

Specifications

Item	E3S-R12/-R62/ -R17/-R67/-R32/-R82/ -R37/-R87	E3S-R11/-R61/ -R16/-R66/-R31/-R81/ -R36/-R86	E3S-RS30E4/ -RS30E42	E3S-R1□4/-R1□42
LED for emitter	Infrared LED	Red LED	Infrared LED	
Indicator	Light indicator (red), excess gain indicator (green)		Light indicator (red)	Light indicator (red), stability indicator (green)
Sensitivity adjustment	Two-turn adjustor with an indicator		One-turn adjustor	
Connection method	See note.		Pre-wired	
Materials	Case: Polybutylene terephthalate Lens: Denatured polyallylate		Case: Zinc die-cast Lens: Polycarbonate	

Note: The E3S-R11/-R12/-R61/-R62/-R31/-R32/-R81/-R82 each have a pre-wired cord.
The E3S-R16/-R17/-R66/-R67/-R36/-R37/-R86/-R87 each have a plug-in connector.

■ Ratings/Characteristics

Item	E3S-R12/-R62/ -R17/-R67	E3S-R11/-R61/ -R16/-R66	E3S-R32/-R82/ -R37/-R87	E3S-R31/-R81/ -R36/-R86	E3S-RS30E4/ -RS30E42	E3S-R1□4/ -R1□42
Power supply voltage	10 to 30 VDC; ripple: 10% max.				12 to 24 VDC±10%; ripple: 10% max.	
Current consumption	30 mA max.				40 mA max.	
Sensing distance	10 to 30 cm	0.1 to 1 m	10 to 30 cm	0.1 to 1 m	30 cm	1 m
Sensing method	Retroreflective	Retroreflective with polarized function	Retroreflective	Retroreflective with polarized function	Retroreflective	
Standard sensing object	0.7-mm-thick LCD glass boards; 10-mm-dia., 1.0-mm-thick, 30-mm-long cylindrical glass objects	0.7-mm-thick LCD glass boards	0.7-mm-thick LCD glass boards; 10-mm-dia., 1.0-mm-thick, 30-mm-long cylindrical glass objects	0.7-mm-thick LCD glass boards	10-mm-dia., 1.0-mm-thick, 30-mm-long cylindrical glass objects	
Response time	1 ms max. for both operation and release					
Control output (no-contact output)	NPN open collector, 30 VDC, 100 mA max.		PNP open collector, 30 VDC, 100 mA max.		Output current: 1.5 to 4 mA at 24 VDC; NPN output (with suffix -E): 80 mA PNP output (with suffix -B): 100 mA	
Ambient illumination	Incandescent lamp	5,000 lx max.			Illumination on optical spot: 3,000 lx max.	
	Sunlight	10,000 lx max.			Illumination on optical spot: 10,000 lx max.	
Ambient temperature	Operating: 0°C to 40°C (with no icing)					Operating: -25°C to 55°C (with no icing)
Ambient humidity	Operating: 35% to 85%					
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 h each in X, Y, and Z directions					
Shock resistance	Destruction: 500 m/s ² (approx. 50G) for 3 times each in X, Y, and Z directions					
Protection	Load short-circuit protection, reverse polarity protection, mutual interference prevention				Load short-circuit protection, mutual interference prevention	
Enclosure rating	IEC: IP67					

Note: 1. The above sensing distances are possible when the E39-R1 Reflector is used. The E39-R1 Reflector is provided with the E3S-R.
2. Even though the excess gain indicator of the E3S-R is dimly lit during sensitivity adjustment of the E3S-R, the E3S-R will provide stable operation if the ambient temperature does not rise or fall by more than 5°C while the E3S-R is operating.

■ Characteristic Data (Reference Values)

Light Level Change Rates with Various Transparent Objects (See Note 1)

The following are the permeation rates of a various transparent objects on condition that a permeation rate of 100 means that there is no object within the sensing distance of the E3S-R. The permeation rate of any type of object sensed by the E3S-R must be as low as possible for the stable sensing of the object. Before using the E3S-R to sense objects, use samples of the objects to check if the E3S-R can sense the samples easily.

Sensing object		E3S-R12/-R62/-R17/ -R67/-R32/-R82/ -R37/-R87	E3S-R11/-R61/-R16/ -R66/-R31/-R81/ -R36/-R86	E3S-RS30□□	E3S-R1□□
		Center	Center	Center	Center
Cylindrical glass object	10-dia. x 30, t = 1.0	27	---	20	33
	15-dia. x 30, t = 1.25	27	---	20	13
	20-dia. x 30, t = 1.7	22	---	28	13
	30-dia. x 30, t = 1.9	41	---	43	23
	100-dia. x 30, t = 2.5	58	---	55	50
	200-dia. x 30, t = 5.0	55	---	58	58
Glass plate	50 x 50, t = 0.5	82	91.5	78	---
	50 x 50, t = 1	74	82.5	70	75
	50 x 50, t = 2	73	81	70	75
	50 x 50, t = 3	62	69	58	65
	50 x 50, t = 5	53	59	50	55
	50 x 50, t = 10	38	42	35	40
Liquid crystal glass	t = 0.5 (permeability of 98%) (see note 2)	86	96	---	---
	t = 0.7 (permeability of 95%) (see note 2)	81	90	---	---
	t = 1.1 (permeability of 91%) (see note 2)	75	83	---	---
Operating range		95 max.	95 max.	90 max.	80 max.
Stable operating range		90 max.	90 max.	70 max.	60 max.

- Note:**
1. The sensing distance of each model was set to the rated sensing distance.
 2. The permeability values were checked with light with a wavelength of 700 μm .