OPTEX FA

Compact Size Photosensor
Z Series

(LED Type : For General Use)

ZT series	Thru-Beam
ZR series	Retro Reflective
ZR-Q series	Retro Reflective specialized for glass / transparent objects
ZD series	Diffuse Refelctive
ZD-W series	Divergent
ZD-L series	Convergent
BGS-Z series	BGS sensing

(LED Type : Coaxial Beam)

ZR-X series	Retro Reflective, coaxial optics
ZR-QX series	ZR-X for glass / transparent objects

(Laser Type)

ZT-L series	Thru-Beam
ZR-L series	Retro Reflective
ZD-L series	Diffuse Reflective
BGS-ZL series	BGS sensing

http://www.optex-fa.com

Nice variety designed under compact size housing.
Coaxial LED and Laser beam sources
flexibly apply your applications.

● Specifications and technical information not mentioned here are written in Operation Manual. Or visit our website for details.
● All the warnings and cautions to know prior to use are given in Operation Manual.
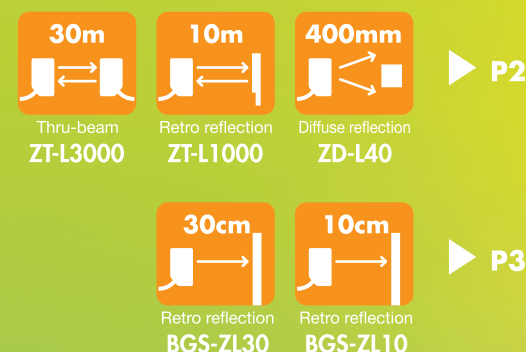
OPTEX FA CO., LTD.

CE

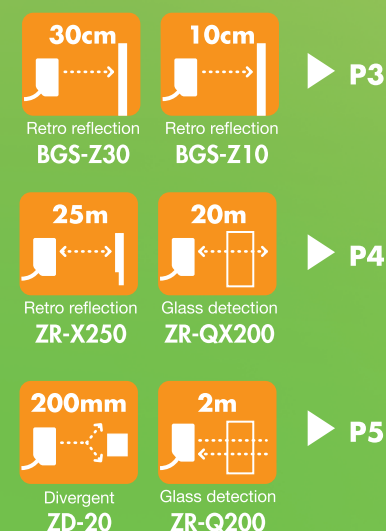Lead-free construction conforms to new RoHS standards.

Z-L Series

Laser Beam light source gives 2mm fine spot in 400mm distance.
BGS (Back Ground Suppression) sensing is also available in BGS-ZL product family.

30m	10m	400mm
Thru-beam **ZT-L3000**	Retro reflection **ZT-L1000**	Diffuse reflection **ZD-L40**	▶ P2

30cm	10cm
Retro reflection **BGS-ZL30**	Retro reflection **BGS-ZL10**	▶ P3

Z Series

A large product family designed in co-axial optical design that enables exact positioning to the object.
Optex FA's specialty of glass/plastic sensing is realized in this compact diminsions.

30cm	10cm
Retro reflection **BGS-Z30**	Retro reflection **BGS-Z10**	▶ P3

25m	20m
Retro reflection **ZR-X250**	Glass detection **ZR-QX200**	▶ P4

12m	3.5m	700mm	700mm	200mm	2m
Thru-beam **ZT-1200**	Retro reflection **ZR-350**	Diffuse reflection **ZD-70**	Convergent **ZD-L09**	Divergent **ZD-20**	Glass detection **ZR-Q200**	▶ P5

30m	10m	400mm
Thru-beam **ZT-L3000**	Retro reflection **ZT-L1000**	Diffuse reflection **ZD-L40**

Laser Type

- 30 meter sensing distance (Thru-beam type), fast 250μsec. responce time.
- Compact size with Laser source, small 2 mm diameter projected beam.
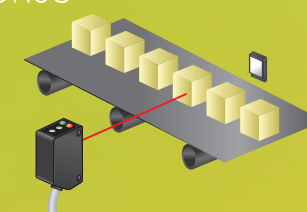- IP67 rating
- M8 QD types are available

Thru-beam type, ZT-L series
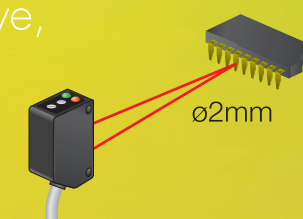
30mm spot size at 30 meter sensing distance
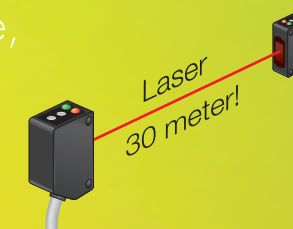
Diffuse Reflective, ZD-L type

Fine 2mm spot at 400mm sensing distance

Retro Reflective, ZR-L type

10mm spot size at 10 meter sensing distance

250μsec response

Good for fast moving object.

Cross-talk prevention

2 sensors can be mounted side-by-side.
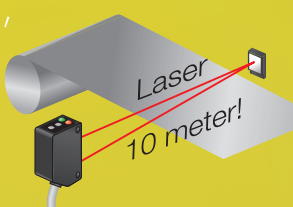
IP67 rating

Hose it down!
Water-tightness is tested to IP67.

Specification

Model		Thru-beam	Retro-reflective	Diffuse-reflective
Cable Type	NPN	ZT-L3000N	ZR-L1000N	ZD-L40N
	PNP	ZT-L3000P	ZR-L1000P	ZD-L40P
M8 connector type	NPN	ZT-L3000CN	ZR-L1000CN	ZD-L40CN
	PNP	ZT-L3000CP	ZR-L1000CP	ZD-L40CP
Supply voltage		DC10~30V Inc. 10% ripple		
Current consumption		30mA max.	20mA max.	
Sensing range		30meter	10meter	400mm
Spot size		30mm/30m	10mm/8m	2mm/400mm
Response time		0.25ms		
Hysteresis		–		20% Max
Operating temp.		-10 to +50℃		
Operating humidity		35 to 85%		
Storage temp./humidity		-25 to +70℃/35 to 95%		
Vibration		10 to 55Hz width 1.5mm		
Shock		500m/s^2		
Protection category		IP67		
Emitter		Laser (650nm)		
Laser class (IEC)		class 1	class 2	
Laser class (FDA)		class 1	class 2	
Indication Output		Orange(Yellow) LED		
Power indicator		Green LED		
Sensitivity adjustment		1 turn		
Mode selection		Light On / Dark On selectable (switch)		
Connection		2m cable / M8 connector		

BGS - Laser Type
Fine spot / fast response jobs

30cm	10cm
Glass detection **BGS-ZL30**	Glass detection **BGS-ZL10**

BGS - LED Type
For general appliactions

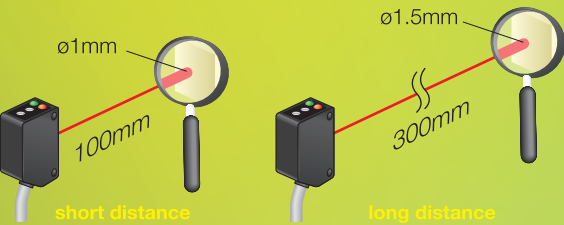| 30cm	10cm
Retro reflection **BGS-Z30**	Retro reflection **BGS-Z10**

- BGS (Background Suppression Type) Sensors, the best sensor for neglecting background. Conventional LED, or Laser Beam types are available.
- 250 μsec fast response (All the Laser Type)
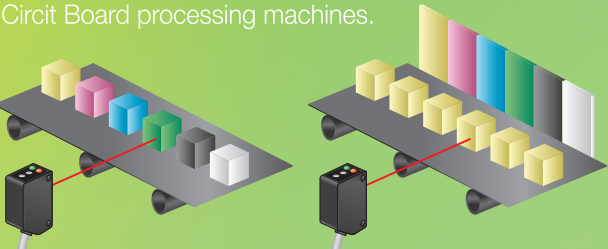- 1mm fine spot in BGS optical system (BGS-ZL : Laser types)

1mm fine spot

φ1mm of fine spot for tiny object even in BGS sensing. Long distance Type gives φ1.5mm fin spot in 300mm distance.

ø1mm
ø1.5mm
100mm
300mm
short distance
long distance

250μsec response

Good for fast moving object.

Dual indicator

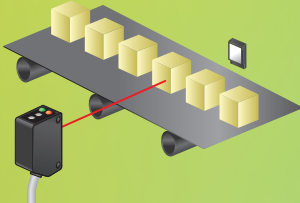BGS-Laser types has dual indicator to let you know if Laser Power is ON / OFF.

output
power

BGS optical system desiged with Laser light source

Extremely small BGS type sensors are only 17 x 10 x 20mm. Ideal for use in OEM equipment such as Printed Circit Board processing machines.
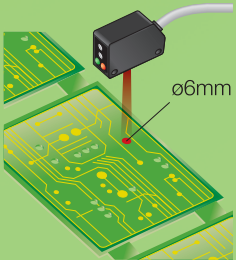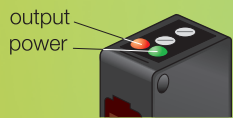
Dual indicator

6mm spot size that could not be influenced with small holes on the PC Boards.
For those PC Boards that may have bigger holes BGS-Z30 models works in 18mm spot size.

ø6mm

4turn Pot

4-turn Pot for convenience of setting distance.
The pot turns endless so you don't break pot stopper.

4turn pot

Specifications

Model	long distance		short distance		long distance		short distance	
	2m Cable	M8 4pin	2m Cable	M8 4pin	2m Cable	M8 4pin	2m Cable	M8 4pin
Type NPN	BGS-ZL30CN	BGS-ZL30N	BGS-ZL10CN	BGS-ZL10N	BGS-Z30CN	BGS-Z30N	BGS-Z10CN	BGS-Z10N
PNP	BGS-ZL30CP	BGS-ZL30P	BGS-ZL10CP	BGS-ZL10P	BGS-Z30CP	BGS-Z30P	BGS-Z10CP	BGS-Z10P
Setting distance	50 - 300 mm (*1)		20 -100 mm (*1)		50 - 300 mm (*1)		20 -100 mm (*1)	
Sensing distance	10 - 300 mm (*1)		5 -100 mm (*1)		10 - 300 mm (*1)		5 -100 mm (*1)	
Response time	250μs				500μs			
Spot size	φ1.5mm/300mm		φ1mm/100mm		φ30mm/300mm		φ10mm/100mm	
Hysteresis (white to white)	5%		3%		5%		3%	
Light / Dark Mode	Light On / Dark On switchover				Light On / Dark On switchover			
Output Indicator	Output : orange, Laser Power : green				Output : orange, Stable : green			
Sensitivity adjustor	4-turn, endless pot.				4-turn, endless pot.			
Output	NPN or PNP open collector, 100mA max / DC30V				NPN or PNP open collector, 100mA max / DC30V			
Voltage	DC 10 - 30V, including 10% ripple				DC 10 - 30V, including 10% ripple			
Power consumption	30mA max				30mA max			
Protection Category	IP 67				IP 67			
Shock resistance	50G				100G			
Environmental Temp/Humid	- 10 to 55℃ / 35 to 85% RH				- 25 to 55℃ / 35 to 85% RH			
Materials	Housing : ABS with glass, Lens : PMMA				Housing : ABS with glass, Lens : PMMA			

*1 = white paper 100 X 100mm

Specifications are subject to change without prior notice.

Retro-Reflective in Coaxial Beam optics
The best for Plastic/Glass Sensing

2.5m	2.0m
Retro reflection **ZR-X250**	Glass detection **ZR-QX200**

- Coaxial light source gives extremely tight alignment to the target. Aligment of sensor is easy thanks to bright projected LED spot.
- 250 μsec fast response (ZR-X, coaxial beam type)
- World's standard model ZR-Q (general type) and ZR-QX (coaxial beam type) for Plastic and Glass applications.
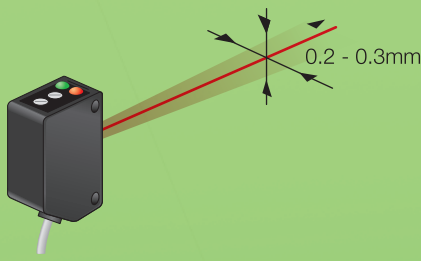
Dead area is zero !

You don't have to mind about dead area that may come in shaking conveyor.

Dead area
mirror
mirror
No Dead area
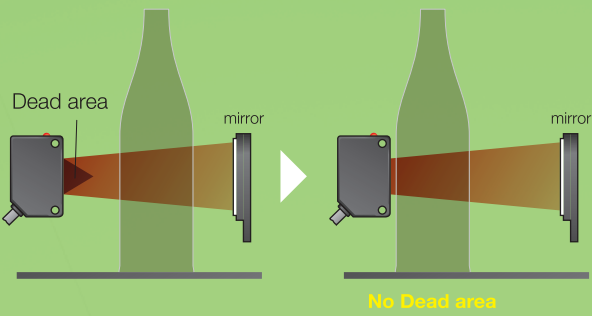
Repeat Accuracy

Very tight Repeat Accuracy, 0.2 - 0.3mm for BGS type.
Even Thru-beam and Retro types have 0.3mm Repeat Accuracy(*).

*=Tested at the middle point of sensing range.

0.2 - 0.3mm

Good selection of sensors for various kind of bottles.

Glass and plastic bottles are curved in various shape, and you are required to find the best optics of sensor in field test.
We provide Co-axial beam sensor as well as non co-axial beam type so you could find the best one for your bottle.

Coaxial LED

Coaxial light source gives extremely tight alignment to the target, Alignment of sensor is very easy thanks to bright projected LED spot.
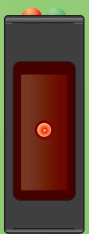
Specification

Model	Retro Reflective for Transparent				Retro reflective (Coaxial Beam)	
	General Use		Coaxial Beam			
	2m Cable	M8 4pin	2m Cable	M8 4pin	2m Cable	M8 4pin
Type NPN	ZR-Q200CN	ZR-Q200N	ZR-QX200CN	ZR-QX200N	ZR-X250CN	ZR-X250N
PNP	ZR-Q200CP	ZR-Q200P	ZR-QX200CP	ZR-QX200P	ZR-X250CP	ZR-X250P
Sensing range	0.01 - 2 meter (V-61 reflector)		0 - 2 meter (P250F reflector)		0 - 2.5 meter (V-61 reflector)	
Response time	500μs				250μs	
Spot size	φ300mm/at 2m		φ60mm/at 2m		φ60mm/at 2m	
Light / Dark Mode	Light On / Dark On switchover					
Output Indicator	Output : orange, Stable : green				single (orange)	
Sensitivity adjustor	1-turn pot.					
Output	NPN or PNP open collector, 100mA max / DC30V					
Voltage	DC 10 - 30V, including 10% ripple					
Power consumption	20mA max					
Protection Category	IP 67					
Shock resistance	100G					
Environmental Temp/Humid	- 25 to 55℃ / 35 to 85% RH					
Materials	Housing : ABS with glass, Lens : PMMA					

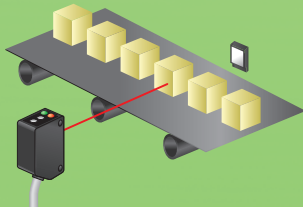Specifications are subject to change without prior notice.

LED Type
For General Use
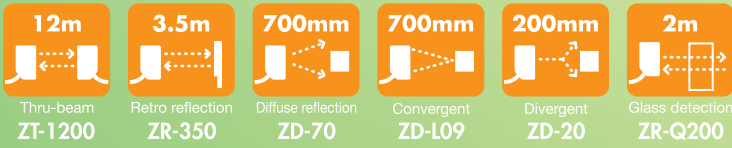
- 100G shock resistance, IP67 ratings. Tough sensor !
- ZR-Q series, ideal for detection of PET bottles, transparent objects, etc.
- Standard models for cot saving.

## 250μsec response

Good for fast moving object.

Cross-talk prevention

With built-in cross-talk prevention, it is possible to mount two sensors side-by-side without mutual interference.
(Use part number BL-100-POLF for thru-beam type sensors.)

ZD-W20 application

A Divergent Type ZD-W20 provides wide angle beam that you could detect transparent film collecting returned light from the surface of object.
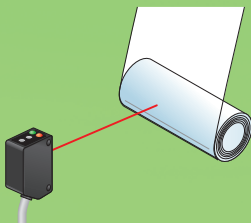
IP67 rating

Hose it down!
Water-tightness is tested to IP67.

High rigidity for 100G shock resistance / IP67

Rigid design for high resistance to mechanical shock

100G

Threaded mounting holes

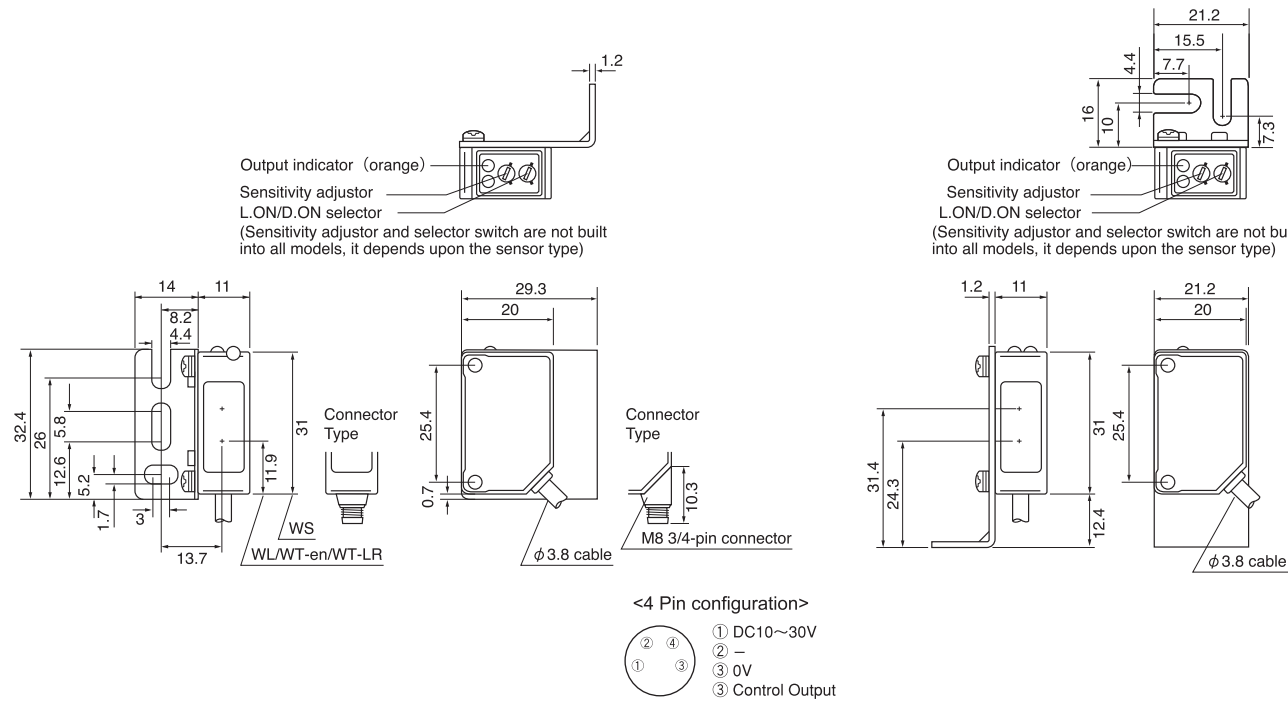Prevents sensor from being damaged when it's mounted.

Specification

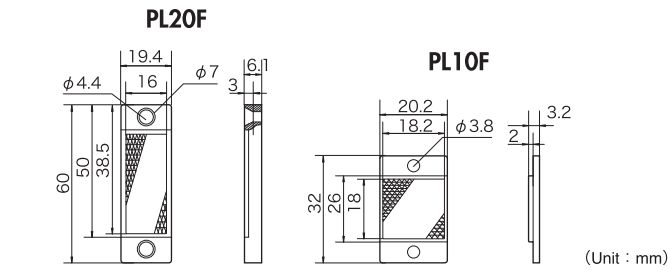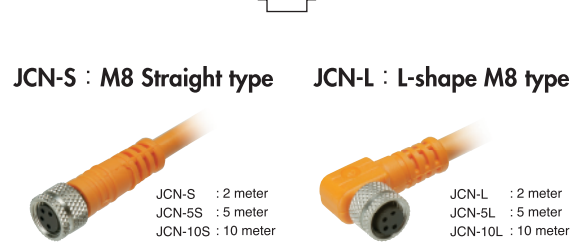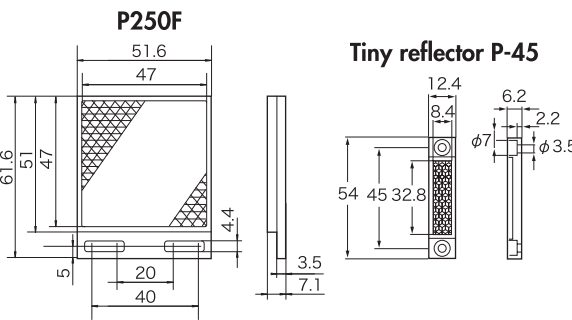| Model		Thru-beam	Retro-reflective	Diffuse-reflective	Convergent	Divergent	Glass detection
Cable type	NPN	ZT-1200N	ZR-350N	ZD-70N	ZD-L09N	ZD-W20N	ZR-Q200N
	PNP	ZT-1200P	ZR-350P	ZD-70P	ZD-L09P	ZD-20P	ZR-Q200P
M8 connector type	NPN	ZT-1200CN	ZR-350CN	ZD-70CN	ZD-L09CN	ZD-W20CN	ZR-Q200CN
	PNP	ZT-1200CP	ZR-350CP	ZD-70CP	ZD-L09CP	ZD-20CP	ZR-Q200CP
Sensing range		12 m	3.5m	70cm	1-9 cm	0-180 mm	2 m
Response		0.5 msec					
Spot size		1.5m @ 12 meter	350mm @ 3.5 meter	100mm @ 700mm	12mm @ 90mm	60mm @ 50mm	300mm @ 2 meter
Light / Dark Mode		Light On/Dark On selectable					
Hysteresis		NIL		20% Max	10% Max		NIL
Light source		Red					
Sensitivity adjustor		1-turn trimmer (240 degree)					
Output		NPN or PNP Open collector, 100mA Max / 30V DC					
Voltage		DC 10 - 30V incl. 10% ripple					
Regulation		JIS/C4525，CE，CUL, VDE					
Power consumption		20mA Max					
Indicator		Dual Indicator (Green = stable output, Orange = detectable)					
Protection Category		IEC 144 IP67, VDE level 3					
Shock resistance		100G (1,000m/S2) , XYZ 3-ways					
Environment Illumination		Sunlight : 10,000 lux Max., Incandescent lamp : 3,000 lux max.					
Materials		ABS with glass fiber (Case), PMMA (Lens)					

Specifications are subject to change without prior notice.

Dimensions (mm)

Cable type with optional bracket (BEF-W100A)

Output indicator（orange）
Sensitivity adjustor
L.ON/D.ON selector
(Sensitivity adjustor and selector switch are not built into all models, it depends upon the sensor type)

Connector Type

WS
WL/WT-en/WT-LR

Connector Type

φ3.8 cable

M8 3/4-pin connector

<4 Pin configuration>
① DC10～30V
② −
③ 0V
③ Control Output

Cable Type with standard bracket (BEF-W100B)

Output indicator（orange）
Sensitivity adjustor
L.ON/D.ON selector
(Sensitivity adjustor and selector switch are not built into all models, it depends upon the sensor type)

φ3.8 cable

Options

Slit mask BL-160-SK (for Thru-beam type)

Type	Size	Attached to	Object size (Min)	Scanning range
Slit a	0.5mm	Receiver,Emitter	0.4mm	0.8mm
Slit B	1mm	Receiver,Emitter	0.6mm	2.5mm
Slit C	2mm	Receiver,Emitter	1.5mm	5mm

BL-100-POLF Cross-talk (prevention filter for ZT-1200)

Standard reflector V-61

Small reflector V-42

P250F

Tiny reflector P-45

PL20F

PL10F

JCN-S：M8 Straight type

JCN-S : 2 meter
JCN-5S : 5 meter
JCN-10S : 10 meter

JCN-L：L-shape M8 type

JCN-L : 2 meter
JCN-5L : 5 meter
JCN-10L : 10 meter

(Unit：mm)