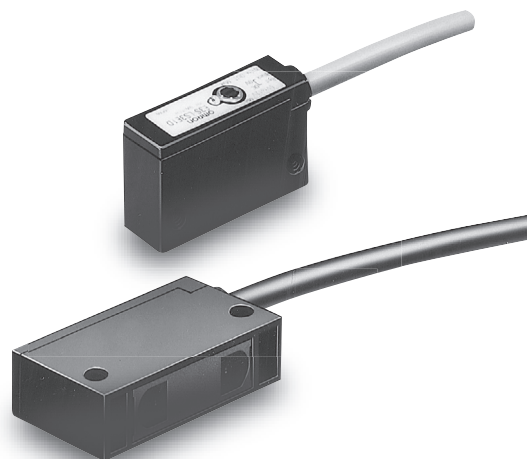


PCB Sensors with Stable Detection



Ordering Information

■ Red light
 ■ Infrared light

Sensing method	Appearance	Connection method	Sensing distance	Output configuration	Model
Convergent-reflective		Pre-wired	□ 30±5 mm	Light-ON	E3S-LS3C1D
			□ 30±5 mm	Light-ON/Dark-ON (selectable)	E3S-LS3RC4

Ratings and Specifications

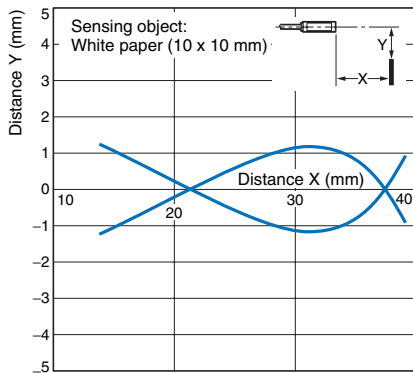
Sensing method		Convergent-reflective	
Item	Model	E3S-LS3C1D	E3S-LS3RC4
Sensing distance		30±5 mm (white paper 10 × 10 mm)	
Light source (wavelength)		Infrared LED (890 nm)	Red LED (660 nm)
Power supply voltage		5 to 24 VDC±10%, ripple (p-p) 10% max.	12 to 24 VDC±10%, ripple (p-p) 10% max.
Current consumption		40 mA max.	
Control output		Load power supply voltage: 24 VDC max., Load current: 30 mA max., (Residual voltage: 1 V max.) NPN open collector output	Load power supply voltage: 24 VDC max., Load current: 50 mA max., (Residual voltage: 1 V max.) NPN open collector output
Response time		Operate: 3 ms max. Reset: 100 ms max.	Operate or reset: 1 ms max.
Sensitivity adjustment		---	One-turn adjuster
Timer function		OFF-delay range: 0.1 to 1.0 s (adjustable)	---
Ambient illumination (receiver side)		Incandescent lamp: 1,000 lx max. Sunlight: 3,000 lx max	Incandescent lamp: 3,000 lx max. Sunlight: 10,000 lx max
Ambient temperature		Operating: -10 to 55°C (with no icing or condensation) Storage: -25 to 70°C (with no icing or condensation)	
Ambient humidity		Operating: 35% to 85% (with no condensation) 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 55 Hz with a 1.5-mm double amplitude for 2 h each in X, Y and Z directions	
Shock resistance (destruction)		500 m/s ² , 10 times each in X, Y and Z directions	500 m/s ² , 3 times each in X, Y and Z directions
Degree of protection		IEC IP40	
Connection method		Pre-wired (standard length: 2 m)	
Weight (packed state)		Approx. 60 g	
Materials	Case	Heat-resistant ABS	
	Lens	Polycarbonate	
Accessories		Instruction sheet	Instruction sheet, Screws M3 × 6

I/O Circuit Diagrams

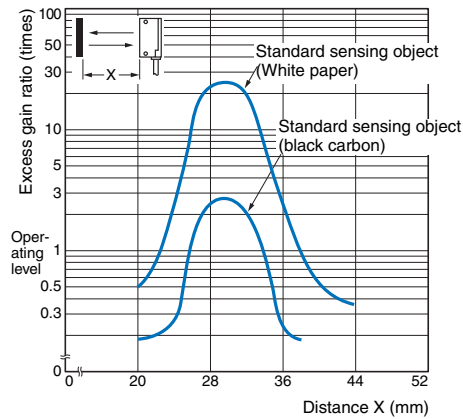
Output configuration	Model	Operating status of output transistor	Timing charts	Operating status	Output circuit
NPN output	E3S-LS3C1D	Light-ON	<p>Sensing object Present/Not present Operation indicator (red) ON/OFF Output transistor (load) ON/OFF 3 ms max. Off-delay Timer *T: 0.1 to 1.0 s</p>	---	
	E3S-LS3RC4		<p>Incident light No incident light Light indicator (red) ON/OFF Output transistor ON/OFF Load (e.g., relay) Operate/Reset (Between brown and black)</p>	Short pink wire to brown wire.	
	E3S-LS3RC4		<p>Incident light No incident light Light indicator (red) ON/OFF Output transistor ON/OFF Load (e.g., relay) Operate/Reset (Between brown and black)</p>	Short pink wire to blue wire or leave pink wire open.	

Engineering Data (Typical)

Operating Range E3S-LS3RC4



Excess Gain vs. Set Distance E3S-LS3RC4



Safety Precautions

⚠ WARNING

This product is not designed or rated for ensuring safety of persons. Do not use it for such purpose.



Precautions for Correct Use

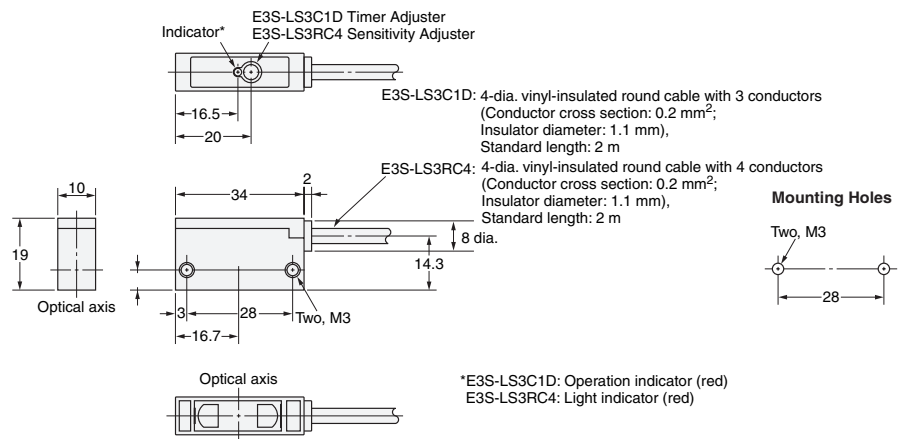
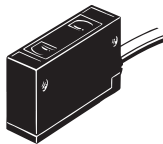
Do not use the product in atmospheres or environments that exceed product ratings.

(Unit: mm)

Dimensions

Unless otherwise specified, the tolerance class IT16 is used for dimensions in this data sheet.

E3S-LS3C1D E3S-LS3RC4



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

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.

Warranty and Limitations of Liability

WARRANTY

OMRON's exclusive warranty is that the products are free from defects in materials and workmanship for a period of one year (or other period if specified) from date of sale by OMRON.

OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, REGARDING NON-INFRINGEMENT, MERCHANTABILITY, OR FITNESS FOR PARTICULAR PURPOSE OF THE PRODUCTS. ANY BUYER OR USER ACKNOWLEDGES THAT THE BUYER OR USER ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. OMRON DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED.

LIMITATIONS OF LIABILITY

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

In no event shall the responsibility of OMRON for any act exceed the individual price of the product on which liability is asserted.

IN NO EVENT SHALL OMRON BE RESPONSIBLE FOR WARRANTY, REPAIR, OR OTHER CLAIMS 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 OR REPAIR.

Application Considerations

SUITABILITY FOR USE

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of products in the customer's application or use of the products.

At the customer's request, OMRON will provide applicable third party certification documents identifying ratings and limitations of use that apply to the products. This information by itself is not sufficient for a complete determination of the suitability of the products in combination with the end product, machine, system, or other application or use.

The following are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible uses of the products, nor is it intended to imply that the uses listed may be suitable for the products:

- Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this catalog.
- Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
- Systems, machines, and equipment that could present a risk to life or property.

Please know and observe all prohibitions of use applicable to the products.

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCTS ARE PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

PROGRAMMABLE PRODUCTS

OMRON shall not be responsible for the user's programming of a programmable product, or any consequence thereof.

Disclaimers

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 model numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the products may be changed without any notice. When in doubt, special model numbers may be assigned to fix or establish key specifications for your application on your request. Please consult with your OMRON representative at any time to confirm actual specifications of purchased products.

DIMENSIONS AND WEIGHTS

Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.

PERFORMANCE DATA

Performance data given in this catalog 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 users must correlate it to actual application requirements. Actual performance is subject to the OMRON Warranty and Limitations of Liability.

ERRORS AND OMISSIONS

The information in this document has been carefully checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical, or proofreading errors, or omissions.

2008.9

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 2008 All Right Reserved.