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

Related products

BGS type
BGS-ZL
P.326

Amplifier separate type
DS
P.280

LED light source
Z3
P.148

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 × 51 mm
Included with retro-reflective type

Small (optional)
PL20F
Sensing distance: 0.2 to 8 m
60 × 20 mm

Ultra-small (optional)
PL10F
Sensing distance: 0.2 to 7 m
32 × 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 screw

LK-S02

LK-S01

Connector cables

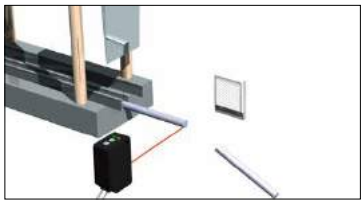
Straight

JCN-5
Cable length: 2 m
JCN-5S
Cable length: 5 m
JCN-10S
Cable length: 10 m

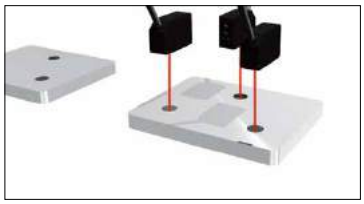
L-shaped

JCN-L
Cable length: 2 m
JCN-5L
Cable length: 5 m
JCN-10L
Cable length: 10 m

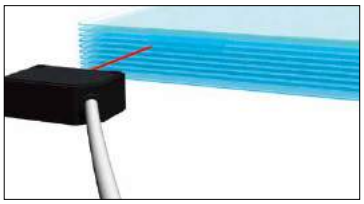
Parts cut sizing



Hole drilling detection for metal parts



Liquid crystal glass mapping



OPTEX FA

Small spot size that can be achieved by lasers

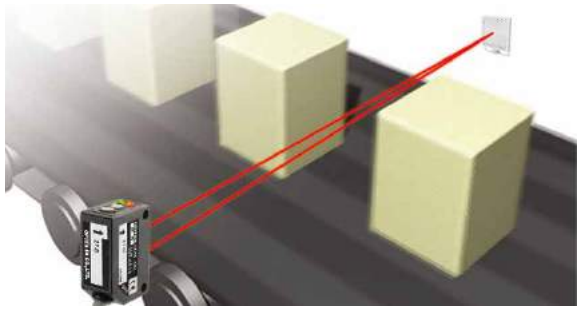
Approx. ø2 mm spot size at a distance of 400 mm (diffuse-reflective type)

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

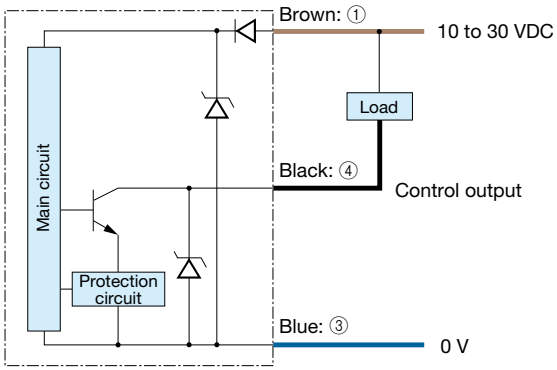
Type			Through-beam type	Retro-reflective type	Diffuse-reflective type
Model	NPN	Cable type	ZT-L3000N	ZR-L1000N	ZD-L40N
		Connector type	ZT-L3000CN	ZR-L1000CN	ZD-L40CN
	PNP	Cable type	ZT-L3000P	ZR-L1000P	ZD-L40P
		Connector type	ZT-L3000CP	ZR-L1000CP	ZD-L40CP
Sensing distance			30 m	0.2 to 10 m*1	400 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		
Rating	Supply voltage		10 to 30 VDC, including 10% ripple (p-p)		
	Current consumption		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/s²); 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 $1/e^2$ (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.

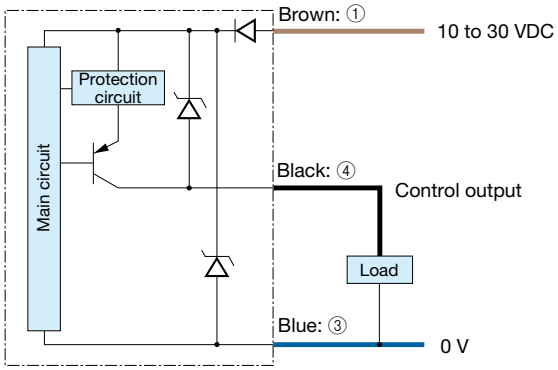
Output circuit diagram

Retro-reflective type/Diffuse-reflective type

■ NPN output type

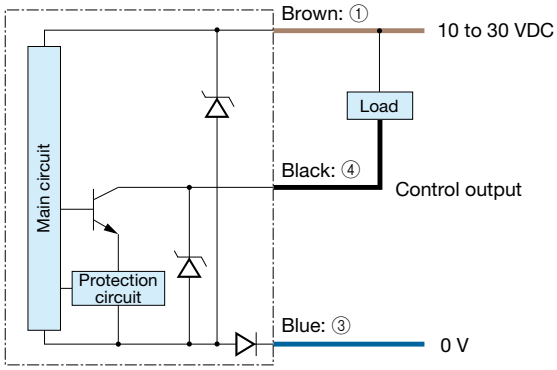


■ PNP output type

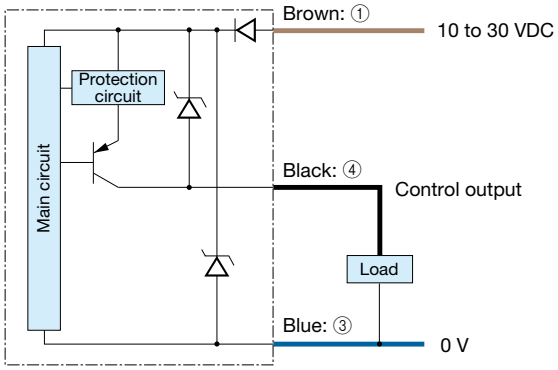


Through-beam type receiver

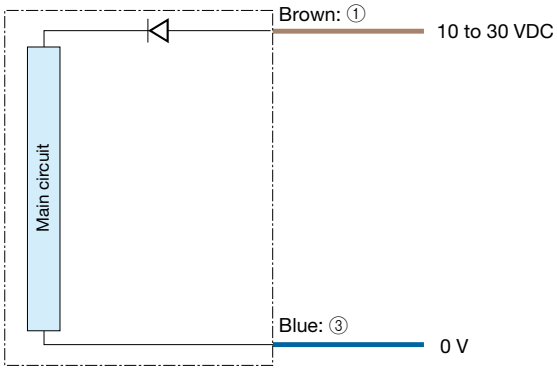
■ NPN output type



■ PNP output type

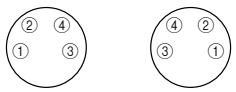


Through-beam type emitter



■ Connector type

(Pin configuration)



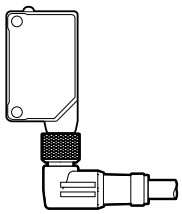
① 10 to 30 VDC
② —
③ 0 V
④ Control output

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.

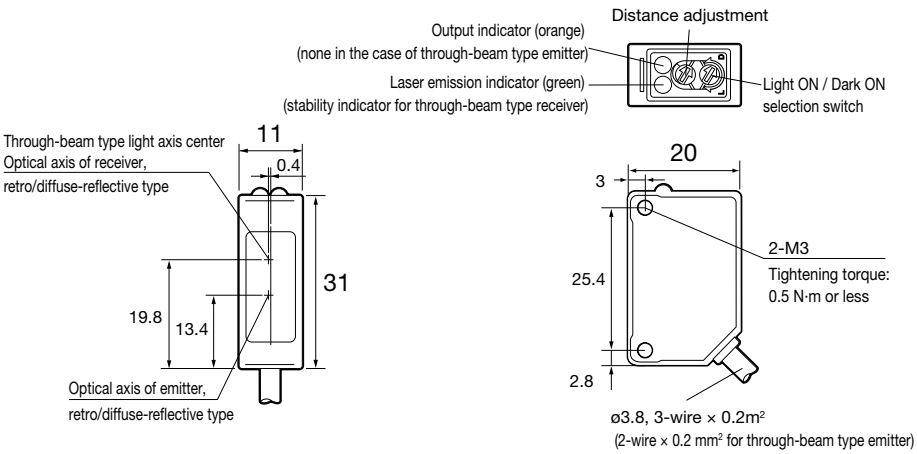


Dimensions

Sensor

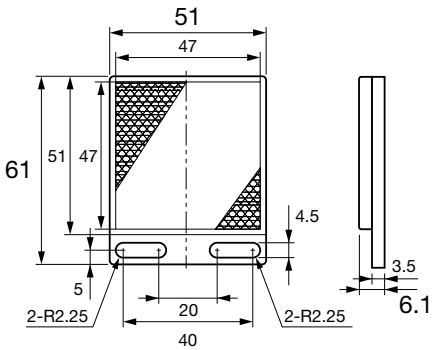
(Unit: mm)

■ Cable type

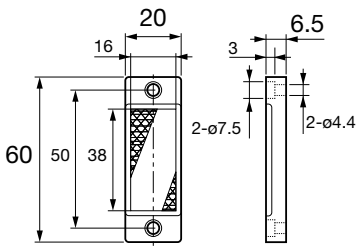


Reflector

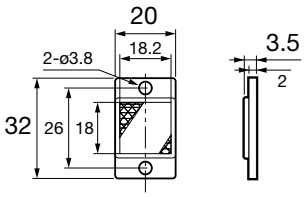
■ P250F (included with ZR-L1000N)



■ PL20F (optional)

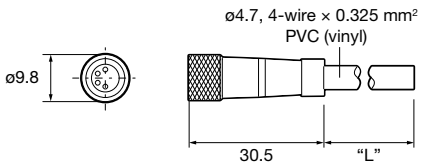


■ PL10F (optional)

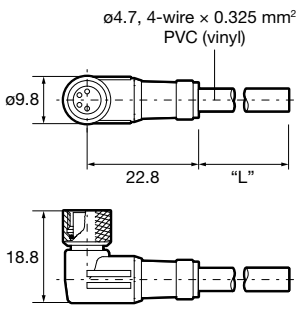


Connector cable (optional)

■ JCN-S, JCN-5S, JCN-10S



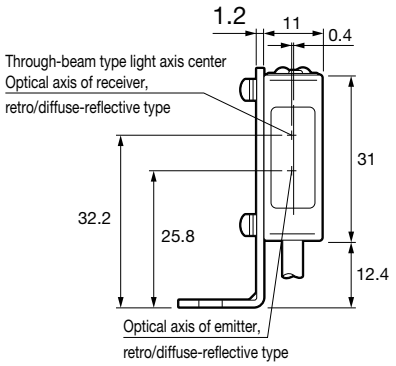
■ JCN-L, JCN-5L, JCN-10L

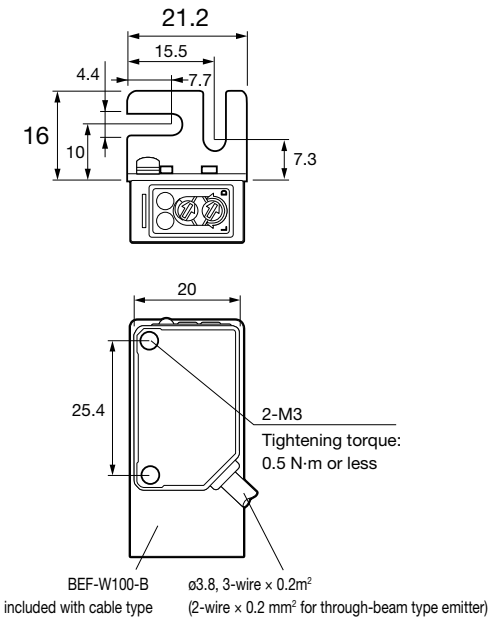


Mounting bracket

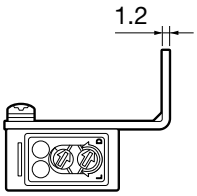
Cable type (when using BEF-W100-B)

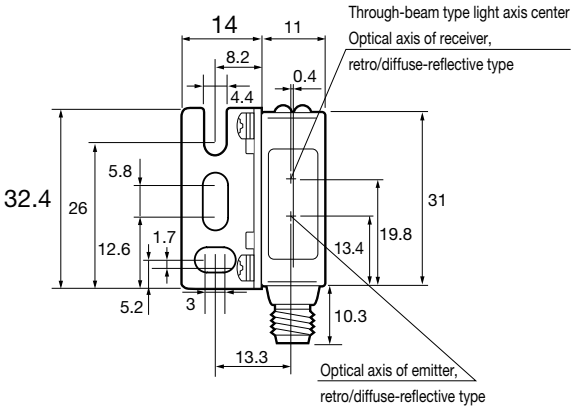
(Unit: mm)

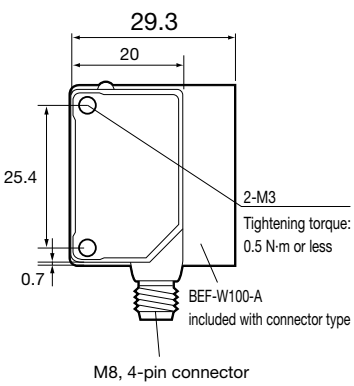




Connector type (when using BEF-W100-A)





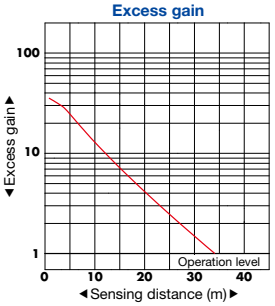


Typical characteristic data

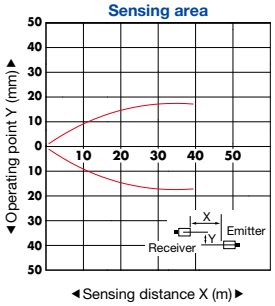
*Contact us for any other characteristic data that may be required.

ZT-L3000□

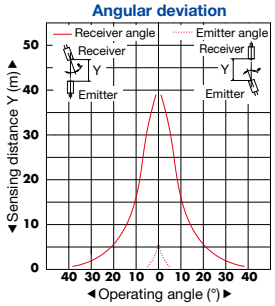
Excess gain



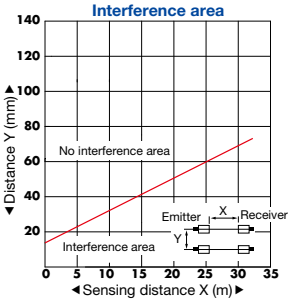
Sensing area



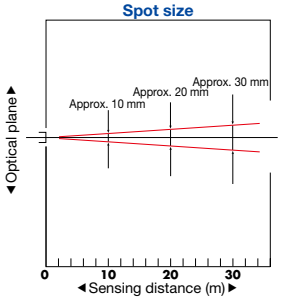
Angular deviation



Interference area

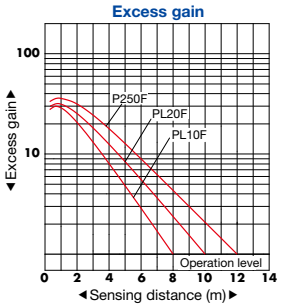


Spot size

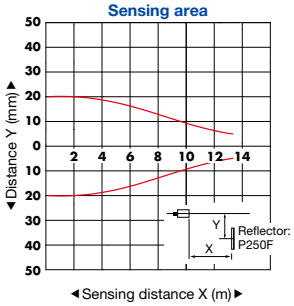


ZR-L1000□

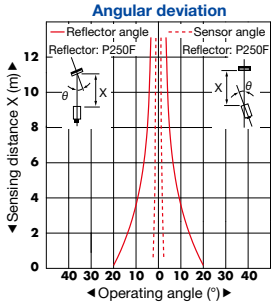
Excess gain



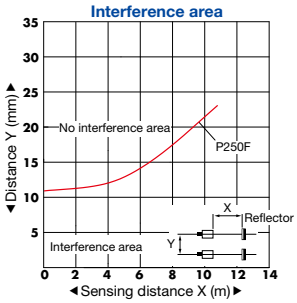
Sensing area



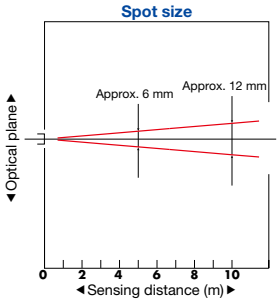
Angular deviation



Interference area

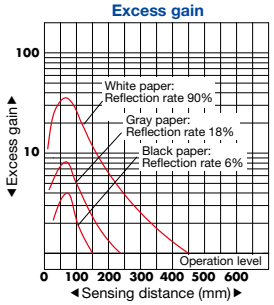


Spot size

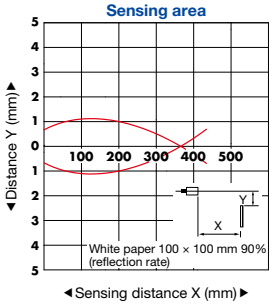


ZD-L40□

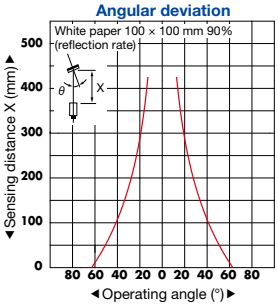
Excess gain



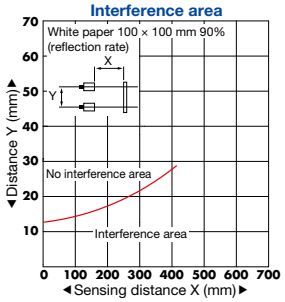
Sensing area



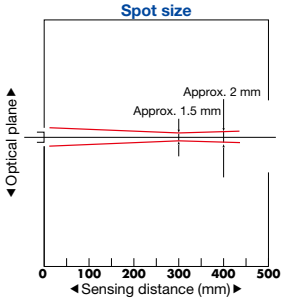
Angular deviation



Interference area



Spot size



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

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.