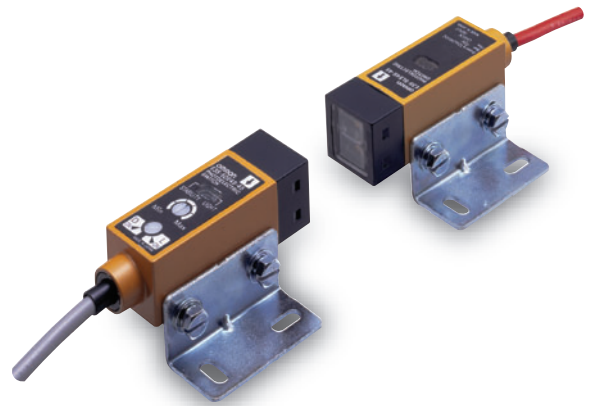



Liquid Detection in Paper Bags!



- Reliable operation in environments subject to water (IP 67 protection).
- Rugged die-cast case.



 Be sure to read *Safety Precautions* on page 3.


Ordering Information

Sensors [Refer to *Dimensions* on page 4.]  Infrared light

Sensing method	Appearance	Sensing distance	Model
Through-beam		 200 mm	E3S-5E4S-45 2M

Accessories (Order Separately)

Mounting Brackets A Mounting Bracket is not provided with the Sensor.

Appearance	Model	Quantity	Remarks
	E39-L6	1	Provided with the Sensor.

Note: Order one Mounting Bracket for the Emitter and one for the Receiver.

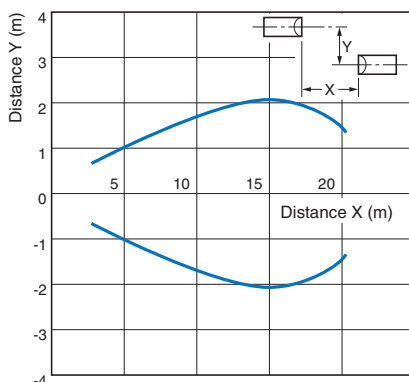
Ratings and Specifications

Sensing method		Through-beam
Item	Model	E3S-5E4S-45
Sensing distance		Through-beam for paper bags: 200 mm (For standard through-beam use: 10 m)
Standard object		Liquid or solid object, Opaque of 11-mm dia. min.
Directional angle		Emitter/Receiver: 10 to 30° each
Light source (wavelength)		Red LED (890 nm)
Power supply voltage		12 to 24 VDC±10%, ripple (p-p): 10% max.
Current consumption		45 mA max. (Emitter: 25 mA max., Receiver: 20 mA max.)
Control output		Load power supply voltage: 24 VDC max., Load current: 80 mA max. (residual voltage: 1 V max.) NPN voltage output configuration Light-ON/Dark-ON mode selector
Self-diagnosis output		Load power supply voltage: 24 VDC max., Load current: 50 mA max. (residual voltage: 1 V max.) Voltage output type
External-diagnosis input		Emission OFF: Short-circuit to 0 V or 1.5 V max. (Outflow current 1 mA max.), Emission ON: Disconnected (Leakage current 0.1 mA max.)
Protective circuits		Power supply reverse polarity protection, Output short-circuit protection
Response time		Operate or reset: 10 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: -10 to 55°C (with no icing and condensation), Storage: 0 to 65°C (with no icing and 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 60529 IP67
Connection method		Pre-wired Models (Standard cable length: 2 m)
Weight (packed state)		Approx. 300 g
Material	Case	Zinc die-cast
	Lens	Polycarbonate (PC)
	Mounting Brackets	Iron
Accessories		Mounting Bracket (with screws), Screw driver for adjustment, Sensitivity adjuster, Instruction manual

Engineering Data (Reference Value)

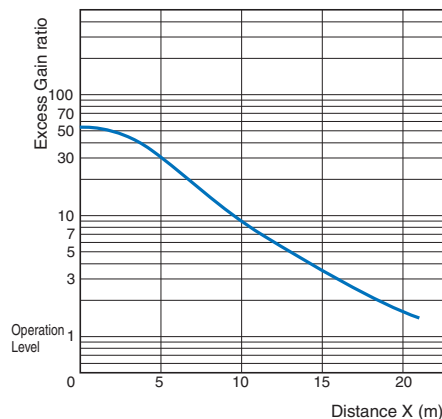
Parallel Operating Range

Through-beam



Excess Gain vs. Set Distance

Through-beam



I/O Circuit Diagrams

NPN output

Model	Operation mode	Timing charts	Operation selector	Output circuit
E3S-5E4S-45	Light-ON	Incident light No incident light Light indicator (red) ON OFF Output transistor ON OFF Load 1 Operate (relay) Reset (Between brown and black leads) Load 2 (Between blue and black leads)	L side (LIGHT ON)	Through-beam Receivers
	Dark-ON	Incident light No incident light Light indicator (red) ON OFF Output transistor ON OFF Load 1 Operate (relay) Reset (Between brown and black leads) Load 2 (Between blue and black leads)	D side (DARK ON)	
	---	External -diagnosis input ON OFF (Between blue and pink leads) Semiconductor laser diode for emission ON OFF Indicator ON OFF	---	Through-beam Emitters

* Voltage output (when connecting a transistor circuit, etc.)

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.

- The paper bag sensors are used to detect whether paper bags contain contents inside. Note, however, that the sensors are not available for some types of paper bags.

Inside paper bag	Type of paper bag	Remarks
Detectable	Light colored paper bags	Empty paper bags allow beam-through while paper bags containing liquid or solid objects do not. Detection uses this difference.
Not detectable	Dark colored paper bags, Paper bags having inner coating of aluminum foil	Paper bags prevent beam-through. Detection cannot be made.

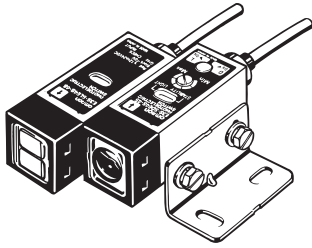
Note: Make sure in which of the types your paper bag is categorized before use.

- About the lens The inside of the emitter lens looks cloudy. This is due to the characteristics of the lens and not abnormal. Use it as it is.

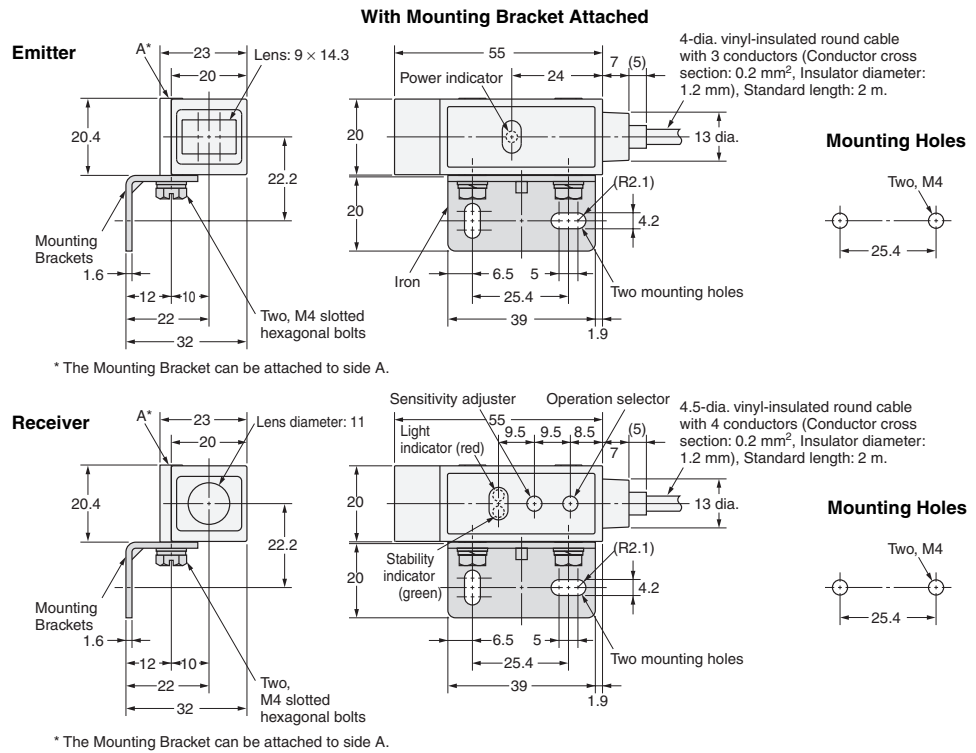
Dimensions

Sensors

E3S-5E4S-45



Emitter: E3S-5LE4S-45
Receiver: E3S-5DE4S-45



Accessories (Order Separately)

Mounting Brackets

Refer to E39-L/F39-L/E39-S/E39-R for details.

Terms and Conditions Agreement

Read and understand this catalog.

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

Warranties.

(a) Exclusive Warranty. Omron's exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Omron (or such other period expressed in writing by Omron). Omron disclaims all other warranties, express or implied.

(b) Limitations. OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCTS. BUYER ACKNOWLEDGES THAT IT ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE.

Omron further disclaims all warranties and responsibility of any type for claims or expenses based on infringement by the Products or otherwise of any intellectual property right. (c) Buyer Remedy. Omron's sole obligation hereunder shall be, at Omron's election, to (i) replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product, (ii) repair the non-complying Product, or (iii) repay or credit Buyer an amount equal to the purchase price of the non-complying Product; provided that in no event shall Omron be responsible for warranty, repair, indemnity or any other claims or expenses regarding the Products unless Omron's analysis confirms that the Products were properly handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification. Return of any Products by Buyer must be approved in writing by Omron before shipment. Omron Companies shall not be liable for the suitability or unsuitability or the results from the use of Products in combination with any electrical or electronic components, circuits, system assemblies or any other materials or substances or environments. Any advice, recommendations or information given orally or in writing, are not to be construed as an amendment or addition to the above warranty.

See <http://www.omron.com/global/> or contact your Omron representative for published information.

Limitation on Liability; Etc.

OMRON COMPANIES SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE OR STRICT LIABILITY.

Further, in no event shall liability of Omron Companies exceed the individual price of the Product on which liability is asserted.

Suitability of Use.

Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases.

NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY OR IN LARGE QUANTITIES WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

Programmable Products.

Omron Companies shall not be responsible for the user's programming of a programmable Product, or any consequence thereof.

Performance Data.

Data presented in Omron Company websites, catalogs and other materials is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of Omron's test conditions, and the user must correlate it to actual application requirements. Actual performance is subject to the Omron's Warranty and Limitations of Liability.

Change in Specifications.

Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change part numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the Product may be changed without any notice. When in doubt, special part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Omron's representative at any time to confirm actual specifications of purchased Product.

Errors and Omissions.

Information presented by Omron Companies has been checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.

2013.12

In the interest of product improvement, specifications are subject to change without notice.

OMRON Corporation
Industrial Automation Company

<http://www.ia.omron.com/>

(c)Copyright OMRON Corporation 2013 All Right Reserved.