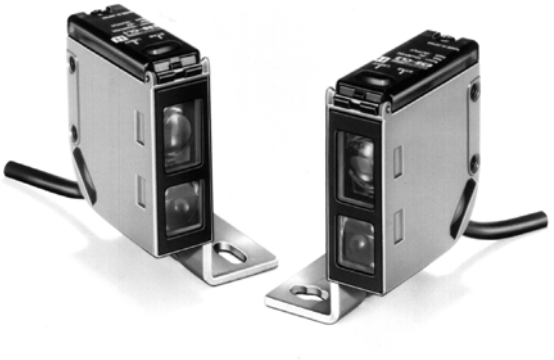
Sensing distance	Supply voltage	Output
3 to 10 cm, 5 to 25 cm	12 to 24 VDC	80 mA 100 mA

Photoelectric Sensor

E3S-LS

Focusable Sensors with Built-in DC Amplifiers

- Pinpoint focusable and area focusable models eliminate background objects.
- Ideal for precise detection of level/height, edges, small holes and openings, objects touching one another, objects inside transparent covers.



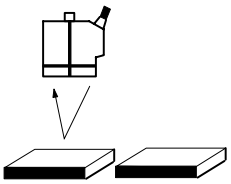
Ordering Information

Sensing method	Sensing distance	Model	
		NPN output	PNP output
Area focusable reflective	5 to 25 cm (continuously variable)	E3S-LS20XE4	E3S-LS20XB4
Pinpoint focusable reflective	3 to 10 cm (continuously variable)	E3S-LS10XE4	E3S-LS10XB4
	3 ± 0.5 cm	E3S-LS3C1D E3S-LS3RC4	---

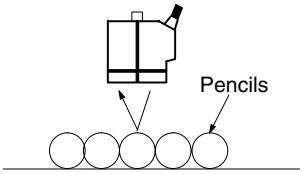
Application Examples

E3S-LS10X

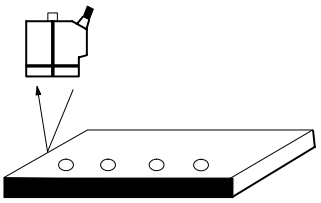
Sensing of objects utilizing their difference in luster.



Sensing of objects traveling in contiguous succession.

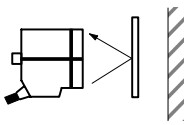


Sensing of small holes, narrow openings, or unevenness.

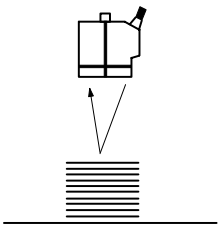


E3S-LS20X

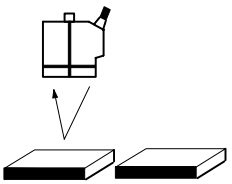
Sensing of objects utilizing their difference in luster.



Sensing of objects traveling in contiguous succession.



Sensing of small holes, narrow openings, or evenness.



Specifications

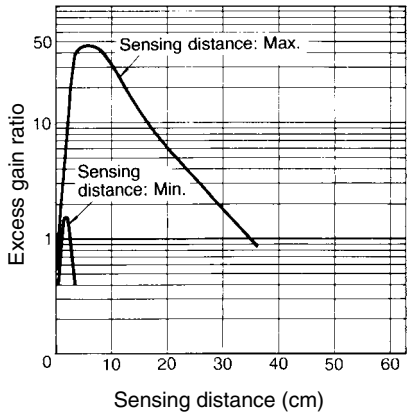
■ Ratings/Characteristics

Item			E3S-LS10X□4	E3S-LS20X□4	E3S-LS3C1D	E3S-LS3RC4
Power supply voltage			12 VDC –10% to 24 VDC +10%, ripple (p-p): 10% max.		5 VDC –10% to 24 VDC +10%, ripple (p-p): 10% max.	12 VDC –10% to 24 VDC +10%, ripple (p-p): 10% max.
Current consumption			40 mA max.			
Sensing distance			3 to 10 cm (variable with distance adjuster)	5 to 25 cm (variable with distance adjuster)	3±0.5 cm	
Differential travel			0.5 mm max. at 3 cm 3 mm max. at 10 cm	5% max.	---	
Standard objects			1 x 1 cm white mat paper	5 x 7.5 cm white mat paper	1 x 1 cm white mat paper	
Control output	**DC solid-state**	**Load**	Model with suffix -E4: 80 mA max. Model with suffix -B4: 100 mA max.		30 mA max.	50 mA max.
		Voltage output	1.1 V max. at 80 mA	2 V max.		
Response time (ON, OFF)			1 ms max.		ON: 3 ms OFF: 100 ms	1 ms max.
Sensitivity			Adjustable		---	Adjustable
Operation mode			Wire-selectable (Refer to *"Output Circuit."*)		---	Wire-selectable (Refer to *"Output Circuit."*)
Indicators			Light indicator (red), stability indicator (green)		Operation indicator (red)	Light indicator (red)
Circuit protection			Short circuit			
Mutual interference protection			Provided		---	Provided
Enclosure rating		**IEC 144**	IP67		IP40	
		NEMA	1, 3, 4X, 6, 12		---	
Housing material			Metal		Plastic	
Light source			Red LED	Infrared LED		Red LED
Ambient temperature			Operating: –25 to 55 °C		Operating: –10 to 55 °C	

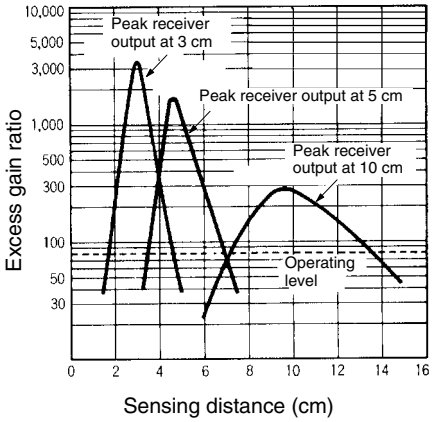
Engineering Data

Excess Gain Ratio

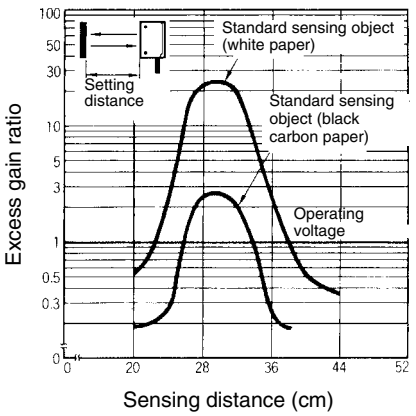
E3S-LS20XE4



E3S-LS10XE4



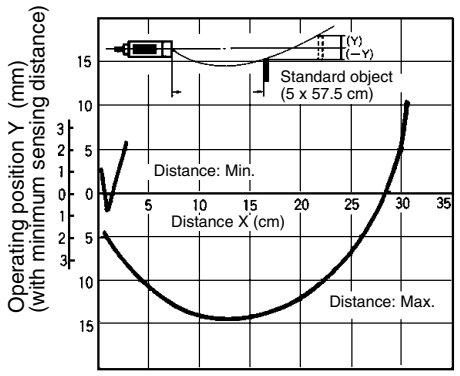
E3S-LS3RC4



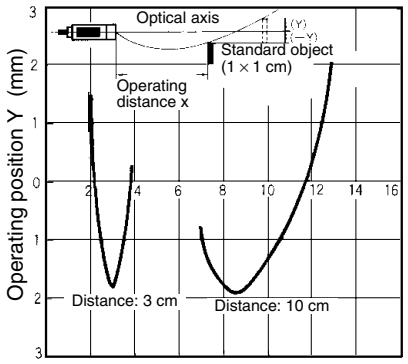
Note:
1. Sensitivity adjustor: Set to MAX.
2. This graph shows the relationship between the optical output and setting distance by adjusting the sensitivity adjustor so that the optical output will be maximum at a sensing distance of 3, 5, or 10 cm.

Operating Range

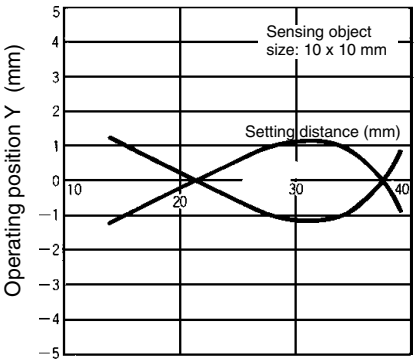
E3S-LS20XE4



E3S-LS10XE4

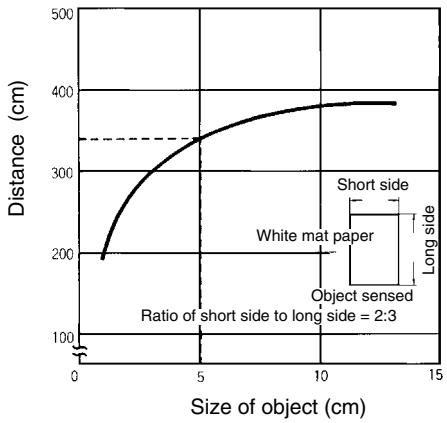


E3S-LS3RC4



Sensitivity

E3S-LS20XE4

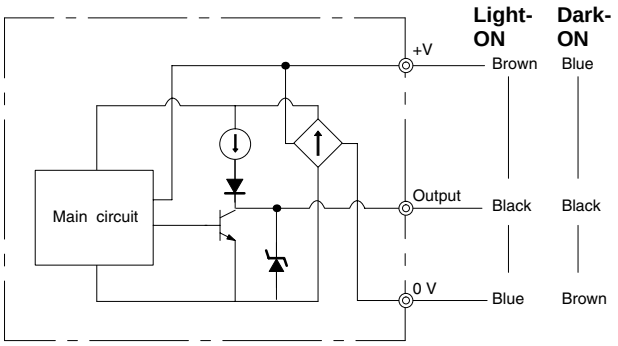


Operation

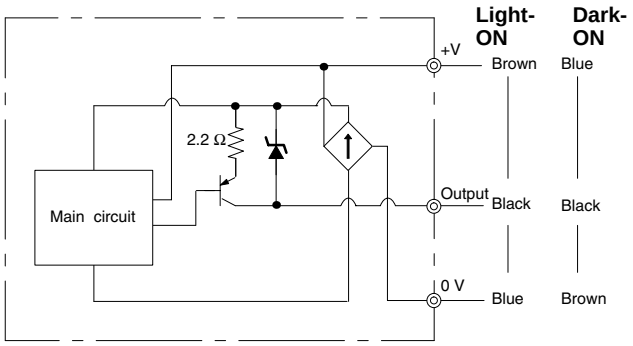
■ Output Circuits

E3S-LS10X

-E4 Type (NPN Output)

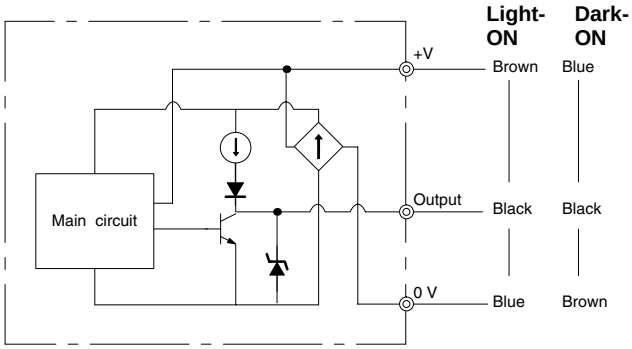


-B4 Type (PNP Output)

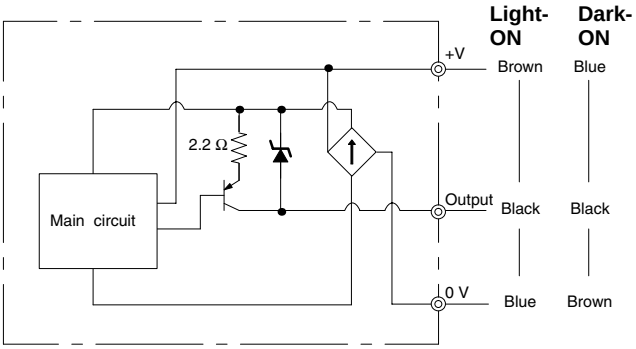


E3S-LS20X

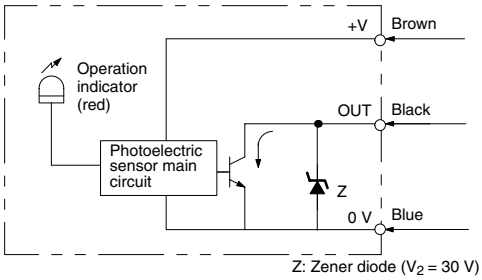
-E4 Type (NPN Output)



-B4 Type (PNP Output)

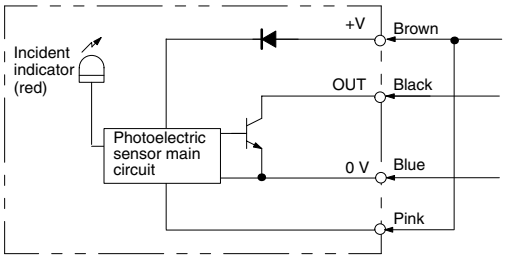


E3S-LS3C1D

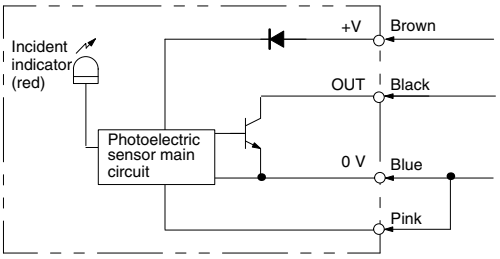


E3S-LS3RC4

Light-ON



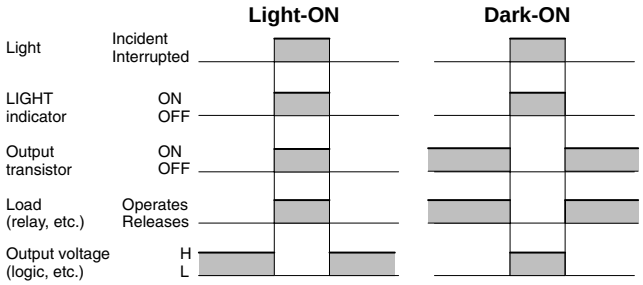
Dark-ON



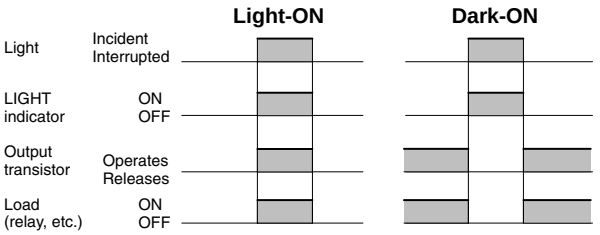
■ Timing Chart

E3S-LS10X

-E4 Type (NPN Output)

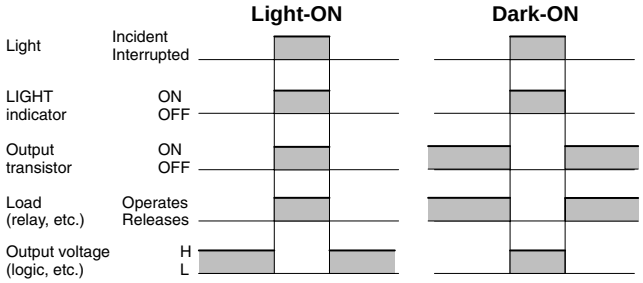


-B4 Type (PNP Output)

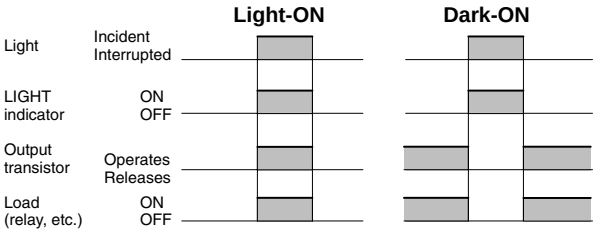


E3S-LS20X

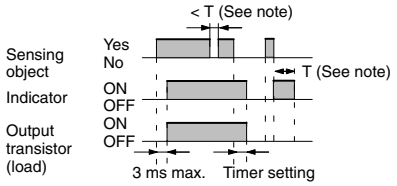
-E4 Type (NPN Output)



-B4 Type (PNP Output)

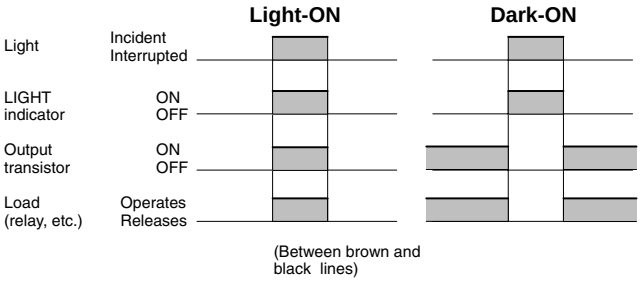


E3S-LS3C1D



Note: Timer setting
T = 0.1 to 1 s

E3S-LS3RC4



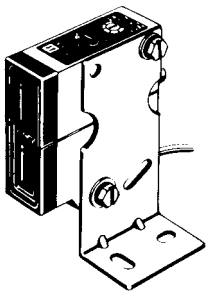
(Between brown and black lines)

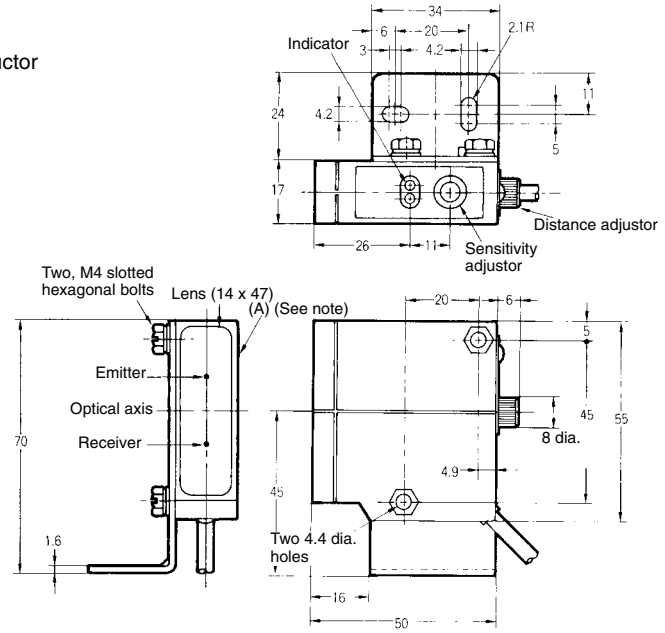
Dimensions

Note: All units are in millimeters unless otherwise indicated.

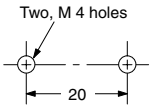
E3S-LS10X□4
E3S-LS20X□4

Cord: 4-mm dia., 18/0.12, 3-conductor
Standard length: 2 m
Weight: approx. 225 g





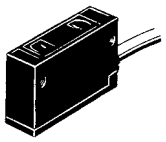
Mounting Holes

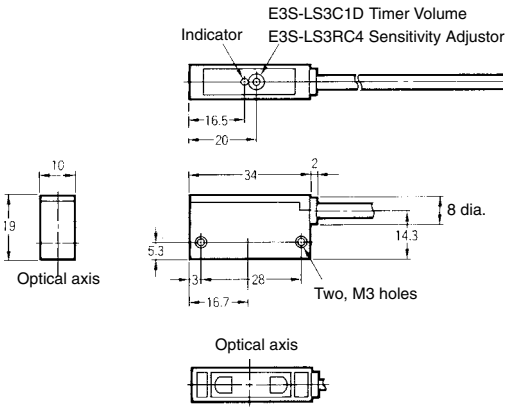


Note: A mounting bracket can be attached to side A.

E3S-LS3C1D
E3S-LS3RC4

Cord: 4-mm dia., 18/0.12, 3-conductor
Standard length: 2 m
Weight: approx. 60 g





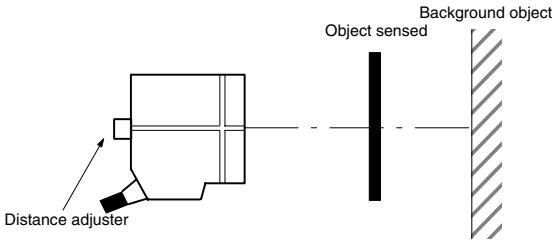
Precautions

Sensing Distance Adjustment

E3S-LS10XE4

Adjustment Method

1. Set the pointer of the sensitivity adjuster to the center of its revolution range.
2. Turn the distance adjuster fully counterclockwise to the “S” position.
3. Set the sensing object in position.
4. Turn the distance adjuster gradually clockwise to a point where both the LIGHT and STABILITY indicators light. Fix the distance adjuster at that point.
5. Adjust sensitivity.

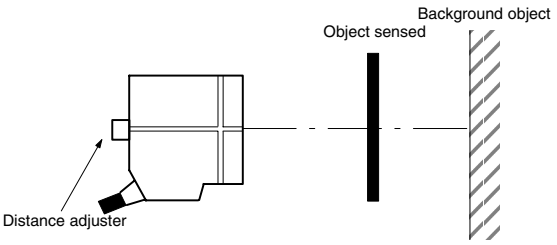


E3S-LS20XE4

Adjustment Method 1

When the quantity of light reflected from the object is greater than that from the background object, adjust the sensing distance in the following sequence:

1. Set the pointer of the sensitivity adjuster to the center of its revolution range.
2. Turn the distance adjuster fully counterclockwise to the “S” position.
3. Set the sensing object in position.
4. Turn the distance adjuster gradually clockwise to a point where both the LIGHT and STABILITY indicators light. Fix the distance adjuster at that point.
5. Adjust sensitivity.



Adjustment Method 2

When the quantity of light reflected from the object is greater than that from the background object, adjust the sensing distance in the following sequence:

1. Set the pointer of the sensitivity adjuster to the center of its revolution range.
2. Turn the distance adjuster fully counterclockwise to the “L” position.
3. Remove the sending object.
4. Turn the distance adjuster gradually clockwise to a point where both the LIGHT and STABILITY indicators light. Fix the distance adjuster at that point.
5. Adjust sensitivity.

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