

Thank you for selecting OMRON product. This sheet primarily describes precautions required in installing and operating the product.

Before operating the product, read the sheet thoroughly to acquire sufficient knowledge of the product. For your convenience, keep the sheet at your disposal.

TRACEABILITY INFORMATION:

Representative in EU: OMRON EUROPE B.V. Wegalaan 67-69, 2132 JD Hoofddorp, The Netherlands
 Manufacturer: OMRON CORPORATION, Shiohji Horikawa, Shimogyo-ku, Kyoto 600-8530 JAPAN
 Ayabe Factory, 3-2 Narutani, Nakayama-cho, Ayabe-shi, Kyoto 623-0105 JAPAN

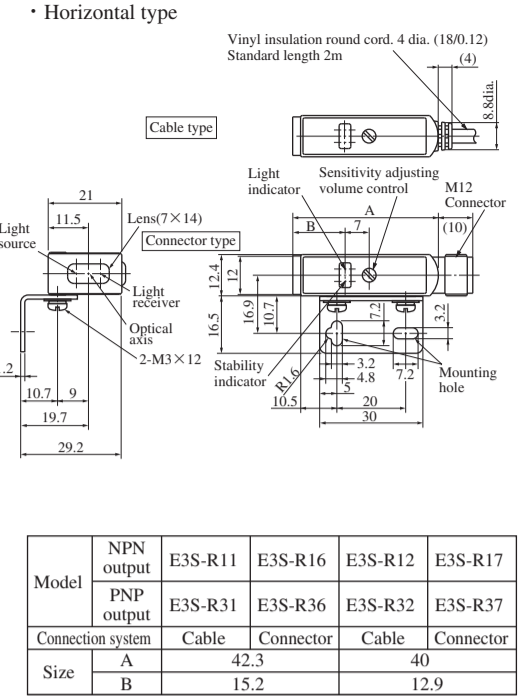
Notice:
 In a residential environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

■ RATING

Function	Output configuration Connection system	Retroreflective type Polarized		Retroreflective type	
		NPN output (open collector)	PNP output (open collector)	NPN output (open collector)	PNP output (open collector)
Horizontal type	Cable	E3S-R11	E3S-R31	E3S-R12	E3S-R32
	Connector	E3S-R16	E3S-R36	E3S-R17	E3S-R37
Vertical type	Cable	E3S-R61	E3S-R81	E3S-R62	E3S-R82
	Connector	E3S-R66	E3S-R86	E3S-R67	E3S-R87
Detecting distance		0.1 to 1m (with reflector E39-R1)		10 to 30cm (with reflector E39-R1)	
Detecting object		LCD glass board t=0.7mm min (Note 1)		LCD glass board t=0.7mm min. (Note 2) Glass tube with 10 dia min (t=1.0mm l=30mm)	
Supply voltage		10 to 30V DC			
Current consumption		30mA max			
Response time (ON, OFF)		1ms max			
Control output (Max.)		30V DC 100mA max. residual voltage 1V max			
Light source		Red LED		Infrared LED	
Case material		PBTP			
Degree of protection		IEC 60529IP67, NEMA250 4X			
Ambient operating temperature		0 to 40°C (Note 3)		0 to 40°C	
Ambient operating humidity		35 to 85%RH			

Note 1 The transmission factor of glass board should be under 95% when the wavelength is 700nm.
 Note 2 The transmission factor of glass board should be under 95% when the wavelength is 880nm.
 Note 3 It is possible to detect stably when the change of temperature is under ±5°C.

■ OVERALL SIZE



Precautions for Safe Use

(1) Operational environment

• Do not use the sensor under the environment with explosive or ignition gas.

(2) Lock mechanism

• When a sensor has cable or unit locking mechanism, make sure the lock is firmly locked.

(3) Load current

• Do not use the sensor over the rated load current.

Precautions for Correct Use

(1) Connection

• Routing the wires of the photoelectric switch with high potential power lines may result malfunction or damage to it because of the inductive effects.

Be sure to route the switch wires separated from the power lines or through an exclusive conduit.

• For extending wires use a cable 0.3mm² min. and 100m max. in length.

• Excessive forces (hitting by hammer, etc) should not be put on the photoelectric switch because they may damage its water-resistive characteristic.

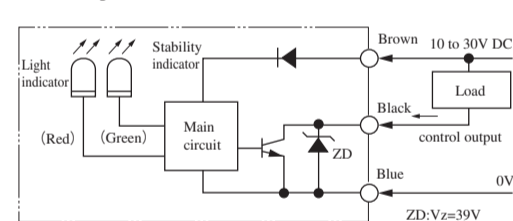
• Excessive force applied to mode changeover switch may cause damage, therefore do not apply more than 0.6mN · m.

(2) Power supply

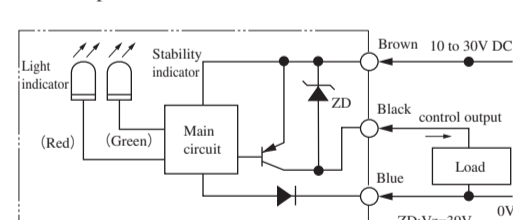
• When using a commercially available switching regulator, be sure to ground the FG (Frame Ground) and G (Ground) terminals. If this is not done, failure in operation may happen switching noise, when switching the power supply.

■ OUTPUT STAGE CIRCUIT DIAGRAM

• NPN output

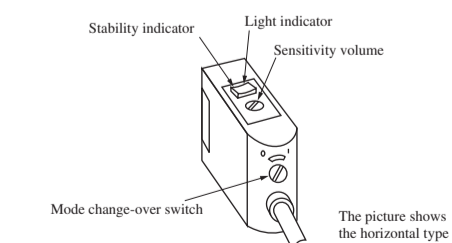


• PNP output



■ OPERATION MODE AND TIME CHART

Mode change-over switch	L	D
Operation condition of output transistor	Light-ON	Dark-ON
Timing chart	Incident light interrupted	Incident light interrupted
	light indicator (red) ON	light indicator (red) ON
	Output transistor ON	Output transistor ON
	Load (relay etc) Operate	Load (relay etc) Operate



■ OPTICAL AXIS ADJUSTMENT

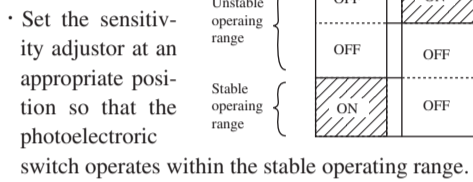
• Optical axis alignment mechanism is adopted and the light travels along the installation.

• Direct the sensor and reflector vertically and horizontally to set in the center of the range where the indicator (red) turns on, and fix there.

Make sure that the indication of STABILITY (green) is on.

(3) Indication

• The green and red indicators turn on and off as shown in right chart.



(4) Lens Material

• Note that material of lens is denaturated polyallylate, and generally dissolves in alkali and strong acid organic solvent.

(5) Cable

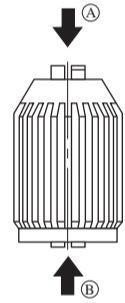
• Do not repeat bending in use.

(6) Handling of attachment

(Sensitivity adjusting knob (attachment))
 • Insert the side A into the shaft in temporarily adjusting sensitivity or changing mode.

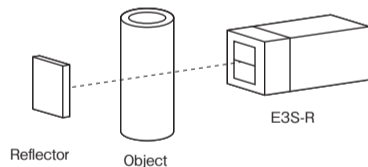
• As a manual handling volume control

• Insert the B side into the shaft in keeping the sensitivity adjusting knob normally attached. (Note that it cannot be detached once it is loaded.)



■ ADJUSTMENT

• To sense a cylindrical object, install the sensor and reflector so that the sensor lens direction (over, under) and the object are as shown below.

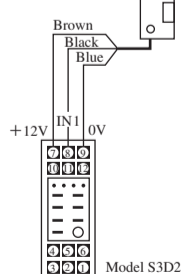


• To sense an uneven plastic case or glass bottle, excess gain changes by sensing point and direction. Turn the detecting object to be detected at the least difference, then set the sensitivity adjustment.

• It is basic that the passing position is the middle between the sensor and the reflector.

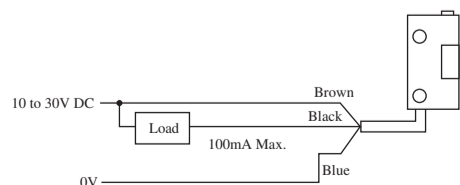
■ CONNECTION

• When sensor controller (Model S3D2) is used. Signal input change-over switch of S3D2 enables reversing of operation.



• Connection to load such as relay and photocoupler.

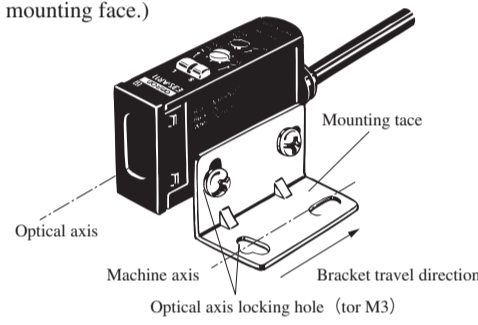
• NPN output



(7) Mounting bracket (attachment)

• Fit a screw into the optical axis locking hole, and the machine axis (screw hole axis) nearly agrees with optical axis.

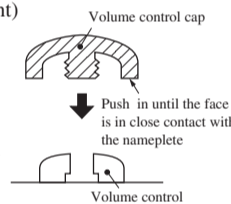
That is, when the mounting face and screw hole are properly directed toward a reflector, fitting the screw in this hole positively allows the machine axis and optical axis to agree with each other, achieving incident condition, so that no optical axis alignment is needed. (However, optical axis alignment is needed as before when there is a stage difference or height difference on the mounting face.)



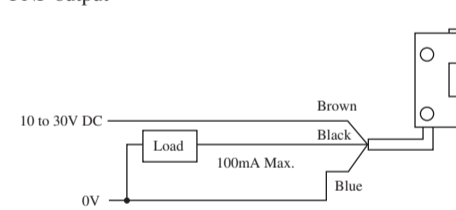
Note. Screw tightening torque should be 0.55N · m max.

(8) Use of volume cap (attachment)

• In order to disable changing sensitivity volume control in use, place the attached volume control cap and clog the screwdriver hole of the volume control.

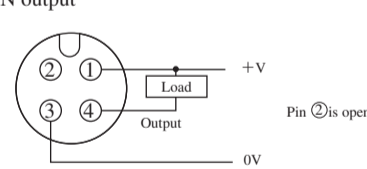


• PNP output

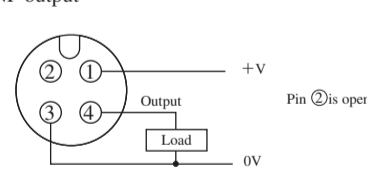


■ WIRING FOR CONNECTOR TYPE

• NPN output



• PNP output



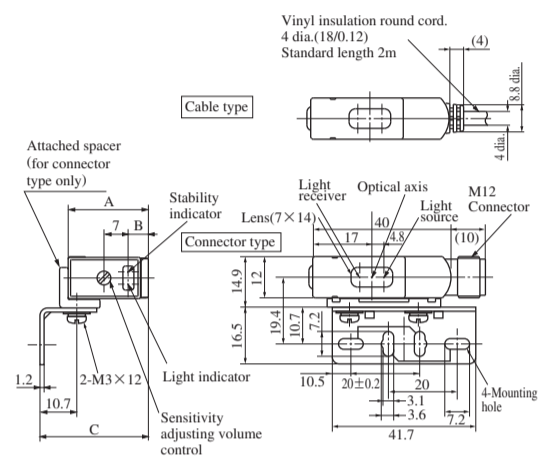
■ PLUG INFORMATION FOR CONNECTOR TYPE

The following plugs compatible with the E3S-R□□ connector type are available from us.

Shape and appearance	Cable length	Type
Straight	2m	XS2F-D421-DC0-A
	5m	XS2F-D421-GC0-A

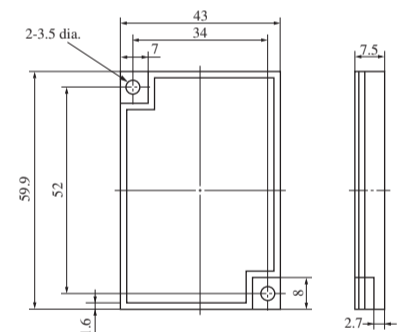
Note :Be sure to attach the accompanying spacer (see the Outer Dimensions drawing). When using the accompanying fixture or fixing directly.

• Vertical type



Model	NPN output	E3S-R61	E3S-R66	E3S-R62	E3S-R67
	PNP output	E3S-R81	E3S-R86	E3S-R82	E3S-R87
Connection system		Cable	Connector	Cable	Connector
Size	A	23.3		21	
	B	5.9		3.6	
	C	31.5		29.2	

• Reflector / E39-R1



Suitability for 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 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.

OMRON Corporation Industrial Automation Company
 Kyoto, JAPAN Contact: www.ia.omron.com

Regional Headquarters
OMRON EUROPE B.V.
 Wegalaan 67-69, 2132 JD Hoofddorp
 The Netherlands
 Tel: (31)2356-81-300/Fax: (31)2356-81-388

OMRON ELECTRONICS LLC
 2895 Greenspoint Parkway, Suite 200
 Hoffman Estates, IL 60169 U.S.A.
 Tel: (1) 847-843-7900/Fax: (1) 847-843-7787

OMRON ASIA PACIFIC PTE. LTD.
 No. 438A Alexandra Road # 05-05/08 (Lobby 2),
 Alexandra Technopark,
 Singapore 119967
 Tel: (65) 6835-3011/Fax: (65) 6835-2711

OMRON (CHINA) CO., LTD.
 Room 2211, Bank of China Tower,
 200 Yin Cheng Zhong Road,
 PuDong New Area, Shanghai, 200120, China
 Tel: (86) 21-5037-2222/Fax: (86) 21-5037-2200

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