

Laser, standard type

**BGS-ZL** (Laser) series,  
**BGS-Z** (LED) series



# Laser type and high power narrow beam LED type BGS!

- | Types with sensing distances of 100 mm and 300 mm
- | Industry standard size
- | Highly accurate height difference detection through low hysteresis

Related products	Higher accuracy <b>BGS-HL, BGS-HDL</b> ● P.310	Universal voltage type <b>BGS-2V</b> ● P.384	Transparent object detection <b>Z3R-Q</b> ● P.404

## Selection table

Type	Shape	Sensing distance (Adjustable distance range shown in parentheses)	Model (Models in parentheses are connector types)	
			NPN type	PNP type
BGS	Class 1 laser	5 to 100 mm (20 to 100 mm)	<b>BGS-ZL10N</b> (BGS-ZL10CN)	<b>BGS-ZL10P</b> (BGS-ZL10CP)
		10 to 300 mm (50 to 300 mm)	<b>BGS-ZL30N</b> (BGS-ZL30CN)	<b>BGS-ZL30P</b> (BGS-ZL30CP)
	High power narrow beam LED	5 to 100 mm (20 to 100 mm)	<b>BGS-Z10N</b> (BGS-Z10CN)	<b>BGS-Z10P</b> (BGS-Z10CP)
		10 to 300 mm (50 to 300 mm)	<b>BGS-Z30N</b> (BGS-Z30CN)	<b>BGS-Z30P</b> (BGS-Z30CP)

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

## Options/Accessories

### 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

### Protective mounting bracket

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

LK-S01

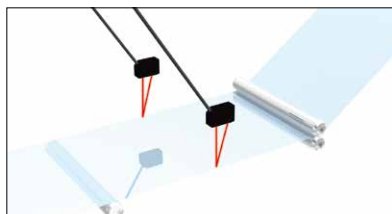


LK-S02



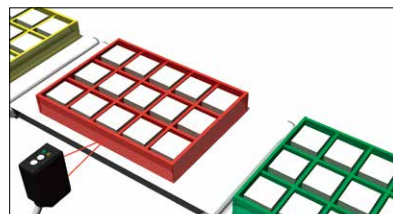
Laser type application 1

### Meander detection of sheet materials



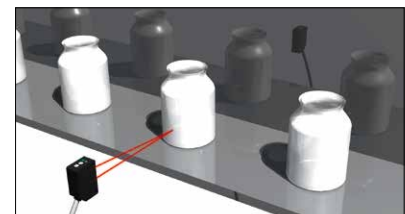
LED type application 1

### Detection of multi-colored trays



LED type application 2

### Detection of items on stainless steel lines



## Laser types (Class 1) and high power narrow beam LED types are available

### Laser type (equipped with laser OFF input)

The spot size of the laser type is  $\phi 1$  mm at 100 mm (short-range type). Optimal for applications that in which **small object detection** and **high repeat accuracy** are required. It is also a Class 1 laser in which eye protection for workers is not necessary.

\*Classified as Class II in the US FDA standards.



### High power narrow beam LED light source type

Features a **high power narrow beam LED light source**. Because the spot light can be seen clearly even in bright factories regardless of the LED light, confirmation of detection position is easier than for any other conventional model.

\*Compared to conventional models: Using LED light source.

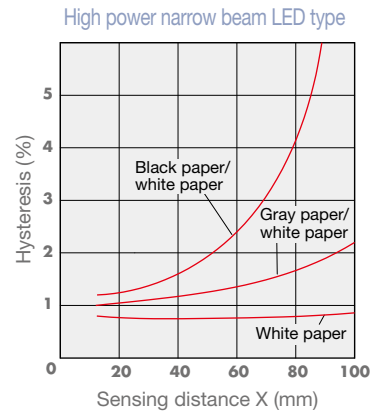
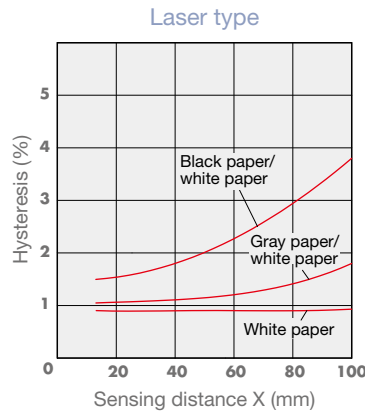


## Ideal for height difference detection using low hysteresis

### Short-range type hysteresis $\leq 3\%$ (typical value)

A short-range type with a sensing distance of 100 mm that achieves a low hysteresis of  $\leq 3\%$ . Demonstrates its strength in small height difference detection.

\*A mid-range type with a sensing distance of 300 mm that achieves a hysteresis of  $\leq 5\%$ .



## Industry standard size

### Mounting hole pitch: 25.4 mm

Features an industry standard pitch of 25.4 mm.



Photoelectric Sensors

Specialized Photoelectric Sensors

Laser Displacement Sensors

BGS Sensors

BGS-HL, BGS-HDL

BGS-DL

BGS-ZL, BGS-Z

BGS-ZM

BGS-S, BGS-2S

BGS

BGS-DL (potentiometer type)

## Specifications

Type		Short-range type (laser)	Mid-range type (laser)	Short-range type (LED)	Mid-range type (LED)	
Model	NPN	Cable type	<b>BGS-ZL10N</b>	<b>BGS-ZL30N</b>	<b>BGS-Z10N</b>	<b>BGS-Z30N</b>
		Connector type	<b>BGS-ZL10CN</b>	<b>BGS-ZL30CN</b>	<b>BGS-Z10CN</b>	<b>BGS-Z30CN</b>
	PNP	Cable type	<b>BGS-ZL10P</b>	<b>BGS-ZL30P</b>	<b>BGS-Z10P</b>	<b>BGS-Z30P</b>
		Connector type	<b>BGS-ZL10CP</b>	<b>BGS-ZL30CP</b>	<b>BGS-Z10CP</b>	<b>BGS-Z30CP</b>
Sensing distance		5 to 100 mm <sup>*1</sup>	10 to 300 mm <sup>*1</sup>	5 to 100 mm <sup>*1</sup>	10 to 300 mm <sup>*1</sup>	
Adjustable distance range		20 to 100 mm <sup>*1</sup>	50 to 300 mm <sup>*1</sup>	20 to 100 mm <sup>*1</sup>	50 to 300 mm <sup>*1</sup>	
Light source		Red semiconductor laser Class 1 (IEC/JIS) <sup>*2</sup> Wavelength: 650 nm, Maximum output: 3.5 mW		Red LED		
Spot size (focal length)		Approx. $\varnothing$ 1 mm <sup>*3</sup> Distance: 100 mm (at normal temperatures)	Approx. $\varnothing$ 1.5 mm <sup>*3</sup> Distance: 300 mm (at normal temperatures)	Approx. $\varnothing$ 10 mm Distance: 100 mm	Approx. $\varnothing$ 30 mm Distance: 300 mm	
Response time		250 $\mu$ s or less		500 $\mu$ s or less		
Hysteresis		3%	5%	3%	5%	
Distance adjustment		4-turn endless potentiometer				
Indicators		Output indicator (orange) Laser emission indicator (green)		Output indicator (orange) Stability indicator (green)		
Control output		NPN/PNP type open collector Max. 100 mA/30 VDC				
Output mode		Light ON / Dark ON selectable				
Connection type		Cable type: Cable length: 2 m $\varnothing$ 3.8 mm / Connector type: M8, 4-pin				
Rating	Supply voltage	10 to 30 VDC, including 10% ripple (p-p)				
	Current consumption	30 mA or less				
Applicable regulations		EMC directive (2004/108/EC) / FDA regulations (21 CFR 1040.10)		EMC directive (2004/108/EC)		
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)		-25 to +55°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 <sup>2</sup> ); 3 times in each of the X, Y, and Z directions		Approx. 100 G (1000 m/s <sup>2</sup> ); 3 times in each of the X, Y, and Z directions		
	Degree of protection	IP67				
Material		Housing: ABS (glass fiber filled), Front cover: PMMA				
Weight without cable		Approx. 10 g				
Included accessories		Mounting bracket: BEF-W100-B <sup>*4</sup>				

\*1. Using a 100 × 100 mm white sheet of paper.

\*2. Classified as Class II in the US FDA standards.

\*3. 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.

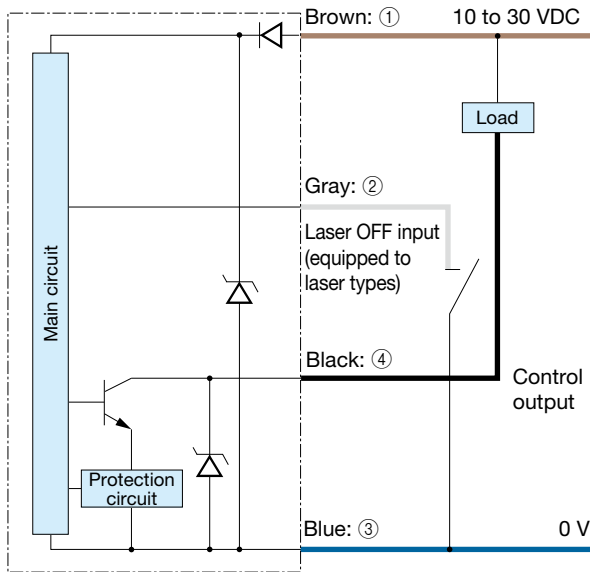
\*4. Mounting bracket BEF-W100-A is included with the connector type.

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

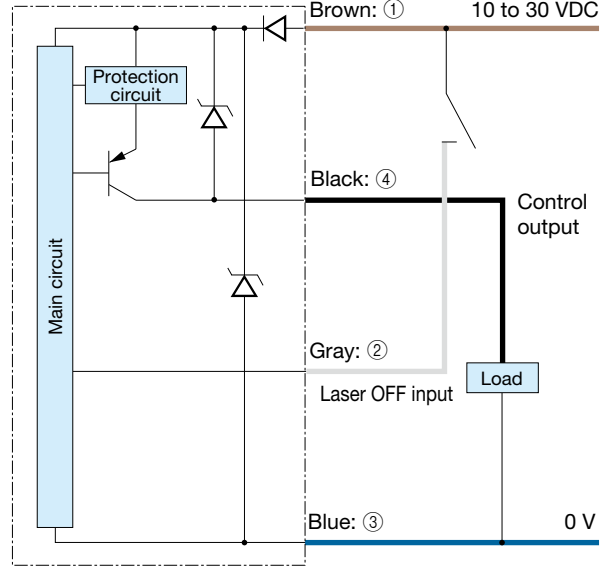
## I/O circuit diagram

Laser type: **BGS-ZL10□/BGS-ZL30□**

### ■ NPN output type

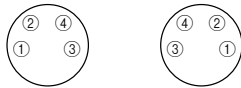


### ■ PNP output type



### ■ Connector type

(Pin configuration) Sensor side Connector cable side



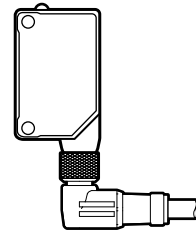
- ① 10 to 30 VDC
- ② Laser OFF input (laser type only)
- ③ 0 V
- ④ Control output

### Connecting

- ① to ④ are connector pin No.

### Notes

- Connect frame ground to the earth when the switching regulator is used for power supply.
- 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 in the drawing to the right when you use L-shaped connector cable. Be aware that rotation is not possible.



## Laser light precautions

This product emits a Class 1 (II) visible laser beam that is compliant with IEC/JIS, FDA laser safety standards.

Warning and explanation labels are affixed to the sides of the sensor.

**CLASS 1  
LASER PRODUCT**

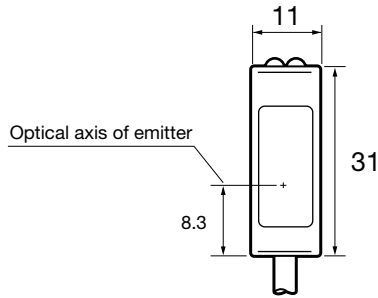
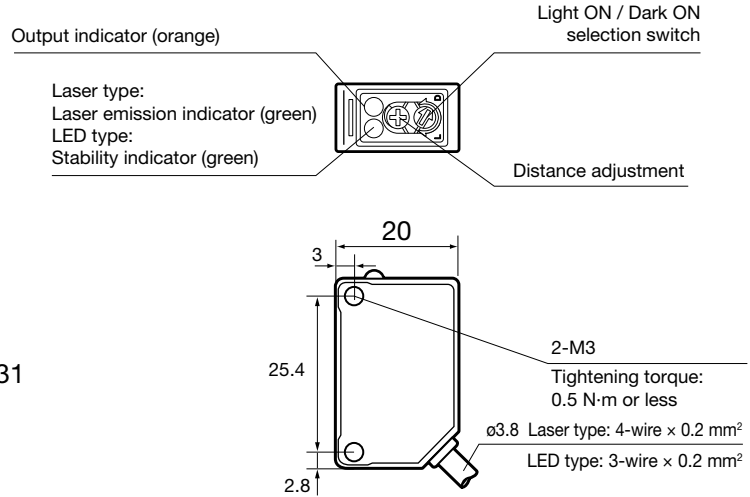
**Warning** Do not look directly at the laser or intentionally shine the laser beam in another person's eyes.

## Dimensions

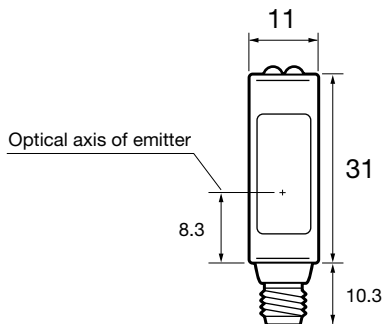
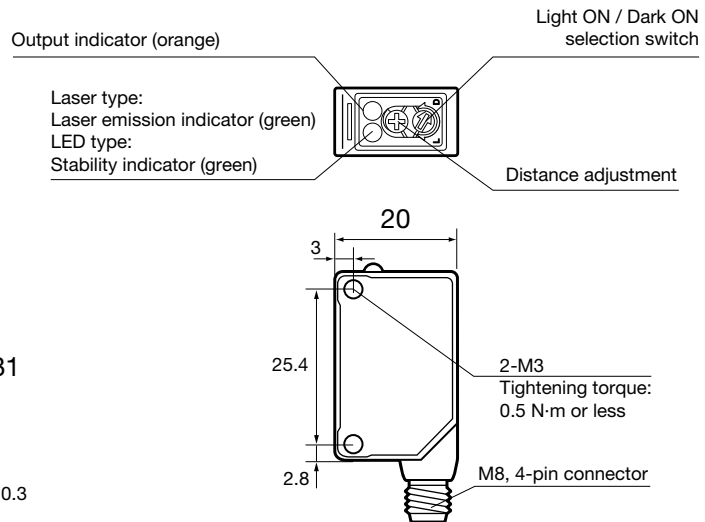
### Sensor

(Unit: mm)

#### ■ Cable type

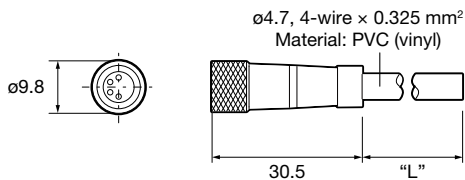


#### ■ Connector type

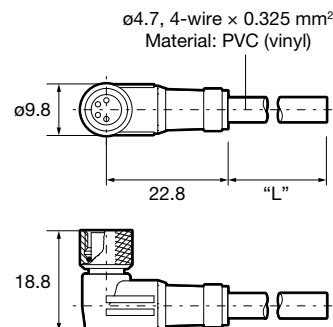


### Connector cable (optional)

#### ■ JCN-S, JCN-5S, JCN-10S



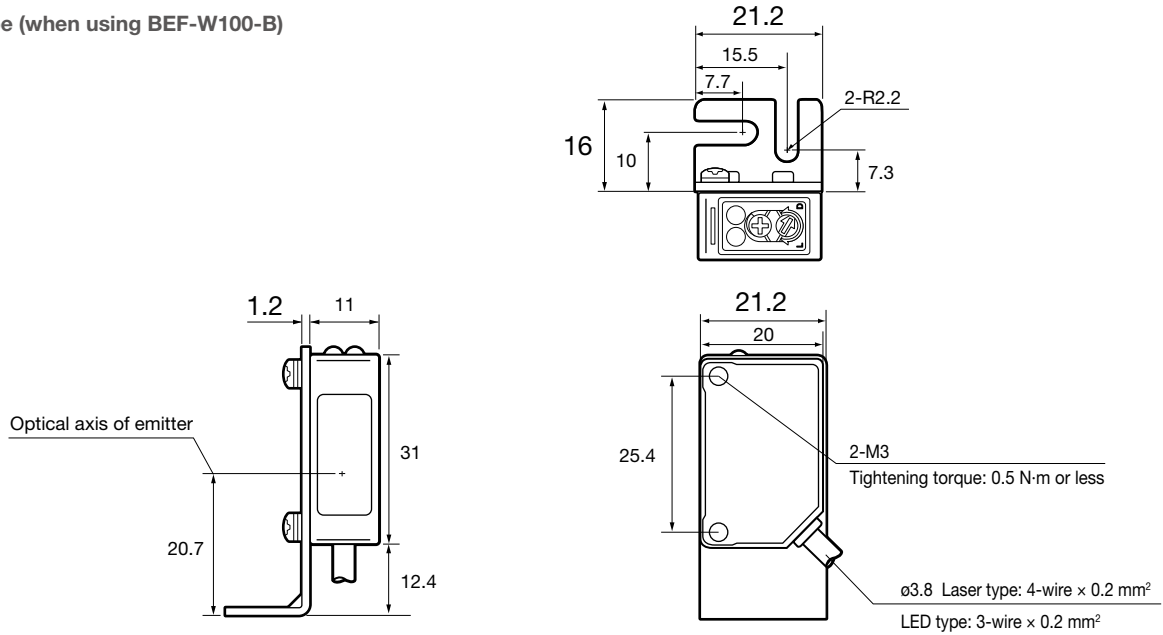
#### ■ JCN-L, JCN-5L, JCN-10L



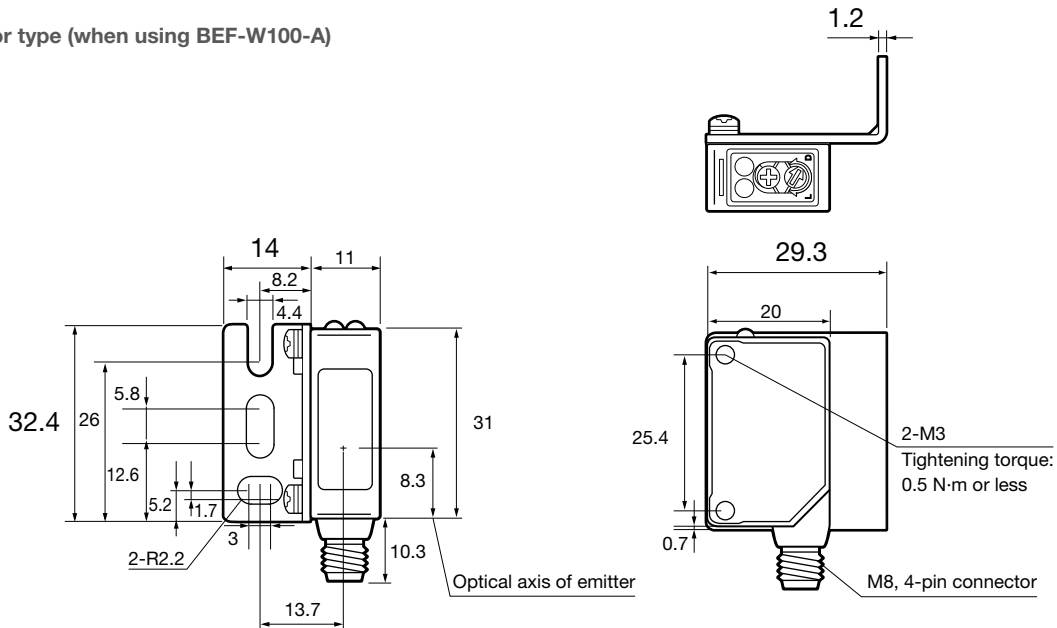
**Mounting bracket**

(Unit: mm)

■ Cable type (when using BEF-W100-B)



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



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BGS-ZM

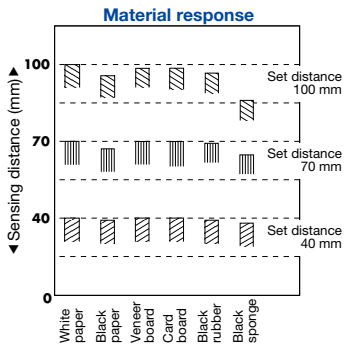
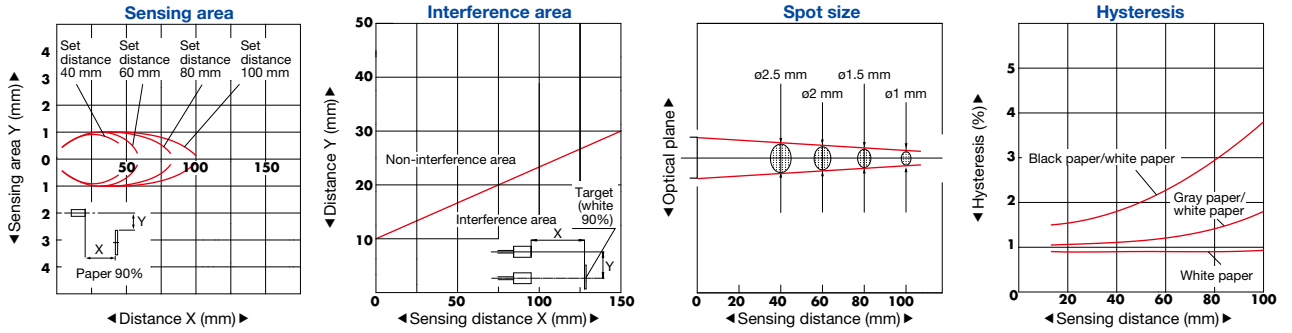
BGS-S, BGS-2S

BGS

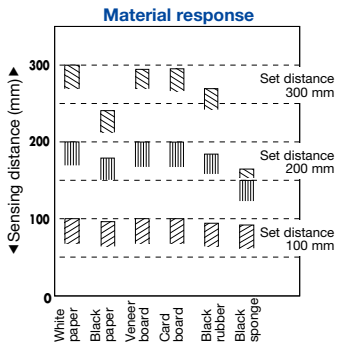
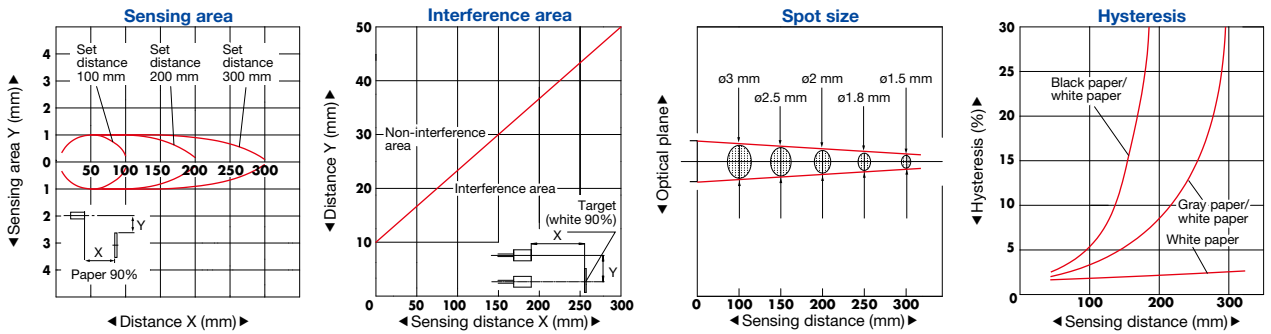
BGS-DL (potentiometer type)

Typical characteristic data

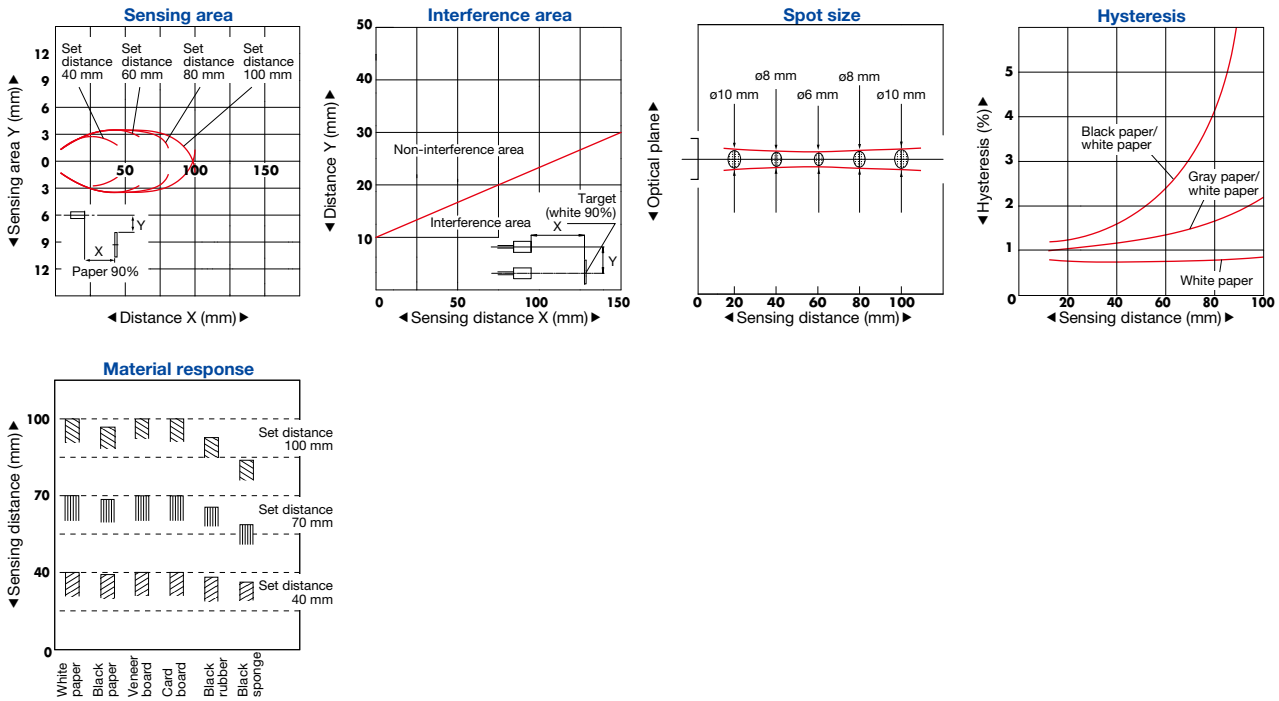
**BGS-ZL10** Laser type



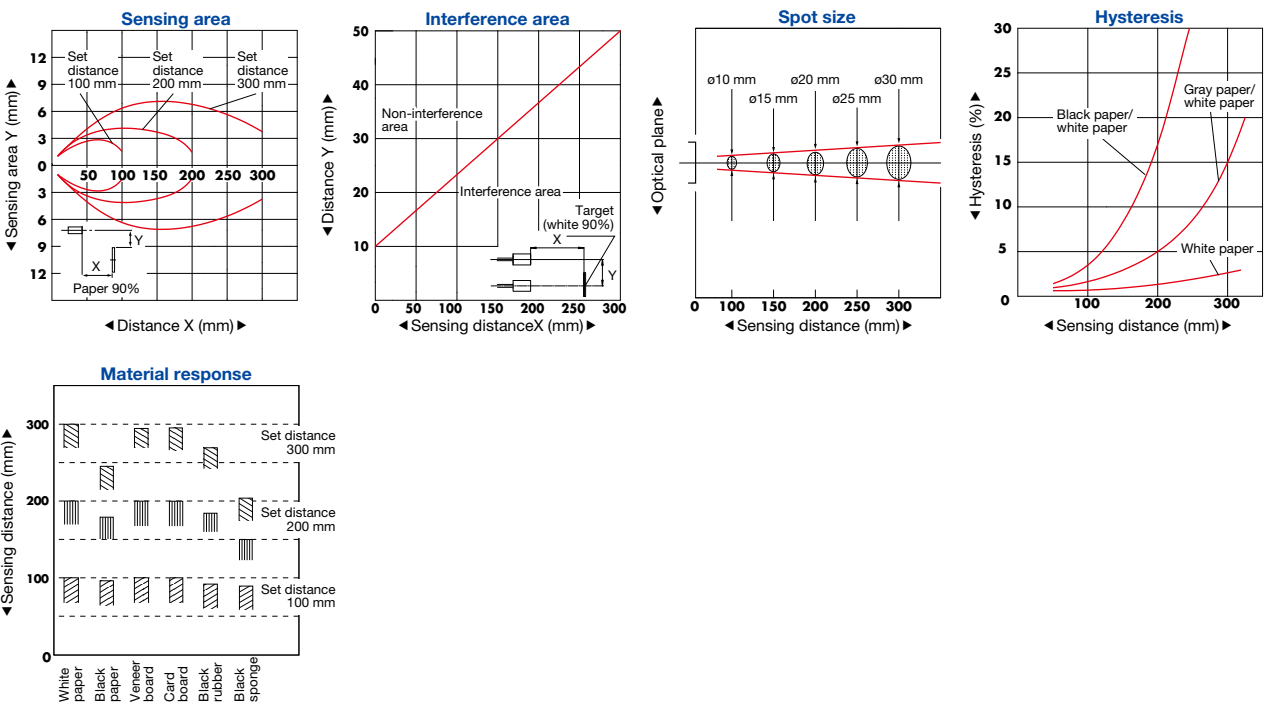
**BGS-ZL30** Laser type



**BGS-Z10** LED type



**BGS-Z30** LED type



Photoelectric Sensors

Specialized Photoelectric Sensors

Laser Displacement Sensors

BGS Sensors

BGS-HL, BGS-HDL

BGS-DL

BGS-ZL, BGS-Z

BGS-ZM

BGS-S, BGS-2S

BGS

BGS-DL (potentiometer type)