

Printed Circuit Board Sensor

E3S-LS3


Wide (6 x 19 mm) Beam Unaffected by Holes, Notches or Colors

- Reliable sensing of printed circuit boards containing holes or notches.
- Unaffected by color.
- Elliptical, wide visible beam (6 x 19 mm).
- 2 Sensing ranges 20 to 35 mm or 10 to 60 mm.
- NPN Light-ON operation.



Ordering Information

Stock Note: Shaded models are normally stocked.

Sensing method	Light source	Appearance	Connection method	Sensing distance	Output configuration	Model
Diffuse reflective	Visible Red LED		Pre-wired cable 2 m	■ 20 to 35 mm	NPN Light-ON	E3S-LS3N
				■ 10 to 60 mm		E3S-LS3NW

Specifications

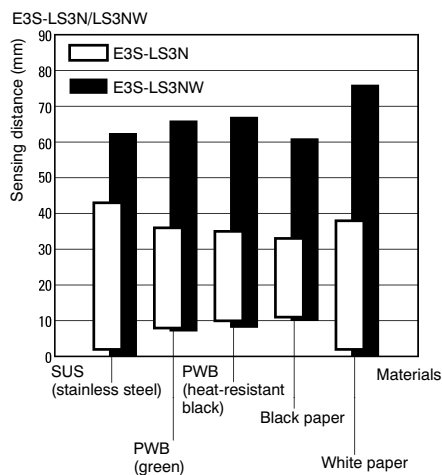
Sensing method		Diffuse reflective	
Model		E3S-LS3N	E3S-LS3NW
Sensing distance	White paper	20 to 35 mm	10 to 60 mm
	Black paper	20 to 30 mm	15 to 50 mm
Light source (wavelength)		Visible Red LED (660 nm)	
Supply voltage		12 to 24 VDC \pm 10%, ripple (p-p) 10% max.	
Current consumption		25 mA max.	
Control output		Load power supply voltage: 24 VDC max., Load current: 100 mA max.; residual voltage: 1 V max. NPN open collector output	
Circuit Protection		Reverse polarity and output short circuit	
Response time		1 ms max. for operation and reset	
Ambient illumination (receiver side)		Incandescent lamp: 5,000 lux max.	
Ambient temperature		Operating: -10° to 55°C (14° to 131°F) with no condensation Storage: -25° to 70°C (-13° to 158°F) with no condensation	
Ambient humidity		Operating: 35 to 85% (with no condensation) Storage: 35 to 95% (with no condensation)	
Insulation resistance		20 M Ω min. at 500 VDC	
Dielectric strength		1,000 VAC at 50/60 Hz for 1 minute	
Vibration resistance		10 to 55 Hz with a 1.5-mm double amplitude for 2 hrs each in X, Y and Z axes	
Shock resistance		500 m/s ² , 3 times each in X, Y and Z axes	
Enclosure rating		IP40	
Approvals		CE	
Connection method		Pre-wired (standard cable length: 2 m)	
Weight (packed state)		Approx. 50 g	
Material	Case	Heat-resistant ABS	
	Lens	Acrylic	
Accessories		Instruction sheet and mounting screws	

Operation

Output	Model	State of output transistor	Timing chart	Output circuit
NPN	E3S-LS3N E3S-LS3NW	Light ON	<p>Incident light</p> <p>No Incident light</p> <p>Operation indicator (orange) ON</p> <p>OFF</p> <p>Output transistor ON</p> <p>OFF</p>	<p>Operation indicator (orange)</p> <p>Photoelectric Sensor main circuit</p> <p>Brown 12 to 24 VDC</p> <p>Black 100 mA max</p> <p>Blue</p> <p>0V</p> <p>OUT</p> <p>Load</p>

Engineering Data

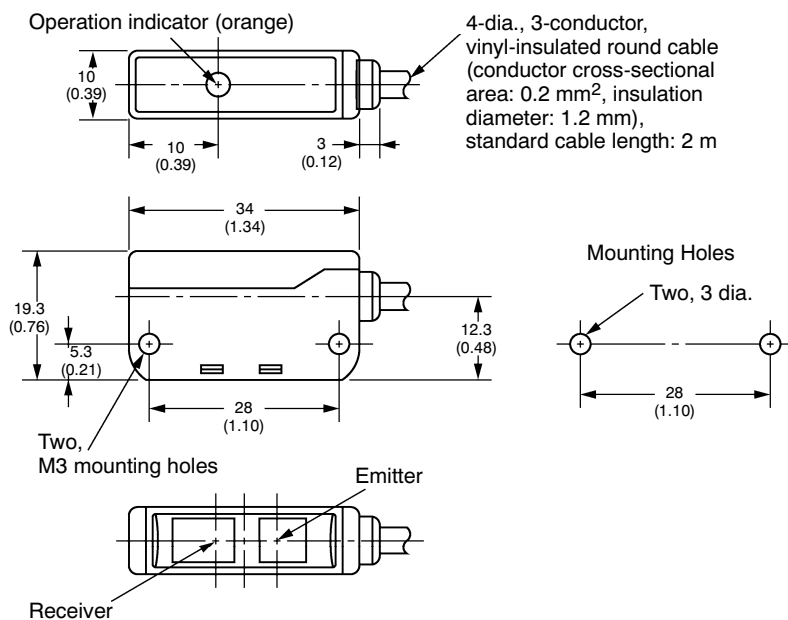
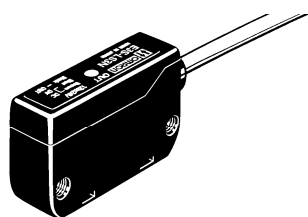
Sensing Distances vs. Materials



Dimensions

Unit: mm (inch)

E3S-LS3N



Precautions

Safety Precautions

- Do not use the sensor near gases.
- Never disassemble, repair or tamper with the product.
- Ensure that the supply voltage is within the specified range.
- Ensure that the actual load current does not exceed the rated value.
- Do not short the load output circuit.
- Check wiring for correct connection.

Do Not Use Product Under The Following Conditions

- In direct sunlight.
- Where humidity is high and condensation may occur.
- Where corrosive gas exists.
- Where vibration or shock is directly transmitted to the product.

Connection

Be sure that the supply voltage is less than the maximum rated voltage (26.4 VDC) before providing supply.

Do not run the wires to this product within the same conduits as power lines.

For extending wires, use a cable 0.3 mm² min. and 100m max. in length.

Cleaning

Do not apply paint thinner to this product.

Power Supply

When using a commercially available power supply, be sure to ground the FG (Frame Ground) and G (Ground) terminals. If this is not performed, failure in operation may occur due to the switching noise of the power supply.

Tightening Torque

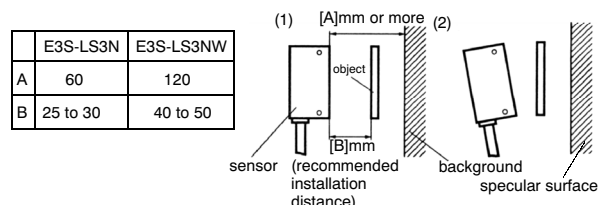
When mounting the sensor, keep the tightening torque below 0.54N • m

Mounting

Note: Never mount sensor looking upward into lights.

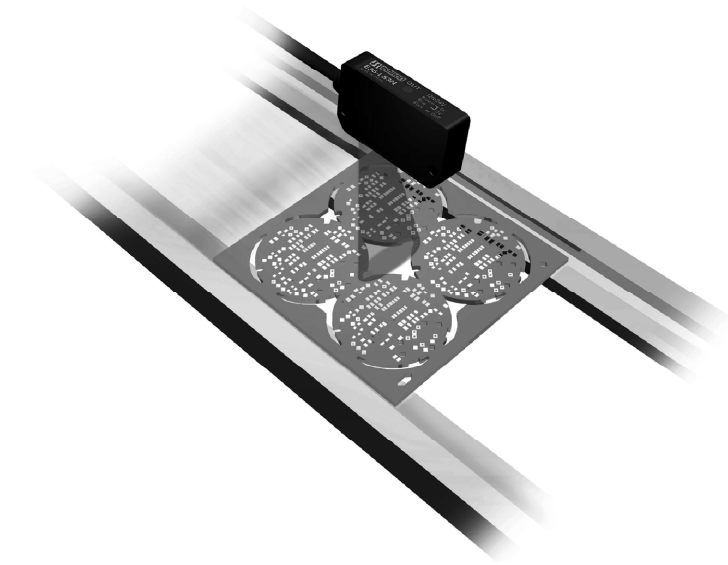
Leave a distance of [A]mm or more from the background.

Operation may become unstable when the background is specular.



Application Examples

E3S-LS3N



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NOTE: DIMENSIONS SHOWN ARE IN MILLIMETERS. To convert millimeters to inches divide by 25.4.

omron[®]**OMRON ELECTRONICS LLC**

One East Commerce Drive
Schaumburg, IL 60173

847-843-7900

For US technical support or other inquiries:

800-556-6766**OMRON CANADA, INC.**

885 Milner Avenue
Toronto, Ontario M1B 5V8

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