OMRON

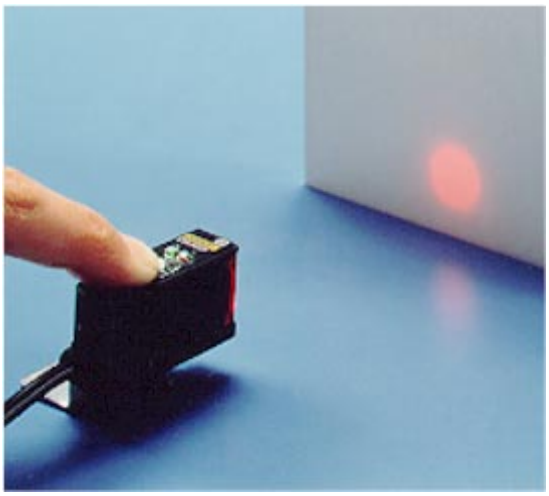
Sensing distance			Supply voltage	Output
2, 5 m	2 m	10, 30 cm	12 to 24 VDC	80 mA

Photoelectric Sensor

E3S

General-purpose Miniature Sensors

- Short response time: 3 ms.
- Easy adjustment of sensitivity and optical axis with STABILITY and LIGHT indicators.
- Wire-selectable operation mode.
- Mutual interference protective circuit eliminates cross talk (reflective sensor only).



Ordering Information

Appearance	Sensing method	Sensing distance	Model	
			NPN output	PNP output
Horizontal	Through-beam (separate)	2 m	E3S-2E4	E3S-2B4
		5 m	E3S-5E4 E3S-5E4S E3S-5E4S1	E3S-5B4 E3S-5B4S
	Retroreflective	2 m	E3S-R2E4	E3S-R2B4
	Diffuse reflective	10 cm	E3S-DS10E4	E3S-DS10B4
		30 cm	E3S-DS30E4 E3S-DS30E4S E3S-DS30E4S1	E3S-DS30B4 E3S-DS30B4S
Vertical	Through-beam (separate)	2 m	E3S-2E41	E3S-2B41
		5 m	E3S-5E41	E3S-5B41
	Retroreflective	2 m	E3S-R2E41	E3S-R2B41
	Diffuse reflective	10 cm	E3S-DS10E41	E3S-DS10B41
		30 cm	E3S-DS30E41	E3S-DS30B41

Specifications

■ Ratings/Characteristics

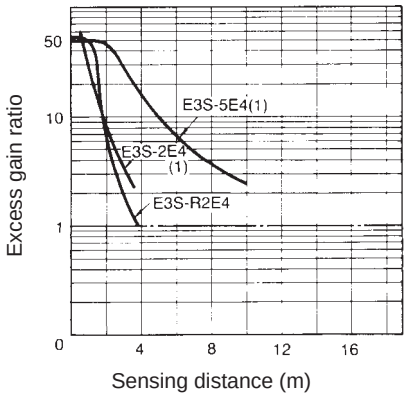
Item			E3S-2□□	E3S-5□□	E3S-R2□□	E3S-DS10□□
Power supply voltage			12 VDC –10% to 24 VDC +10%, ripple (p-p): 10% max.			
Current consumption			50 mA max.		40 mA max.	
Sensing distance			2 m	5 m	0.1 to 2 m (with E39-R1 reflector)	10 cm
Differential travel			---			20% max. of sensing distance
Standard objects			Opaque (7 mm)	Opaque (11 mm)	Opaque (30 mm)	5 x 5 cm white mat paper
Control output	DC solid-state	Load	Load current: Models with suffix -E4: 80 mA max. Models with suffix -B4: 100 mA max.			
		Voltage output	2 V max.			
Response time (ON, OFF)			3 ms max.		1 ms max.	
Operation mode			Wire-selectable			
Indicators			Light indicator (red), stability indicator (green)			
Enclosure rating		IEC 144	IP65	IP67		IP65
		NEMA	1, 2, 12	1, 3, 4X, 6, 12		1, 2, 12
Housing material			Plastic	Metal		Plastic
Light source			Infrared LED			
Ambient temperature			Operating: –25 to 55 °C			

Item			E3S-DS30□□	E3S-5□4S(1)	E3S-DS30□4S(1)
Power supply voltage			12 VDC –10% to 24 VDC +10%, ripple (p-p): 10% max.		
Current consumption			40 mA max.	70 mA max.	
Sensing distance			30 cm	5 m	30 cm
Differential travel			20% max. of sensing distance	---	20% max. of sensing distance
Standard objects			10 x 10 cm white mat paper	Opaque (11 mm)	10 x 10 cm white mat paper
Control output	DC solid-state	Load	Load current: Models with suffix -E4: 80 mA max. Models with suffix -B4: 100 mA max.		
		Voltage output	2 V max.		
Response time (ON, OFF)			1 ms max.	3 ms max.	1 ms max.
Operation mode			Wire-selectable	Switch selectable	
Indicators			Light indicator (red), stability indicator (green)		
Enclosure rating		IEC 144	IP67		
		NEMA	1, 3, 4X, 6, 12		
Housing material			Metal		
Light source			Infrared LED		
Ambient temperature			Operating: –25 to 55 °C		

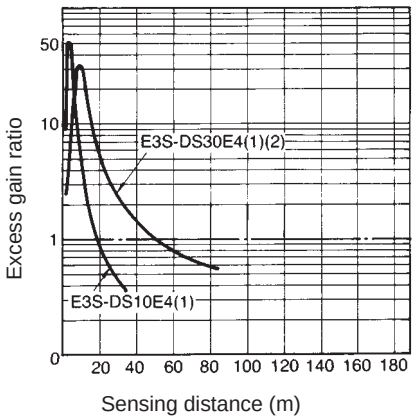
Engineering Data

Excess Gain Ratio

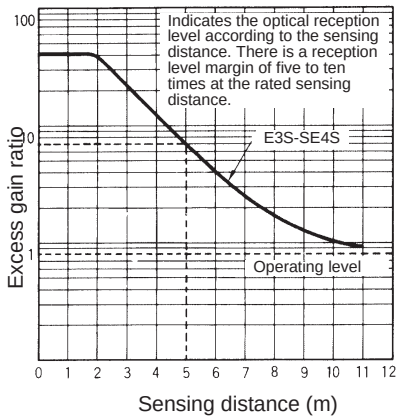
E3S-2E4(1), E3S-5E4(1), E3S-R2E4



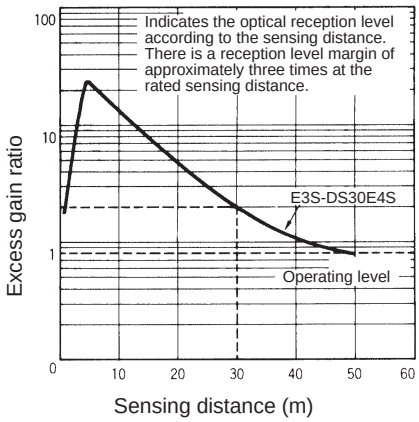
E3S-DS10E4(1), E3S-DS30E4(1)(2)



E3S-5E4S(1)

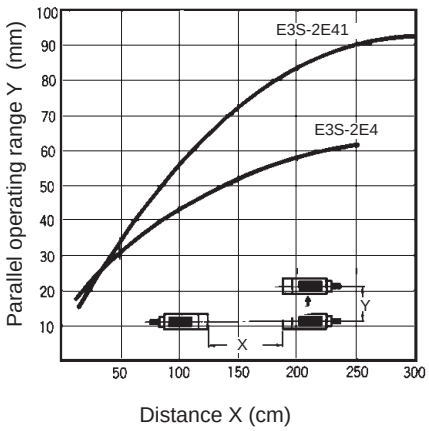


E3S-DS30E4S(1)

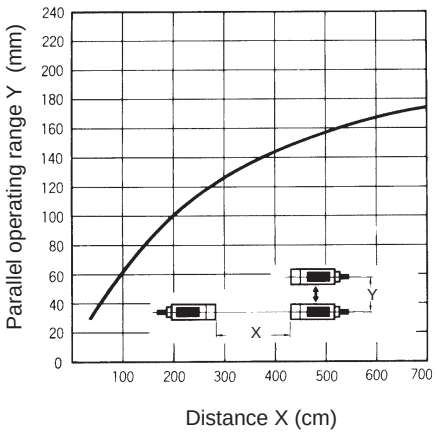


Parallel Operating Range

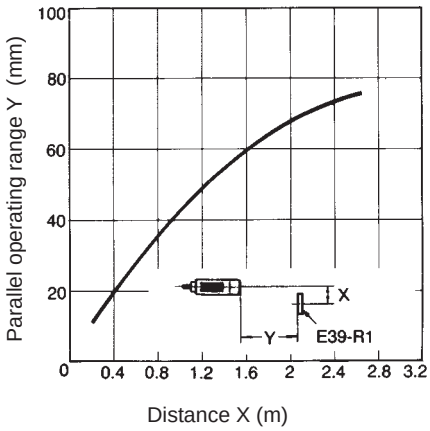
E3S-2E4(1)



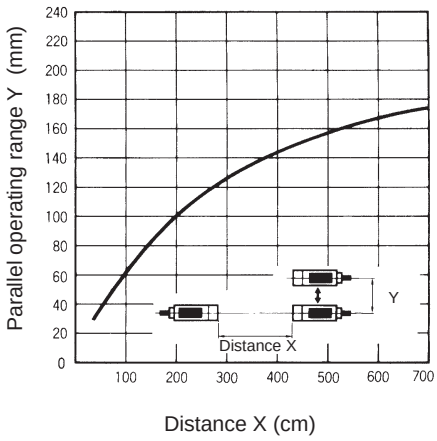
E3S-5E4(41)(42)



E3S-R2E4(1)



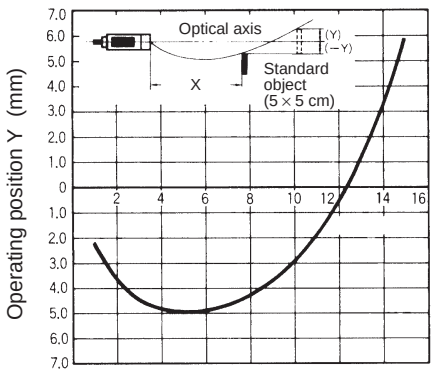
E3S-5E4S(1)



Distance X (cm)

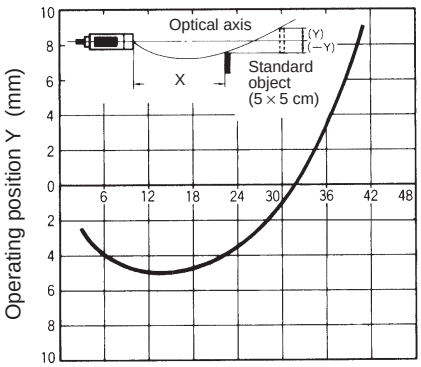
Operating Range

E3S-DS10E4(1)



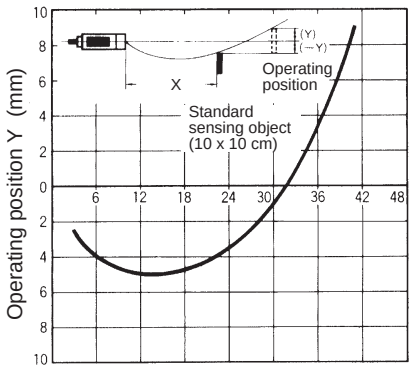
Distance X (cm)

E3S-5E4(41)(42)



Distance X (cm)

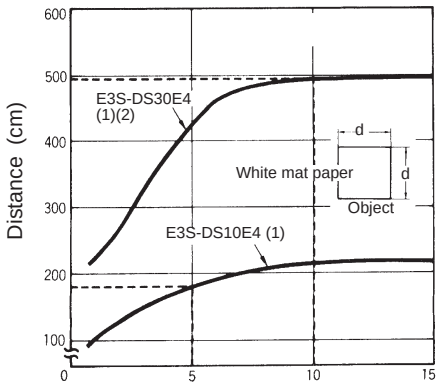
E3S-R2E4(1)



Distance X (cm)

Sensitivity

E3S-DS30E4(1)(2), E3S-DS10E4(1)

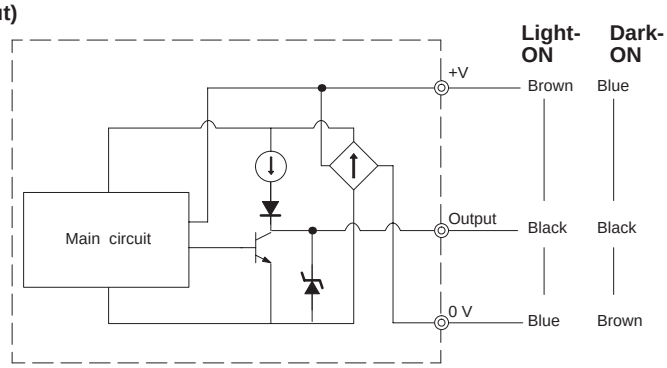


Size of object d (cm)

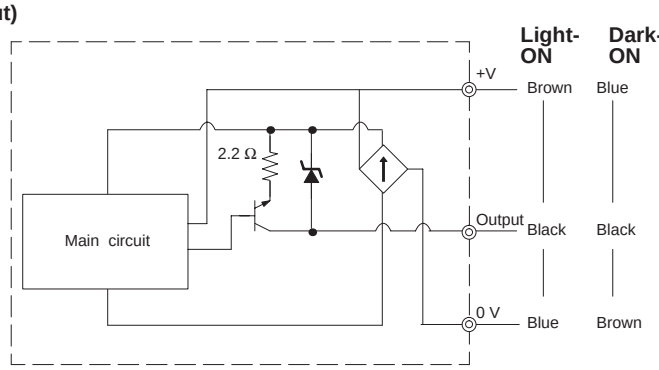
Operation

■ Output Circuits

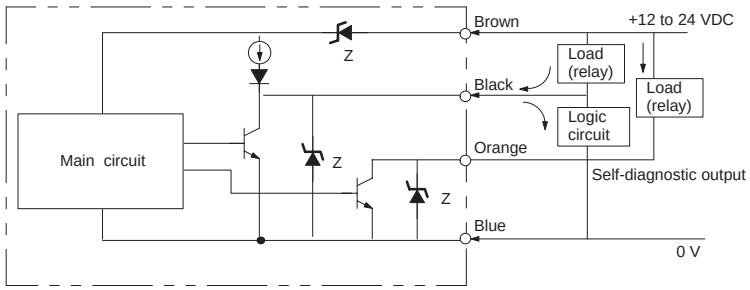
-E4 Type (NPN Output)



-B4 Type (PNP Output)



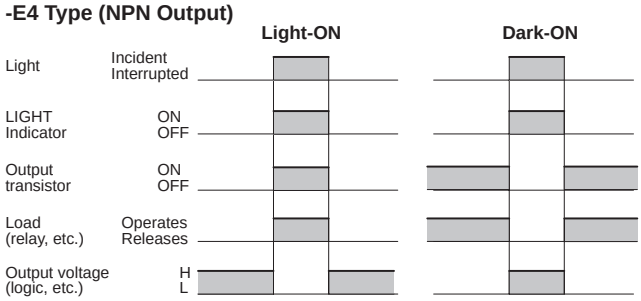
-E4S(1) Type



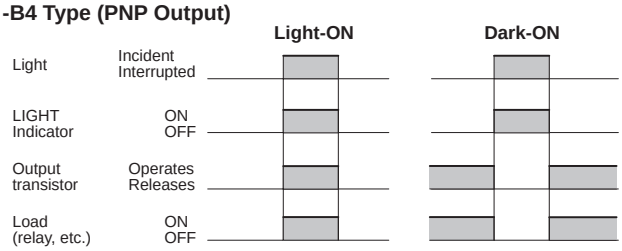
Z: Zener diode
*The color of the code for the self-diagnostic output is orange for models whose model number suffix is S1.

■ Timing Chart

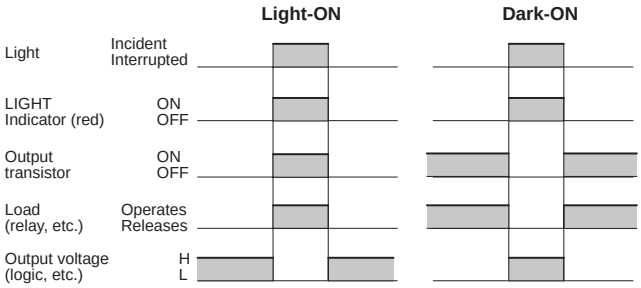
-E4 Type (NPN Output)



-B4 Type (PNP Output)



-E4S(1) Type



(Between brown (red) and black (white) lines)

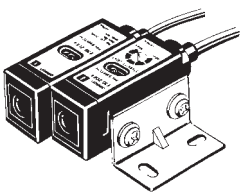
(Blue brown (black) and black (white) lines)

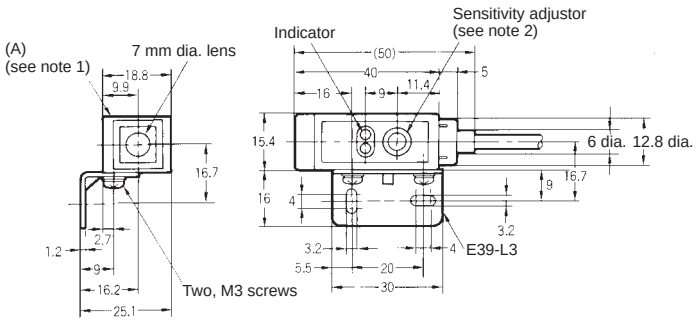
Dimensions

Note: All units are in millimeters unless otherwise indicated.

E3S-2E(B)4

Cord: 4-mm dia., 18/0.12, 3-conductor
Standard length: 2 m
Weight: approx. 80 g each for emitter and receiver

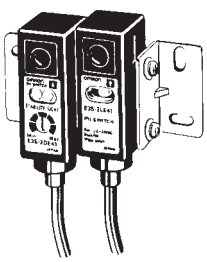


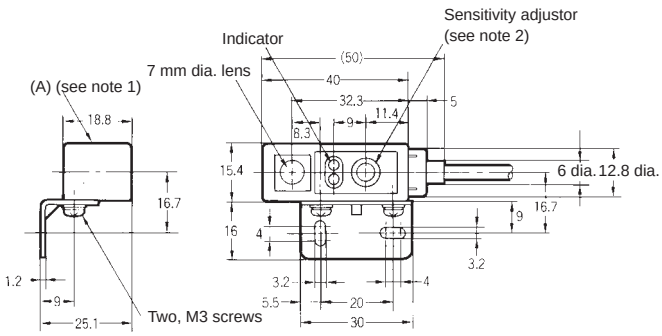


Note: 1. A mounting bracket can be attached to side A.
2. Receiver only.

E3S-2E(B)41

Cord: 4-mm dia., 18/0.12, 3-conductor
Standard length: 2 m
Weight: approx. 80 g each for emitter and receiver

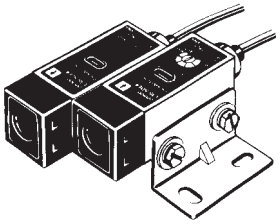


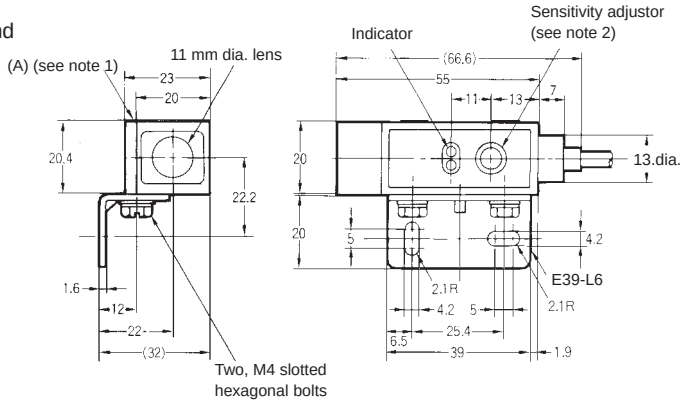


Note: 1. A mounting bracket can be attached to side A.
2. Receiver only.

E3S-5E(B)4

Cord: 4-mm dia., 18/0.12, 3-conductor
Standard length: 2 m
Weight: approx. 155 g each for emitter and receiver

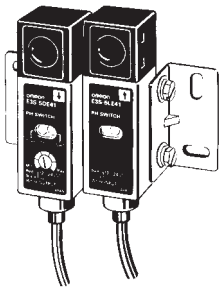


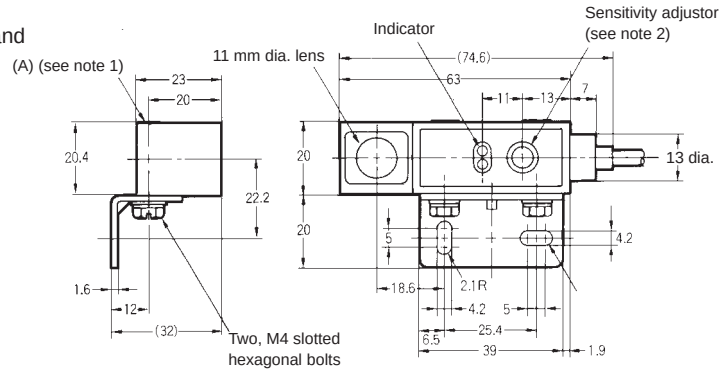


Note: 1. A mounting bracket can be attached to side A.
2. Receiver only.

E3S-5E(B)41

Cord: 4-mm dia., 18/0.12, 3-conductor
Standard length: 2 m
Weight: approx. 165 g each for emitter and receiver

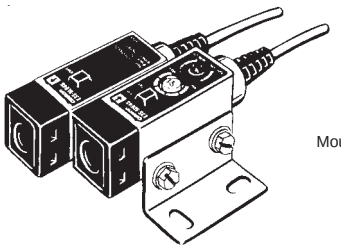


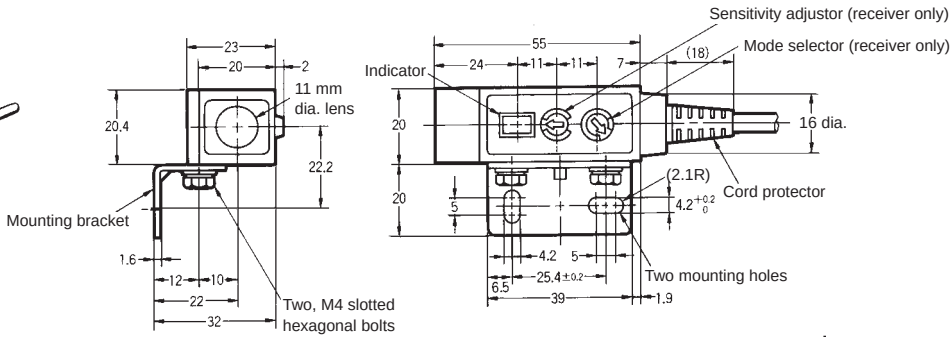


Note: 1. A mounting bracket can be attached to side A.
2. Receiver only.

E3S-5E(B)4S(1)

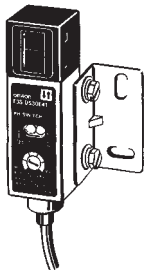
Cord: 4.5-mm dia., 18/0.12, 4-conductor
Standard length: 2 m
Weight: approx. 155 g

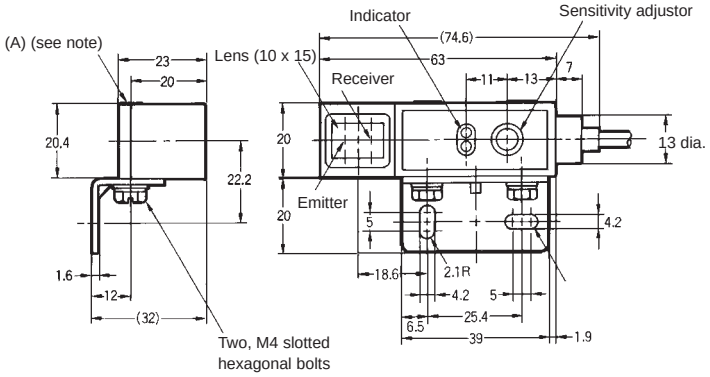




E3S-R2E(B)41
E3S-DS30E(B)41

Cord: 4-mm dia., 18/0.12, 3-conductor
Standard length: 2 m
Weight: approx. 165 g

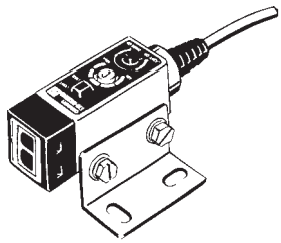


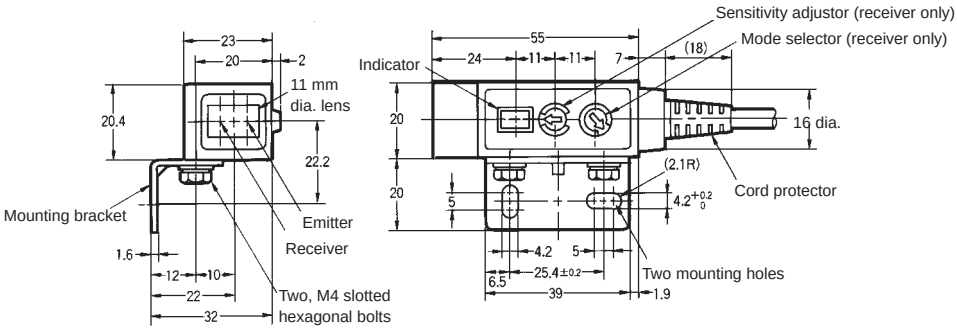


Note: A mounting bracket can be attached to side A.

E3S-DS30E(B)4S(1)

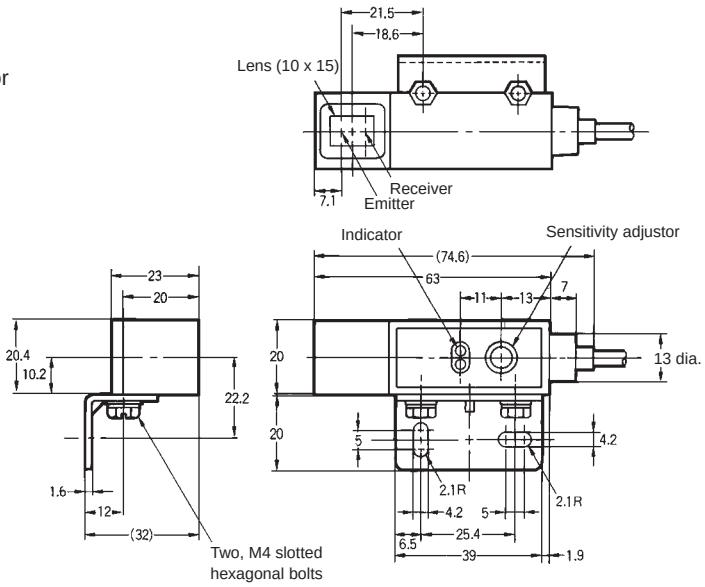
Cord: 4.5-mm dia., 18/0.12, 4-conductor
Standard length: 2 m
Weight: approx. 155 g





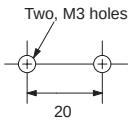
E3S-R2E42
E3S-DS30E42

Cord: 4-mm dia., 18/0.12, 3-conductor
Standard length: 2 m
Weight: approx. 165 g

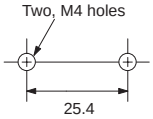


Mounting Holes

E3S-2LE(B)4, E3S-2DE(B)4
E3S-2LE(B)41, E3S-2DE(B)41
E3S-DS10E(B)4, E3S-DS10E(B)41

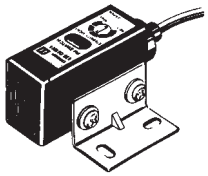


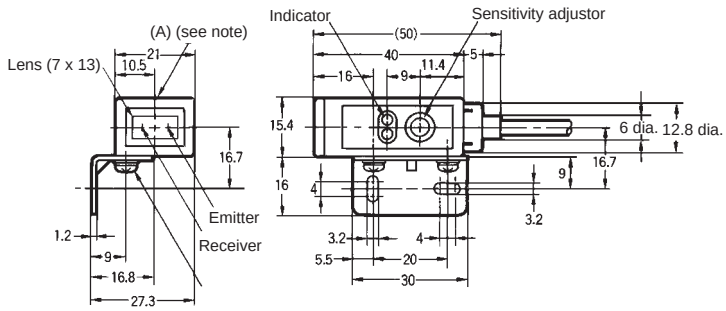
E3S-5LE(B)4(1), E3S-5DE(B)4(1), E3S-5E4S(1)
E3S-DS30E(B)4, E3S-R2E(B)4, E3S-R2E42
E3S-DS30E(B)41, E3S-R2E(B)41
E3S-DS30E42, E3S-DS30E4S(1)



E3S-DS10E(B)4

Cord: 4-mm dia., 18/0.12, 3-conductor
Standard length: 2 m
Weight: approx. 80 g

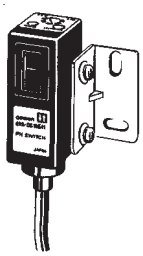


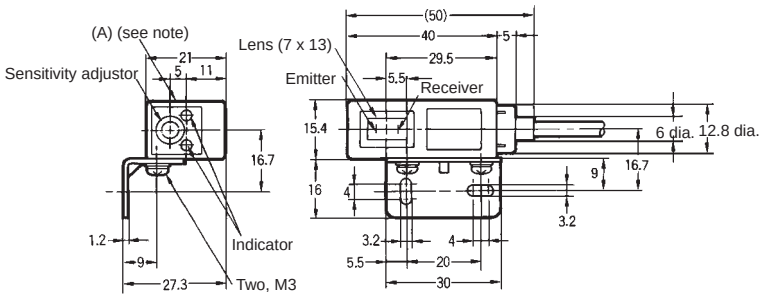


Note: A mounting bracket can be attached to side A.

E3S-DS10E(B)41

Cord: 4.5-mm dia., 18/0.12, 3-conductor
Standard length: 2 m
Weight: approx. 80 g

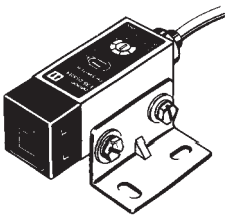


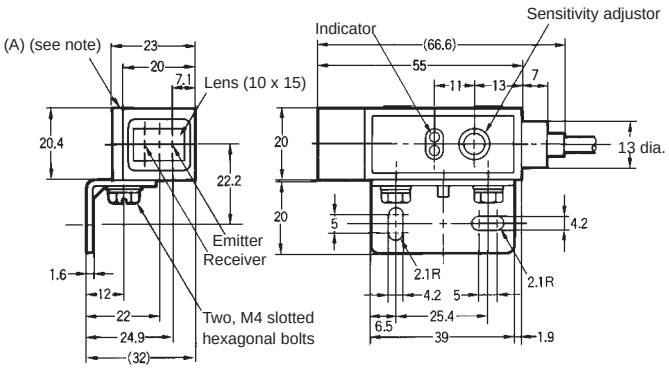


Note: A mounting bracket can be attached to side A.

E3S-R2E(B)4
E3S-DS30E(B)4

Cord: 4-mm dia., 18/0.12, 3-conductor
Standard length: 2 m
Weight: approx. 165 g



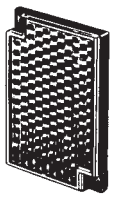


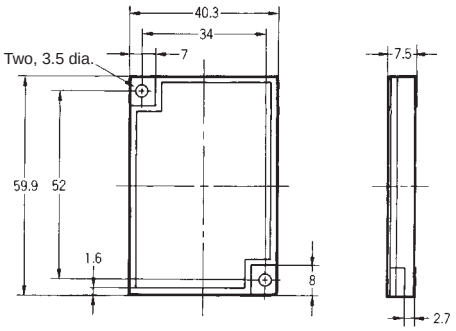
Note: A mounting bracket can be attached to side A.

Accessories (Order Separately)

E39-R1 Retroreflector

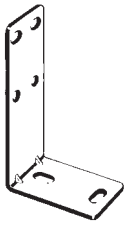
(Supplied with E3S-R2E(B)4(1))

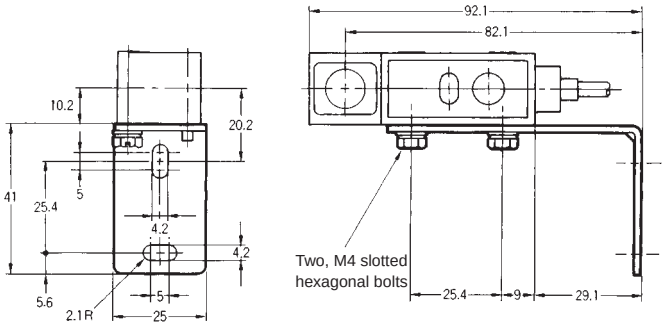




E39-L2 Mounting Bracket

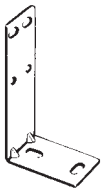
Applicable Photoelectric Sensors:
E3S-5E41, E3S-R2E41,
E3S-DS30E41

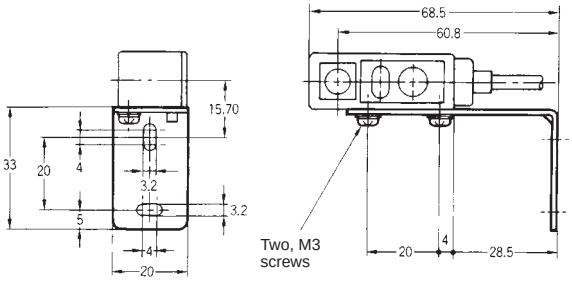




E39-L4 Mounting Bracket

Applicable Photoelectric Sensors:
E3S-2E41, E3S-DS10E41

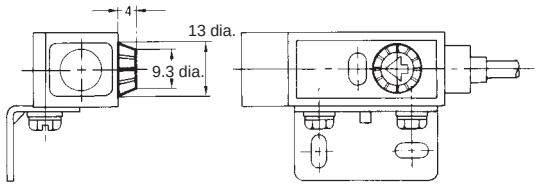




E39-G1 Sensitivity Adjuster Knob

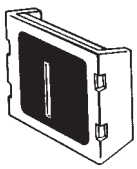
This accessory is attached to the following models:
E3S-5E4(41), E3S-DS30E4(41), E3S-R2E4(41),
E3S-LS10XE4, E3S-LS20XE4, E3S-GS1E4, E3S-GS3E4

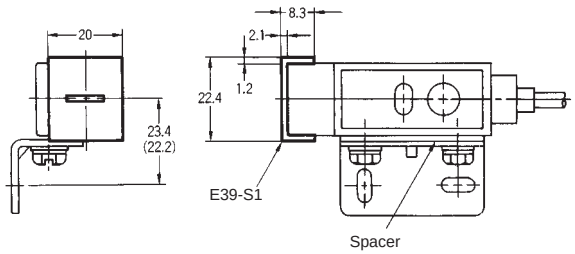
Note: This adjuster cannot be used with Models E3S-2DE4(41) and E3S-DS10E4(41).



E39-S1 Slit

Applicable Photoelectric Sensors:
E3S-5E4, E3S-5E41 (see note 3)

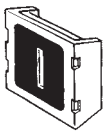


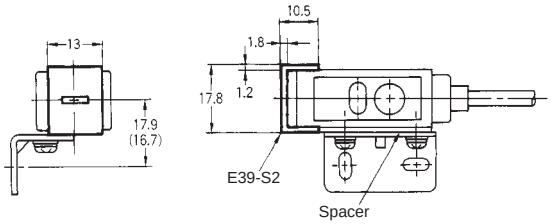


Note:
1. Model E39-S2 can have any of four different dimensions: 11 x 0.5 mm, 11 x 1 mm, 11 x 2 mm, and 11 x 4 mm.
2. Two slits (one for the emitter and the other for the receiver) are used in pairs.
3. Dimensions in parentheses are without the Spacer.
   Use the Spacer with the E3S-2E4(41) as shown above to prevent the supporter and mounting bracket from touching each other when the optical axis is adjusted. The Spacer is not usually necessary with the E3S-5E4(41) unless the E3S-2E4(41) and E3S-5E4(41) are directly mounted together.

E39-S2 Slit

Applicable Photoelectric Sensors:
E3S-2E4, E3S-2E41





Note: 1. Model E39-S2 can have any of three different dimensions: 6.5 x 0.5 mm, 6.5 x 1 mm, and 6.5 x 2 mm.
2. Two slits (one for the emitter and the other for the receiver) are used in pairs.

Sensing Distance with Slit

Photoelectric sensor	E3S-5E4, E3S-5E4□, E3S-5B4, E3S-5B4□				E3S-2E4, E3S-2E41, E3S-2B4, E3S-2B41		
Slit	E39-S1				E39-S2		
Width of slit	0.5 mm	1 mm	2 mm	4 mm	0.5 mm	1 mm	2 mm
Sensing distance	23 cm	58 cm	1.2 m	2.5 m	17 cm	42 cm	82 cm
Sensing object	0.5 mm	1 mm	2 mm	4 mm	0.5 mm	1 mm	2 mm

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. E01-E1-11 **In the interest of product improvement, specifications are subject to change without notice.**

OMRON Corporation
Sensing Components & Systems Division
28th Fl., Crystal Tower Bldg.
1-2-27, Shiromi, Chuo-ku,
Osaka 540 Japan
Phone: 06-949-6012 Fax: 06-949-6021

Printed in Japan
1194-0.5M (1194) **a**