

Amplifier built-in type

Z-L series

Industry standard sized laser sensors with built-in amplifiers

Same low cost as LED light source types

Laser class 1 for through-beam type

Outstanding environmental resistance



HM 2504

Selection table

Type	Shape	Sensing distance (Adjustable distance range shown in parentheses)	Light source	Model (Models in parentheses are connector types)	
				NPN type	PNP type
Laser Through-beam		30 m	Class 1 laser	ZT-L3000N (ZT-L3000CN)	ZT-L3000P (ZT-L3000CP)
Laser Retro-reflective		0.2 to 10 m	Class 2 laser	ZR-L1000N (ZR-L1000CN)	ZR-L1000P (ZR-L1000CP)
Laser Diffuse-reflective		400 mm	Class 2 laser	ZD-L40N (ZD-L40CN)	ZD-L40P (ZD-L40CP)
Laser BGS		5 to 100 mm (20 to 100 mm)	Class 1 laser	BGS-ZL10N (BGS-ZL10CN) ● P.326	BGS-ZL10P (BGS-ZL10CP) ● P.326
		10 to 300 mm (50 to 300 mm)		BGS-ZL30N (BGS-ZL30CN) ● P.326	BGS-ZL30P (BGS-ZL30CP) ● P.326

● For the connector type, please purchase an optional JCN series connector cable.

Options/Accessories

Reflector

Standard

P250F

Sensing distance:
0.2 to 10 m
61 x 51 mm
Included with
retro-reflective type



Small (optional)

PL20F

Sensing
distance:
0.2 to 8 m
60 x 20 mm



Ultra-small (optional)

PL10F

Sensing
distance:
0.2 to 7 m
32 x 20 mm



Protective mounting bracket

● Ultra-durable 2 mm thick type ● Rust-resistant
stainless steel ● Sensor is firmly secured using an
M3 Hex socket head cap screws ● The bracket is
also firmly secured using M6 screws



Connector cables

Straight



JCN-S

Cable length: 2 m

JCN-5S

Cable length: 5 m

JCN-10S

Cable length: 10 m

L-shaped



JCN-L

Cable length: 2 m

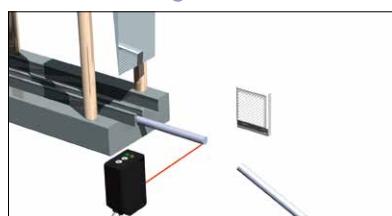
JCN-5L

Cable length: 5 m

JCN-10L

Cable length: 10 m

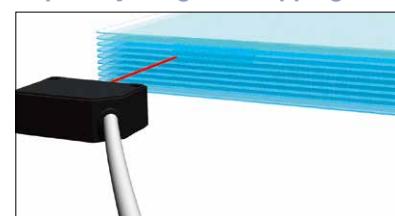
Parts cut sizing



Hole drilling detection for metal parts



Liquid crystal glass mapping



Small spot size that can be achieved by lasers

Approx. ø2 mm spot size at a distance of

400 mm (diffuse-reflective type)

Optimal for applications that in which small object detection and high repeat accuracy are required.

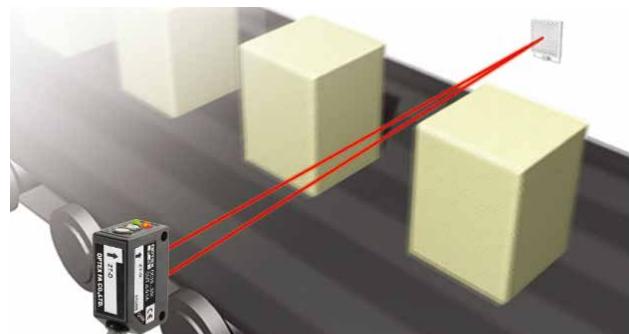


For high-speed lines

Response time: 250 µs

The laser sensor provides a top class response time.

This feature makes detection in high speed production line possible.



Outstanding environmental resistance

Degree of protection: IP67, Shock resistance: 50 G

Its integrally molded structure enables all models to conform to IP67 and achieve a shock resistance up to 50 G. It doesn't break even when wet and can be used in locations where vibrations are generated.



Standard specification size

25.4 mm standard pitch

Features an industry standard pitch of 25.4 mm.



Specifications

Type		Through-beam type	Retro-reflective type	Diffuse-reflective type		
Model	NPN	Cable type ZT-L3000N	ZR-L1000N	ZD-L40N		
		Connector type ZT-L3000CN	ZR-L1000CN	ZD-L40CN		
	PNP	Cable type ZT-L3000P	ZR-L1000P	ZD-L40P		
		Connector type ZT-L3000CP	ZR-L1000CP	ZD-L40CP		
Sensing distance		30 m	0.2 to 10 m ¹	400 mm ²		
Light source		Red semiconductor laser Class 1 (IEC/JIS) ³ Wavelength: 650 nm, Maximum output: 390 µW	Red semiconductor laser Class 2 (IEC/JIS) ³ Wavelength: 650 nm, Maximum output: 3 mW			
Spot size (at focal distance)		Approx. ø2 mm ⁴ Distance: 2 m (at ordinal temperatures)	Approx. ø2.5 mm ⁴ Distance: 2 m (at ordinal temperatures)	Approx. ø2 mm ⁴ Distance: 400 mm (at ordinal temperatures)		
Response time		250 µs or less				
Hysteresis		—		20%		
Distance adjustment		1-turn potentiometer				
Indicators		Output indicator (orange LED), Laser emission indicator (green LED: stability indicator for through-beam type receiver)				
Control output		NPN/PNP type Open collector Max. 100 mA/30 VDC				
Output mode		Light ON / Dark ON selection switch				
Connection type		Cable type: Cable length: 2 m ø3.8 mm / Connector type: M8, 4-pin				
Z-L	Supply voltage	10 to 30 VDC, including 10% ripple (p-p)				
	Rating	Emitter: 15 mA or less Receiver: 15 mA or less	20 mA or less			
Applicable regulations		EMC directive (2004/108/EC) / FDA regulations (21 CFR 1040.10)				
Applicable standards		EN 60947-5-2				
Company standards		Noise resistance: Feilen Level 3 cleared				
Environmental resistance	Ambient temperature/humidity	-10 to +50°C (no freezing) / 35 to 85% RH (no condensation)				
	Ambient illuminance	Sunlight: 10,000 lx/Incandescent lamp: 3,000 lx				
	Vibration resistance	10 to 55 Hz; double amplitude 1.5 mm; 2 hours in each of the X, Y, and Z directions				
	Shock resistance	Approx. 50 G (500 m/s ²); 3 times in each of the X, Y, and Z directions				
	Degree of protection	IP67				
Material		Housing: ABS (glassfiber reinforced), Front cover: PMMA				
Weight without cable		Approx. 20 g	Approx. 10 g			
Included accessories		Mounting bracket: BEF-W100-B ⁵	Mounting bracket: BEF-W100-B ⁵ Reflector: P250F	Mounting bracket: BEF-W100-B ⁵		

¹ With P250F reflector ² 100 mm × 100 mm white paper ³ Classified as class II in the US FDA standards

⁴ Defined with center strength 1/e² (13.5%).

There may be light leakage outside of the specified spot size. The sensor may be affected when there is a highly reflective object close to the target area.

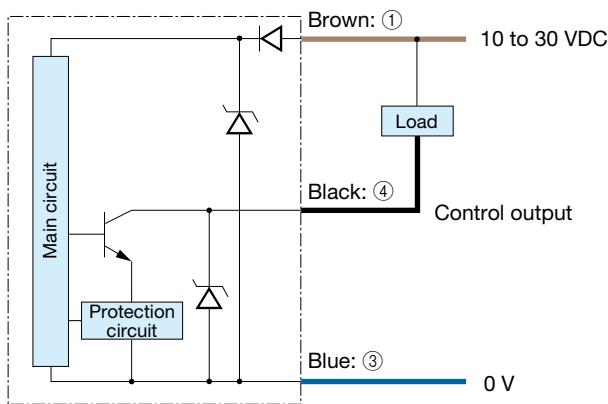
⁵ Mounting bracket BEF-W100-A is included with the connector type.

● Specifications are subject to change without prior notice for product improvement purposes.

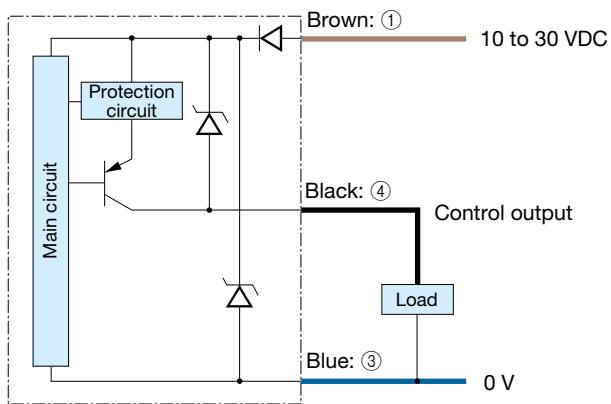
Output circuit diagram

Retro-reflective type/Diffuse-reflective type

NPN output type

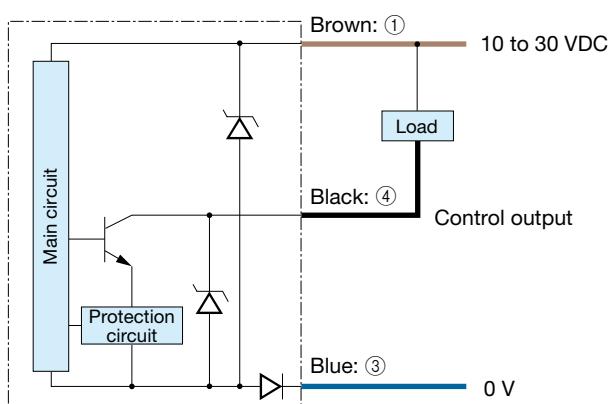


PNP output type

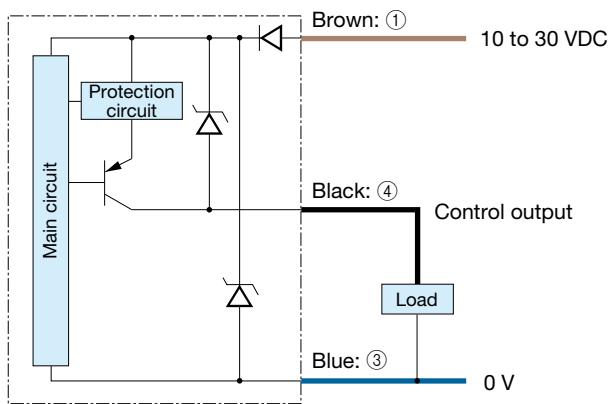


Through-beam type receiver

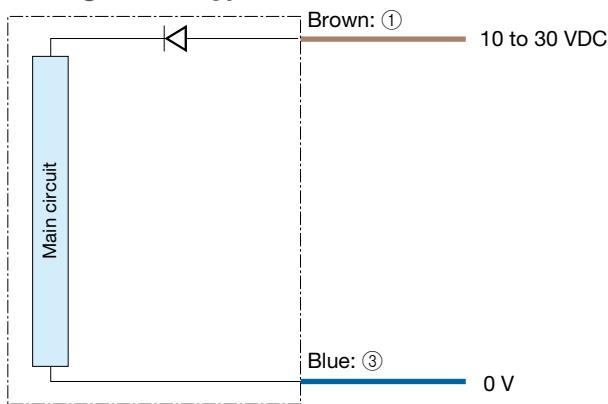
NPN output type



PNP output type



Through-beam type emitter



Connector type

(Pin configuration) Sensor side Connector cable side



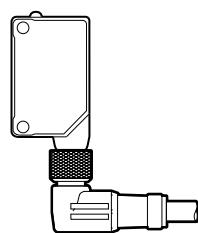
① 10 to 30 VDC
② —
③ 0 V
④ Control output

Connecting

■ ① to ④ are connector pin No.

Notes

- When using a switching regulator for the power supply, be sure to ground the frame ground terminal.
- Avoid wiring in parallel with or in the same piping as high-voltage wires or power lines. Doing so may lead to malfunctions caused by noise. Also, shorten the power supply and signal wires as much as possible.
- Avoid using the transient state while the power is on (approx. 100 ms).
- The connector direction is fixed as in the drawing to the right when you use L-shaped connector cable. Be aware that rotation is not possible.

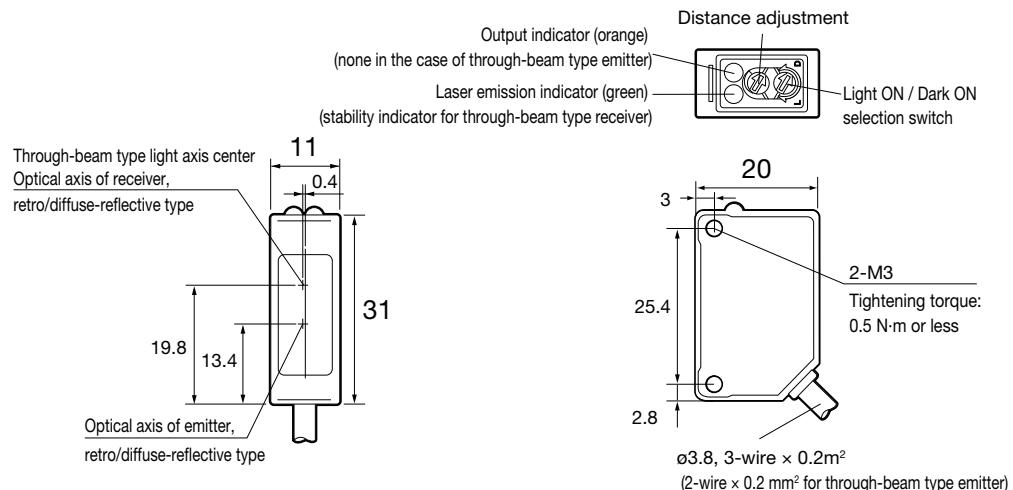


Dimensions

Sensor

■ Cable type

(Unit: mm)

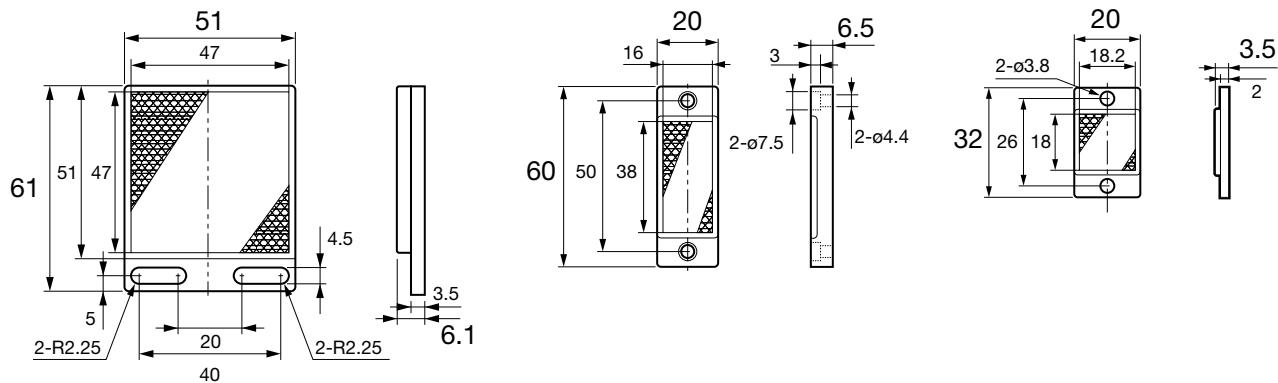


Reflector

■ P250F (included with ZR-L1000N)

■ PL20F (optional)

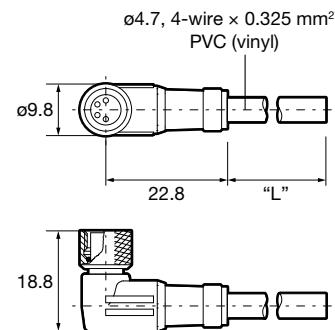
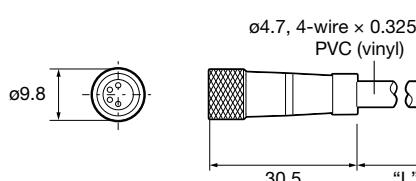
■ PL10F (optional)



Connector cable (optional)

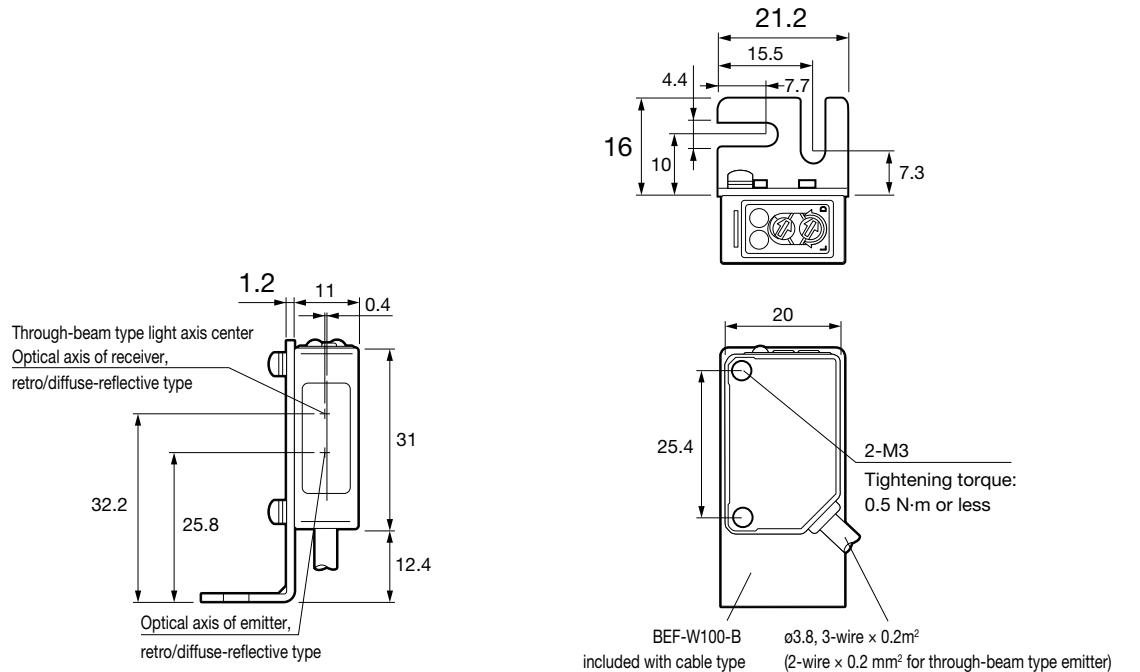
■ JCN-S, JCN-5S, JCN-10S

■ JCN-L, JCN-5L, JCN-10L

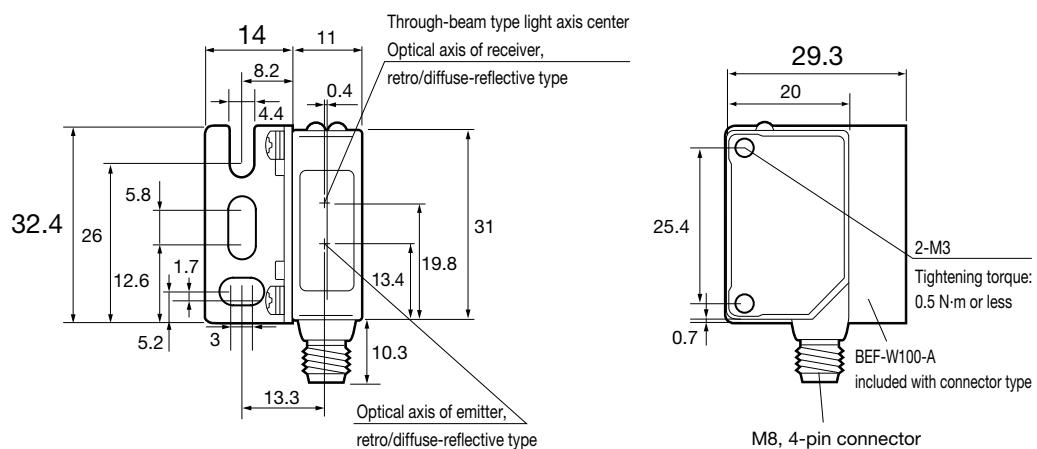


Mounting bracket

■ Cable type (when using BEF-W100-B)



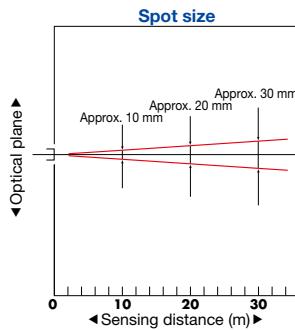
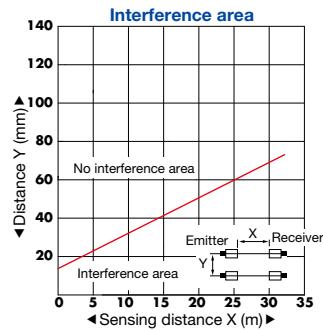
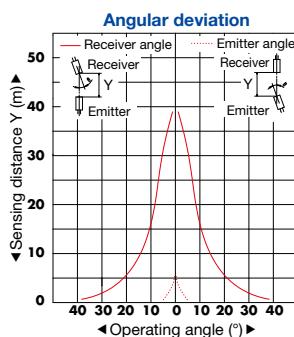
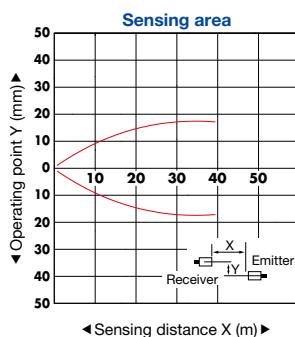
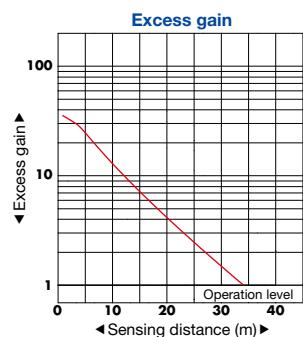
■ Connector type (when using BEF-W100-A)



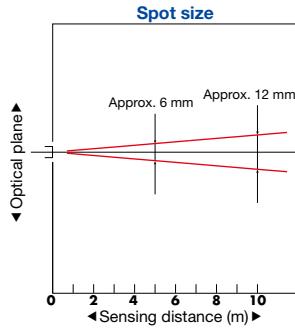
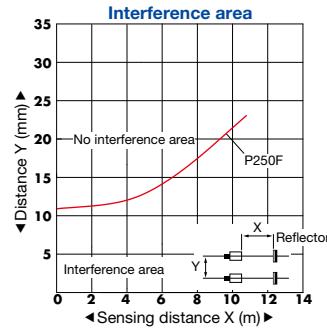
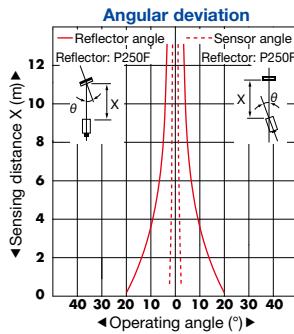
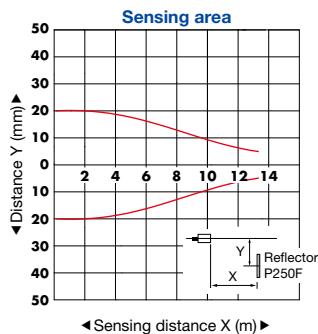
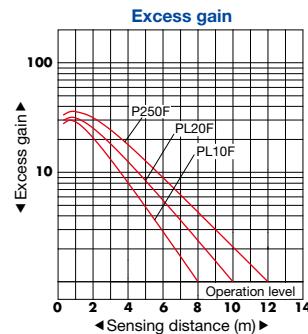
Typical characteristic data

*Contact us for any other characteristic data that may be required.

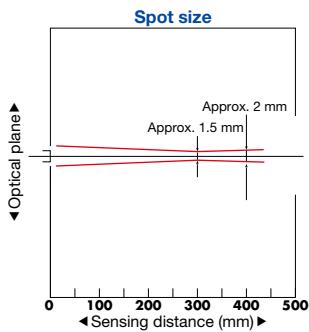
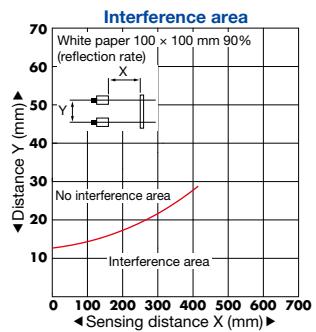
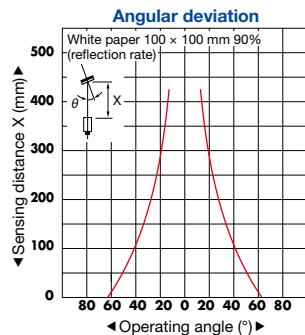
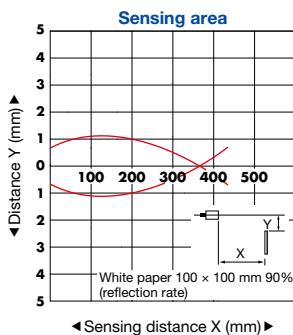
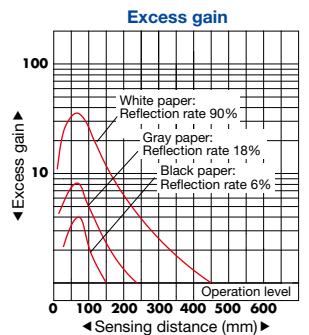
ZT-L3000□



ZR-L1000□



ZD-L40□



Photoelectric Sensors

Photoelectric Sensors

Specialized Photoelectric Sensors

Laser Displacement Sensors

Laser Sensors

Z-L

DS

D

Notes for sensor usage



Warning

Do not look directly at the laser or intentionally shine the laser beam in another person's eyes. Doing so may cause damage to the eyes or health.



ZR-L1000N
ZD-L40N

**CLASS 1
LASER PRODUCT**

ZT-L3000N

■ Regarding the laser label, this product emits a Class 2 (II) visible laser beam that is compliant with JIS C6802/IEC/FDA laser safety standards. A CLASS 2/CLASS II warning label and explanation label (English) is affixed to the side of the sensor head.

*The ZT-L3000N emitter is Class II in FDA standards (when exported to the United States), but is Class 1 according to JIS/IEC standards, so change the label that it is packaged with for use.