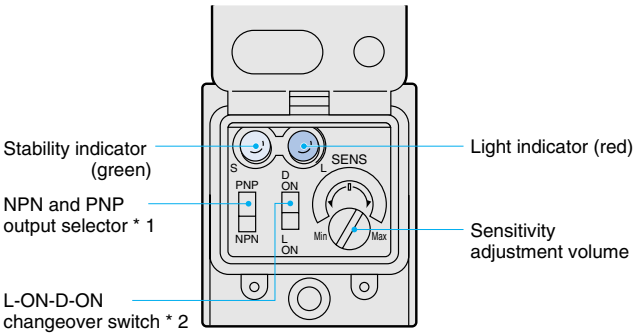
Connectors (Sensor I/O connectors)



Class	Wire, outer	Connector pin	Application
For DC	Brown	①	+V
	-	②	-
	Blue	③	0V
	Black	④	Output

Note: Pin 2 is open.

Nomenclature

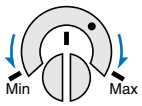
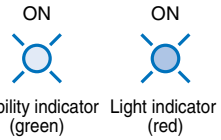
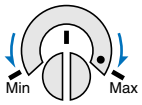
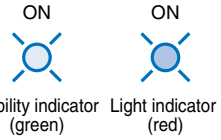


*1. Output transistor switching is possible by means of NPN/PNP output switch.
*2. Operation mode can be switched using L ON/D ON switch.

Operation

Sensitivity adjustment

The light source switch and reflective plate can be moved horizontally and vertically to set them in the center of the illumination area of the red incident light indicator lamp, allowing the operator to check whether the green stability indicator lamp is illuminated.

Sensing object	Detection state	Sensitivity adjuster	Indicator state	Adjustment procedure
Transparent pin or glass plate	Without sensing object			Turn sensitivity control from minimum to maximum and set at point where incoming light stabilizes.
Opaque object	Object detected, object not detected			If the object is larger than the lens diameter, set the sensitivity control to the maximum setting. If the object is the same size or smaller, turn the sensitivity control from minimum to maximum and set at point where incoming light stabilizes.

Correct Use

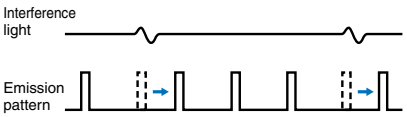
Design

Fuzzy mutual interference prevention

- If the light source switches for the reflective plates are arranged in a row, light from a neighboring light source switch may be received, causing erroneous light reception signals and errors.
- The fuzzy reciprocal interference prevention function monitors interference light for a certain period of time before illumination, and gathers data on the strength of the interference light and the frequency of incidence. It then determines the risk of error due to these two factors using fuzzy logic and controls the timing of illumination to reduce the risk.

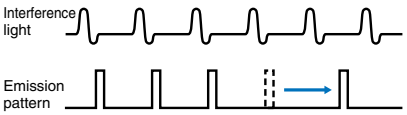
(When risk is low)

- Light is emitted after interfering light is gone.



(In case of high risk)

- Light is emitted after shifting to a gap of interfering light.



Bottles

In some cases, factors such as the shape of a bottle prevent stable detection. Please confirm that a correct detection is performed before use.

Wiring Considerations

Cable

- An oil resistant cable is used to ensure oil resistance. Avoid repeated bending of the cable.
- The bending radius should be 25 mm or more.

Avoiding Malfunctions

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

Installation

Sensor installation

- When installing a photoelectric switch, avoid tapping with a hammer. This may damage the water resistance function.
- Use an M4 screw, tightened to a torque of no more than 1.18 Nm.

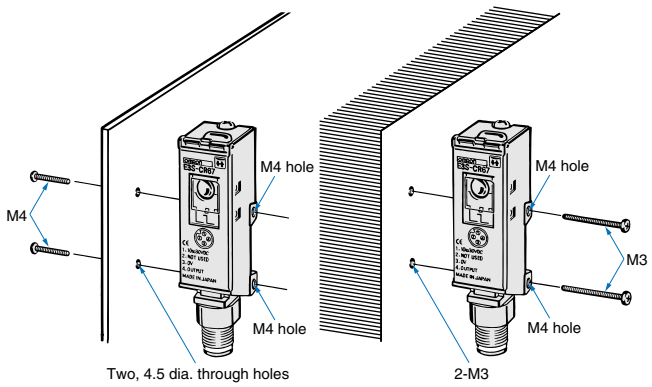
(When using the mounting bracket)

- 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 installation)

Install the photoelectric switch as shown in the following diagram.

Tighten M4 screw Tighten M3 screw



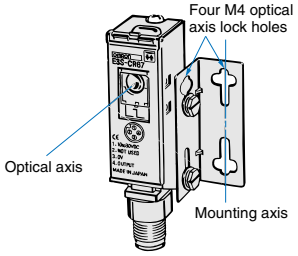
● For adjustment

Light axis adjustment

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

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)

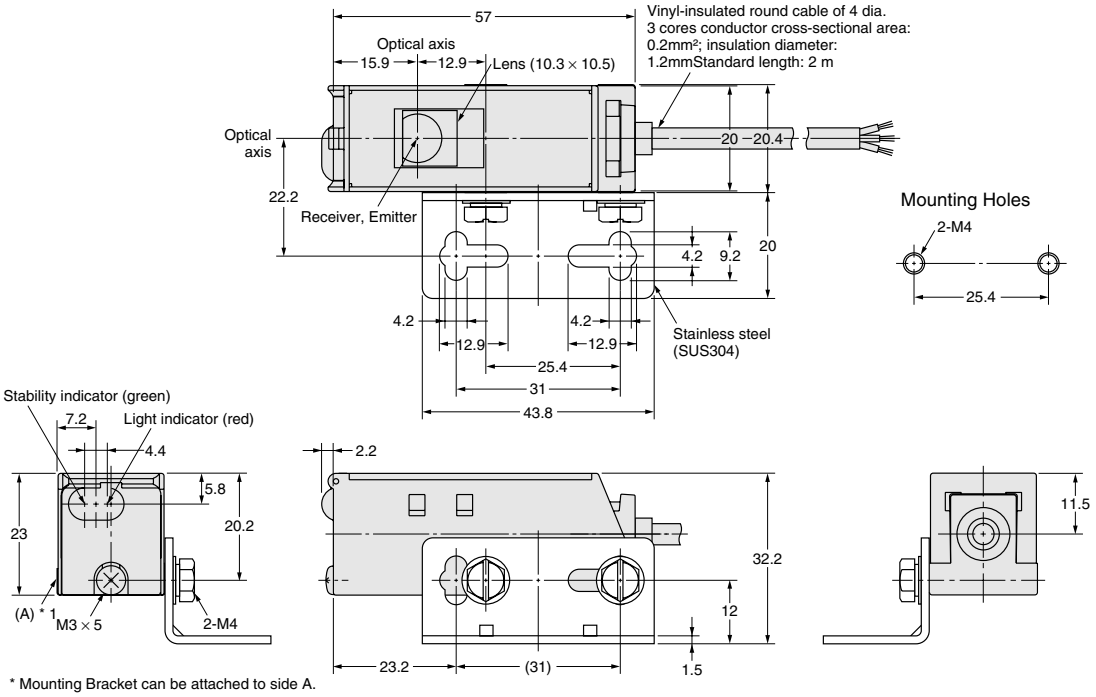
Sensors

Retroreflective Models

Pre-wired

E3S-CR62-C

With Mounting Blanket Attached

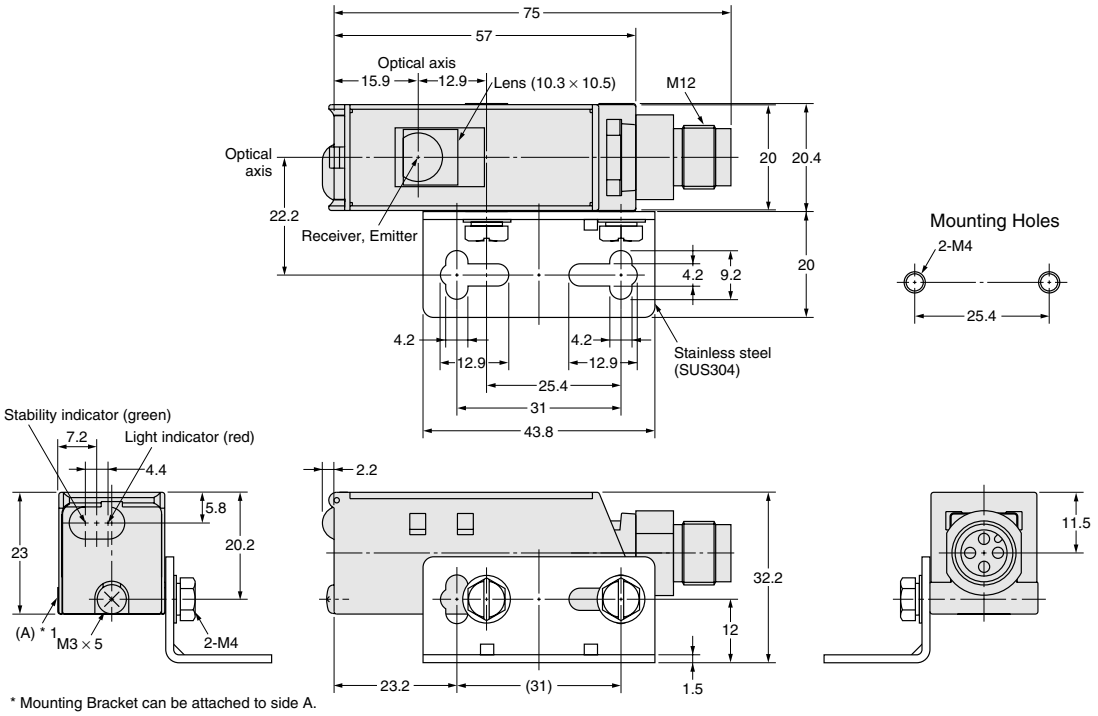


* Mounting Bracket can be attached to side A.

Connector type

E3S-CR67-C

With Mounting Blanket Attached



* Mounting Bracket can be attached to side A.

Accessories (Order Separately)

H-3

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. E268-E2-01-X In the interest of product improvement, specifications are subject to change without notice.