


E3Z-L

Small 2.5-mm-diameter Spot Ideal for Detecting Small Workpieces

- Tiny workpieces as little as 0.1 mm in diameter can be detected with the 2.5-mm-dia. spot.
- The narrow beam enables sensing from small slots or holes.
- The small spot of light enables visual checking of sensing spot position.
- IP67 degree of protection, mutual interference prevention, and EN standard compliance.





 Be sure to read *Safety Precautions* on page 4.

Ordering Information

Sensors

 Infrared light

Sensing method	Appearance	Connection method	Sensing distance	Model	
				NPN output	PNP output
Narrow-beam reflective		Pre-wired	 90±30 mm	E3Z-L61	E3Z-L81
		Connector (M8, 4pins)		E3Z-L66	E3Z-L86

Accessories (Order Separately)

[Mounting Brackets](#)

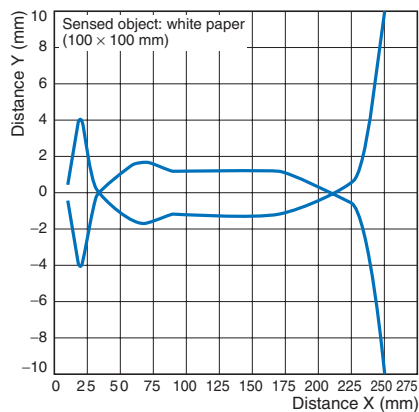
[Sensor I/O Connectors](#)

Ratings and Specifications

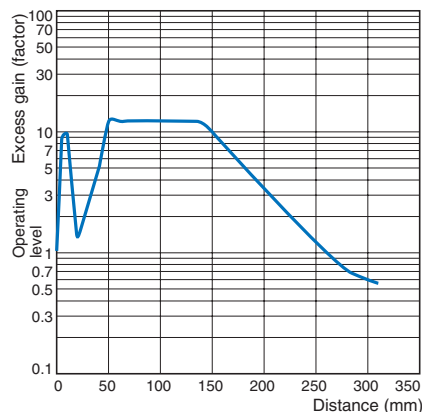
Item	Sensing method		Narrow-beam reflective	
	Model	NPN output	E3Z-L61	E3Z-L66
		PNP output	E3Z-L81	E3Z-L86
Sensing distance	White paper (100 × 100 mm): 90±30 mm			
Spot diameter (typical)	2.5-mm dia. min. (at sensing distance of 90 mm)			
Minimum detectable object (typical)	0.1-mm dia. (copper wire)			
Differential travel (typical)	Refer to <i>Differential Travel vs. Sensing Distance</i> on page 2.			
Light source (wavelength)	Red LED (650 nm)			
Power supply voltage	12 to 24 VDC ±10%, ripple (p-p): 10% max.			
Current consumption	30 mA max.			
Control output	Load power supply voltage: 26.4 V max.; Load current: 100 mA max. Residual voltage: Load current of less than 10 mA: 1 V max. Load current of 10 to 100 mA: 2 V max. Open collector output (NPN or PNP depending on model) Light-ON/Dark-ON selectable			
Protection circuits	Power supply reverse polarity protection, Output short-circuit protection, Mutual interference prevention, Reverse output polarity protection			
Response time	Operate or reset: 1 ms max.			
Sensitivity adjustment	One-turn adjuster			
Ambient illumination (Receiver side)	Incandescent lamp: 3,000 lx max., Sunlight: 10,000 lx max.			
Ambient temperature range	Operating: -25 to 55°C, Storage: -40 to 70°C (with no icing or condensation)			
Ambient humidity range	Operating: 35 to 85%, Storage: 35 to 95% (with no condensation)			
Insulation resistance	20 MΩ min. at 500 VDC			
Dielectric strength	1,000 VAC 50/60 Hz for 1 min			
Vibration resistance	Destruction: 10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions.			
Shock resistance	Destruction: 500m/s ² 3 times each in the X, Y, and Z directions			
Degree of protection	IP67 (IEC 60529)			
Connection method	Pre-wired (standard length: 2 m and 0.5 m)		Connector (M8, 4 pins)	
Indicators	Operation indicator (orange), Stability indicator (green)			
Weight (packed state)	Pre-wired type, 2 m: Approx. 65 g		Approx. 20 g	
Material	Case	PBT (polybutylene terephthalate)		
	Lens	Modified polyarylate		
Accessories	Instruction manual (Mounting Brackets must be ordered separately.)			

Engineering Data

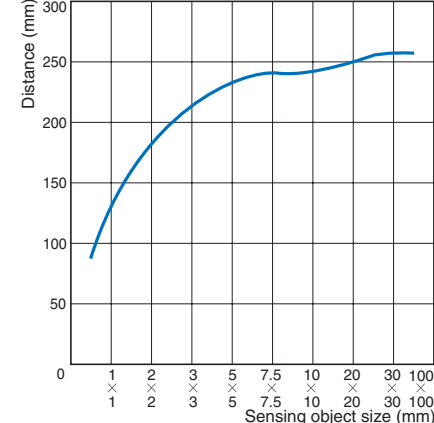
Operating Range



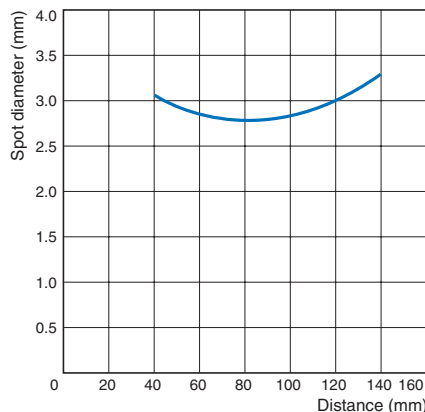
Excess Gain vs. Sensing Distance



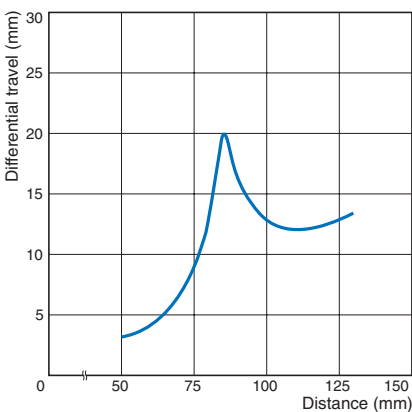
Sensing Object Size vs. Sensing Distance



Spot Diameter vs. Sensing Distance

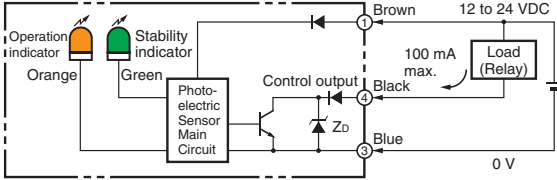



Differential Travel vs. Sensing Distance

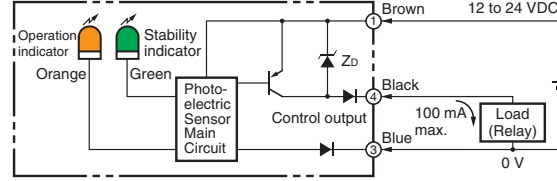



I/O Circuit Diagrams

NPN Output

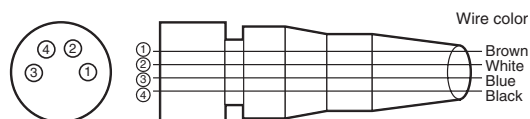
Model	Operation mode	Timing charts	Operation selector	Output circuit
E3Z-L61 E3Z-L66	Light-ON	Incident light: [Pulse] No incident light: [Blank] Operation indicator (orange): ON [Pulse] OFF [Blank] Output transistor: ON [Pulse] OFF [Blank] Load (e.g., relay): Operate [Pulse] Reset [Blank] (Between brown and black leads)	L side (LIGHT ON)	Narrow-beam Reflective Models  Connector Pin Arrangement  Pin 2 is not used.
	Dark-ON	Incident light: [Pulse] No incident light: [Blank] Operation indicator (orange): ON [Blank] OFF [Pulse] Output transistor: ON [Blank] OFF [Pulse] Load (e.g., relay): Operate [Blank] Reset [Pulse] (Between brown and black leads)	D side (DARK ON)	

PNP Output

Model	Operation mode	Timing charts	Operation selector	Output connector
E3Z-L81 E3Z-L86	Light-ON	Incident light: [Pulse] No incident light: [Blank] Operation indicator (orange): OFF [Pulse] ON [Blank] Output transistor: Operate [Pulse] OFF [Blank] Load (e.g., relay): Operate [Pulse] Reset [Blank] (Between brown and black leads)	L side (LIGHT ON)	Narrow-beam Reflective Models  Connector Pin Arrangement  Pin 2 is not used.
	Dark-ON	Incident light: [Pulse] No incident light: [Blank] Operation indicator (orange): ON [Blank] OFF [Pulse] Output transistor: ON [Blank] OFF [Pulse] Load (e.g., relay): Operate [Blank] Reset [Pulse] (Between brown and black leads)	D side (DARK ON)	

Plugs (Sensor I/O Connectors)

M8 connector



XS3F-M421-402-A
 XS3F-M421-405-A
 XS3F-M422-402-A
 XS3F-M422-405-A

Pin arrangement

Classification	Wire color	Connector pin No.	Application
DC	Brown	1	Power supply (+V)
	White	2	---
	Blue	3	Power supply (0 V)
	Black	4	Output

Note: Pin 2 is not used.

Safety Precautions

Refer to *Warranty and Limitations of Liability*.

⚠ WARNING

This product is not designed or rated for ensuring safety of persons either directly or indirectly. Do not use it for such purposes.



Precautions for Correct Use

Do not use the product in atmospheres or environments that exceed product ratings.

Dimensions

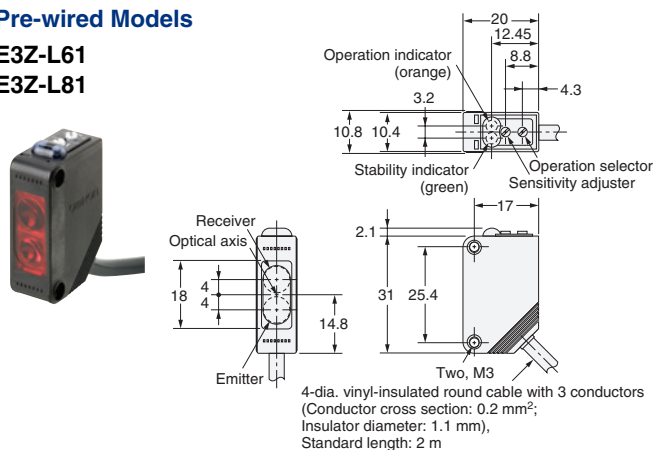
(Unit: mm)

Sensors

Pre-wired Models

E3Z-L61

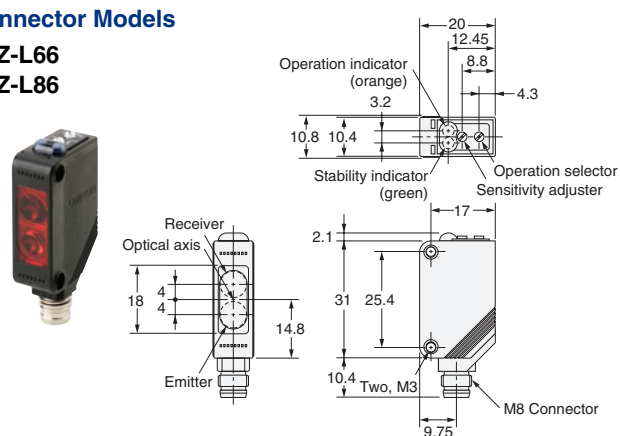
E3Z-L81



Connector Models

E3Z-L66

E3Z-L86



Accessories (Order Separately)

Mounting Brackets

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Schaumburg, IL USA • 847.843.7900 • 800.556.6766 • www.omron247.com

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OMRON ELECTRONICS DE MEXICO • HEAD OFFICE

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