

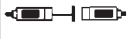



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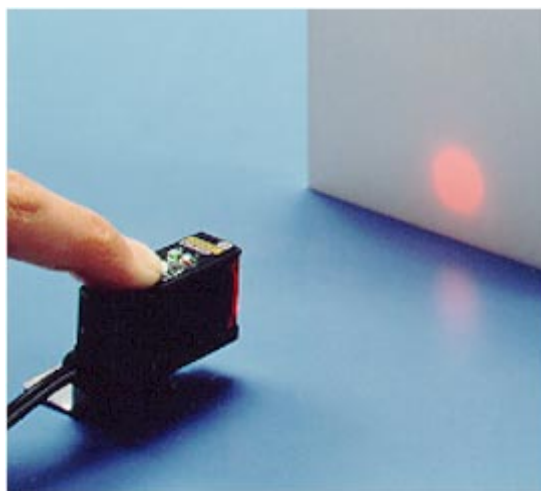
| Sensing distance | | | Supply voltage | Output |
|---|--|---|----------------|---|
|  |  |  | 12 to 24 VDC |  |
| 2, 5 m | 2 m | 10, 30 cm | | 80 mA |

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

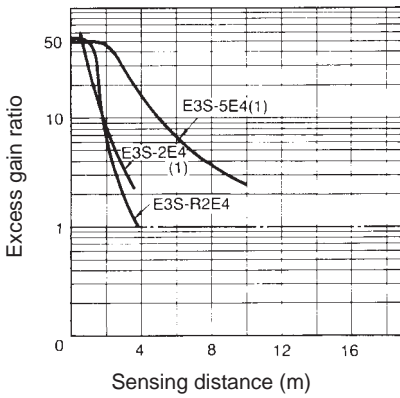
| Item | | E3S-2□□ | E3S-5□□ | E3S-R2□□ | E3S-DS10□□ |
|-------------------------|----------------|--|---|------------------------------------|------------------------------|
| Power supply voltage | | 12 VDC -10% to 24 VDC +10%, ripple (p-p): 10% max. | | | |
| Current consumption | | 50 mA max. | | 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 | | |

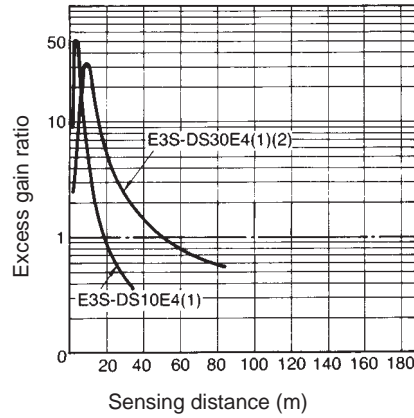
Engineering Data

Excess Gain Ratio

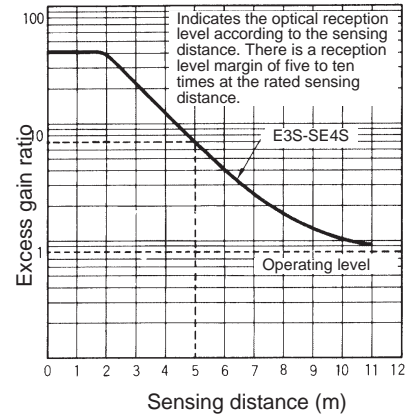
E3S-2E4(1), E3S-5E4(1), E3S-R2E4



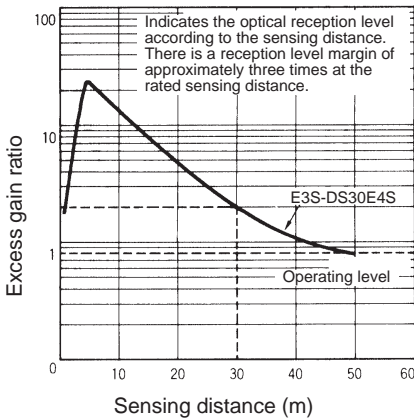
E3S-DS10E4(1), E3S-DS30E4(1)(2)



E3S-5E4S(1)

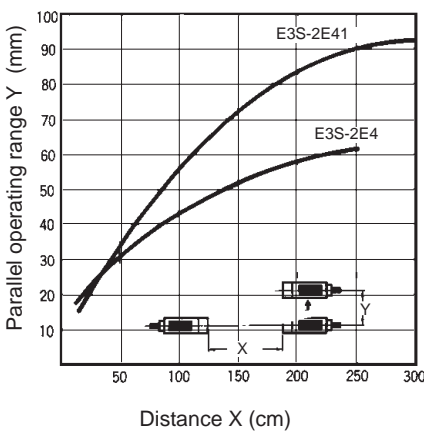


E3S-DS30E4S(1)

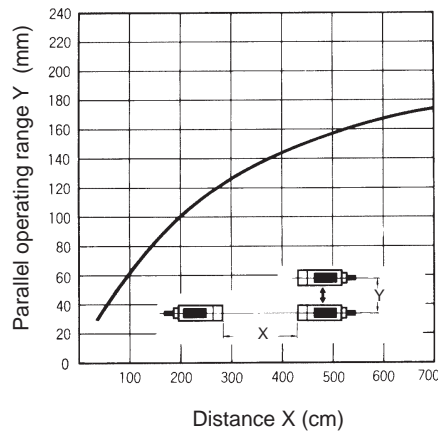


Parallel Operating Range

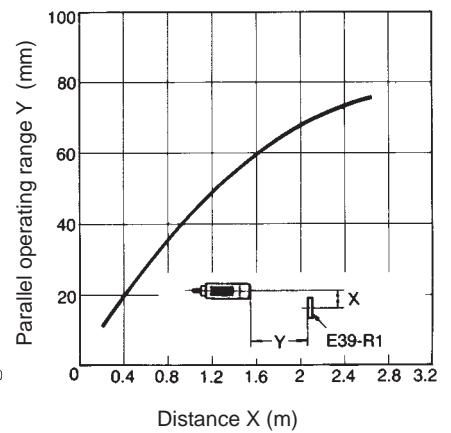
E3S-2E4(1)



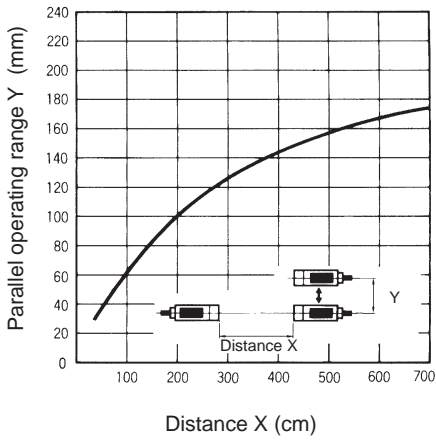
E3S-5E4(41)(42)



E3S-R2E4(1)

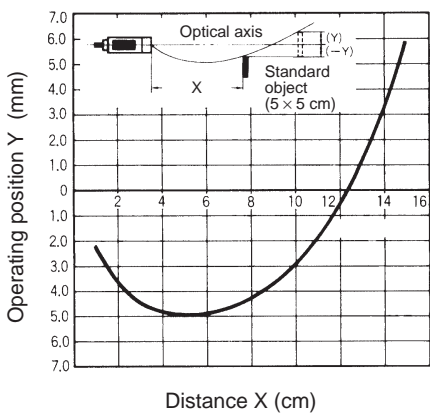


E3S-5E4S(1)

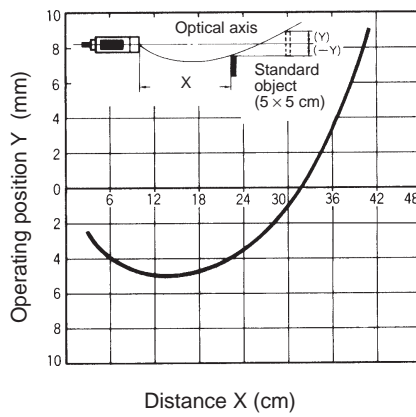


Operating Range

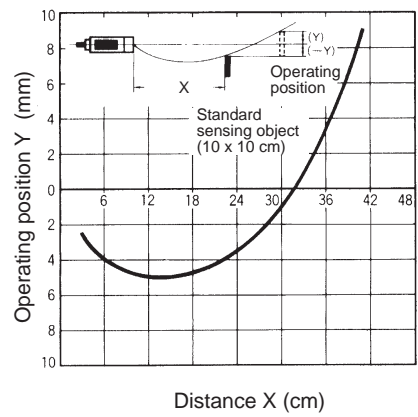
E3S-DS10E4(1)



E3S-5E4(41)(42)

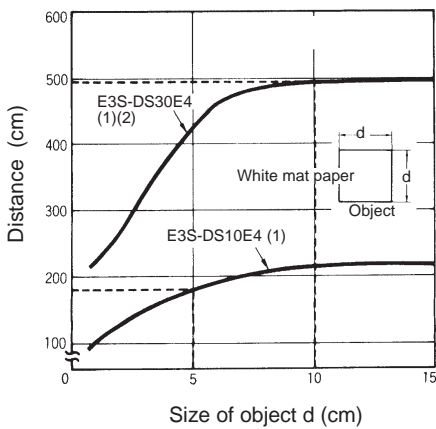


E3S-R2E4(1)



Sensitivity

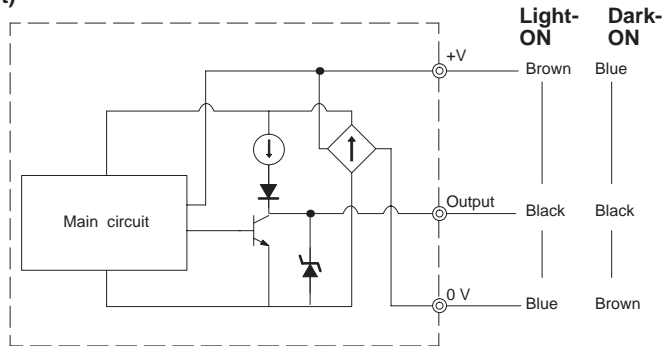
E3S-DS30E4(1)(2), E3S-DS10E4(1)



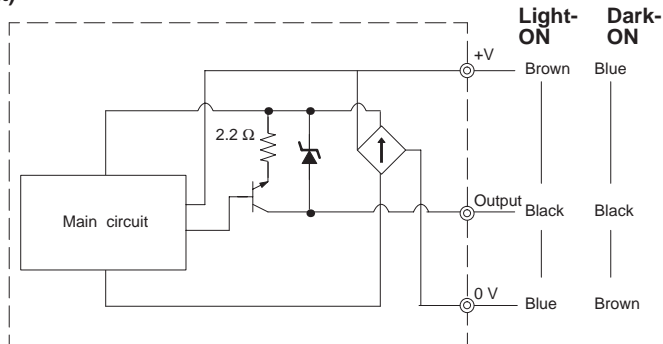
Operation

■ Output Circuits

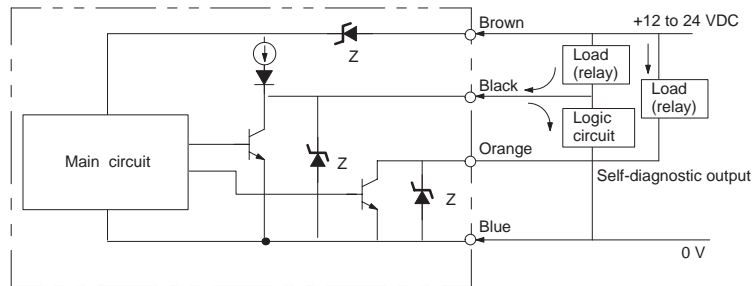
-E4 Type (NPN Output)



-B4 Type (PNP Output)



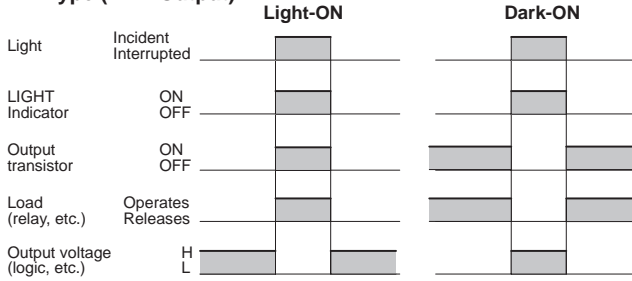
-E4S(1) Type



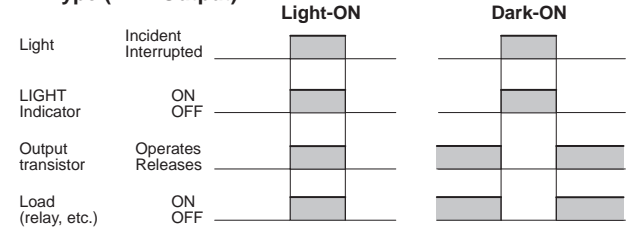
Z: Zener diode
 *The color of the code for the self-diagnostic output is orange for models whose model number suffix is S1.

■ Timing Chart

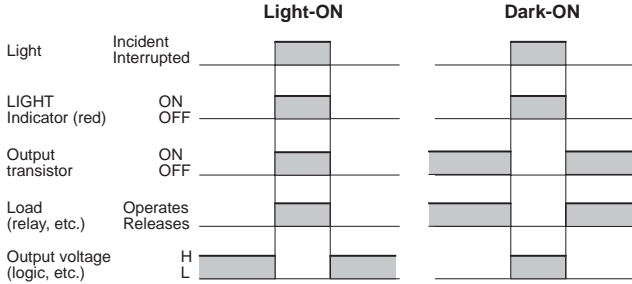
-E4 Type (NPN Output)



-B4 Type (PNP Output)



-E4S(1) Type



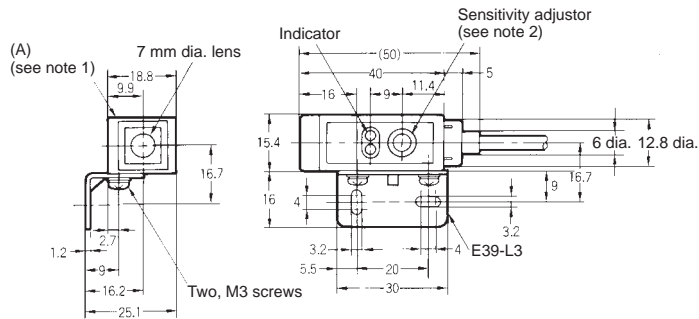
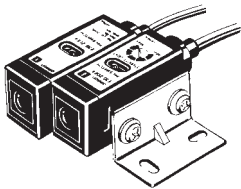
(Between brown (red) and black (white) lines)
(Blue brown (black) and black (white) lines)

Dimensions

Note: All units are in millimeters unless otherwise indicated.

E3S-2E(B)4

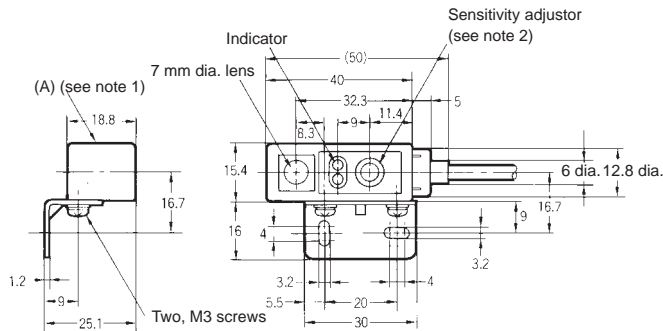
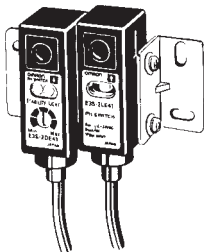
Cord: 4-mm dia., 18/0.12, 3-conductor
Standard length: 2 m
Weight: approx. 80 g each for emitter and receiver



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

E3S-2E(B)41

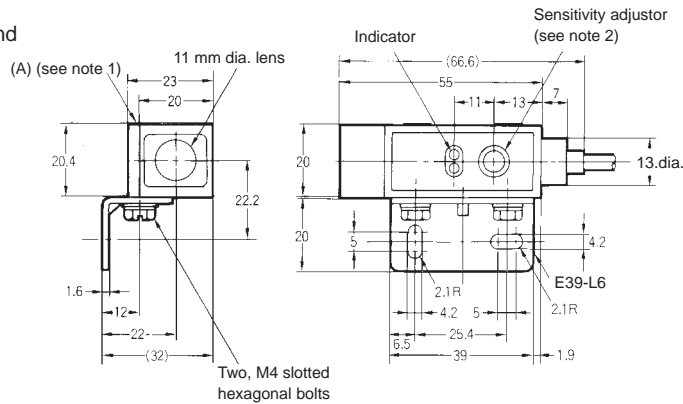
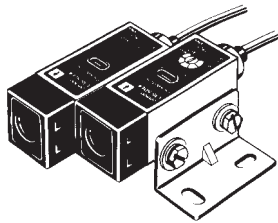
Cord: 4-mm dia., 18/0.12, 3-conductor
Standard length: 2 m
Weight: approx. 80 g each for emitter and receiver



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

E3S-5E(B)4

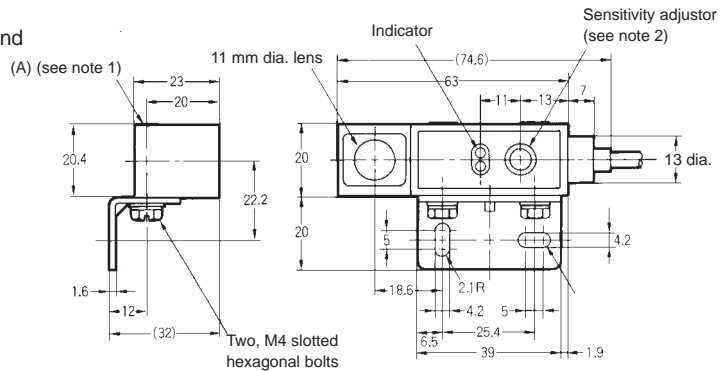
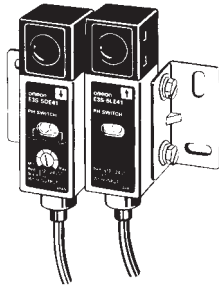
Cord: 4-mm dia., 18/0.12, 3-conductor
 Standard length: 2 m
 Weight: approx. 155 g each for emitter and receiver



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

E3S-5E(B)41

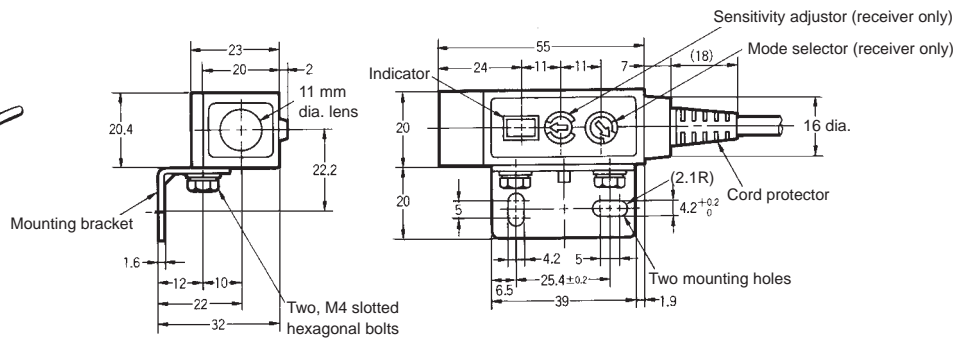
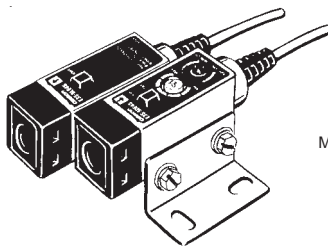
Cord: 4-mm dia., 18/0.12, 3-conductor
 Standard length: 2 m
 Weight: approx. 165 g each for emitter and receiver



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

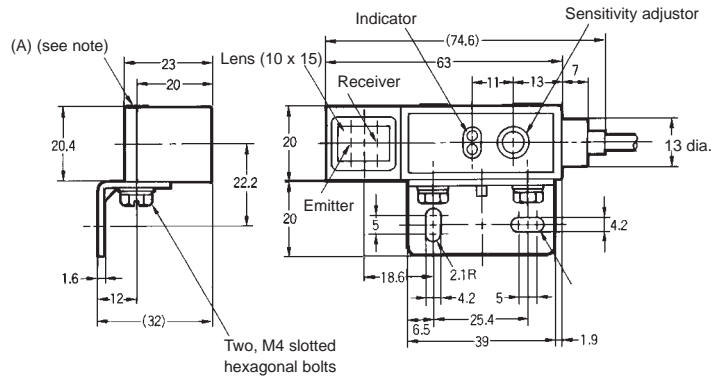
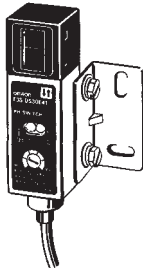
E3S-5E(B)4S(1)

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

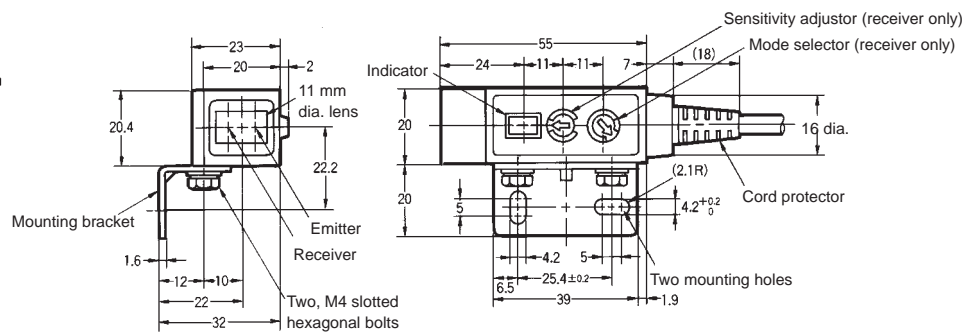
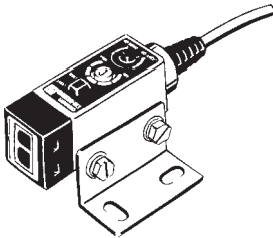
Cord: 4-mm dia., 18/0.12, 3-conductor
Standard length: 2 m
Weight: approx. 165 g



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

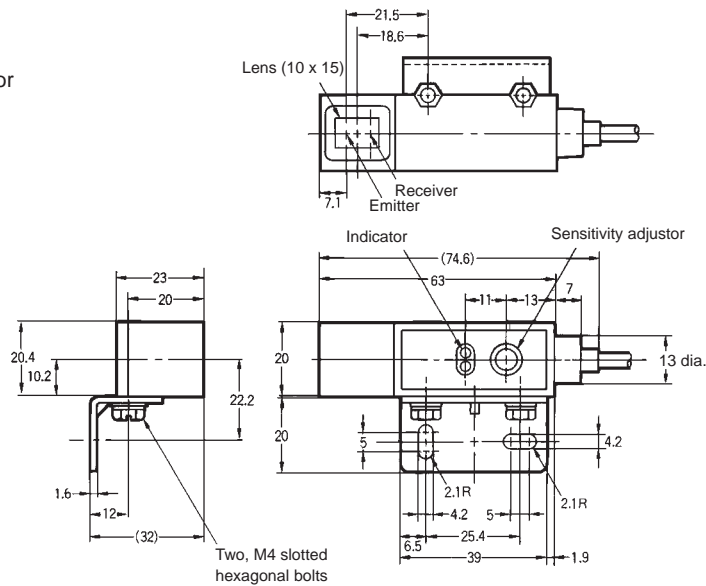
E3S-DS30E(B)4S(1)

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



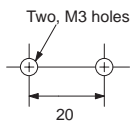
E3S-R2E42
E3S-DS30E42

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

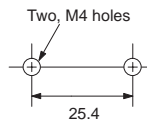


Mounting Holes

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

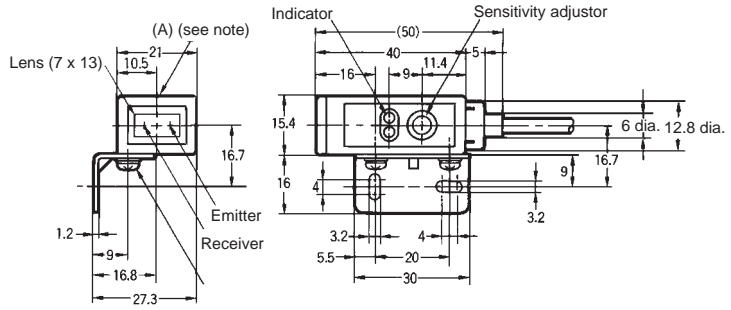
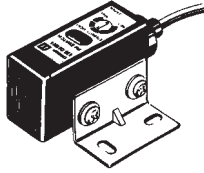


E3S-5LE(B)4(1), E3S-5DE(B)4(1), E3S-5E4S(1)
E3S-DS30E(B)4, E3S-R2E(B)4, E3S-R2E42
E3S-DS30E(B)41, E3S-R2E(B)41
E3S-DS30E42, E3S-DS30E4S(1)



E3S-DS10E(B)4

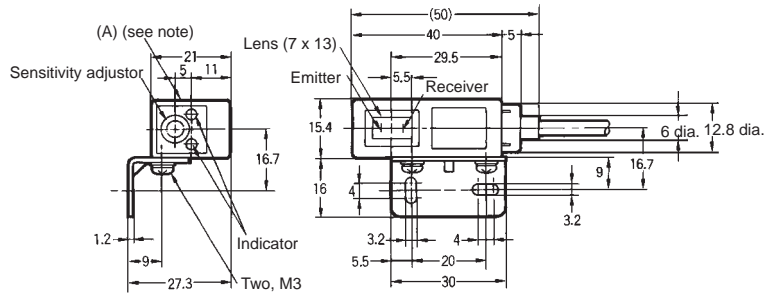
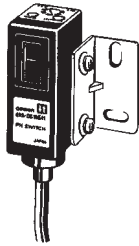
Cord: 4-mm dia., 18/0.12, 3-conductor
 Standard length: 2 m
 Weight: approx. 80 g



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

E3S-DS10E(B)41

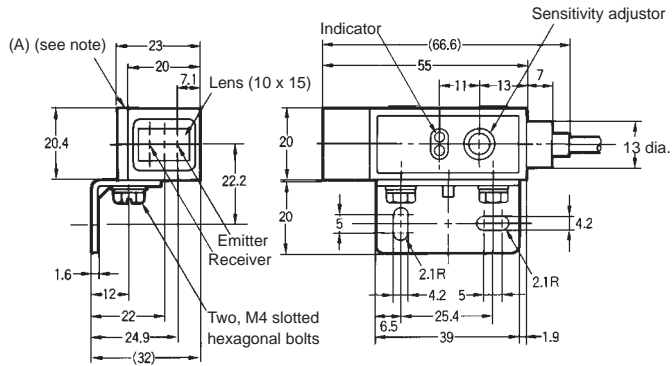
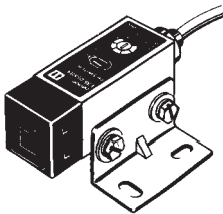
Cord: 4.5-mm dia., 18/0.12, 3-conductor
 Standard length: 2 m
 Weight: approx. 80 g



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

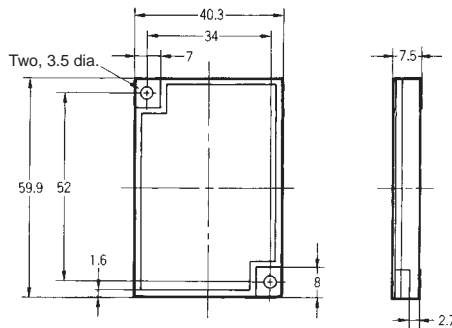
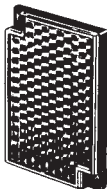


Note: A mounting bracket can be attached to side A.

Accessories (Order Separately)

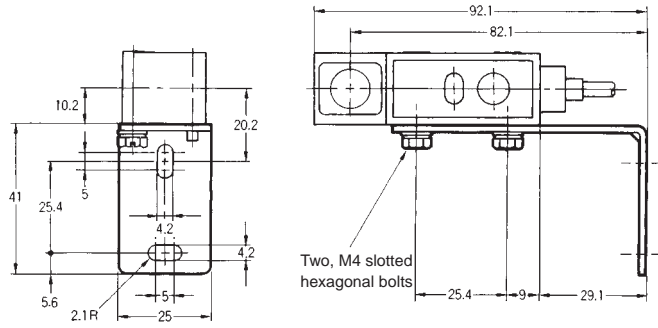
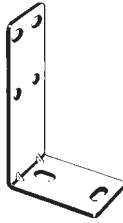
E39-R1 Retroreflector

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



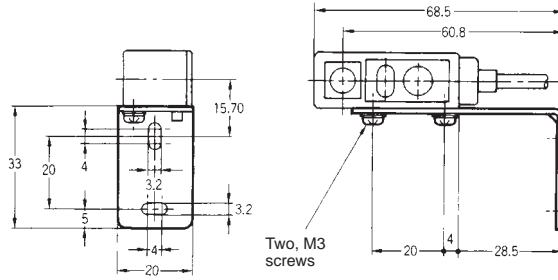
E39-L2 Mounting Bracket

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



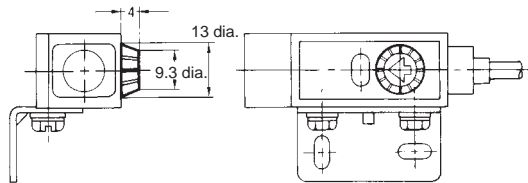
E39-L4 Mounting Bracket

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



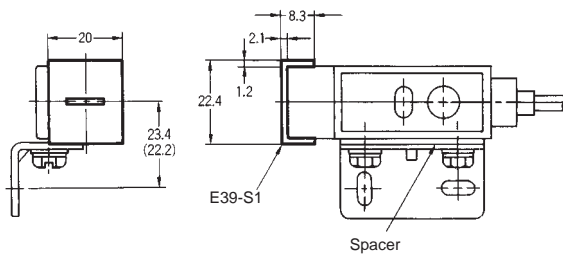
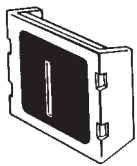
E39-G1 Sensitivity Adjuster Knob

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

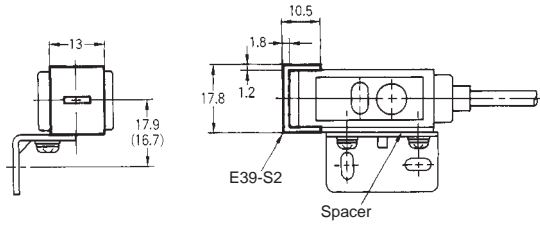
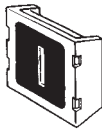
Applicable Photoelectric Sensors:
E3S-5E4, E3S-5E41 (see note 3)



- 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.**

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