

Stainless steel housing type

Z-M series

Excellent water resistance/oil resistance! Suitable for automobiles, machine tools and food industry

- Longest sensing distance in the class!
- Employs a low deterioration 4 element red LED for the light source
- Degree of protection: IP69K (cable type), Equivalent to IP67g (connector type)

Related products

BGS type

BGS-ZM
 ● P.334


Laser type

Z-L
 ● P.272


General-purpose type

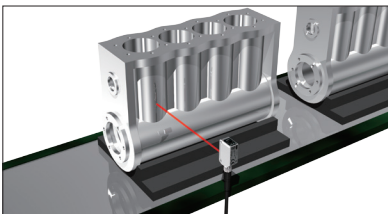
Z3
 ● P.148


Selection table

	Type	Shape	Sensing distance (Adjustable distance range shown in parentheses)	Degree of protection	Model	
					NPN type	PNP type
Cable type	Through-beam type		30 m	IP67 IP69K*	ZT-M3000N	ZT-M3000P
	Retro-reflective type		0.01 to 5.5 m		ZR-M550N	ZR-M550P
	Diffuse-reflective type		0 to 800 mm		ZD-M80N	ZD-M80P
	BGS		 		BGS-ZM10N ● P.334	BGS-ZM10P ● P.334
					BGS-ZM30N	BGS-ZM30P
					● P.334	● P.334
Connector type	Through-beam type		30 m	IP67 Equivalent to IP67g*	ZT-M3000CN4	ZT-M3000CP4
	Retro-reflective type		0.01 to 5.5 m		ZR-M550CN4	ZR-M550CP4
	Diffuse-reflective type		0 to 800 mm		ZD-M80CN4	ZD-M80CP4
	BGS		 		BGS-ZM10CN4 ● P.334	BGS-ZM10CP4 ● P.334
					BGS-ZM30CN4	BGS-ZM30CP4
					● P.334	● P.334

● For the connector type, please purchase an optional oil resistant connector cable. ● For the BGS type, please refer to P.334. *Reflector degree of protection is IP67.

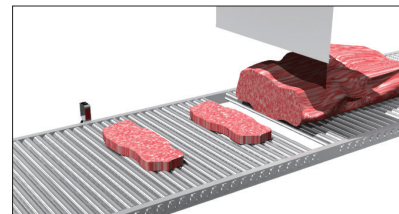
Engine block detection



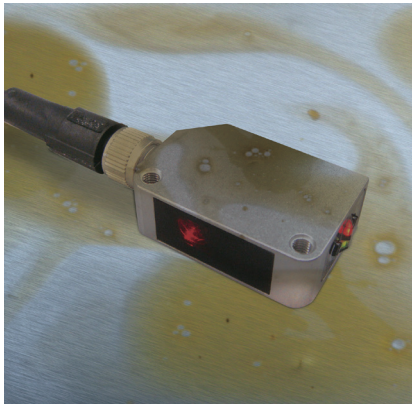
Drill breakage on NC machine



For meat/fresh food lines (cable type)



Tough against oil and coolant! Cost effective sensor with excellent oil resistance



Connector type features oil resistance of equivalent to IP67g



PPSU is used for the front window!

*Excluding the retro-reflective type

The through-beam type and diffuse-reflective type are the only in the industry in which a PPSU (polyphenylsulfone resin) material is used. This material has superior oil resistant properties to the PMMA (acrylic resin) materials often used in the industry.

Connector cable: PUR (polyurethane)

A PUR (polyurethane) material with excellent oil resistance is used for the connector type cable. A PVC (polyvinyl chloride) material with excellent chemical resistance is used for the cable type cable.



Top cover: PES (polyether sulfone)

Excellent resistance against oil and cleaning solutions.

Switch and Potentiometer: PEEK (polyether ether ketone)

Features excellent shock resistance, wear resistance, and chemical resistance and is ideal for cutting, etc.

Housing: SUS316L

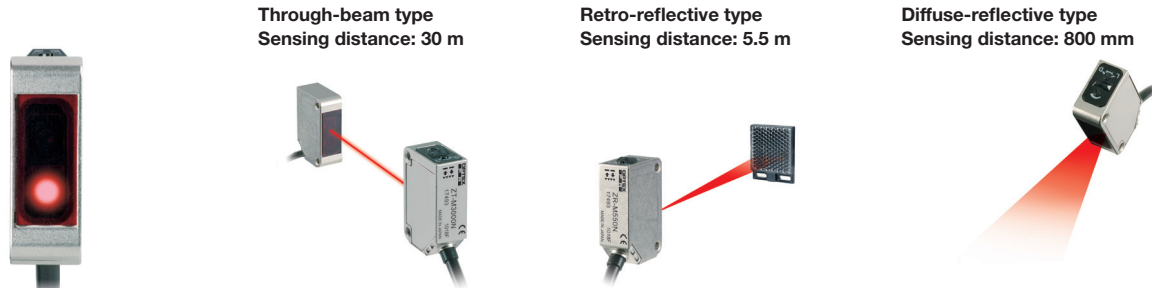
Excellent corrosion-resistance to chemicals.

Employs a newly developed high-brightness 4 element LED

Longest sensing distance in the class!

Equipped with a newly developed 4 element red LED light source. In addition to minimizing the decreases in emitted light that occur over time, it features a through-beam type sensor with a longest-in-class 30 m sensing distance! Not only is detection over long distances possible, but it is also tolerant against dust and fine particles.

High brightness 4 element red LED



Degree of protection of cable type is IP69K

Achieved a degree of protection on IP66 that is tough against humidity, water, steam cleaning, etc. Sensor features a tough design that doesn't break even when exposed to high-pressure washing on food processing machinery or when used in severe environments. Of course, it has also cleared IP67.

What is IP69K?

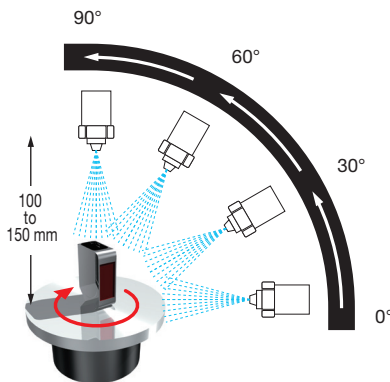
IP69K is a protection rating stipulated by German standard DIN40050 Part 9.

Test details:

Sensors are placed on a turntable and rotated 5 times per minute while being sprayed with water under the following conditions.

- Water pressure: 80 to 100 bar
- Flow rate: 14 to 16 l/m
- Water temperature: +80°C / -5°C
- Distance from spray nozzle: 100 to 150 mm
- Spray angle: 0°, 30°, 60°, 90°
- Spray time: 30 seconds at each angle

*IP69k does not guarantee operation under the above conditions. Water or oil that adhere to the optical surface could cause light to refract and prevent detection from being performed correctly.
*Excluding connector type and reflector.



Specifications

■ Cable type

Type		Through-beam type	Retro-reflective type	Diffuse-reflective type
Model	NPN type	ZT-M3000N	ZR-M550N	ZD-M80N
	PNP type	ZT-M3000P	ZR-M550P	ZD-M80P
Sensing distance		30 m	0.01 to 5.5 m ¹	0 to 800 mm ²
Light source		4 element red LED		
Spot size		Approx. ø1200 mm (at distance of 30 m)	Approx. ø300 mm (at distance of 5.5 m)	Approx. ø40 mm (at distance of 800 mm)
Response time		500 µs or less		
Hysteresis		—	—	20% or less
Distance adjustment		1-turn potentiometer		
Indicators		Output indicator: orange LED, Stability indicator: green LED (no indicator equipped on through-beam type emitter)		
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 (ø4)		
Rating	Supply voltage	10 to 30 VDC, including 10% ripple (p-p)		
	Current consumption	Emitter/receiver: 15 mA or less	18 mA or less	18 mA or less
Applicable regulations		EMC directive (2004/108/EC)		
Applicable standards		EN 60947-5-2		
Company standards		Noise resistance: Feilen Level 3 cleared		
Environmental resistance	Ambient temperature/humidity	-25 to +55°C (no freezing) / 35 to 85% RH (no condensation)		
	Ambient illuminance	Sunlight: 10,000 lx or less Incandescent lamp: 3,000 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	Approx. 100 G (1000 m/s ²); 3 times in each of the X, Y, and Z directions		
	Degree of protection	IP67 DIN standard: IP69K	IP67 DIN standard: IP69K (IP67 for reflector)	IP67 DIN standard: IP69K
Material		Housing: SUS316L Top cover: PES Front window: PPSU Switch, potentiometer: PEEK Cable: PVC Gasket: FKM	Housing: SUS316L Top cover: PES Front window: PMMA Switch, potentiometer: PEEK Cable: PVC Gasket: FKM	Housing: SUS316L Top cover: PES Front window: PPSU Switch, potentiometer: PEEK Cable: PVC Gasket: FKM
Weight without cable		Approx. 20 g		
Included accessories		Mounting bracket: BEF-W100-B	Mounting bracket: BEF-W100-B Reflector: V-61	Mounting bracket: BEF-W100-B

*1. With the V-61 reflector *2. Using a 200 × 200 mm white sheet of paper.

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

Options/Accessories

Reflector (Reflector degree of protection is IP67.)

Standard
(included with
retro-reflective type)

V-61
60.9 × 50.9 mm
Sensing distance:
0.01 to 5.5 m



Small type

V-42
42 × 35 mm
Sensing distance:
0.015 to 4 m



Vertical type

P45A
54 × 12.4 mm
Sensing distance:
0.015 to 1.5m



Protective mounting bracket

● Durable 2 mm thick
stainless steel type

LK series
LK-S01



LK-S02



■ Connector type

Type		Through-beam type	Retro-reflective type	Diffuse-reflective type
Model	NPN type	ZT-M3000CN4	ZR-M550CN4	ZD-M80CN4
	PNP type	ZT-M3000CP4	ZR-M550CP4	ZD-M80CP4
Sensing distance		30 m	0.01 to 5.5 m ^{*1}	0 to 800 mm ^{*2}
Light source		4 element red LED		
Spot size		Approx. ϕ 1200 mm (at distance of 30 m)	Approx. ϕ 300 mm (at distance of 5.5 m)	Approx. ϕ 40 mm (at distance of 800 mm)
Response time		500 μ s or less		
Hysteresis		—	—	20% or less
Distance adjustment		1-turn potentiometer		
Indicators		Output indicator: orange LED, Stability indicator: green LED (no indicator equipped on through-beam type emitter)		
Control output		NPN/PNP type Open collector Max. 100 mA/30 VDC		
Output mode		Light ON / Dark ON selection switch		
Connection type		Connector type: M8, 4-pin		
Rating	Supply voltage	10 to 30 VDC, including 10% ripple (p-p)		
	Current consumption	Emitter/receiver: 15 mA or less	18 mA or less	18 mA or less
Applicable regulations		EMC directive (2004/108/EC)		
Applicable standards		EN 60947-5-2		
Company standards		Noise resistance: Feilen Level 3 cleared		
Environmental resistance	Ambient temperature/humidity	-25 to +55°C (no freezing) / 35 to 85% RH (no condensation)		
	Ambient illuminance	Sunlight: 10,000 lx or less Incandescent lamp: 3,000 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	Approx. 100 G (1000 m/s ²); 3 times in each of the X, Y, and Z directions		
	Degree of protection	IP67 Company standards: Oil resistance (JEM standard: equivalent to IP67g)	IP67 Company standards: Oil resistance (JEM standard: equivalent to IP67g) (IP67 for reflector)	IP67 Company standards: Oil resistance (JEM standard: equivalent to IP67g)
Material		Housing: SUS316L Top cover: PES Front window: PPSU Switch, potentiometer: PEEK Gasket: FKM	Housing: SUS316L Top cover: PES Front window: PMMA Switch, potentiometer: PEEK Gasket: FKM	Housing: SUS316L Top cover: PES Front window: PPSU Switch, potentiometer: PEEK Gasket: FKM
Weight without cable		Approx. 20 g		
Included accessories		Mounting bracket: BEF-W100-A	Mounting bracket: BEF-W100-A Reflector: V-61	Mounting bracket: BEF-W100-A

*1. With the V-61 reflector *2. Using a 200 × 200 mm white sheet of paper.

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

Options/Accessories

Oil resistant connector cables

Straight



DOL-0804-G02MC

Cable length: 2 m

DOL-0804-G05MC

Cable length: 5 m

DOL-0804-G10MC

Cable length: 10 m

L-shaped



DOL-0804-W02MC

Cable length: 2 m

DOL-0804-W05MC

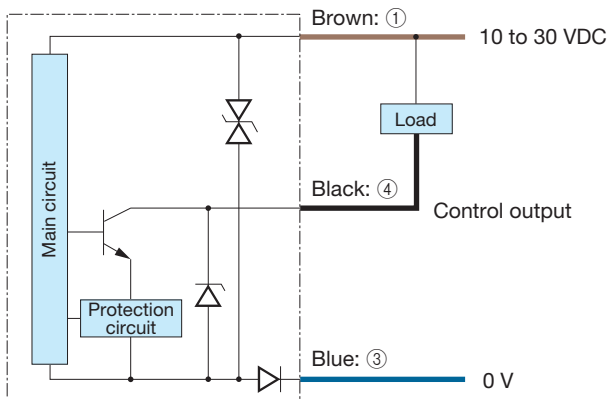
Cable length: 5 m

DOL-0804-W10MC

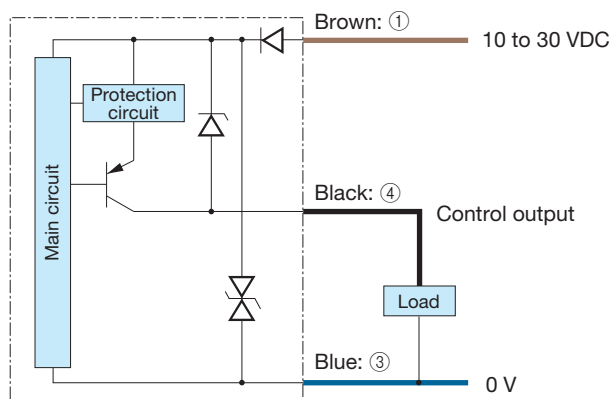
Cable length: 10 m

Output circuit diagram

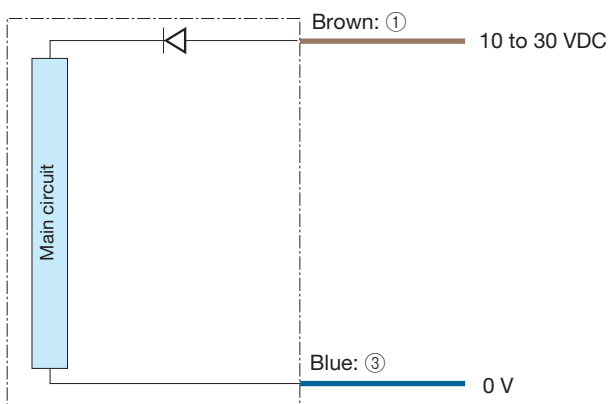
■ NPN output type



■ PNP output type



■ Through-beam type emitter



■ Connector type

(Pin configuration) Sensor side Connector cable side



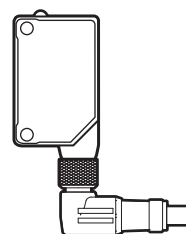
- ① 10 to 30 VDC
- ② —
- ③ 0 V
- ④ Control output

Connecting

■ ① to ④ are connector pin No.

Notes

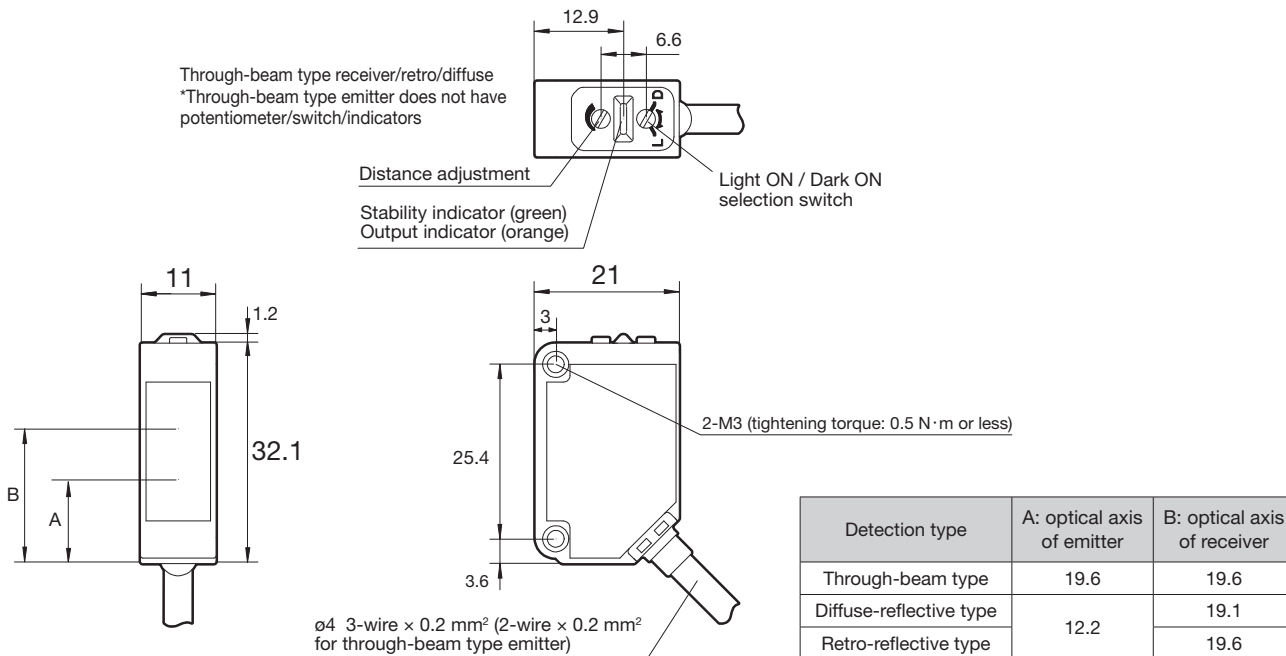
- When using a switching regulator for the power supply, be sure to ground the frame ground terminal.
- Because wiring sensor wires with high-voltage wires or power supply wires can result in malfunctions due to noise, which can cause damage, make sure to wire separately.
- Avoid using the transient state while the power is on (approx. 100 ms).
- The connector direction is fixed as the drawing below when you use L-shaped connector cable. Be aware that rotation is not possible.



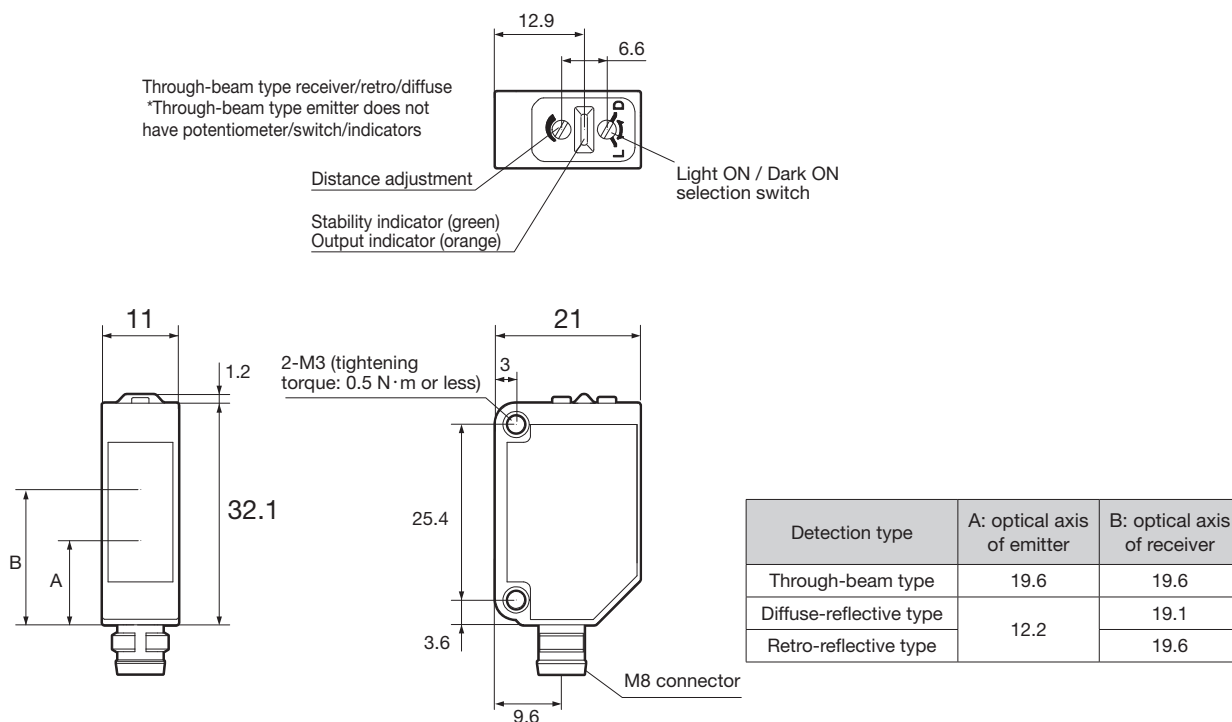
Dimensions

Cable type

(Unit: mm)



Connector type



Photoelectric Sensors

Specialized Photoelectric Sensors

Laser Displacement Sensors

Sensors with Built-in Amplifier

Z3

Z-M

Z2

E

J

K

S

S2

C-R

C2

PLN

Dimensions

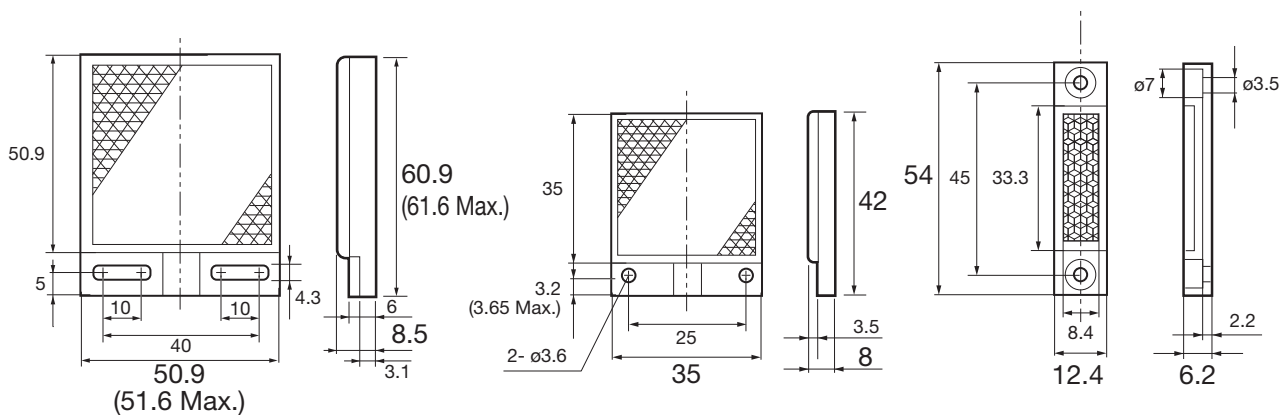
Reflector

(Unit: mm)

■ **V-61: Standard type reflector (included with retro-reflective type)**

■ **V-42: Small reflector (optional)**

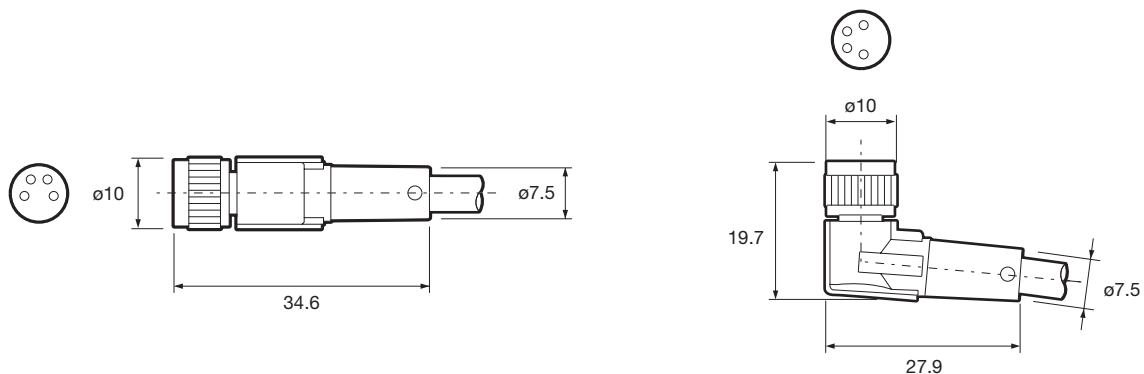
■ **P45A: Vertical type reflector (optional)**



Oil resistant connector cable (optional)

■ **DOL-0804-G02MC**
 ■ **DOL-0804-G05MC**
 ■ **DOL-0804-G10MC**

■ **DOL-0804-W02MC**
 ■ **DOL-0804-W05MC**
 ■ **DOL-0804-W10MC**

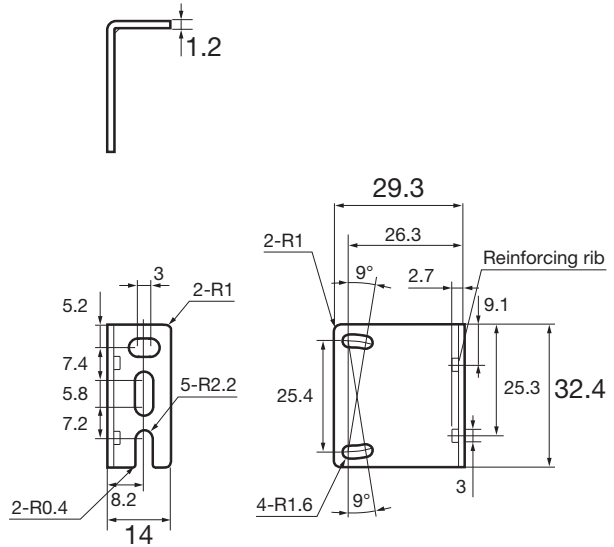
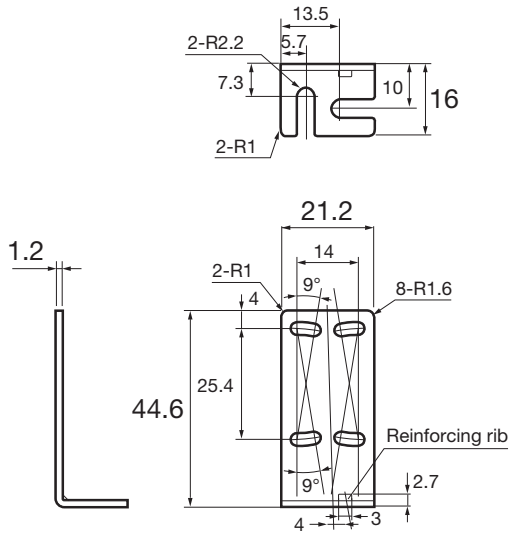


Mounting bracket

(Unit: mm)

■ BEF-W100-B (included with cable type)

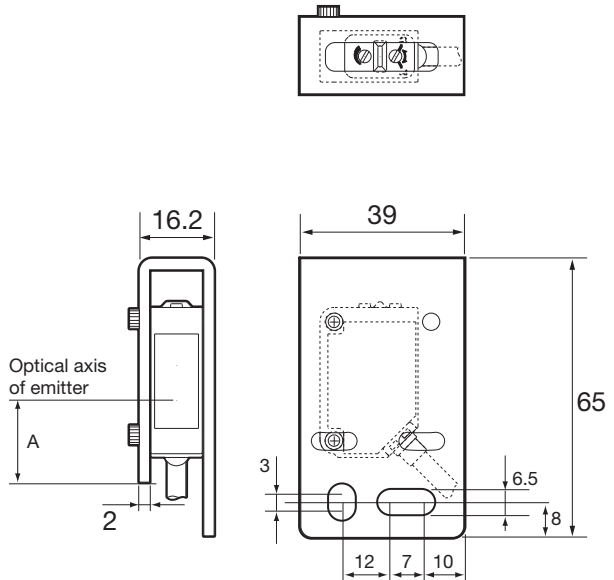
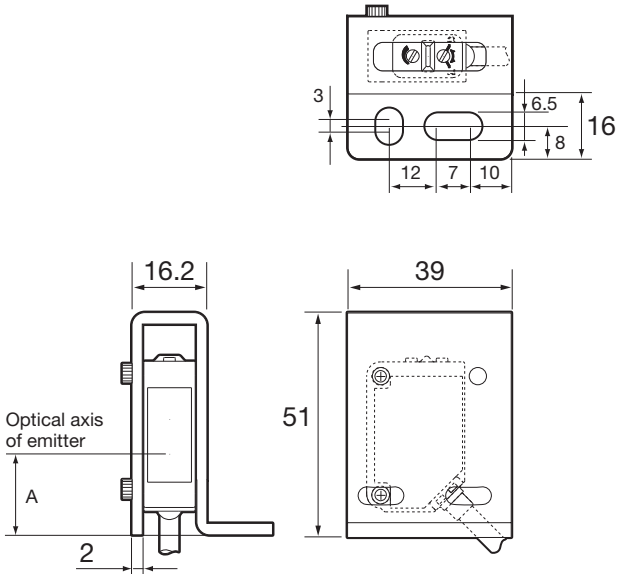
■ BEF-W100-A (included with connector type)



Protective mounting bracket (option for cable type)

■ LK-S01

■ LK-S02



Detection type	A: optical axis of emitter
Through-beam type	26.6
Diffuse-reflective type Retro-reflective type	19.2

Photoelectric Sensors

Specialized Photoelectric Sensors

Laser Displacement Sensors

Sensors with Built-in Amplifier

Z3

Z-M

Z2

E

J

K

S

S2

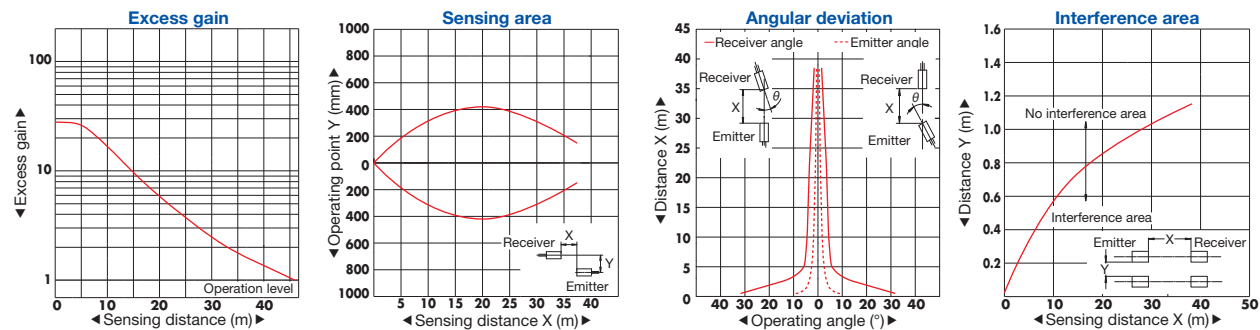
C-R

C2

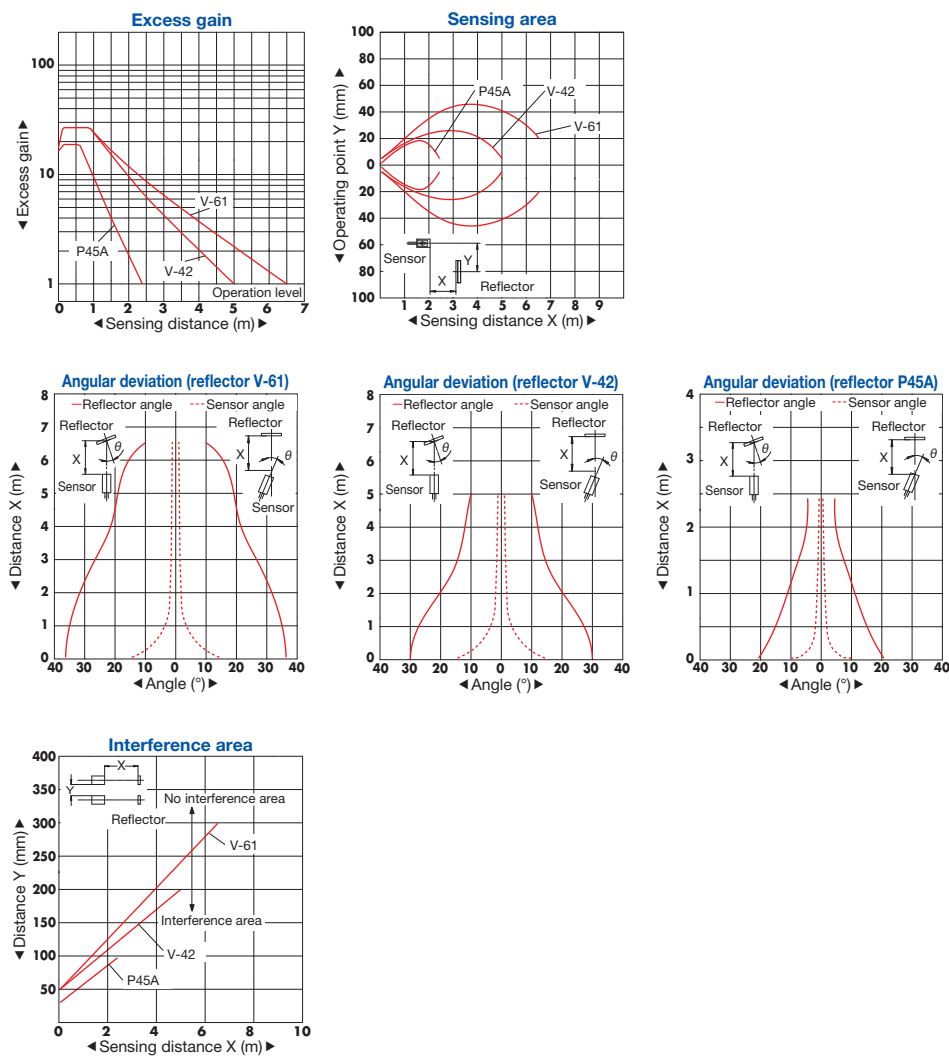
PLN

Typical characteristic data

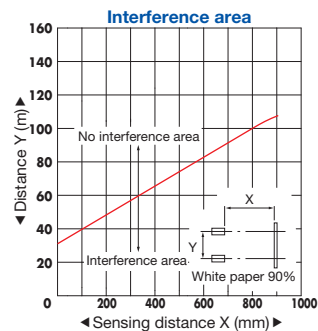
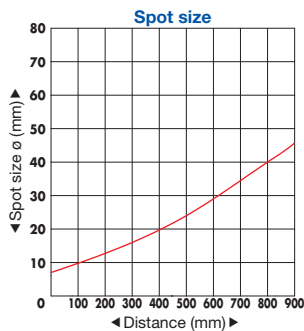
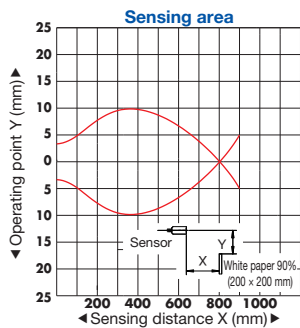
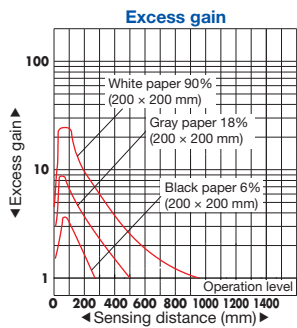
ZT-M3000



ZR-M550



ZD-M80 □



Photoelectric Sensors

Photoelectric Sensors

Specialized Photoelectric Sensors

Laser Displacement Sensors

Sensors with Built-in Amplifier

Z3

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