

**NO:** PH-175B      **PRODUCT:** Legacy E3S Photoelectric Sensors  
**DATE:** April 2014      **TYPE:** Discontinuation Notice Update

## Legacy E3S Photoelectric Sensors will be Discontinued March 2014; Replace with E3Z or E3S-A/E3S-C Series

Effective Date: March 2014

### Discontinued Series

[Through-beam Sensors]

**Model E3S-2 series**

**Model E3S-5 series**

[Retro-reflective Sensors]

**Model E3S-R2 series**

[Diffuse-reflective Sensors]

**Model E3S-DS series**



### Recommended Replacement

[Through-beam Sensors]

**Model E3Z-T/ E3S-AT series**

**Model E3Z-T/ E3S-CT series**

[Retro-reflective Sensors]

**Model E3Z-R/E3S-CR series**

[Diffuse-reflective Sensors]

**Model E3Z-D/E3S-AD/E3S-CD series**

### Affected Parts

Discontinued Product	Recommended Replacement	
E3S-2B41 2M E3S-2DE4 2M E3S-2DE41 2M E3S-2E4 2M E3S-2E41 2M E3S-2LE4 2M E3S-2LE41 2M	E3Z-T81 2M E3Z-T61 2M E3Z-T61 2M E3Z-T61 2M E3Z-T61 2M E3Z-T61 2M E3Z-T61 2M	E3S-AT31 2M E3S-AT11 2M E3S-AT61 2M E3S-AT11 2M E3S-AT61 2M E3S-AT11 2M E3S-AT61 2M
E3S-5B41 2M E3S-5DE4 2M E3S-5DE41 2M E3S-5E4 2M E3S-5E41 2M E3S-5E41-43-M1J 0.2M	E3Z-T81 2M E3Z-T61 2M E3Z-T61 2M E3Z-T61 2M E3Z-T61 2M E3Z-T61-M1J 0.3M	E3S-CT11 2M E3S-CT11 2M E3S-CT61 2M E3S-CT11 2M E3S-CT61 2M E3S-CT61-M1J 0.3M
E3S-5E4S-45 2M E3S-5LE4S-45 (emitter only) E3S-5DE4S-45 (receiver only)	No recommended replacement Discontinued March 2012 Discontinued March 2012	No recommended replacement Discontinued March 2012 Discontinued March 2012
E3S-5LE4 2M E3S-5LE41 2M	E3Z-T61 2M E3Z-T61 2M	E3S-CT11 2M E3S-CT61 2M
E3S-DS10B4 2M E3S-DS10B41 2M E3S-DS10E4 2M E3S-DS10E41 2M	E3Z-D81 2M E3Z-D81 2M E3Z-D61 2M E3Z-D61 2M	E3S-AD63 2M E3S-AD83 2M E3S-AD13 2M E3S-AD33 2M
E3S-DS30B4 2M E3S-DS30B41 2M E3S-DS30E4 2M E3S-DS30E41 2M	E3Z-D82 2M E3Z-D82 2M E3Z-D62 2M E3Z-D62 2M	E3S-CD11 2M E3S-CD61 2M E3S-CD11 2M E3S-CD61 2M
E3S-R2B4 2M E3S-R2B41 2M E3S-R2E4 2M E3S-R2E4 5M E3S-R2E41 2M E3S-R2E43 2M	E3Z-R81 2M E3Z-R81 2M E3Z-R61 2M E3Z-R61 5M E3Z-R61 2M E3Z-R61 2M	E3S-CR11 2M E3S-CR61 2M E3S-CR11 2M E3S-CR11 5M E3S-CR61 2M E3S-CR61 2M

## Precautions on Installing the Recommended Replacement

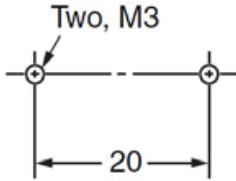
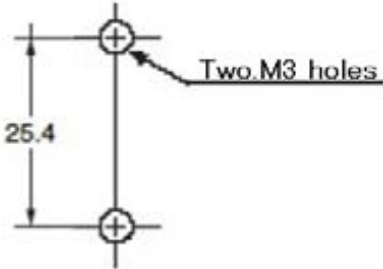
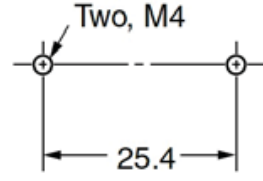
1. The E3Z series sensor output is Open Collector type. Please make sure the circuit you are connecting it to can accept an Open Collector output.
2. For through-beam models, replace the emitter and receiver as a set.

Review the detailed differences on the following pages.

## Body Color

Discontinued Product	Recommended Replacement
<b>Model E3S-2 series/E3S-DS10 series</b> Color: Black Material (Case): Polybutylene terephthalate Material (Lens): Polycarbonate	<b>Model E3Z-T series/E3Z-D series</b> Color: Black Material (Case): Polybutylene terephthalate Material (Lens): Modified polyarylate  <b>E3S-AT/-AD series</b> Color: Black Material (Case): Polybutylene terephthalate Material (Lens): Denatured polyarylate
<b>Model E3S-5 series/E3S-DS30 series</b> Color: Black/Yellow Material (Case): Zinc die-cast Material (Lens): Polycarbonate	<b>Model E3Z-T series/E3Z-D series</b> Color: Black Material (Case): Polybutylene terephthalate Material (Lens): Modified polyarylate  <b>E3S-CT/-CD series</b> Color: Gray Material (Case): Zinc die-cast Material (Lens): Acrylic
<b>Model E3S-R2 series</b> Color: Black/Yellow Material (Case): Zinc die-cast Material (Lens): Polycarbonate	<b>Model E3Z-R series</b> Color: Black Material (Case): Polybutylene terephthalate Material (Lens): Modified polyarylate  <b>E3S-CR series</b> Color: Gray Material(Case): Zinc die-cast Material(Lens): Acrylic

## Mounting Dimensions

Discontinued Product	Recommended Replacement
<b>Model E3S-2,-DS10 series</b> 	<b>Model E3Z-T,-D,-R series</b> 
<b>Model E3S-5,-DS30,-R2 series</b> 	

# Wiring Connection

**Discontinued Product**  
**Model E3S-2E4 / E3S-5E4 series**  
**Model E3S-DS10E4 / E3S-DS30E4 series**  
**Model E3S-R2E4 series**

**<Receiver>**

- Reverse the polarity of the power supply to switch the operating mode.
- Voltage output (when connecting transistor circuit).

**<Emitter>**

**M12 Connector Pin Arrangement**

Note. Receiver/Emitter: Pin ② is not used.

It becomes **Power indicator**,  
 if the pink cord of the emitter connects with the 0V of the emitter.  
 It becomes **Light indicator**,  
 if the pink cord of the emitter connects with the output of the receiver.

**Recommended Replacement**  
**Model E3Z-T6/E3Z-D6/E3Z-R6 series**  
**<Through-beam Receiver, Reflective Types>**

**<Emitter>**

**M12 Connector Pin Arrangement**  
**<Through-beam Receiver, Reflective Types>**

Pin 2 is not used.

**<Emitter>**

Pins 2 and 4 are not used.

**Discontinued Product**  
**Model E3S-2B4 / E3S-5B4 series**  
**Model E3S-DS10B4 / E3S-DS30B4 series**  
**Model E3S-R2B4 series**

**<Receiver>**

- Reverse the polarity of the power supply to switch the operating mode.

**<Emitter>**

It becomes **Power indicator**,  
 if the pink cord of the emitter connects with the brown cord of the emitter.  
 It becomes **Light indicator**,  
 if the pink cord of the emitter connects with the output of the receiver.

**Recommended Replacement**  
**Model E3Z-T8 series**  
**Model E3Z-D8 series**  
**Model E3Z-R8 series**

**<Receiver>**

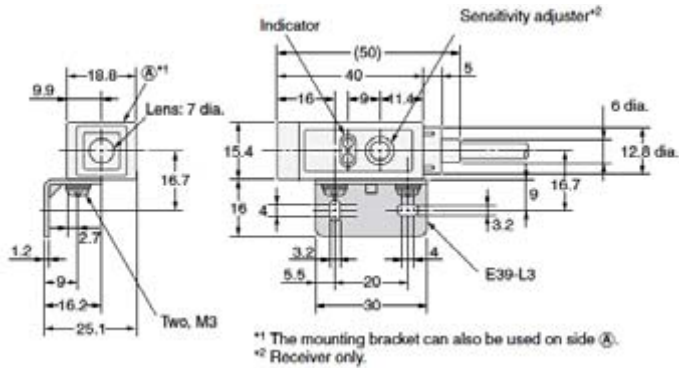
**<Emitter>**

# Mounting Dimensions

<b>Discontinued Product</b> <b>Through-beam</b> <b>Model E3S-2 series / E3S-5 series</b>	<b>Recommended Replacement</b> <b>Through-beam</b> <b>Model E3Z-T series</b>
<p><b>E3S-2E4</b></p> <p>Indicator      Sensitivity adjuster<sup>*2</sup></p> <p>18.8 (A)<sup>*1</sup>      Lens: 7 dia.      9.9      16.7      15.4      16      4      3.2      5.5      20      30      40      50      5      9      1.4      6 dia.      12.8 dia.      9      16.7      3.2      4      E39-L3      25.1</p> <p>Two, M3</p> <p><sup>*1</sup> The mounting bracket can also be used on side (A).  <sup>*2</sup> Receiver only.</p>	<p><b>E3Z-T61 / E3Z-T81</b></p> <p>Emitter      Lens      10.8      7.2      2.1      31      11</p> <p>Power indicator (orange)      12      2.8      3      20      25.4      12.7      Two, M3</p> <p>Receiver      Operation Indicator (orange)      11.2      4.5      7.5      20      12.7      Stability indicator (green)      Operation selector      Sensitivity adjuster      2.8      3      20      25.4      12.7      Two, M3</p>
<p><b>E3S-2E41 / E3S-2B41</b></p> <p>Indicator      Sensitivity adjuster<sup>*2</sup></p> <p>18.8 (A)<sup>*1</sup>      Lens: 7 dia.      16.7      15.4      16      4      3.2      5.5      20      30      40      50      5      9      1.4      6 dia.      12.8 dia.      9      16.7      3.2      4      E39-L3      25.1</p> <p>Two, M3</p> <p><sup>*1</sup> The mounting bracket can also be used on side (A).  <sup>*2</sup> Receiver only.</p>	<p><b>E3Z-T61 / E3Z-T81</b></p> <p>Emitter      Lens      10.8      7.2      2.1      31      11</p> <p>Receiver      Operation Indicator (orange)      11.2      4.5      7.5      20      12.7      Stability indicator (green)      Operation selector      Sensitivity adjuster      2.8      3      20      25.4      12.7      Two, M3</p>
<p><b>E3S-5E4</b></p> <p>Indicator      Sensitivity adjuster<sup>*2</sup></p> <p>23 (A)<sup>*1</sup>      Lens: 11 dia.      20.4      22.2      1.6      12      22      32      20      20      5      2.1R      4.2      5      2.1R      6.5      25.4      30      1.9      E39-L6      67      55      11      13      7      13 dia.      25.1</p> <p>Two, M4 slotted hexagonal bolts</p> <p><sup>*1</sup> The mounting bracket can also be used on side (A).  <sup>*2</sup> Receiver only.</p>	<p><b>E3Z-T61 / E3Z-T81</b></p> <p>Emitter      Lens      10.8      7.2      2.1      31      11</p> <p>Receiver      Operation Indicator (orange)      11.2      4.5      7.5      20      12.7      Stability indicator (green)      Operation selector      Sensitivity adjuster      2.8      3      20      25.4      12.7      Two, M3</p>
<p><b>E3S-5E41 / E3S-5B41</b></p> <p>Indicator      Sensitivity adjuster<sup>*2</sup></p> <p>23 (A)<sup>*1</sup>      Lens: 11 dia.      20.4      22.2      1.6      12      22      32      20      20      5      2.1R      4.2      5      2.1R      6.5      25.4      30      1.9      E39-L6      75      63      11      13      7      13 dia.      25.1</p> <p>Two, M4 slotted hexagonal bolts</p> <p><sup>*1</sup> The mounting bracket can also be used on side (A).  <sup>*2</sup> Receiver only.</p>	<p><b>E3Z-T61 / E3Z-T81</b></p> <p>Emitter      Lens      10.8      7.2      2.1      31      11</p> <p>Receiver      Operation Indicator (orange)      11.2      4.5      7.5      20      12.7      Stability indicator (green)      Operation selector      Sensitivity adjuster      2.8      3      20      25.4      12.7      Two, M3</p>

**Discontinued Product**  
**Through-beam**  
**Model E3S-2 series**

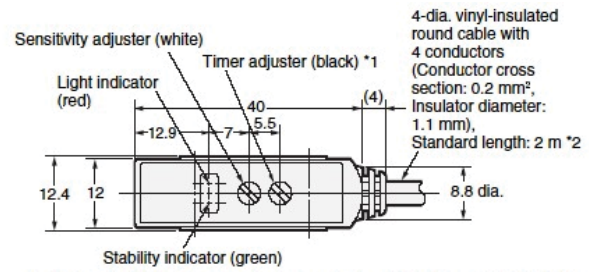
**E3S-2E4**



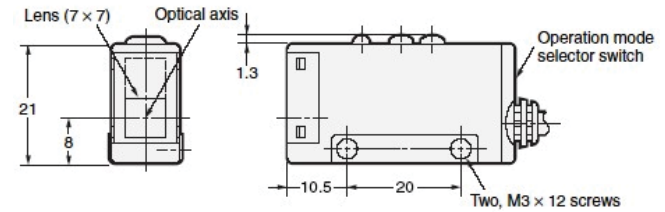
**Recommended Replacement**  
**Through-beam**  
**Model E3S-AT series**

**E3S-AT11/-AT31**

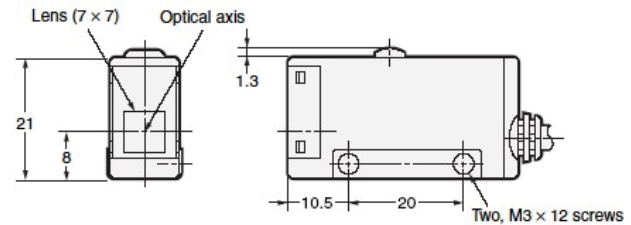
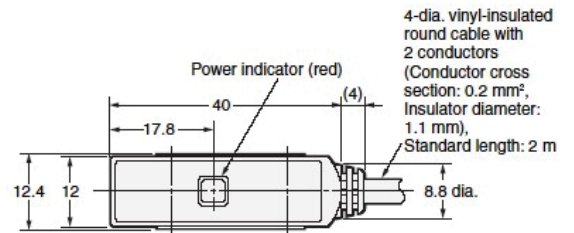
**< Receiver >**



\*1. Not applicable to Sensors with timer adjusters (E3S-AT11 and E3S-AT31).  
 \*2. The E3S-AT11 or E3S-AT31 has three conductors.

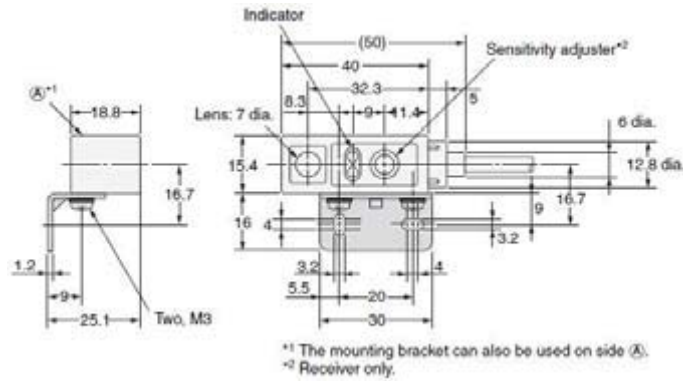


**< Emitter >**



**Discontinued Product**  
**Through-beam**  
**Model E3S-2 series**

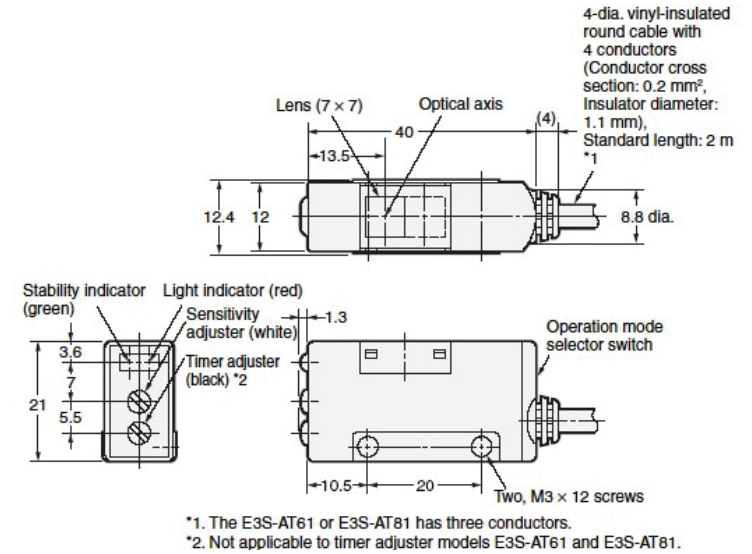
**E3S-2E41 / -2B41**



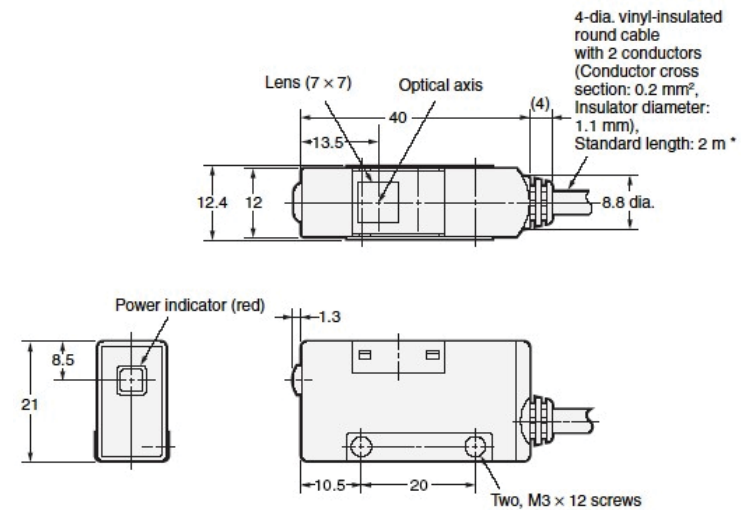
**Recommended Replacement**  
**Through-beam**  
**Model E3S-AT series**

**E3S-AT61**

**< Receiver >**

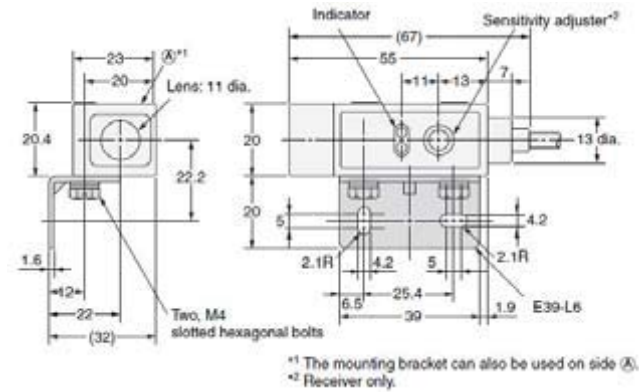


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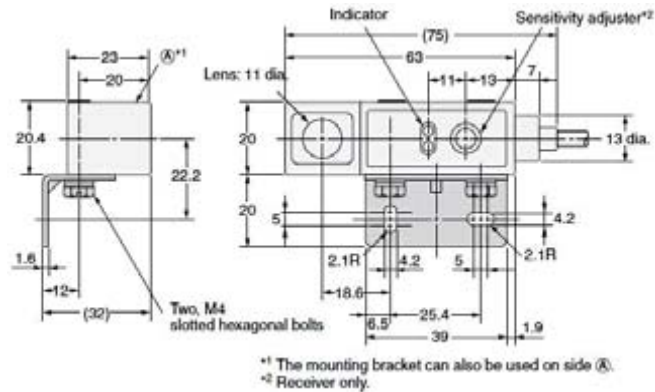


**Discontinued Product**  
**Through-beam**  
**Model E3S-5 series**

**E3S-5E4**



**E3S-5E41 / -5B41**

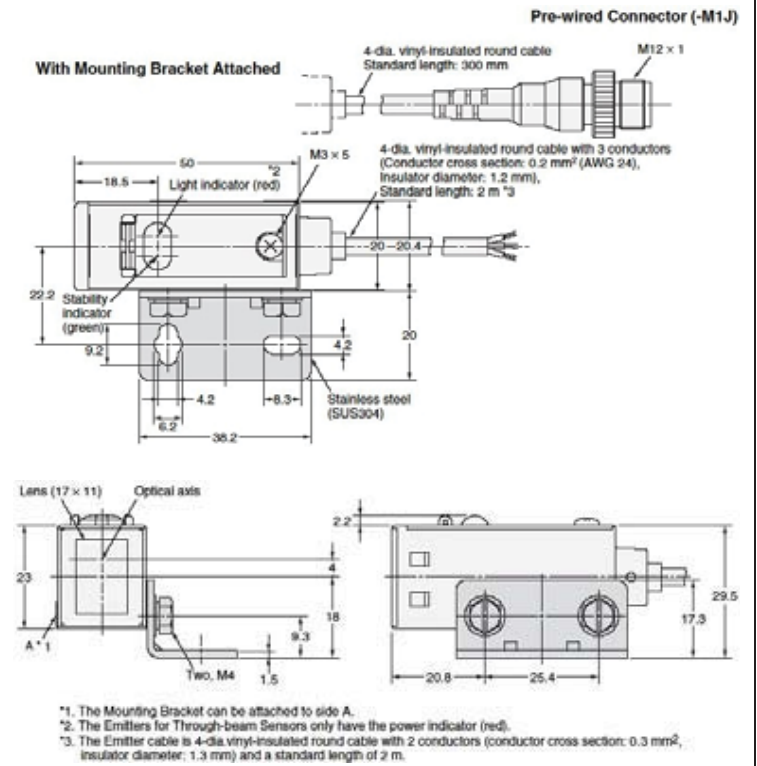


**Recommended Replacement**  
**Through-beam**  
**Model E3S-CT series**

**E3S-CT11**

< Receiver: E3S-CT11-D >

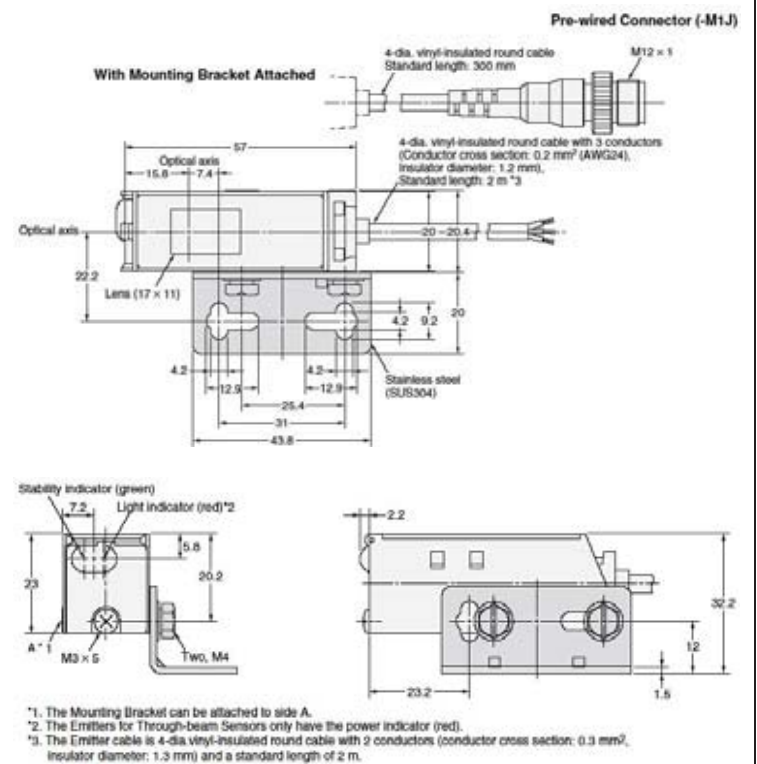
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**E3S-CT61**

< Receiver: E3S-CT61-D >

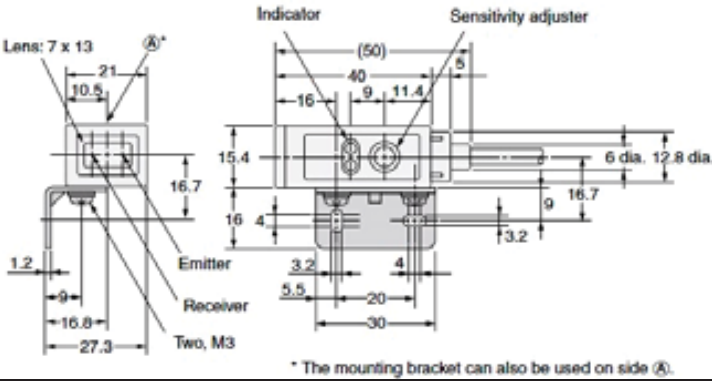
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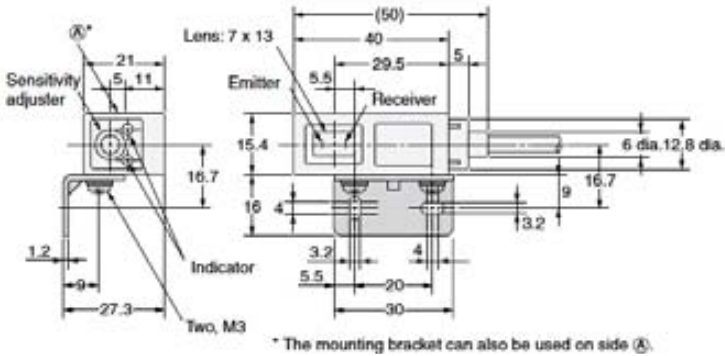
# Mounting Dimensions

**Discontinued Product**  
**Diffuse Reflective**  
**Model E3S-DS10 series / E3S-DS30 series**

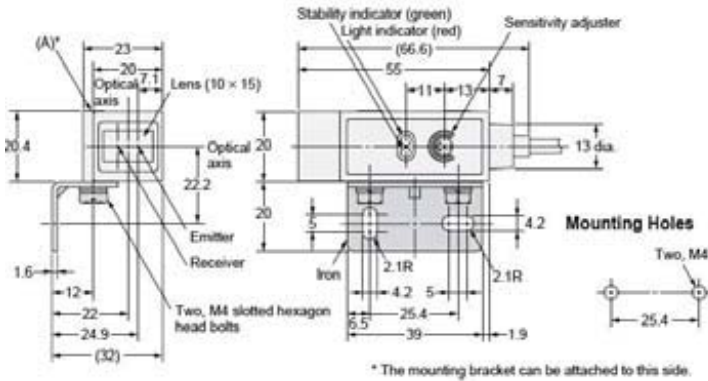
**E3S-DS10E4 / E3S-DS10B4**



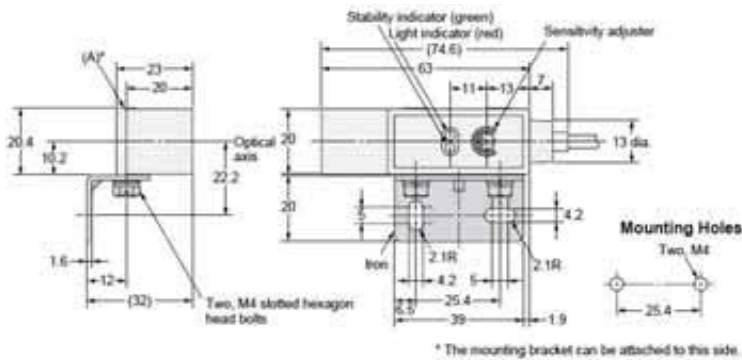
**E3S-DS10E41 / E3S-DS10B41**



**E3S-DS30E4 / E3S-DS30B4**

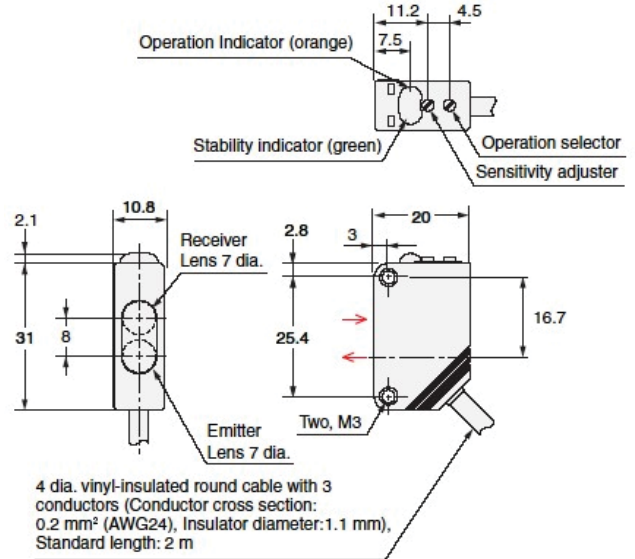


**E3S-DS30E41 / E3S-DS30B41**



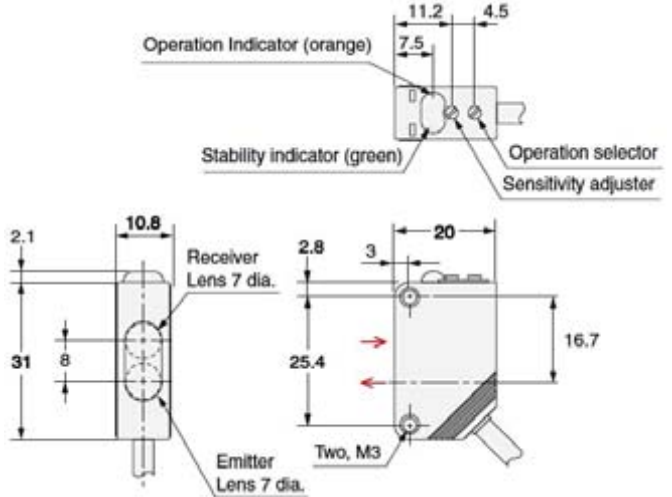
**Recommended Replacement**  
**Diffuse Reflective**  
**Model E3Z-D series**

**E3Z-D61 / E3Z-D81**



Terminal No.	Specifications
1	+V
2	---
3	0V
4	Output

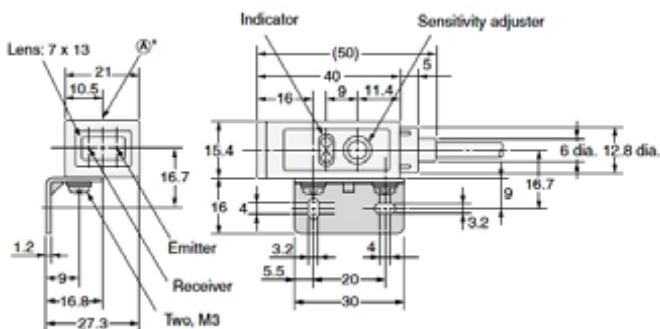
**E3Z-D62 / E3Z-D82**





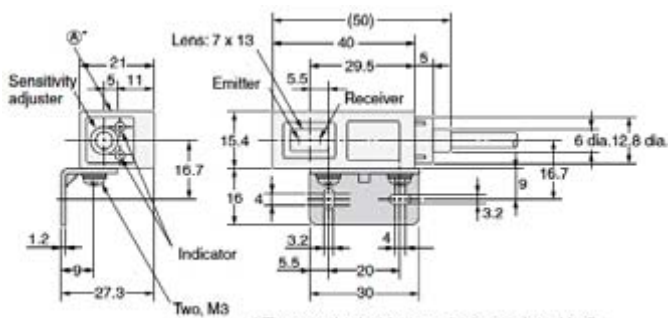
**Discontinued Product**  
**Diffuse Reflective**  
**Model E3S-DS10 series**

**E3S-DS10E4 / -DS10B4**



\* The mounting bracket can also be used on side (A).

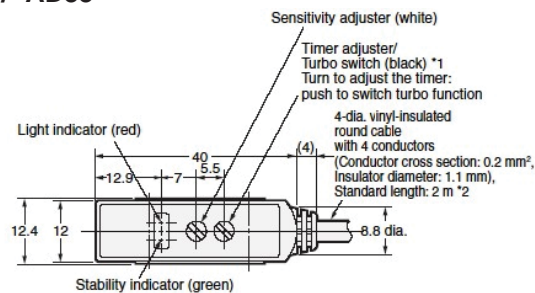
**E3S-DS10E41 / -DS10B41**



\* The mounting bracket can also be used on side (A).

**Recommended Replacement**  
**Diffuse Reflective**  
**Model E3S-AD series**

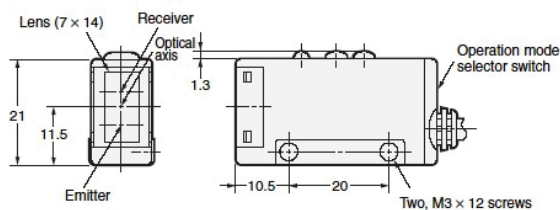
**E3S-AD13 / -AD33**



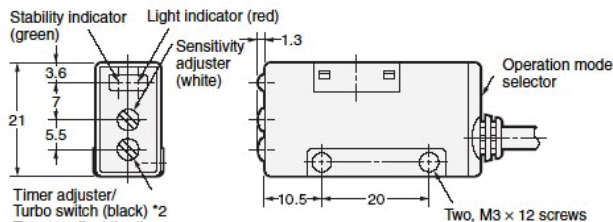
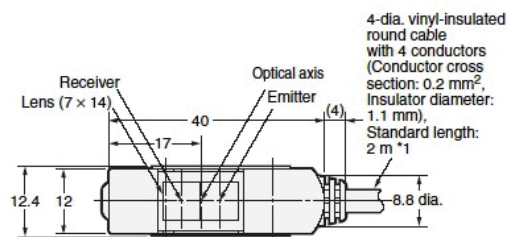
\*1. Timer adjuster: Not available on E3S-AD11, E3S-AD12, E3S-AD13, E3S-AD31, E3S-AD32 and E3S-AD33.

Turbo switch: Available on E3S-AD21 and E3S-AD41 only.

\*2. The E3S-AD11, E3S-AD12, E3S-AD13, E3S-AD31, E3S-AD32, or E3S-AD33 has three conductors.



**E3S-AD63 / -AD83**



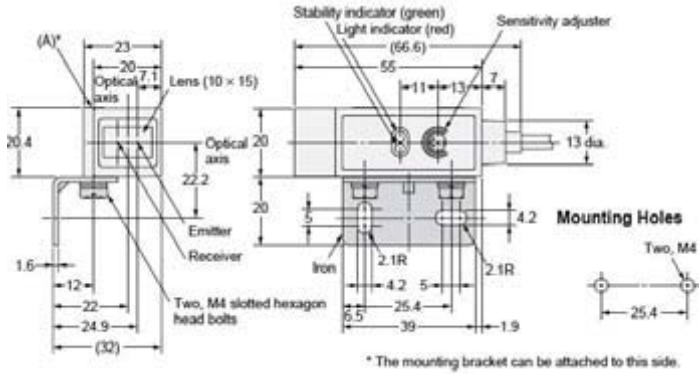
Timer adjuster/  
 Turbo switch (black) \*2  
 Turn to adjust the timer:  
 push to switch turbo function

\*1. E3S-AD61, E3S-AD62, E3S-AD63, E3S-AD81, E3S-AD82, and E3S-AD83 have three conductors.

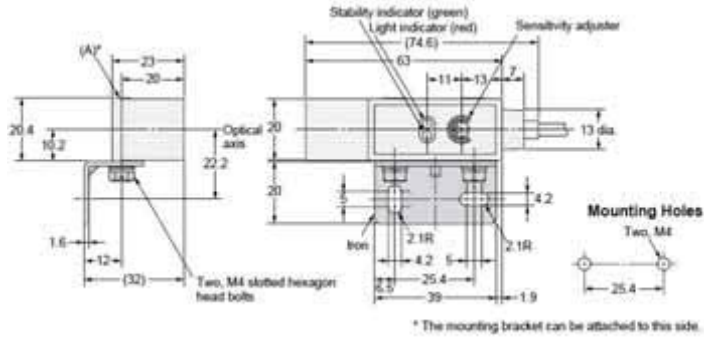
\*2. Timer adjuster: Not available on E3S-AD61, E3S-AD62, E3S-AD63, E3S-AD81, E3S-AD82 and E3S-AD83.  
 Turbo switch: Available on E3S-AD71 and E3S-AD91 only.

**Discontinued Product**  
**Retro-reflective**  
**Model E3S-R2 series**

**E3S-R2E4 / -R2B4**

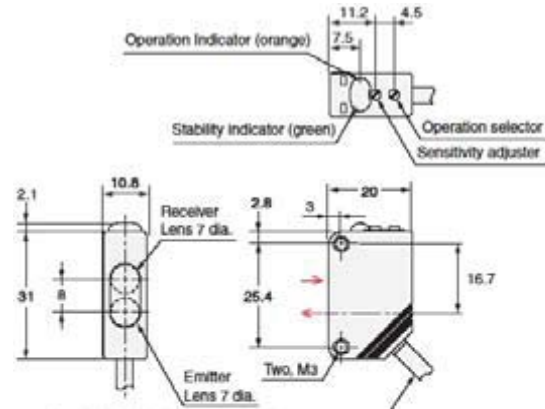


**E3S-R2E41 / -R2B41**



**Recommended Replacement**  
**Retro-reflective**  
**Model E3Z-R series**

**E3Z-R61 / -R81**

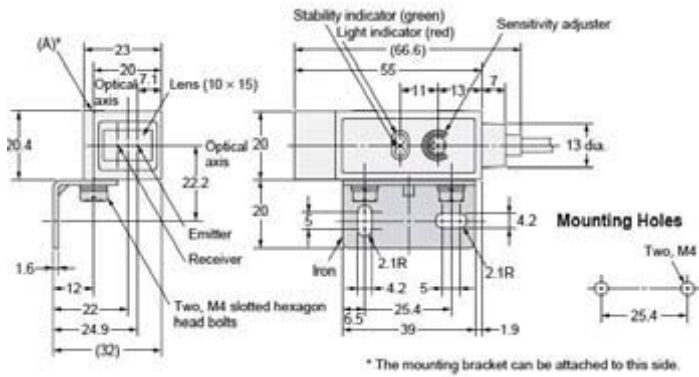


4 dia. vinyl-insulated round cable with 3 conductors (Conductor cross section: 0.2 mm<sup>2</sup> (AWG24), Insulator diameter: 1.1 mm). Standard length: 2 m

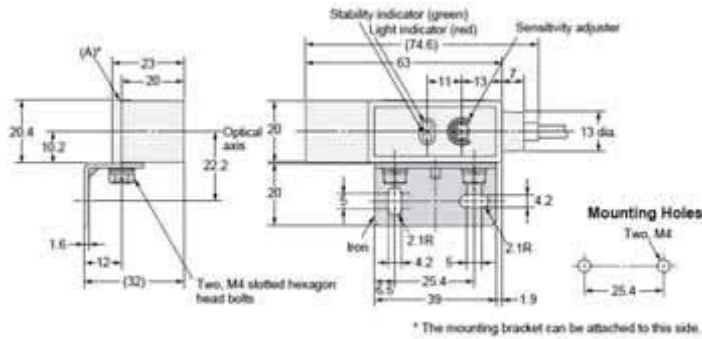
Terminal No.	Specifications
1	+V
2	---
3	0V
4	Output

**Discontinued Product**  
**Retro-reflective**  
**Model E3S-R2 series**

**E3S-R2E4 / -R2B4**

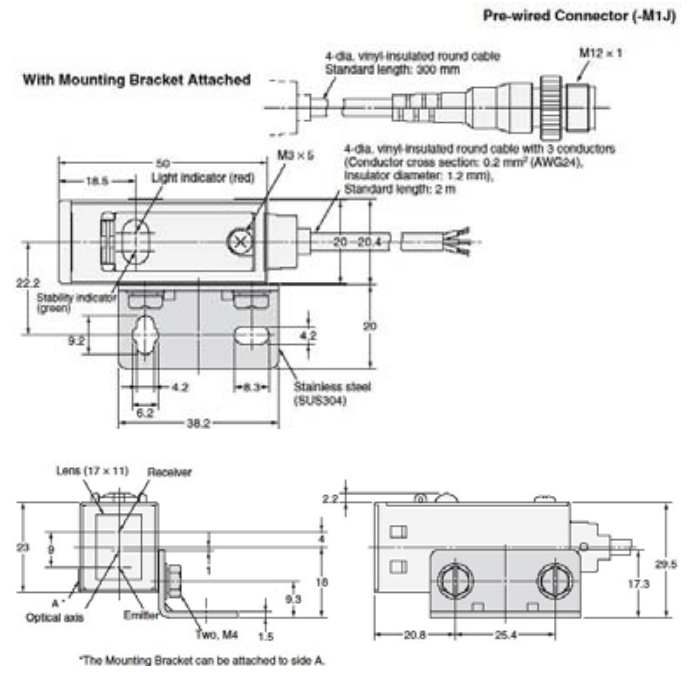


**E3S-R2E41 / -R2B41**

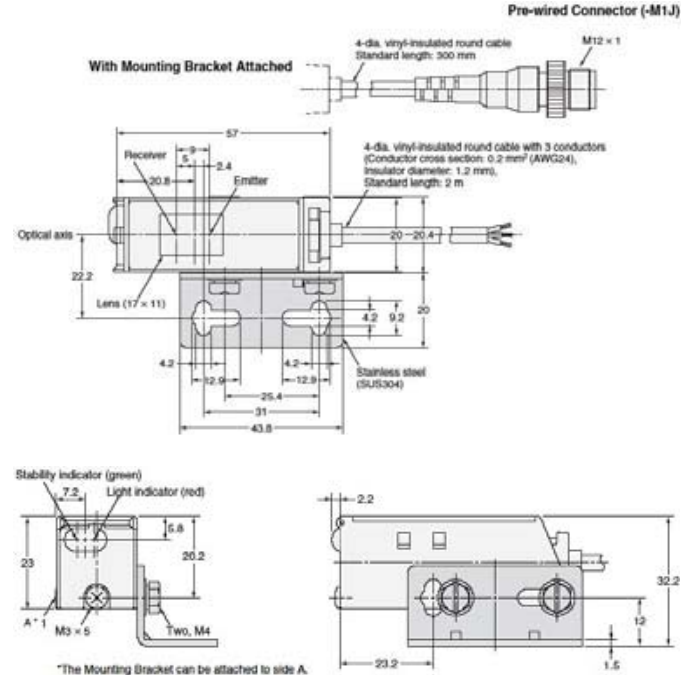


**Recommended Replacement**  
**Retro-reflective**  
**Model E3S-CD/-CR series**

**E3S-CD11 / -CR11**



**E3S-CD61 / -CR61**



## Characteristics

Item	Discontinued Product		Recommended Replacement
	Model E3S-2 series	Model E3S-5 series	Model E3Z-T series
Sensing distance	2 m	5 m	15 m
Standard sensing object	Opaque: 7 mm.dia.min.	Opaque: 11 mm.dia.min.	Opaque: 12 mm dia. min.
Directional angle	Both emitter and receiver: 3° to 10°		Both emitter and receiver: 3° to 15°
Light source	Infrared LED (950 nm)		Infrared LED (870 nm)
Power supply voltage	12 to 24 VDC -10% to 10% ripple (p-p): 10% max.		12 to 24 VDC -10% to 10% ripple (p-p): 10% max.
Current consumption	50 mA max. (Emitter: 25 mA max., Receiver: 25 mA max.)		35 mA max. (Emitter: 15 mA max., Receiver: 20 mA max.)
Control output	(E3S-□E4 type) NPN voltage-current output Output current: 1.5 to 4 mA Load current: 80 mA max Residual voltage: 2 V max  (E3S-□B4 type) PNP open collector output (2B4) Load current: 100 mA max. Residual voltage: 2 V max		Open collector output E3Z-T61:NPN open collector output E3Z-T81:PNP open collector output  Load current: 100 mA max Residual voltage: Load current of less than 10mA: 1 V max. Load current of 10 to 100 mA: 2 V max.
Response time	Operate or reset 3 ms max.		Operate or reset: 1 ms max.
Degree of protection	IEC60529: IP65	IEC60529: IP67	IEC60529: IP67
Indicators	Light indicator (red), Stability indicator (green)		Operation indicator (orange) Stability indicator (green) Through-beam Emitter has power indicator (orange) only.

Item	Product discontinuation	Recommended replacement
	Model E3S-2 series	Model E3S-AT111/-AT31/-AT61 series
Sensing distance	2 m	7 m
Standard sensing object	Opaque: 7 mm dia. min.	Opaque: 10 mm dia. min.
Directional angle	Both emitter and receiver: 3° to 10°	Both emitter and receiver: 3° to 15°
Light source	Infrared LED (950nm)	Red LED (700nm)
Power supply voltage	12 to 24 VDC -10% to 10% (ripple (p-p): 10% max.)	12 to 30 VDC, ripple: 10% max.
Current consumption	50 mA max. (Emitter: 25 mA max. Receiver: 25 mA max.)	40 mA max. (Emitter: 20 mA max. Receiver: 20 mA max.) Plus approx. 15 mA with turbo function.
Control output	(E3S-□E4 type) NPN voltage-current output. Output current: 1.5 to 4 mA. Load current: 80 mA max. Residual voltage: 2 V max.  (E3S-□B4 type) PNP open collector output. Load current: 100 mA max. Residual voltage: 2 V max.	Open collector current output (NPN or PNP) (E3S-AT111/-AT61) NPN open collector (E3S-AT31) PNP open collector Load power supply voltage: 30 VDC max. Current: 100 mA max. Residual voltage 1 V max. Open collector output type (depends on the NPN/PNP output format) Light-ON/Dark-ON: Switch selectable.
Response time	Operate or reset 3 ms Max.	0.5 ms max. for both operation and release.
Degree of protection	IEC60529: IP65	IEC60529: IP67 NEMA: 4X
Indicators	Light indicator (red). Stability indicator (green).	Receiver Emission indicator (red). Emitter Stability indicator (green). Operating indicator (red).

## Characteristics

Item	Product discontinuation	Recommended replacement
	Model E3S-5 series	Model E3S-CT111/-CT61 series
Sensing distance	5 m	30 m
Standard sensing object	Opaque: 11 mm dia. min.	Opaque: 15 mm dia. min.
Directional angle	Both emitter and receiver: 3° to 10°	Both emitter and receiver: 3° to 15°
Light source	Infrared LED (950nm)	Infrared LED (880nm)
Power supply voltage	12 to 24 VDC -10% to 10% (ripple( p-p): 10% max.)	12 to 30 VDC, ripple:10% max
Current consumption	50 mA max. (Emitter: 25 mA max. Receiver: 25 mA max.)	50 mA max. (Emitter: 25 mA max. Receiver: 25 mA max.)
Control output	(E3S-□E4 type) NPN voltage-current output. Output current: 1.5 to 4 mA. Load current: 80 mA max. Residual voltage: 2 V max.(E3S-□B4 type) PNP open collector output. Load current: 100 mA max. Residual voltage: 2 V max.	NPN or PNP (selectable) open collector current Output.load power supply voltage: 30 VDC max. load Current 100 mA max. Residual voltage NPN output 1.2V max., PNP output 2.0V max.) Open collector output type (NPN/PNP output switch selectable). Light-ON/Dark-ON switch selectable.
Response time	Operate or reset 3 ms max.	1 ms max. for both operation and release.
Degree of protection	IEC60529: IP67	IEC60529: IP67 (company standard: oil proof) NEMA: 6P (restricts to indoor use.)
Indicators	Light indicator (red). Stability indicator (green).	Light indicator (red). Stability indicator (green). Power ON (red).

Item	Discontinued Product		Recommended Replacement	
	Model E3S-DS10 series	Model E3S-DS30 series	Model E3Z-D□1 series	Model E3Z-D□2 series
Sensing distance	100 mm (White paper 50x50 mm)	300 mm (White paper 100x100 mm)	100 mm (White paper 100x100 mm)	1 m (White paper 300x300 mm)
Differential distance	20% max. of sensing distance		20% max. of sensing distance	
Light source	Infrared LED (950nm)		Infrared LED (860nm)	
Power supply voltage	12 to 24 VDC -10% to 10% ripple (p-p): 10% max.		12 to 24 VDC -10% to 10% ripple (p-p): 10% max.	
Current consumption	40 mA max.		30 mA max.	
Control output	(E3S-□E4 type) NPN voltage-current output Output current: 1.5 to 4 mA Load current: 80 mA max Residual voltage: 2 V max  (E3S-□B4 type) PNP open collector output (2B4) Load current: 100 mA max. Residual voltage: 2 V max		Open collector output E3Z-T61:NPN open collector output E3Z-T81:PNP open collector output  Load current: 100 mA max Residual voltage: Load current of less than 10mA: 1 V max. Load current of 10 to 100 mA: 2 V max.	
Response time	Operate or reset: 1 ms max.		Operate or reset: 1 ms max.	
Degree of protection	IEC60529: IP65	IEC60529: IP67	IEC60529: IP67	
Indicators	Light indicator (red) Stability indicator (green)		Operation indicator (orange) Stability indicator (green)	

## Characteristics

Item	Product discontinuation	Recommended replacement
	Model E3S-DS10 series	Model E3S-AD13/-AD63/-AD33/-AD83 series
Sensing distance	100 mm (White paper 50×50 mm)	100 mm (White paper 100×100 mm)
Differential distance	20% max. of sensing distance	20% max. of sensing distance
Light source	Infrared LED (950nm)	Infrared LED (880nm)
Power supply voltage	12 to 24 VDC -10% to 10% (ripple (p-p): 10% max.)	12 to 30 VDC, ripple: 10% max
Current consumption	40 mA max.	35 mA max.
Control output	(E3S-□E4 type) NPN voltage-current output. Output current: 1.5 to 4 mA. Load current: 80 mA max. Residual voltage: 2 V max. (E3S-□B4 type) PNP open collector output. Load current: 100 mA max. Residual voltage: 2 V max.	Open collector output. E3S-AD13/-AD63: NPN open collector output. E3S-AD33/-AD83: PNP open collector output. Load power supply voltage: 30 VDC max. load Current 100 mA max. Residual voltage 1 V max. Open collector output type (depends on the NPN/PNP output format) Light-ON/Dark-ON switch selectable.
Response time	Operate or reset: 1 ms max.	0.5 ms max. for both operation and release.
Degree of protection	IEC60529: IP65	IEC60529: IP67 NEMA: 4X (restricts to indoor use.)
Indicators	Light indicator (red) Stability indicator (green)	Light indicator (red) Stability indicator (green)

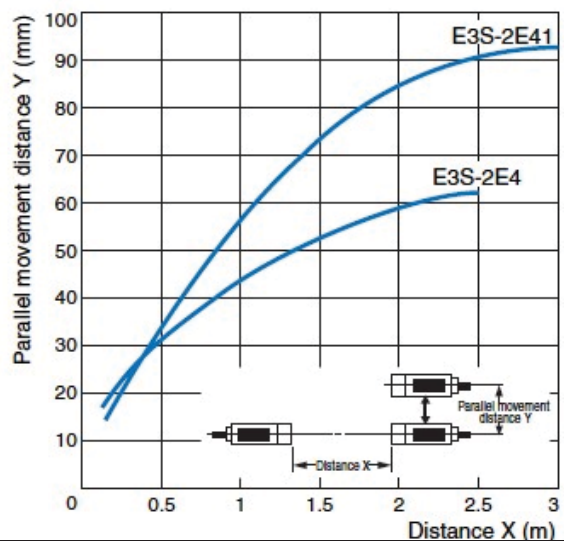
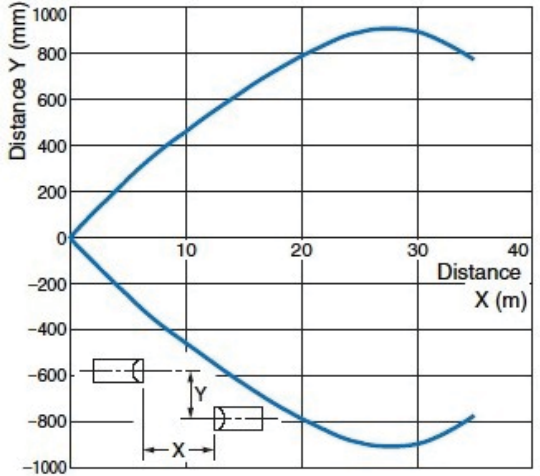
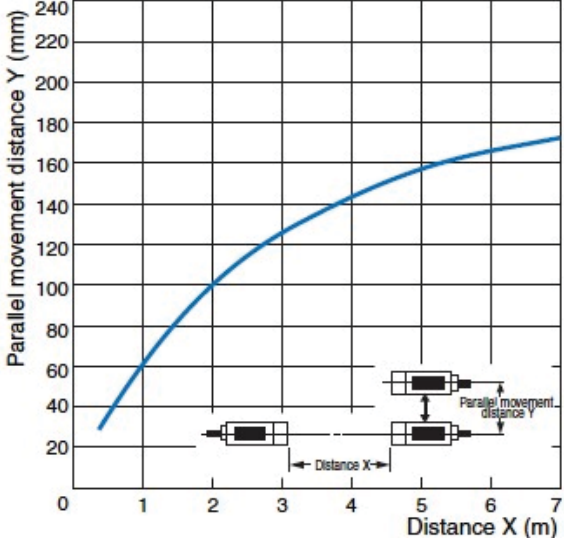
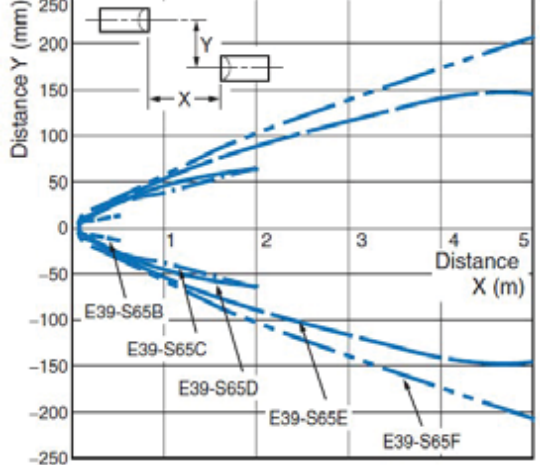
Item	Product discontinuation	Recommended replacement
	Model E3S-DS30 series	Model E3S-CD11/-CD61 series
Sensing distance	300 mm (White paper 100×100 mm)	700 mm (White paper 100×100 mm)
Differential distance	20% max. of sensing distance	20% max. of sensing distance
Light source	Infrared LED (950nm)	Infrared LED (880nm)
Power supply voltage	12 to 24 VDC -10% to 10% (ripple (p-p): 10% max.)	12 to 30 VDC, ripple: 10% max.
Current consumption	40 mA max.	40 mA max.
Control output	(E3S-□E4 type) NPN voltage-current output. Output current: 1.5 to 4 mA. Load current: 80 mA max. Residual voltage: 2 V max. (E3S-□B4 type) PNP open collector output. Load current: 100m A max. Residual voltage: 2 V max.	NPN or PNP open collector current output (switch selectable) Load power supply voltage 30 VDC max. Load current 100mA max. Residual voltage: NPN output 1.2 V max. PNP output 2.0 V max. Light-ON/Dark-ON switch selectable.
Response time	Operate or reset: 1 ms max.	1.0 ms max. for both operation and release.
Degree of protection	IEC60529: IP67	IEC60529: IP67 (company standard: oil proof) NEMA: 6P (restricts to indoor use.)
Indicators	Light indicator (red) Stability indicator (green)	Light indicator (red) Stability indicator (green)

## Characteristics

Item	Discontinued Product	Recommended Replacement
	Model E3S-R2 series	Model E3Z-R series
Sensing distance	0.1 to 2 m (When using the E39-R1)	4 m (When using the E39-R1S)
Standard sensing object	Opaque: 30-mm dia. min.	Opaque: 75-mm dia. min.
Light source	Infrared LED (950nm)	Red LED (660nm)
Power supply voltage	12 to 24 VDC -10% to 10% ripple (p-p): 10% max.	12 to 24 VDC -10% to 10% ripple (p-p): 10% max.
Current consumption	40 mA max.	30 mA DC max.
Control output	(E3S-□E4 type) NPN voltage-current output Output current: 1.5 to 4 mA Load current: 80 mA max Residual voltage: 2 V max  (E3S-□B4 type) PNP open collector output (2B4) Load current: 100 mA max. Residual voltage: 2 V max	Open collector output E3Z-T61:NPN open collector output E3Z-T81:PNP open collector output  Load current: 100 mA max Residual voltage: Load current of less than 10mA: 1 V max. Load current of 10 to 100 mA: 2 V max.
Response time	Operate or reset: 1 ms max.	Operate or reset: 1 ms max.
Degree of protection	IEC60529: IP67	IEC60529: IP67
Indicators	Light indicator (red), Stability indicator (green)	Operation indicator (orange)Stability indicator (green)

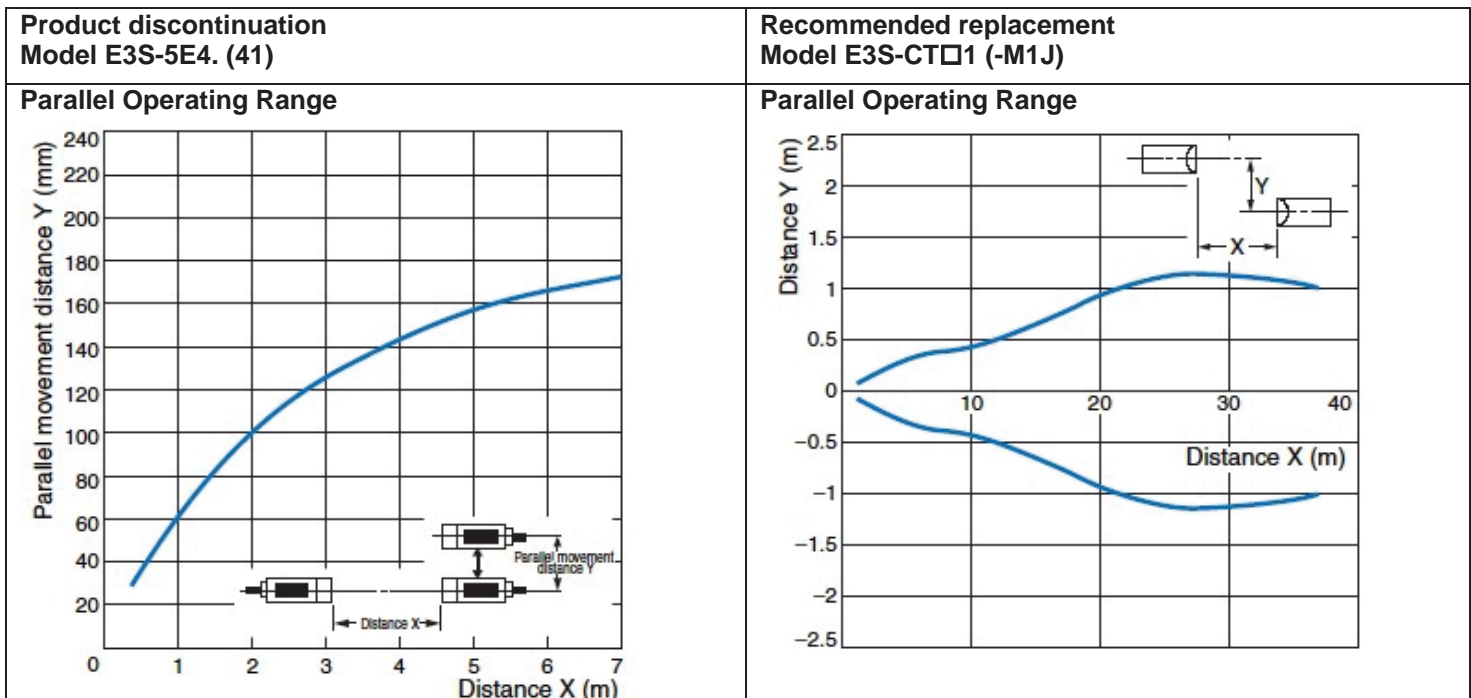
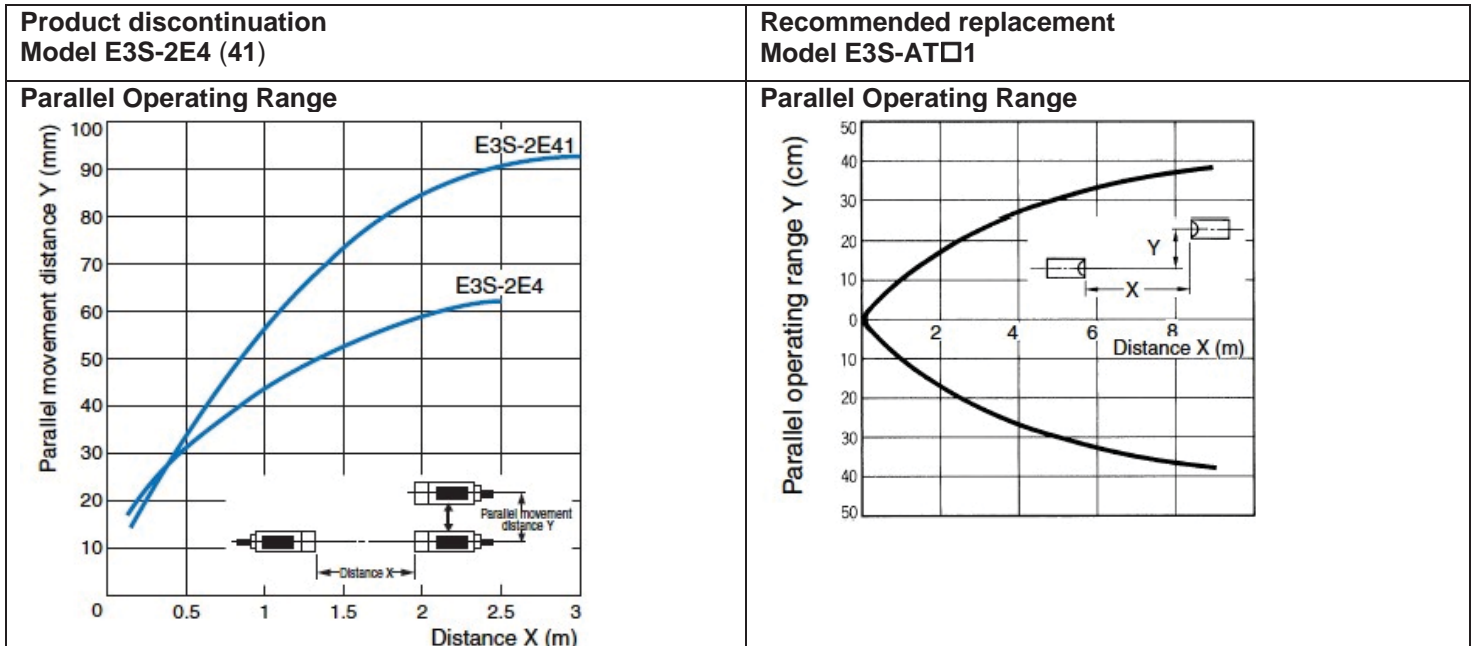
Item	Product discontinuation	Recommended replacement
	Model E3S-R2 series	Model E3S-CR11/-CR61 series
Sensing distance	0.1 to 2 m (When using the E39-R1)	3 m (When using the E39-R1)
Standard sensing object	Opaque: 30 mm dia. min.	Opaque: 75 mm dia. min.
Light source	Infrared LED (950nm)	Red LED (700nm)
Power supply voltage	12 to 24 VDC -10% to 10% (ripple (p-p): 10% max.)	12 to 30 VDC, ripple:10% max
Current consumption	40mA max.	40mA max.
Control output	(E3S-□E4 type) NPN voltage-current output Output current: 1.5 to 4 mA. Load current: 80 mA max. Residual voltage: 2 V max. (E3S-□B4 type) PNP open collector output Load current: 100 mA max. Residual voltage: 2 V max.	NPN or PNP open collector current output (switch selectable) Load power supply voltage: 30 VDC max. Load current: 100 mA max. Residual voltage: NPN output 1.2 V max. PNP output 2.0 V max.) Light-ON/Dark-ON switch selectable.
Response time	Operate or reset: 1 ms max.	Operate or reset: 1 ms max.
Degree of protection	IEC60529: IP67	IEC60529: IP67 (company standard: oil proof) NEMA: 6P (restricts to indoor use.)
Indicators	Light indicator (red) Stability indicator (green)	Light indicator (red) Stability indicator (green)

## Operation Ratings

<p><b>Product discontinuation</b>  <b>Model E3S-2E4 (41)</b>  <b>Model E3S-5E4. (41), (42)</b></p>	<p><b>Recommended replacement</b>  <b>Model E3Z-T□1 (T□6)</b></p>
<p><b>Parallel Operating Range</b>  <b>E3S-2E4 (41)</b></p> 	<p><b>Parallel Operating Range</b>  <b>E3Z-T□1(T□6)</b></p> 
<p><b>E3S-5E4 (41) (42)</b></p> 	<p><b>E3Z-T□1(T□6) and Slit</b>  <b>(A Slit is mounted to the Emitter and Receiver.)</b></p> 



## Operation Ratings



# Operation Ratings

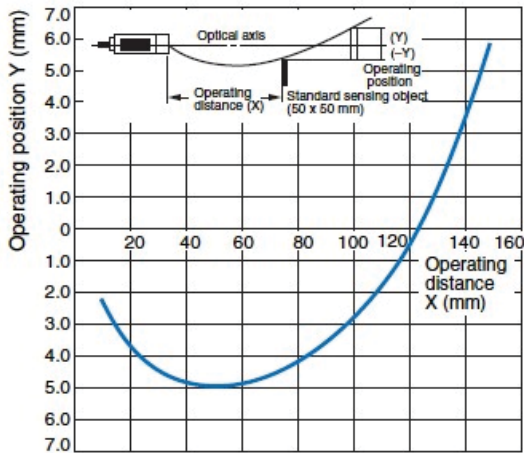
<p><b>Discontinued Product</b>  <b>Model E3S-DS10 / E3S-DS30 series</b></p> <p><b>Operating Range</b>  <b>E3S-DS10E4 (41)</b></p>	<p><b>Recommended Replacement</b>  <b>Model E3Z-D series</b></p> <p><b>Operating Range</b>  <b>E3Z-D□1(D□6)</b></p>
<p><b>E3S-DS30E4 (41) (42)</b></p>	<p><b>E3Z-D□2(D□7)</b></p>

## Operation Ratings

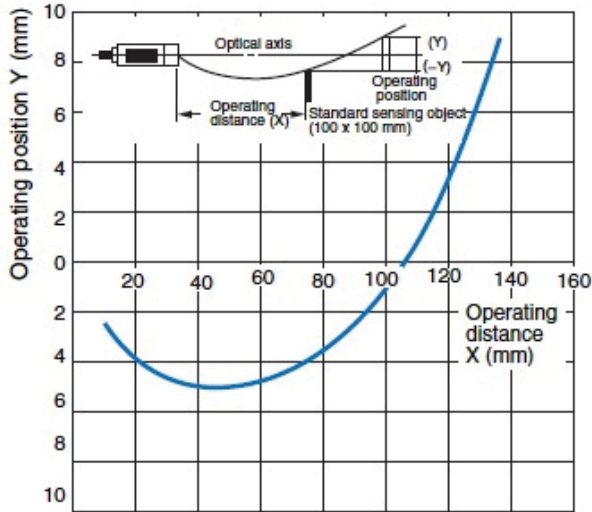
**Discontinued Product**  
**Model E3S-DS10 / E3S-DS30 series**

**Recommended Replacement**  
**Model E3S-AD series**  
**Model E3S-CD series**

### Operating Range E3S-DS10E4 (41)



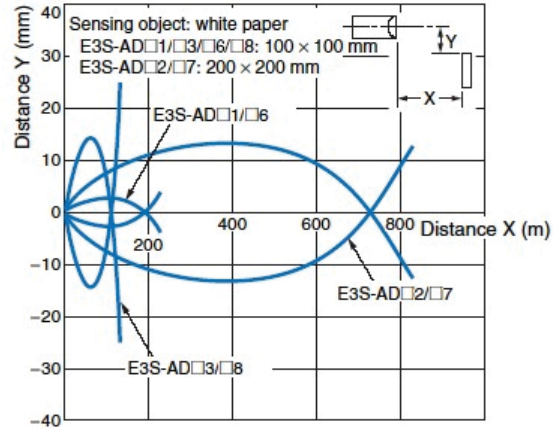
### E3S-DS30E4 (41) (42)



### Sensing Range

**Diffuse-reflective Sensors**

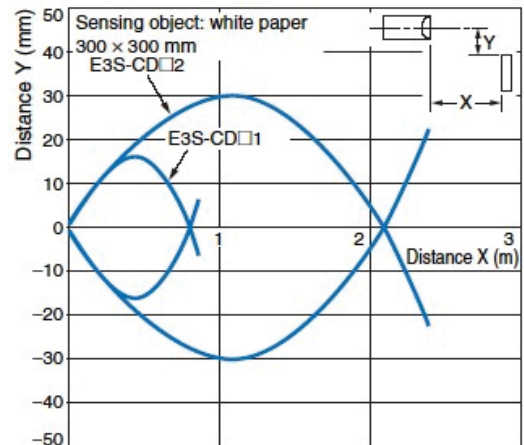
**E3S-AD□1/AD□2/AD□3/AD□6/AD□7/AD□8**



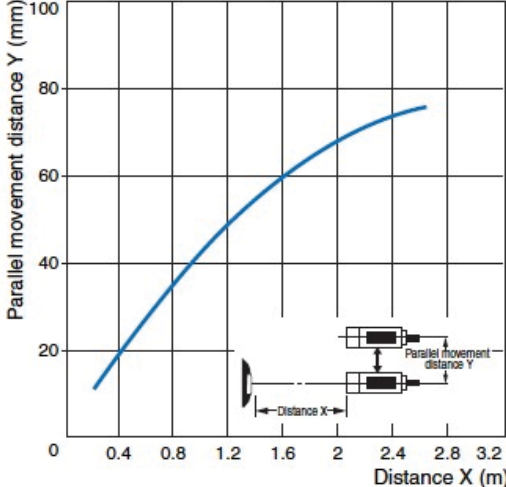
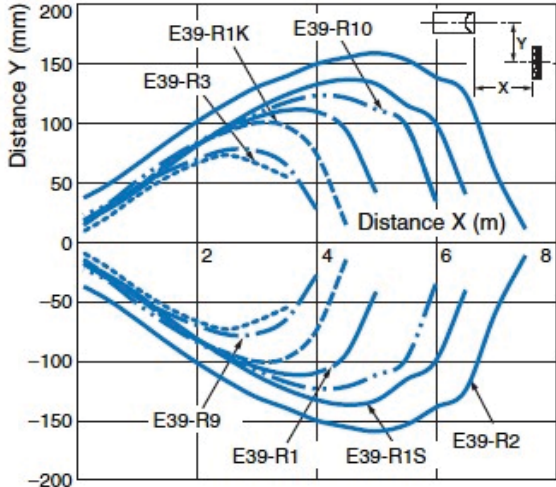
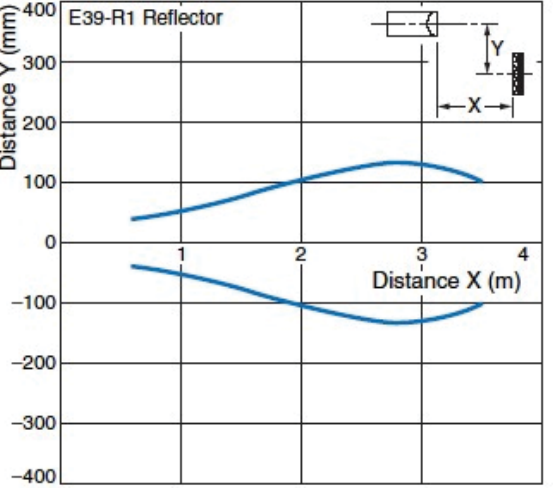
### Operating Range

**Diffuse-reflective**

**E3S-CD□□ (-M1J)**



## Operation Ratings

<p><b>Discontinued Product</b>  <b>Retro-reflective Sensors</b>  <b>Model E3S-R2 series</b></p>	<p><b>Recommended Replacement</b>  <b>Retro-reflective Sensors</b>  <b>Model E3Z-R series</b>  <b>Model E3S-CR□1 (-M1J) + E39-R1 Reflector</b></p>
<p><b>Parallel Operating Range</b>  <b>E3S-R2E4 (41) (42)</b></p> 	<p><b>Parallel Operating Range</b>  <b>E3Z-R□1 (R□6) and Reflector</b></p> 
	<p><b>E3S-CR1 (-M1J) + E39-R1 Reflector (provided)</b></p> 

## Operation Method

<p><b>Discontinued Product</b>  <b>Model E3S-2, E3S-5, E3S-DS, E3S-R2 series</b></p>	<p><b>Recommended Replacement</b>  <b>Model E3Z-T, E3Z-D, E3Z-R series</b>  <b>Model E3S-AT,-AD series</b>  <b>Model E3S-CT,-CD,CR series</b></p>
<p>Light-ON/Dark-ON operation is wire selectable by inverting the connection (Brown-Blue).          Sensitivity adjuster (one-turn) sets the operation threshold.</p>	<p><b>E3Z-T/-D/-R series</b>  <b>E3S-CT/-CR series</b>          Sensitivity adjustment: One-turn adjuster.          Light-ON/Dark-ON: Switch selectable.</p> <p><b>E3S-AT/-AD series</b>  <b>E3S-CD series</b>          Sensitivity adjustment: Two-turn endless adjuster with an indicator.          Light-ON/Dark-ON: Switch selectable</p>

## Reference Documentation

Description	Media	Publication number
E3S Photoelectric Sensors Data Sheet	PDF	<a href="#">CSM E3S DS E 8 1</a>
E3Z Photoelectric Sensors Data Sheet	PDF	<a href="#">E3Z DS E 15 1</a>

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