







**NO:** PH-163  
**DATE:** July 2012

**PRODUCT:** E3S-R Photoelectric Sensors  
**TYPE:** Discontinuation Notice

E3S-R Transparent Object Detection Photoelectric Sensors will be Discontinued March 2014; Use E3Z-B or E3ZM-B

Discontinued product		Recommended replacement	
Plastic housing	Metal housing	Plastic housing	Metal housing
E3S-R1□ Series	E3S-RS30 Series, E3S-R1□4 Series	E3Z-B Series	E3ZM-B Series
			

#### Affected Parts

Product discontinuation	Recommended replacement
E3S-R11 2M	E3Z-B62 2M
E3S-R11 5M	E3Z-B62 5M
E3S-R12 2M	E3Z-B61 2M
E3S-R12 5M	E3Z-B61 5M
E3S-R16	E3Z-B67
E3S-R17	E3Z-B66
E3S-R31 2M	E3Z-B82 2M
E3S-R32 2M	E3Z-B81 2M
E3S-R36	E3Z-B87
E3S-R37	E3Z-B86
E3S-R61 2M	E3Z-B62 2M
E3S-R61 5M	E3Z-B62 5M
E3S-R62 2M	E3Z-B61 2M
E3S-R62 5M	E3Z-B61 5M
E3S-R66	E3Z-B67
E3S-R67	E3Z-B66
E3S-R81 2M	E3Z-B82 2M
E3S-R82 2M	E3Z-B81 2M
E3S-R86	E3Z-B87
E3S-R87	E3Z-B86
E3S-R1B4 2M	E3ZM-B81T 2M
E3S-R1B42 2M	E3ZM-B81T 2M
E3S-R1E4 2M	E3ZM-B61T 2M
E3S-R1E42 2M	E3ZM-B61T 2M
E3S-RS30B4-30 2M	E3ZM-B81T 2M
E3S-RS30B42-30 2M	E3ZM-B81T 2M
E3S-RS30E4 2M	E3ZM-B61T 2M
E3S-RS30E4-30 2M	E3ZM-B61T 2M
E3S-RS30E42 2M	E3ZM-B61T 2M
E3S-RS30E42-30 2M	E3ZM-B61T 2M

## Caution on Applying the Recommended Replacement

- 1) The E3S-R sensor can be replaced without changing the body position or optical axis when combined with a conversion mounting bracket. For the E3Z-B horizontal models use the E39-L176 mounting bracket; for the E3Z-B vertical models use the E39-L176 mounting bracket. Please refer to the Mounting Dimensions.
- 2) The metal body sensor changes color from yellow to silver.
- 3) Sensing distance will change. Please refer to the operation ratings and characteristics.

## Body color

Item	Plastic Housing		Metal Housing	
	Product discontinuation	Recommended replacement	Product discontinuation	Recommended replacement
Color	E3S-R	E3Z-B	E3S-R30/E3S-R1	E3Z-B
	Black	Black	Yellow	Silver

## Wire connection

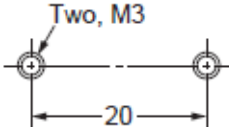
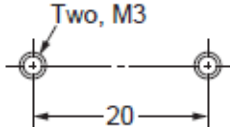
Product discontinuation E3S-R/RS30/R1			Recommended replacement E3Z-B/E3ZM-B		
<b>Models with Plastic Housing</b> <b>E3S-R</b> <b>NPN Output</b>			<b>Models with Plastic Housing</b> <b>E3Z-B</b> <b>NPN Output</b>		
Model	Operation selector	Output circuit	Model	Operation mode	Output circuit
E3S-R11(12) E3S-R61(62) E3S-R16(17) E3S-R66(67)	L side (LIGHT ON)		E3Z-B61 E3Z-B62 E3Z-B66 E3Z-B67	Light-ON	<b>Retro-reflective Model</b> 
	D side (DARK ON)	<p>Note: Pin 2 is not used.</p>			<p>Note: Pin 2 is not used.</p>
<b>PNP Output</b>			<b>PNP Output</b>		
Model	Operation mode	Output circuit	Model	Operation mode	Output circuit
E3S-R31 E3S-R36 E3S-R81 E3S-R86	Light-ON		E3Z-B81 E3Z-B82 E3Z-B86 E3Z-B87	Light-ON	<b>Retro-reflective Model</b> 
	Dark-ON	<p>Note: Pin 2 is not used.</p>			<p>Note: Pin 2 is not used.</p>

Product discontinuation E3S-R/RS30/R1		Recommended replacement E3Z-B/E3ZM-B	
<b>Models with Metal Housing</b> <b>E3S-RS30/R1</b> <b>NPN Output</b>		<b>Models with Metal Housing</b> <b>E3ZM-B</b> <b>NPN Output</b>	
Model	Operation mode	Output circuit	
E3S-RS30E4(42) E3S-R1E4(42)	Light-ON		
	Dark-ON		
<p>*1. Reverse the polarity of the power supply to change the output mode of the E3S-R.  *2. Voltage output (When connecting a transistor circuit, etc.)</p>			
<b>PNP Output</b> <b>E3S-R□B4 (PNP Output)</b>		<b>PNP Output</b>	
Model	Operation mode	Output circuit	
E3ZM-B81T, -B86T	Light ON		
	Dark ON		

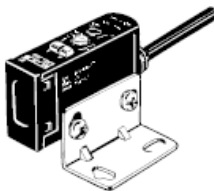
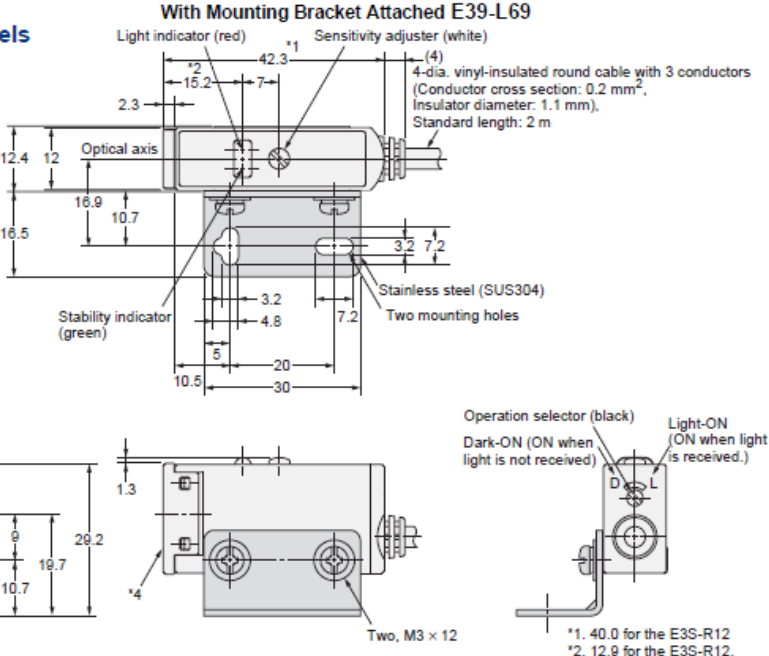
### Mounting dimensions [Unit: mm]

Product discontinuation Model E3S-R/RS30/R1		Recommendable replacement Model E3Z-B/E3ZM-B	
<b>Models with Plastic Housing</b> <b>E3S-R</b> <b>Mounting Holes</b>		<b>Models with Plastic Housing</b> <b>E3Z-B</b> <b>Mounting Holes</b>	
<b>Models with Metal Housing</b> <b>E3S-RS30/R1</b> <b>Mounting Holes</b>		<b>Models with Metal Housing</b> <b>E3ZM-B</b> <b>Mounting Holes</b>	

## Mounting dimensions (When using the conversion mounting hardware)

Product discontinuation Model E3S-R	Recommendable replacement Model E3Z-B
<p>Models with Plastic Housing E3S-R</p> <p><b>Mounting Holes</b></p> 	<p>Models with Plastic Housing E3Z-B + E39-L174/E39-L176</p> <p><b>Mounting Holes</b></p> 

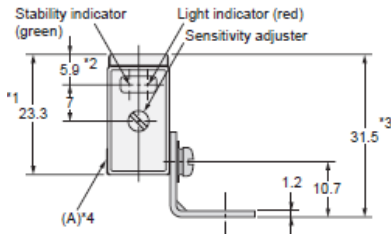
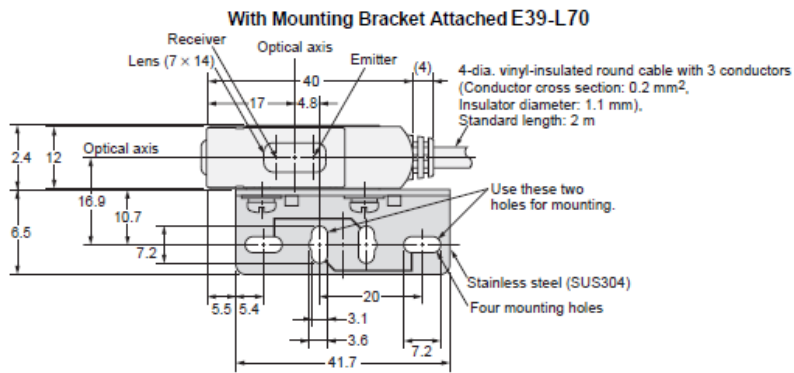
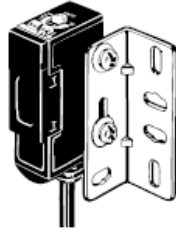
## Dimensions

Product discontinuation Model E3S-R/-RS30/-R1	
<p>Models with Plastic Housing [Horizontal] Connection method: Pre-wired</p> <p><b>Sensors</b> Compact Horizontal Models with Plastic Housing Pre-wired Models E3S-R11, E3S-R12 E3S-R31</p> 	<p><b>With Mounting Bracket Attached E39-L69</b></p>  <p>*3. The mounting bracket can be attached to this side. *4. Not available on the E3S-R12.</p> <p>*1. 40.0 for the E3S-R12 *2. 12.9 for the E3S-R12.</p>

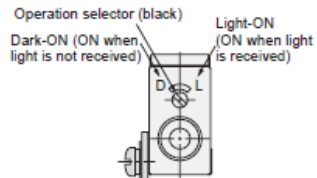
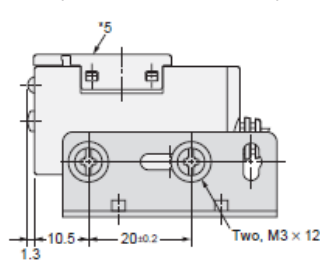
**Product discontinuation  
Model E3S-R/-RS30/-R1**

**Models with Plastic Housing [Vertical]  
Connection method: Pre-wired**

**Compact Vertical Models with  
Plastic Housing  
Pre-wired Models  
E3S-R61, E3S-R62  
E3S-R81**



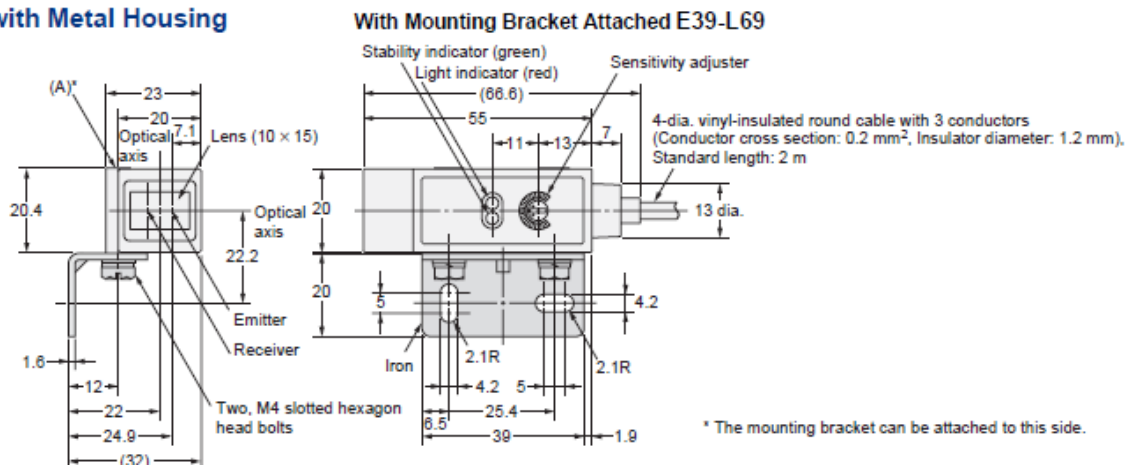
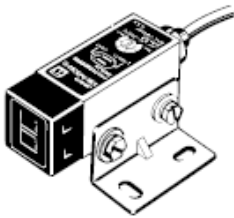
\*4. The mounting bracket can be attached to this side.  
\*5. Not available on the E3S-R62.



\*1. 21.0 for the E3S-R62.  
\*2. 3.6 for the E3S-R62.  
\*3. 29.2 for the E3S-R62.

**Models with Metal Housing [Horizontal]**

**Horizontal Models with Metal Housing  
E3S-RS30E4  
E3S-R1E4**

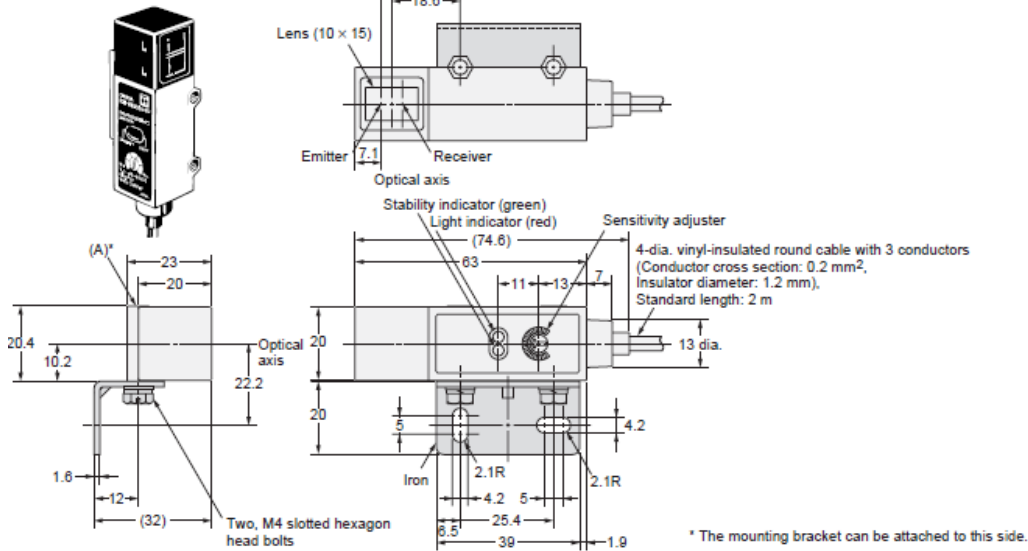


**Product discontinuation  
Model E3S-R/RS30-R1**

**Models with Metal Housing [Vertical]**

**Vertical Models with Metal Housing**  
E3S-RS30E42  
E3S-R1E42

With Mounting Bracket Attachment E39-L70

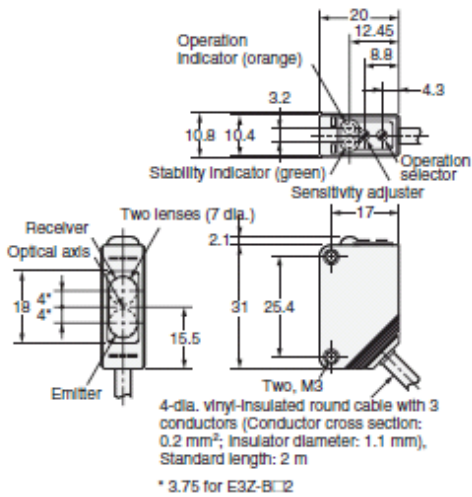


**Recommended replacement  
Model E3Z-B/E3ZM-B**

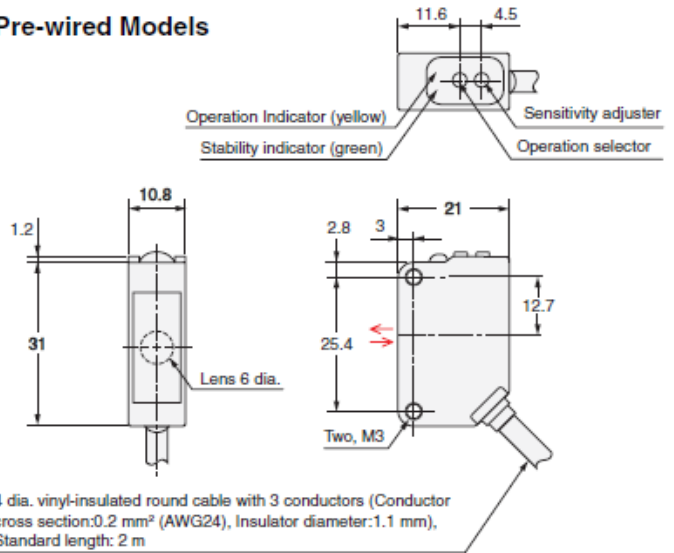
**Models with Plastic Housing**  
E3Z-B

**Models with Metal Housing**  
E3ZM-B

**Pre-wired Models**  
E3Z-B61  
E3Z-B81  
E3Z-B62  
E3Z-B82



**Pre-wired Models**



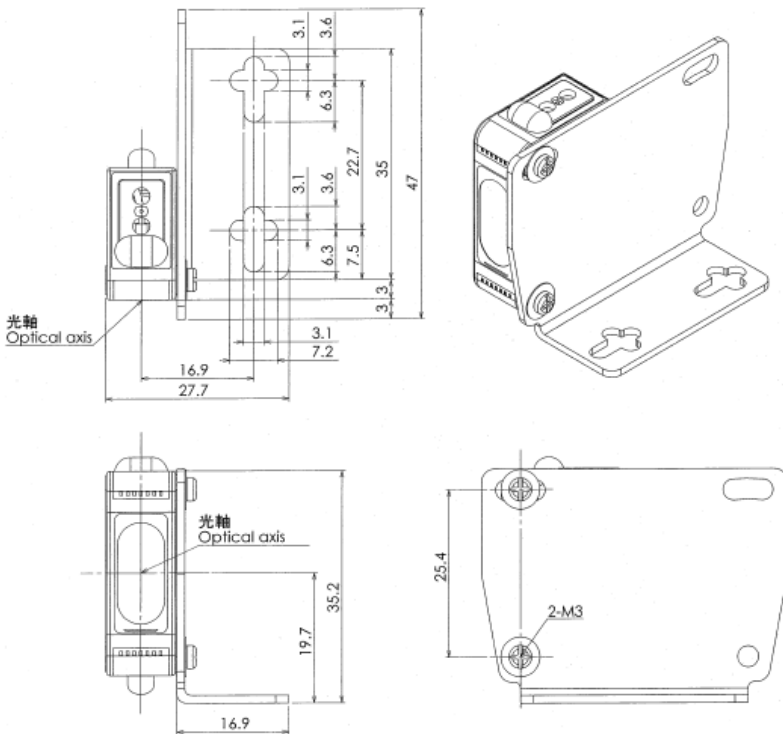
**Dimensions** (When using the mounting hardware conversion)

Maintain the optical axis of discontinued E3S-R sensors by mounting E3Z-B using specially designed mounting brackets.

Product discontinuation			Recommended replacement	
Model	Appearance	Connection Method	Model	Mounting Brackets
E3S-R	Horizontal	Pre wired	E3Z-B	E39-L176
		Connector		—
	Vertical	Pre wired		E39-L174
		Connector		E39-L174

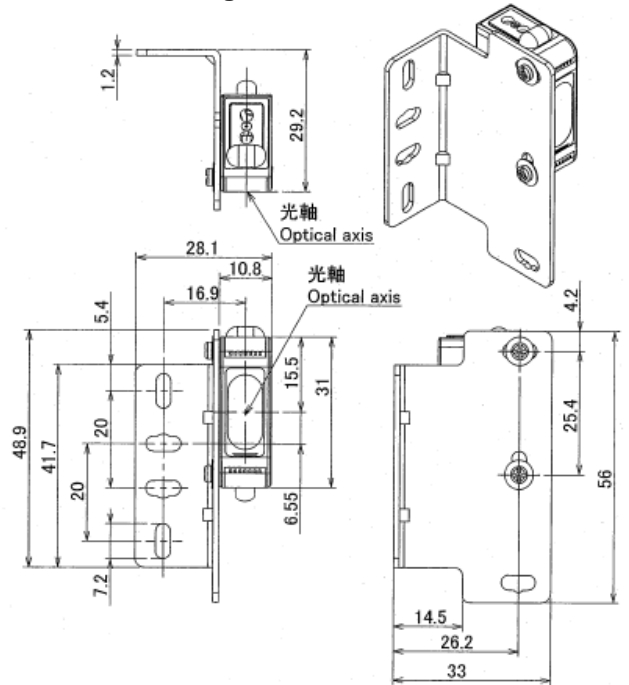
**Recommended replacement: E3Z-B**

**Models with Plastic Housing [Horizontal]**  
**Connection method: Pre-wired**  
**E3Z-B + Mounting Bracket E39-L176**



Note: Do not use E39-L176 mounting bracket with E3Z-B connector versions.

**Models with Plastic Housing [Vertical]**  
**Connection method: Pre-wired**  
**E3Z-B + Mounting Bracket E39-L174**



## Characteristics

	Models with Plastic Housing				
	Product discontinuation			Recommended replacement	
	Retro-reflective		Retro-reflective (with MSR function)	Retro-reflective (with MSR function)	
	NPN	E3S-R12/-R62/-R17/-R67	E3S-R11/-R16/-R61/-R66	E3Z-B61/-B66	E3Z-B62/B67
PNP	E3S-R32/-R82/-R37/-R87	E3S-R31/-R36/-R81/-R86	E3Z-B81/-B86	E3Z-B82/B87	
Light source (wavelength)	Infrared LED (880 nm)		Red LED (700 nm)	Red LED (660 nm)	
Power supply voltage	10 to 30 VDC; Ripple:10% max			10 to 24 VDC; Ripple:10% max	
Current consumption	30 mA max			30 mA max	
Sensing distance	300 mm [100 mm]*1 (using E39-R1)		1 m [100 mm]*1 (using E39-R1)	500 mm [80 mm]*1 (using E39-R1S)	2 m [500 mm]*1 (using E39-R1S)
Response time	Operate or Reset: 1 ms max			Operate or Reset: 1 ms max	
Control output	Load power supply voltage:30 VDC max Load current: 100 mA max. with a maximum residual voltage of 1 V Open collector output configuration Light-ON/dark-ON selector switch			Load power supply voltage:26.4 VDC max Load current: 100 mA max. Residual voltage:10 mA:1 V max :10 to 100 mA:2 V max Open collector output configuration Light-ON/dark-ON selector switch	
Sensitivity adjustment	Two-turn endless adjuster			One-turn adjuster	
Ambient Illumination	Incandescent lamp: 5,000lx max Sunlight:10,000lx max			Incandescent lamp: 3,000lx max Sunlight:10,000lx max	
Ambient temperature range	Operating:0 to 40°C Storage: -40 to 70°C			Operating:-25 to 55°C Storage: -40 to 70°C	
Ambient humidity range	Operating: 35 to 85% Storage: 35 to 95%			Operating: 35 to 85% Storage: 35 to 95%	
Insulation resistance	20MΩ min (at 500 VDC)			20MΩ min (at 500 VDC)	
Dielectric strength	1,000 VAC, 50/60 Hz for 1 minute			1,000 VAC, 50/60 Hz for 1 minute	
Vibration resistance	10 to 55 Hz 1.5-mm double amplitude for 2h each in X,Y,Z			10 to 55 Hz 1.5-mm double amplitude for 2h each in X,Y,Z	
Shock resistance	500 m/s <sup>2</sup> for 3times each in X,Y,Z			500 m/s <sup>2</sup> for 3times each in X,Y,Z	
Degree of protection	IEC IP67			IEC IP67	

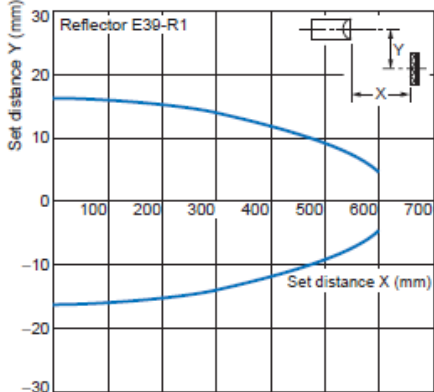
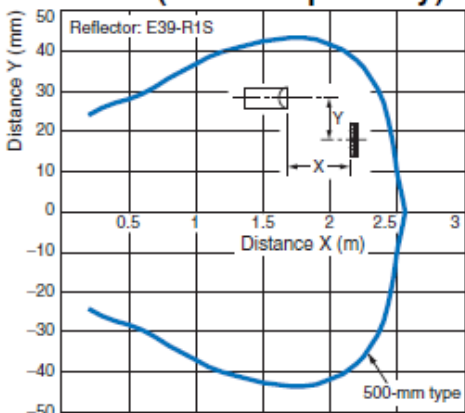
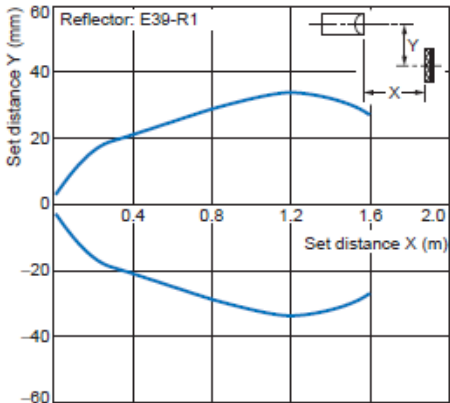
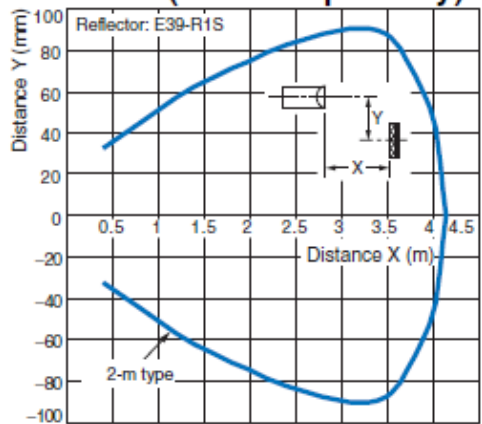
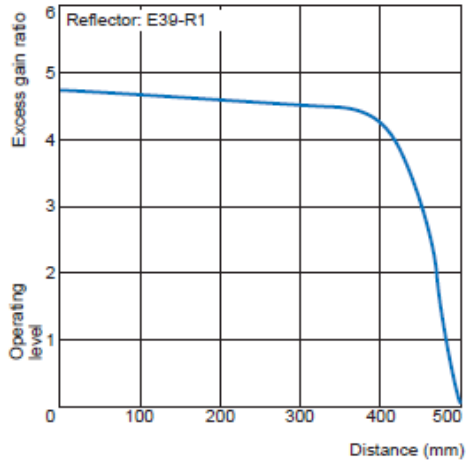
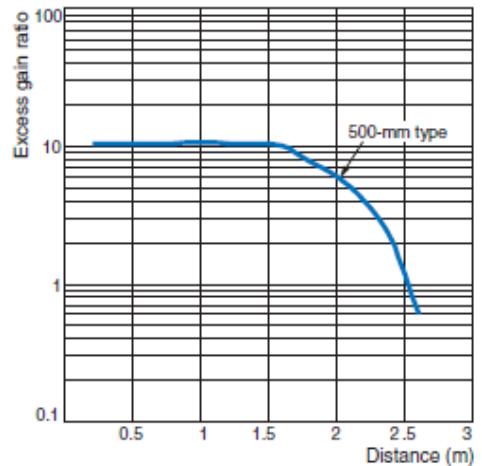
\*1: Distance between transparent target and the reflective sensor. [ ] Figures in brackets are minimum distance from sensor.



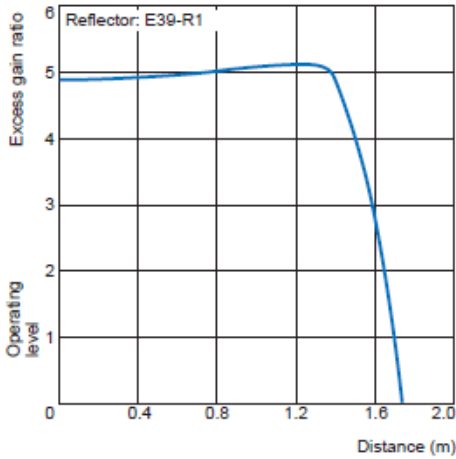
	<b>Models with Metal Housing</b>		
	<b>Product discontinuation</b>		<b>Recommended replacement</b>
	<b>Retro-reflective</b>		<b>Retro-reflective</b>
	<b>NPN</b>	<b>E3S-RS30E4* -RS30E4*-30</b>	<b>E3S-R1E4 -R1E42</b>
<b>PNP</b>	<b>E3S-RS30B4-30 -RS30B42-30</b>	<b>E3S-R1B4 -R1B42</b>	
Light source (wavelength)	Infrared LED (950 nm)		Red LED (650 nm)
Power supply voltage	12 to 24 VDC; ripple:10% max		10 to 30 VDC; ripple:10% max
Current consumption	40 mA max		25 mA max
Sensing distance	300 mm (using E39-R1)	1 m (using E39-R1)	100 to 500 mm (using E39-RP1)
Response time	Operate or Reset : 1 ms max		Operate or Reset : 1 ms max
Control output	Load power supply voltage:24 VDC max Load current: 80 mA max. with a maximum residual voltage of 1V Open collector output configuration		Load power supply voltage:30 VDC max Load current: 100 mA max. with a maximum residual voltage of 2 V Open collector output (NPN/PNP output depending on model)
Sensitivity adjustment	One-turn adjuster		One-turn adjuster
Ambient Illumination	Incandescent lamp: 3,000lx max Sunlight:10,000lx max		Incandescent lamp: 3,000lx max Sunlight:10,000lx max
Ambient temperature range	Operating: “not -30” 0 to +40°C “-30” -25 to +55°C Storage: -40 to 70°C	Operating: -25 to 55°C Storage: -40 to 70°C	Operating:-40 to 60°C Storage: -40 to 70°C
Ambient humidity range	Operating: 35 to 85% Storage: 35 to 95%		Operating: 35 to 85% Storage: 35 to 95%
Insulation resistance	20MΩ min (at 500 VDC)		20MΩ min (at 500 VDC)
Dielectric strength	1,000 VAC, 50/60 Hz for 1 minute		1,000 VAC, 50/60 Hz for 1 minute
Vibration resistance	10~55 Hz 1.5-mm double amplitude for 2h each in X,Y,Z		10~55 Hz 1.5-mm double amplitude for 2h each in X,Y,Z
Shock resistance	500m/s <sup>2</sup> for 3 times each in X,Y,Z		500m/s <sup>2</sup> for 3 times each in X,Y,Z
Degree of protection	IEC IP67		IEC IP67

\*1: Distance between transparent target and the reflective sensor. [ ] Figures in brackets are minimum distance from sensor.

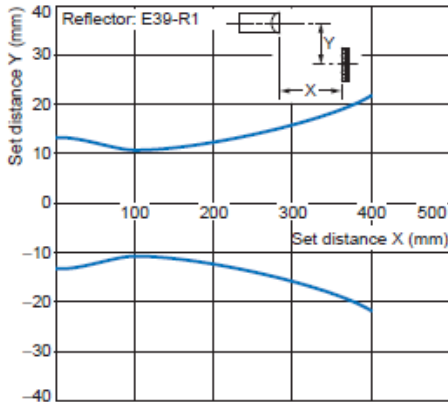
# Operation ratings

<b>Product discontinuation</b> <b>Model E3S-R/RS30/R1</b>	<b>Recommendable replacement</b> <b>Model E3Z-B/E3ZM-B</b>
<p><b>Models with Plastic Housing</b>  <b>Parallel Operating Range</b>  <b>Retro-reflective</b>  <b>E3S-R12, E3S-R62 + E39-R1</b>  <b>(Supplied Reflector)</b></p> 	<p><b>Models with Plastic Housing</b>  <b>Parallel Operating Range</b>  <b>E3Z-B□1/B□6 + E39-R1S</b>  <b>Reflector (Order Separately)</b></p> 
<p><b>Parallel Operating Range</b>  <b>Retro-reflective</b>  <b>E3S-R□1, E3S-R□6 + E39-R1</b>  <b>(Supplied Reflector)</b></p> 	<p><b>Parallel Operating Range</b>  <b>E3Z-B□2/B□7 + E39-R1S</b>  <b>Reflector (Order Separately)</b></p> 
<p><b>Excess Gain vs. Set Distance</b>  <b>E3S-R12, E3S-R62 + E39-R1</b>  <b>(Supplied Reflector)</b></p> 	<p><b>Excess Gain vs. Set Distance</b>  <b>E3Z-B□1/B□6 + E39-R1S</b>  <b>Reflector (Order Separately)</b></p> 

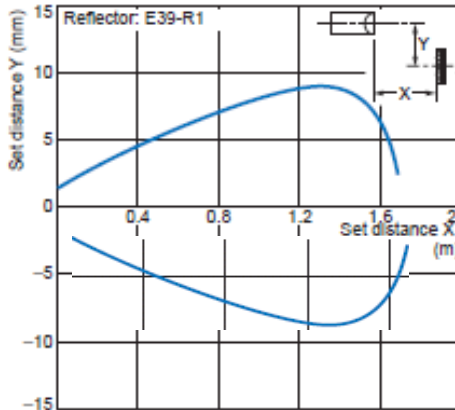
**Excess Gain vs. Set Distance**  
**E3S-R□1, E3S-R□6 + E39-R1**  
**(Supplied Reflector)**



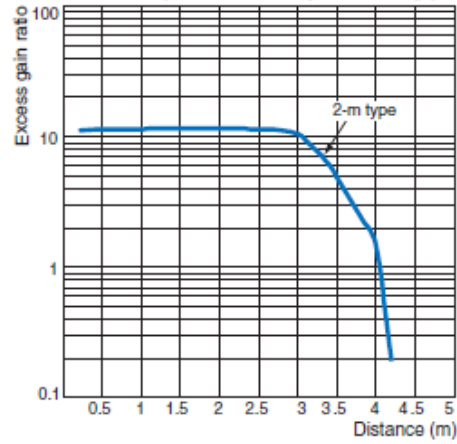
**Models with Metal Housing**  
**Parallel Operating Range**  
**Retro-reflective**  
**E3S-RS30E4□ + E39-R1**  
**(Supplied Reflector)**



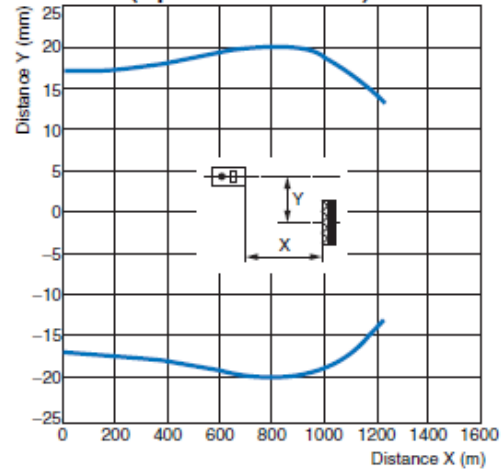
**Parallel Operating Range**  
**Retro-reflective**  
**E3S-R1E4□ + E39-R1**  
**(Supplied Reflector)**



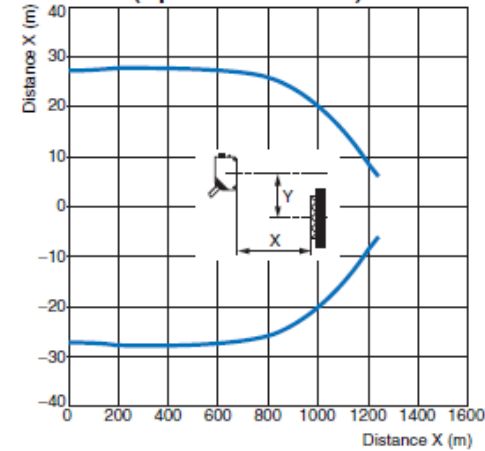
**Excess Gain vs. Set Distance**  
**E3Z-B□2/B□7 + E39-R1S**  
**Reflector (Order Separately)**



**Models with Metal Housing**  
**Parallel Operating Range (Horizontal)**  
**E3ZM-B□1/B□6 +**  
**E39-RP1 (Special Reflector)**



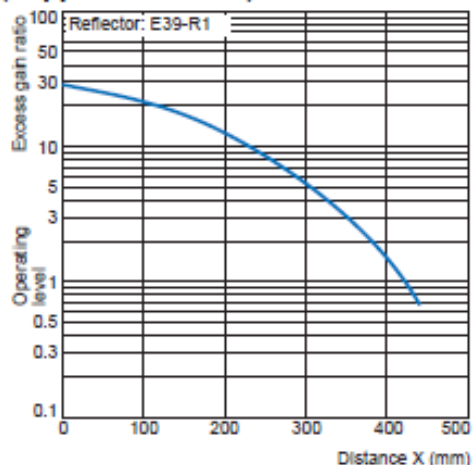
**Parallel Operating Range (Vertical)**  
**E3ZM-B□1/B□6 +**  
**E39-RP1 (Special Reflector)**



### Excess Gain vs. Set Distance

E3S-RS30E4 + E39-R1

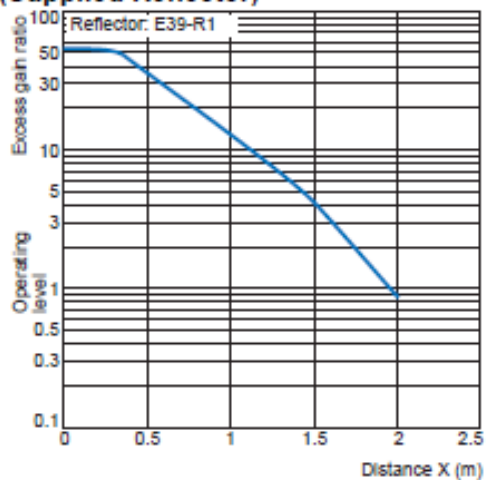
(Supplied Reflector)



### Excess Gain vs. Set Distance

E3S-R1E4 + E39-R1

(Supplied Reflector)



### Excess Gain vs. Distance

E3ZM-B1/B6 +

E39-RP1 (Special Reflector)

