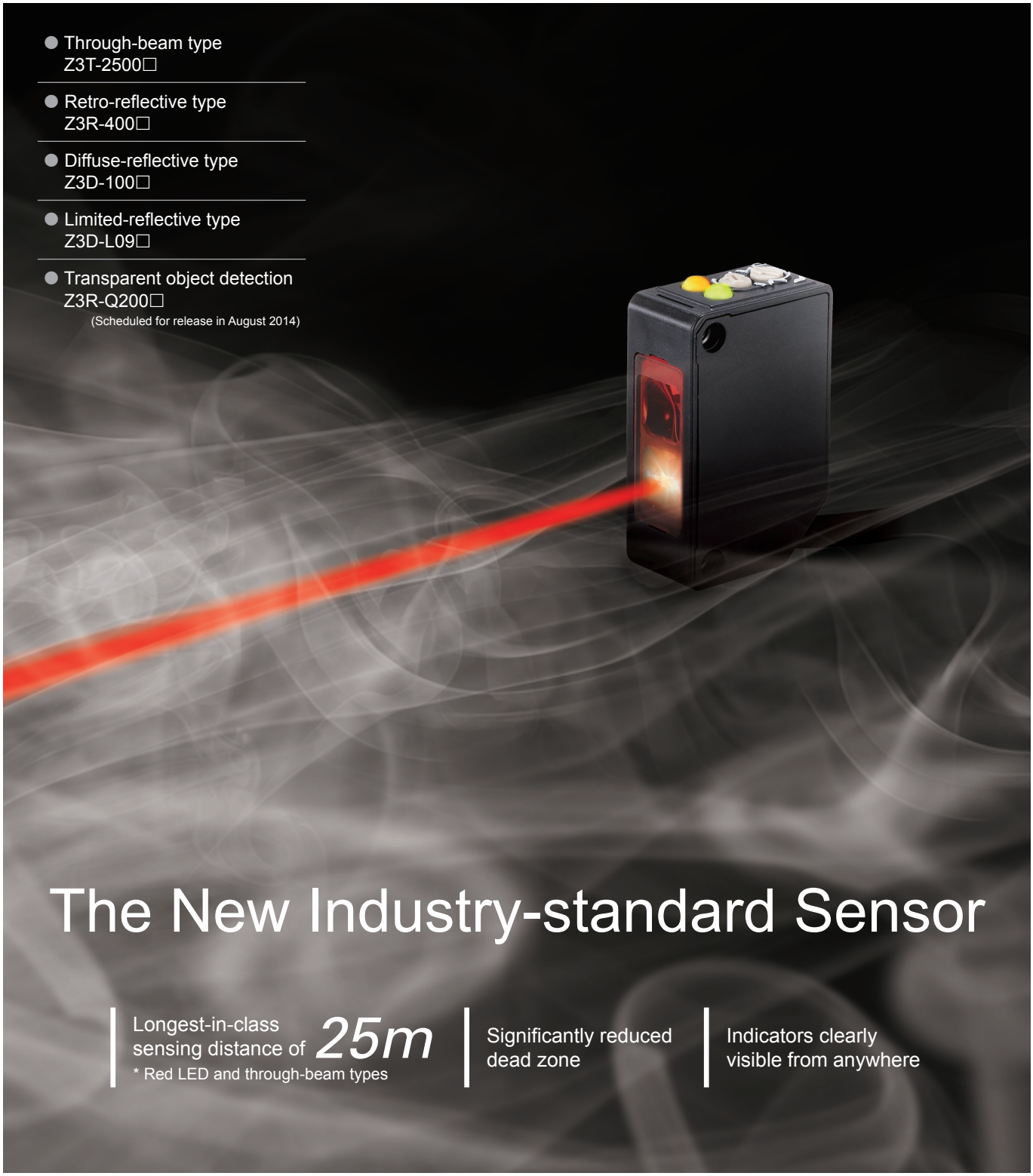
FASTUS

Good Thinking, Good Future

Photoelectric Sensor with Built-in Amplifier

Z3 Series

* FASTUS is a product brand of Optex FA.



OPTEX FA CO., LTD.

The next evolution of the globally acclaimed Z series standard photoelectric sensor

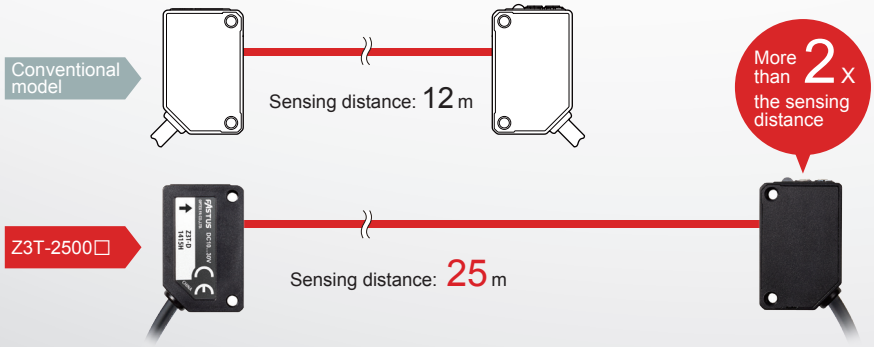
Over 3 Million units of the Z series have been shipped globally.
FASTUS set out to improve upon the design of this popular self-contained photoelectric sensor series while keeping the same ease of use.
Introducing the new Z3 series with greatly improved detection performance, usability, and increased value for the money.
The Z3 series easily exceeds the requirements of general-purpose photoelectric sensors.

High Power LED Provides Stable Detection

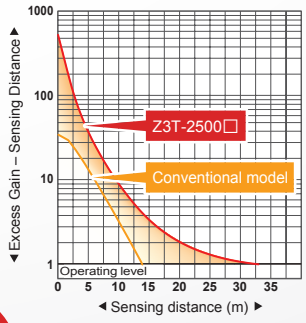
The Z3 series through-beam type sensor has a 25 m sensing distance, the longest in its class. This high power provides a significant increase in excess gain, which helps the sensor overcome interference from dust or other fine particles.

Plus

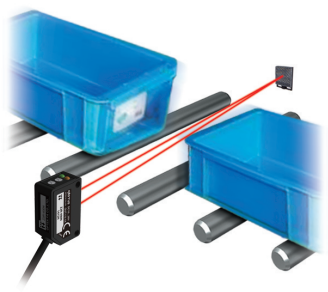
- Easy optical axis adjustment thanks to a large spot size with good visibility
- Four-element LED helps reduce beam degradation during long-term use



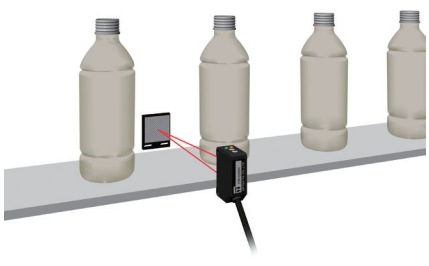
Excess Gain – Sensing Distance



Applications



Detecting or counting boxes flowing through a process (Retro-reflective type)



Detecting plastic bottles on a conveyor (Retro-reflective type for transparent object detection)

Detecting tires protruding from conveyors (Through-beam type)

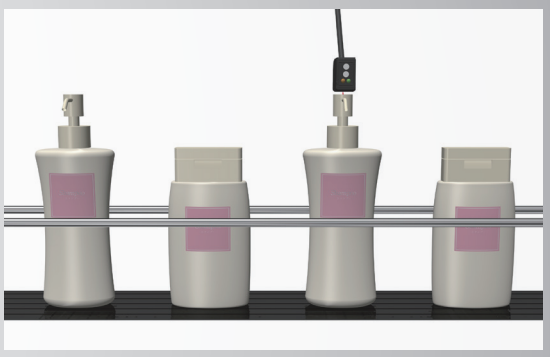
Output and stability indicators are brighter than those of conventional models and easier to view from any direction.

Significantly Reduced Dead Zone

The diffuse-reflective type features an optimized optical receiver system that successfully minimizes the dead zone in front of the lens. This makes it easier to detect workpieces with a low reflectivity that pass close to the sensor even on lines that convey workpieces of varying heights.

Close range dead zone (typical values)

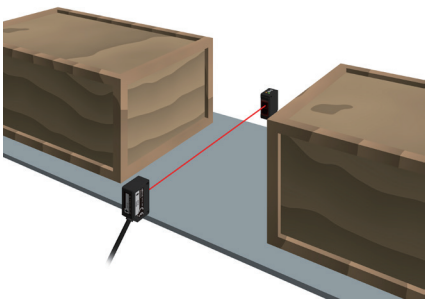
Gray paper (18%)	Conventional model	Up to 2 mm	
	Z3D-100□	0	No dead zone even with gray paper
Black paper (6%)	Conventional model	Up to 13 mm	
	Z3D-100□	Up to 2 mm	Less than one-sixth the dead zone of previous models



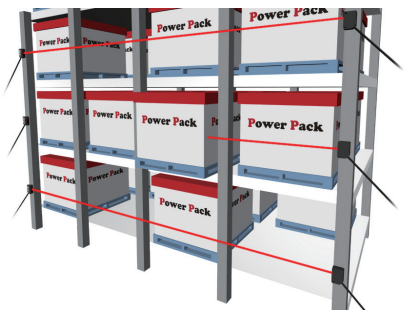
Lineup

Type	Appearance	Sensing range	Model (Connector type)	
			NPN type	PNP type
Through-beam		25 m	Z3T-2500N (Z3T-2500CN4)	Z3T-2500P (Z3T-2500CP4)
Retro-reflective*		0.01 to 4 m	Z3R-400N (Z3R-400CN4)	Z3R-400P (Z3R-400CP4)
Diffuse-reflective		0 to 1 m	Z3D-100N (Z3D-100CN4)	Z3D-100P (Z3D-100CP4)
Limited-reflective		10 to 90 mm	Z3D-L09N (Z3D-L09CN4)	Z3D-L09P (Z3D-L09CP4)
Transparent object detection* *Coming soon		0.01 to 2 m	Z3R-Q200N (Z3R-Q200CN4)	Z3R-Q200P (Z3R-Q200CP4)

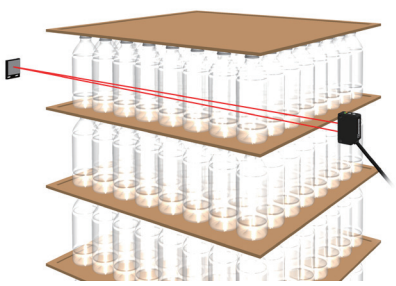
*Reflectors sold separately



Detecting large packed items on a conveyor (Through-beam type)



Detecting boxes protruding from shelves (Through-beam type)

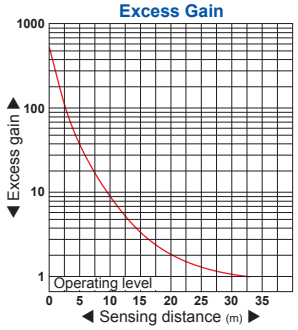


Detecting palletized plastic bottles (Retro-reflective type for transparent object detection)

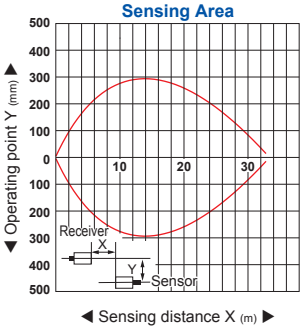
Characteristic Diagrams (typical data)

Z3T-2500□

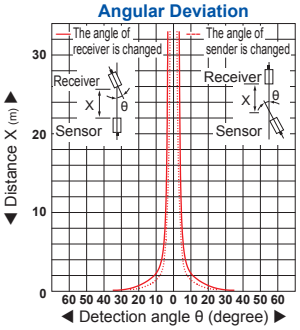
Excess Gain



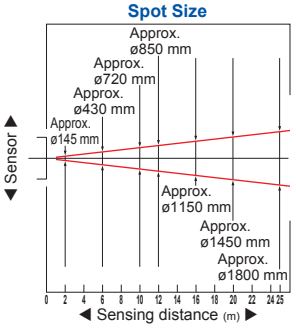
Sensing Area



Angular Deviation

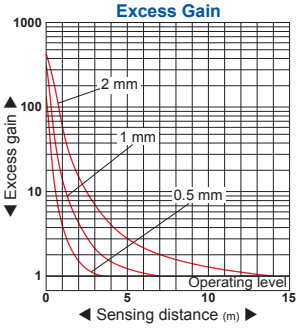


Spot Size

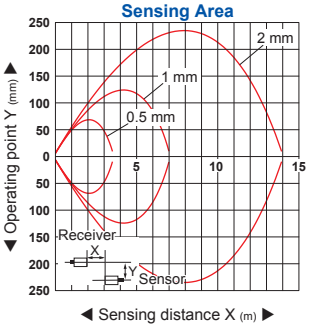


With slit mask attached Z3T-2500□

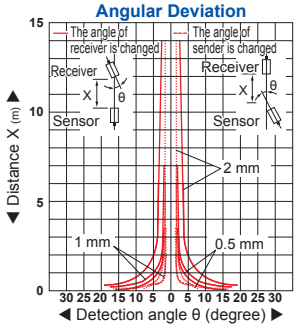
Excess Gain



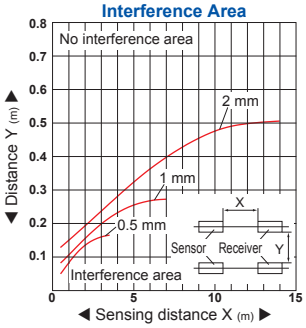
Sensing Area



Angular Deviation

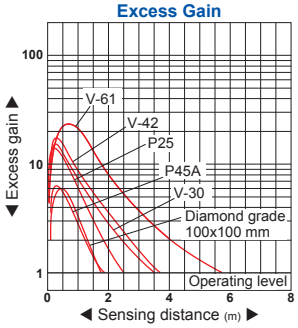


Interference Area

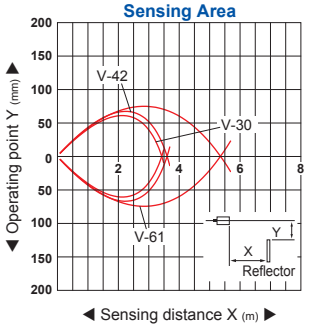


Z3R-400□

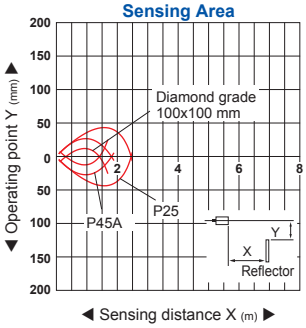
Excess Gain



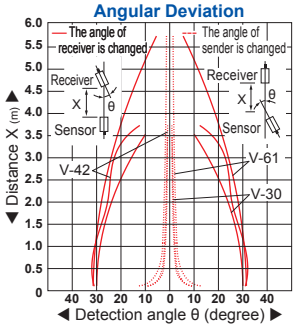
Sensing Area



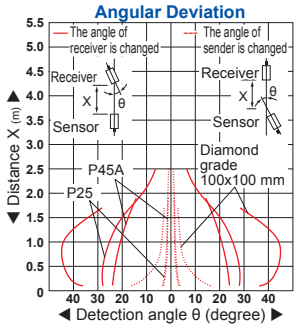
Sensing Area



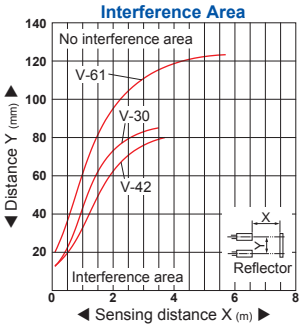
Angular Deviation



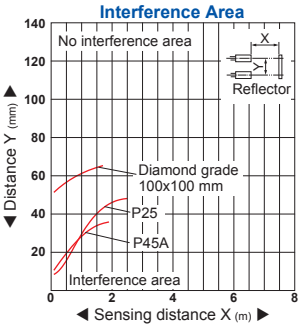
Angular Deviation



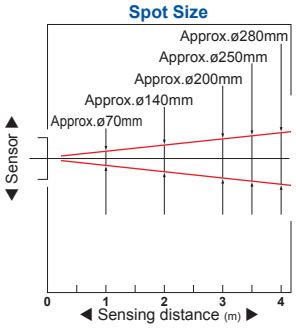
Interference Area



Interference Area

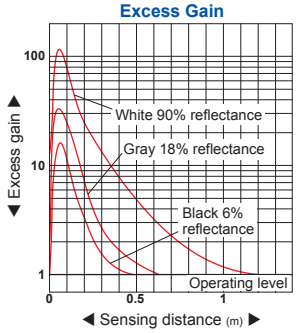


Spot Size

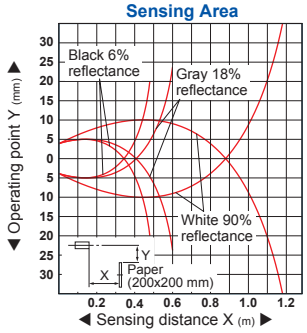


Z3D-100□

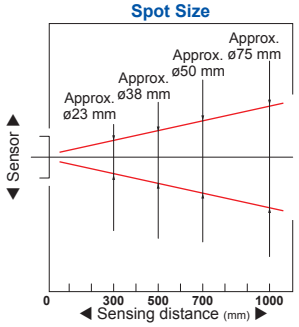
Excess Gain



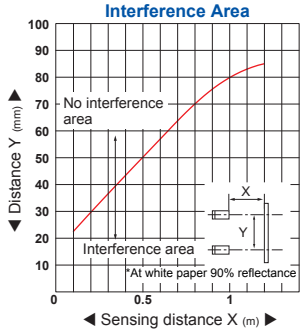
Sensing Area



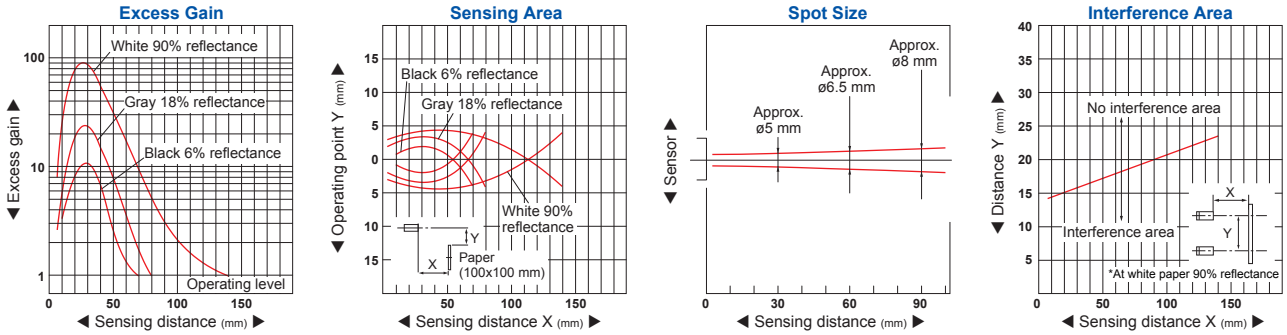
Spot Size



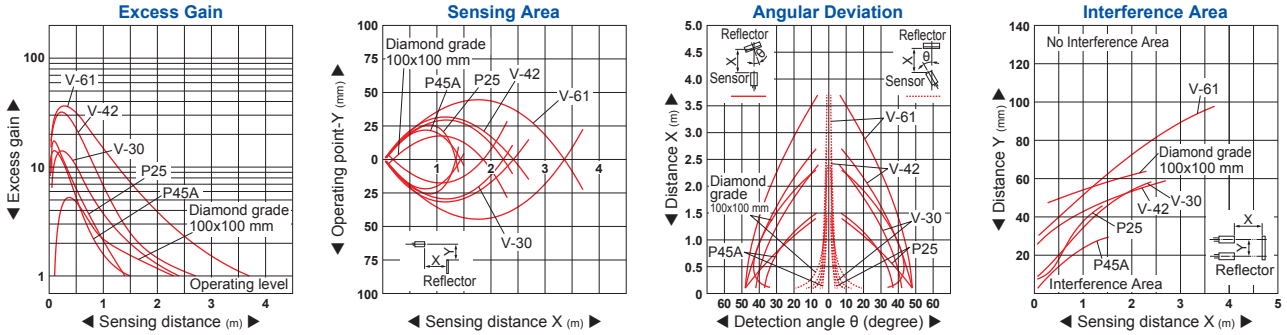
Interference Area



Z3D-L09□

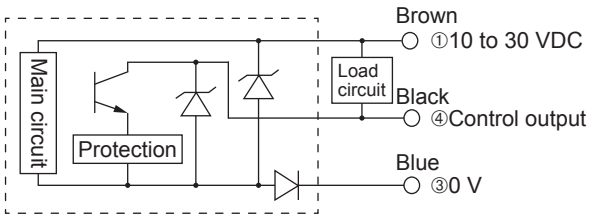


Z3R-Q200□

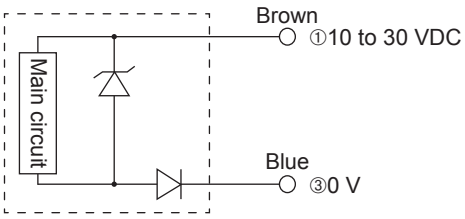


Input and Output Circuit Diagram

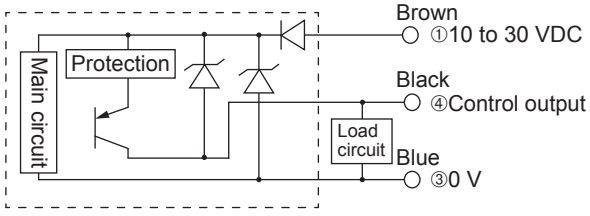
NPN type



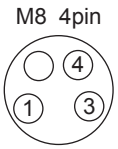
Through beam emitter



PNP type



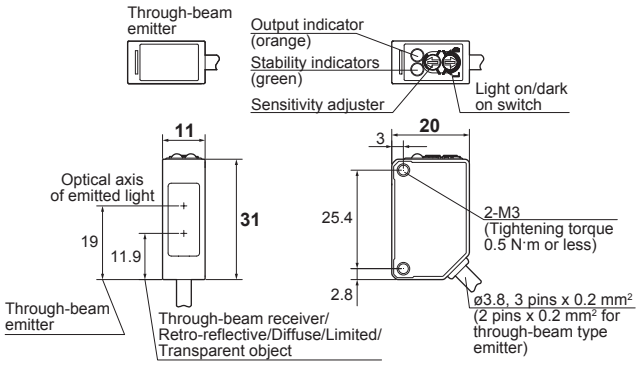
Connector pin No.



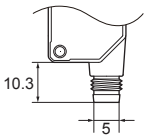
① • • • 10 to 30 VDC
③ • • • 0 V
④ • • • Control output

Dimensions (mm)

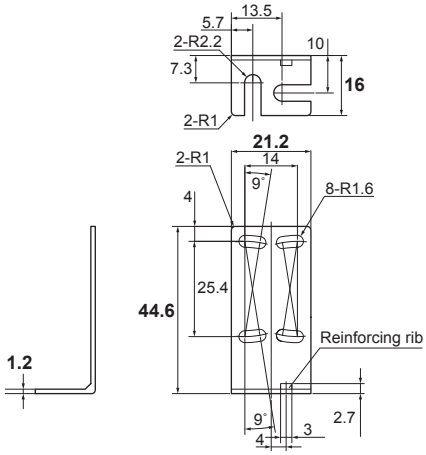
Cable type



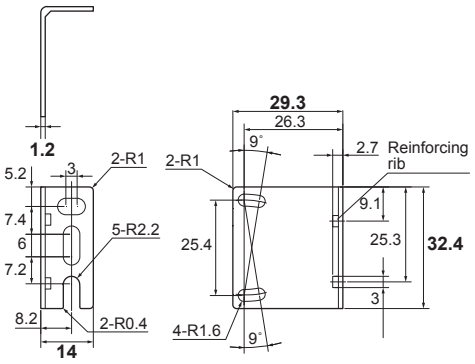
Connector type



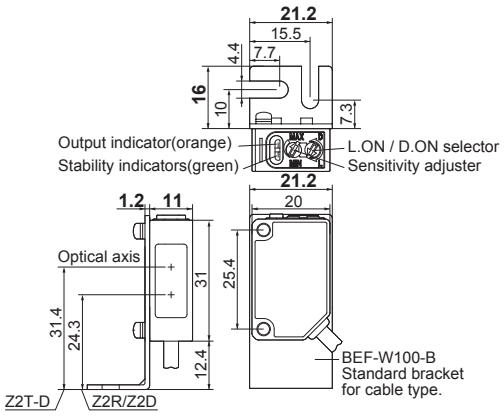
Mounting bracket BEF-W100-B For cable type



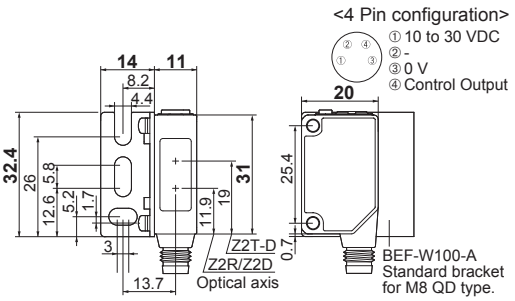
Mounting bracket BEF-W100-A For connector type



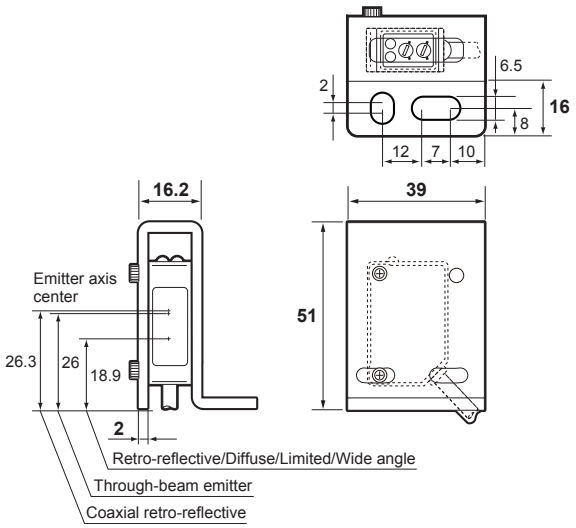
Cable type with mounting bracket



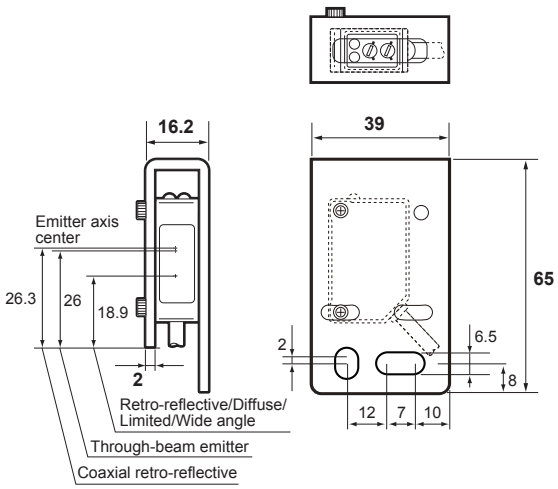
Connector type with mounting bracket



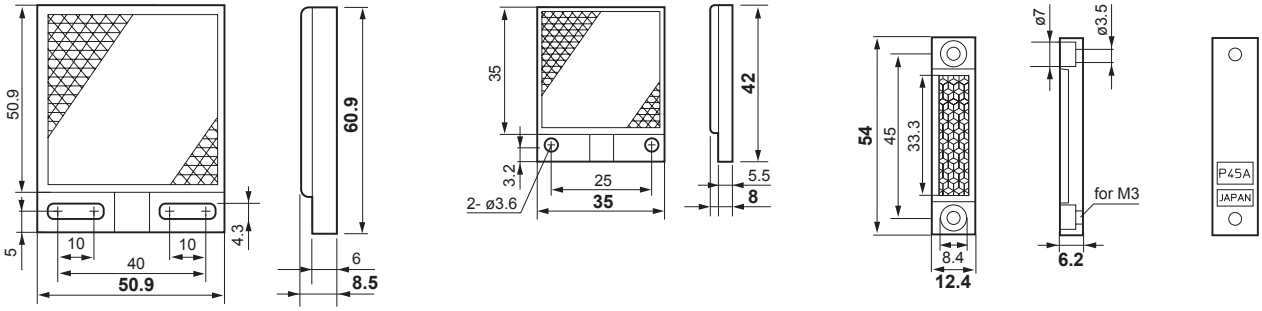
Cable type with protective bracket LK-S01 (only for cable type)



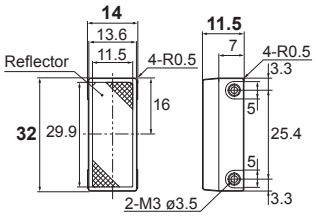
Cable type with protective bracket LK-S02 (only for cable type)



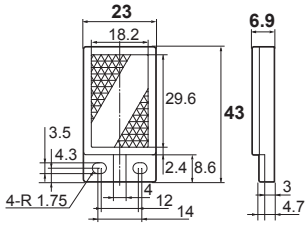
■ V61: Standard reflector (optional) ■ V-42: Small reflector (optional) ■ P45A: Tiny reflector (optional)



■ P25: Ultra-compact reflector (optional)



■ V-30: Ultra-compact reflector (optional)



Optional Products

All optional products are sold separately. Select appropriate options based on sensing distance and installation requirements.

Reflector (required for retro-reflective type)

Standard
V-61
60.9 x 50.9 mm
Sensing distance:
Z3R-400□, Z3R-Q200□
0.01 to 4 m

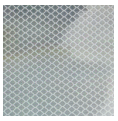
Small
V-42
42 x 35 mm
Sensing distance:
Z3R-400□, Z3R-Q200□
0.01 to 2.4 m

Upright
P45A
54 x 12.4 mm
Sensing distance:
Z3R-400□, Z3R-Q200□
0.01 to 1.4 m

Side-mounted
P25
32 x 14 mm
Sensing distance:
Z3R-400□, Z3R-Q200□
0.01 to 1.6 m

Ultra-small
V-30
42 x 23 mm
Sensing distance:
Z3R-400□, Z3R-Q200□
0.01 to 2.2 m

Reflective sheet



Diamond grade sheet
Sensing distance:
Z3R-400□, Z3R-Q200□
0.1 to 1 m
100 x 100 mm (adhesive type)

Mounting bracket

For cable type
Floor-mounted
BEF-W100-B

For connector type
Back-mounted
BEF-W100-A
Cannot be used with JCN-□L connector cables.

Connector cable (required for connector type)

Straight

- 2 m **JCN-S**
- 5 m **JCN-5S**
- 10 m **JCN-10S**

L-shaped

- 2 m **JCN-L**
- 5 m **JCN-5L**
- 10 m **JCN-10L**

Protective brackets for cable type

- Ultra-robust 2 mm thick type
- Stainless steel for good rust resistance

LK-S01

LK-S02

Slit mask

Slit mask for through-beam type (adhesive type)
BL-W100
Shipped as set containing masks with 0.5 mm, 1.0 mm, and 2.0 mm wide slits x 2 each.

Stainless steel slit mask

Stainless steel slit mask for through-beam type
BL-100-M1
BL-100-M05
M1 is 1 mm slit, M05 is 0.5 mm slit x 1 each.

Anti-interference filter

For through-beam type (set of four)
BL-100-POLF

■ Specifications

Type			Through-beam type	Retro-reflective type	Diffuse-reflective type	For transparent object detection	Limited-reflective type
Model	NPN	Cable type	Z3T-2500N	Z3R-400N	Z3D-100N	Z3R-Q200N	Z3D-L09N
		Connector type	Z3T-2500CN4	Z3R-400CN4	Z3D-100CN4	Z3R-Q200CN	Z3D-L09CN4
	PNP	Cable type	Z3T-2500P	Z3R-400P	Z3D-100P	Z3R-Q200P	Z3D-L09P
		Connector type	Z3T-2500CP4	Z3R-400CP4	Z3D-100CP4	Z3R-Q200CP4	Z3D-L09CP4
Sensing distance			25 m	0.01 to 4 m*1	0 to 1 m*2	0.01 to 2 m*1	10 to 90 mm*3
Light source			Four-element red LED, wavelength 632 nm				
Spot size			ø1800 mm (at distance of 25 m)	ø280 mm (at distance of 4 m)	ø75 mm (at distance of 1 m)	ø140 mm (at distance of 2 m)	ø8 mm (at distance of 90 mm)
Response time			500 µs or less				
Hysteresis			—	—	20% Max.	—	10% Max.
Sensitivity adjustment			Single-turn adjuster				
Indicators			Output display: orange LED, Stability display: green LED (through-beam type emitter has no indicators)				
Control output			NPN/PNP type open collector Max.100 mA/30 VDC				
Operating mode			Light on, Dark on (Selectable by switch)				
Connections			Cable type: cable length 2 m x ø3.8 mm/Connector type: M8 4 pin				
Power supply voltage			10 to 30 VDC Including ripple (P-P) 10%				
Current consumption			Emitter: 20 mA max. Receiver: 15 mA max.	20 mA max.	25 mA max.	20 mA max.	
Operating temperature/humidity			-25°C to +55°C (no freezing)/35 to 85%RH (no condensation)				
Operating illuminance			Sunlight: 10000 lx or less, high-frequency lamp: 3000 lx or less				
Vibration resistance			10 to 55 Hz; double amplitude 1.5 mm; 2 hours in each of the X, Y, and Z directions				
Shock resistance			Approximately 100 G (1000 m/s^2), 3 times in each of the X, Y, and Z directions				
Protection category			IP67				
Material			Housing: ABS Front cover: PMMA				
Weight (excluding cord)			Approximately 10 g				
Included items			Instruction manual (mounting bracket and reflector are not included)				

*1 When using reflector V-61 (optional)
*2 When using 200 x 200 mm square of white paper
*3 When using 100 x 100 mm square of white paper

Attention: Not to be Used for Personnel Protection.

Never use these products as sensing devices for personnel protection. Doing so could lead to serious injury or death.
These sensors do not include the self-checking redundant circuitry necessary to allow their use in personnel safety applications.
A sensor failure or malfunction can cause either an energized or de-energized sensor output condition.
Please consult our distributors about safety products which meet OSHA, ANSI and IEC standards for personnel protection.

- **Specifications are subject to change without prior notice.**
- **Specifications and technical information not mentioned here are written in Instruction Manual. Or visit our website for details.**
- **All the warnings and cautions to know prior to use are given in Instruction Manual.**

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