




C-MOS laser type

BGS-DL series


CE

High detection stability by using C-MOS element

- | C-MOS linear image sensor
- | “SEN” automatic sensitivity control function
- | Equipped with FGS mode

Related products
Higher accuracy
BGS-HL,
BGS-HDL
 ● P.310
 
Height/width measurement
LS
 ● P.454
 
Analog output
CD22
 ● P.464
 

Selection table

Type	Shape	Sensing distance (Adjustable distance range shown in parentheses)	Distance adjustment	Model (Models in parentheses are connector types)	
				NPN type	PNP type
C-MOS laser		20 to 100 mm (40 to 100 mm)	Teaching + Manual adjustment	BGS-DL10TN (BGS-DL10TCN)	BGS-DL10TP (BGS-DL10TCP)
		20 to 250 mm (100 to 250 mm)	Teaching + Manual adjustment	BGS-DL25TN (BGS-DL25TCN)	BGS-DL25TP (BGS-DL25TCP)

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

Options/Accessories

Connector cables

Straight



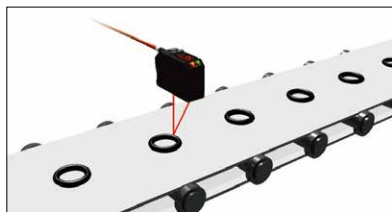
JCN-S
Cable length: 2 m
JCN-5S
Cable length: 5 m
JCN-10S
Cable length: 10 m

L-shaped



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

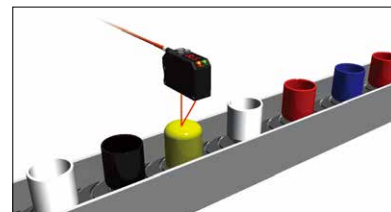
Confirmation of rubber gasket passage

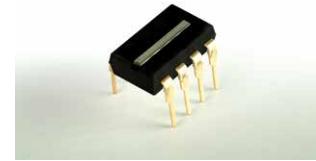


Confirmation of retort pouch passage



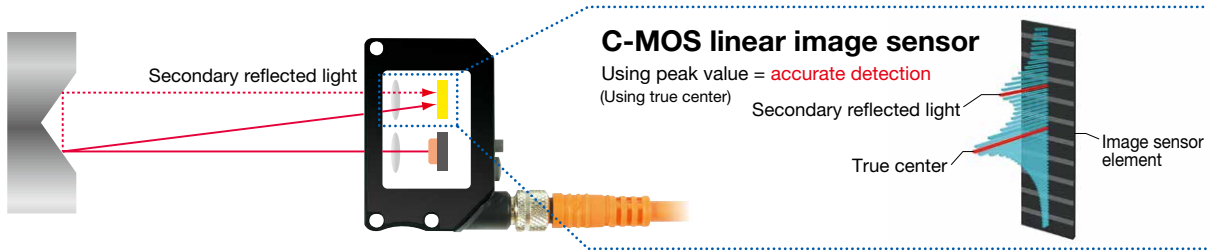
Cosmetic container cap orientation detection





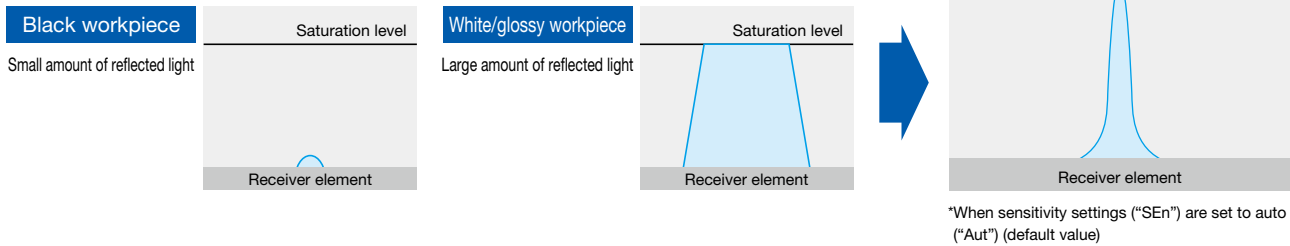
Industry's first! C-MOS linear image sensor*As a distance setting type. Optex FA examination performed August 2003.

With the linear image sensor method, the position at which reflected light is received most along a row of elements arranged in a straight line can be accurately detected. By accurately detecting the peak value of a received light waveform, any errors caused by the color of a workpiece or any surface roughness can be shut out.



“SEN” automatic sensitivity control function

Sensitivity is automatically adjusted to the optimal level in accordance with the amount of light received by the sensor. Sensitivity is automatically increased for black-colored surfaces with low levels of reflected light and is automatically decreased for white or glossy surfaces with high levels of reflected light. Stable detection is also possible for glossy surfaces in which light levels undulate and are not constant. (Response time: Max. 14 ms)



FGS mode Foreground Suppression

Features a FGS mode in which the principals of retro-reflective types are applied to the FGS types. Because light is normally received from the background (Ex.: white conveyor belt) and operation occurs due to shading from workpieces, these sensors are optimal for slightly black workpieces or glossy workpieces, as well as rough workpieces, etc.

<p>If setting using the conveyor, light will enter into the limited area of the light receiving element, and the output will be in an OFF state.</p>	<p>When workpieces pass on the conveyor near the sensor, light will not enter into the limited area of the light receiving element, resulting in an ON state.</p>	<p>Will be in ON state even in the case of low-reflectivity workpieces in which light does not return.</p>	<p>Will be in ON state even in the case of rough and glossy workpieces in which light is reflected.</p>

*A bright background is necessary when in FGS mode.

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

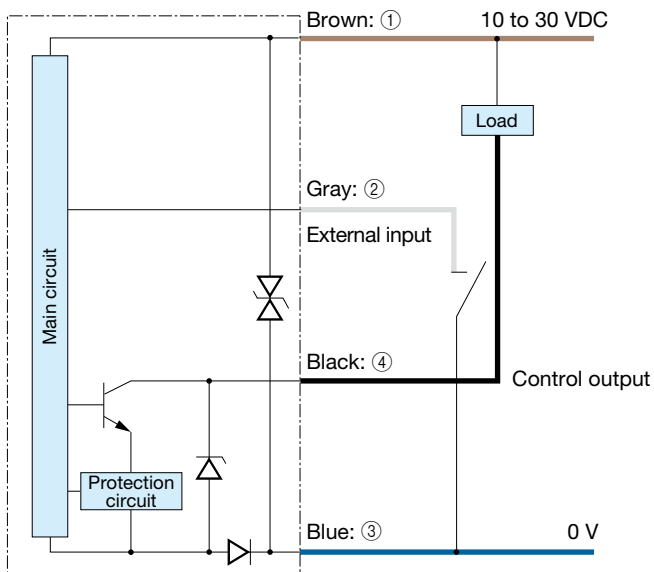
Type		C-MOS laser sensors		
Model	NPN	Cable type	BGS-DL10TN	BGS-DL25TN
		Connector type	BGS-DL10TCN	BGS-DL25TCN
	PNP	Cable type	BGS-DL10TP	BGS-DL25TP
		Connector type	BGS-DL10TCP	BGS-DL25TCP
Sensing distance		20 to 100 mm ^{*1}	20 to 250 mm ^{*1}	
Adjustable distance range		40 to 100 mm ^{*1}	100 to 250 mm ^{*1}	
Light source		Red semiconductor laser Class 2 (IEC/JIS) ^{*2} Wavelength: 650 nm Pulse width: 300 μs Maximum output: 1 mW		
Spot size		Approx. ø1 mm At distance of 80 mm	Approx. ø2 mm At distance of 200 mm	
Response time		1.5 ms (when sensitivity is fixed), Max. 14 ms (when sensitivity is in Auto)		
Hysteresis		3% or less	10% or less	
Distance adjustment		Teaching type		
Threshold adjustment		Manual adjustment is possible after teaching		
Indicators		Output indicator (orange) Laser emission indicator (green)		
Digital display		7-segment, 3-digit display		
Control output		NPN/PNP open collector Max. 100 mA/30 VDC		
External input		Laser OFF input or teaching input (selectable by setting)		
Timer function		ON delay / OFF delay /One-shot 0 to 999 ms (setting is possible in 1 ms increments), 1 to 10 s (setting is possible in 1 s increments)		
Output mode		Light ON / Dark ON selectable by setting		
Connection type		Cable type: Cable length: 2 m (ø4 mm) / Connector type: M8, 4-pin		
Insulation resistance		20 MΩ or more (with 500 VDC)		
Rating	Supply voltage	10 to 30 VDC, including 10% ripple (p-p)		
	Current consumption	50 mA max (12 V), 35 mA max (24 V)		
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 +40°C / 35 to 85% RH		
	Ambient illuminance	Sunlight: 10,000 lx or less Incandescent light: 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. 50 G (500 m/s ²); 3 times in each of the X, Y, and Z directions		
	Degree of protection	IP67		
Material		Housing: ABS Front cover: PMMA		
Weight without cable		Approx. 20 g (excluding cable)		
Included accessories		Mounting bracket: BEF-WK-190		

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

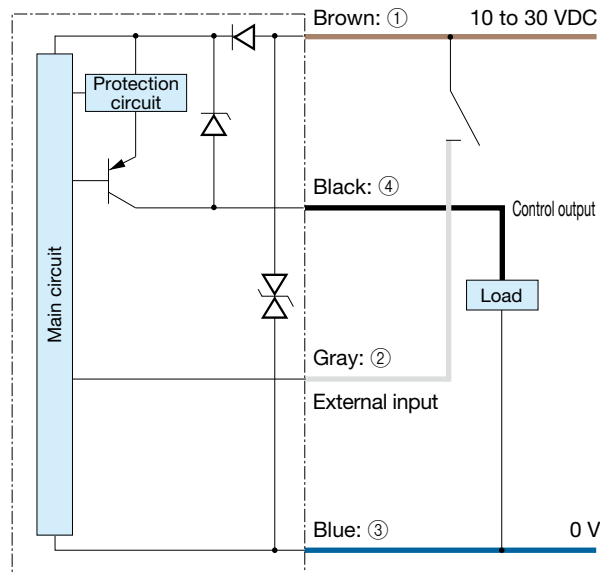
*2. Classified as Class II in the US FDA standards.

I/O circuit diagram

NPN output type



PNP output type



*When using the FGS function with a background, this will be OFF during workpiece detection with Light ON, and ON when detecting with Dark ON.

Connector type

(Pin configuration) Sensor side Connector cable side



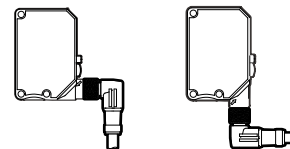
- ① 10 to 30 VDC
- ② External input
- ③ 0 V
- ④ Control output

Connecting

- When not used for external input, cut the lead wire and wrap it individually with insulating tape, and do not connect it to any other terminal.
- 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 the drawing below when you use L-shaped connector cable. Be aware that rotation is not possible.



Distance adjustment

1-point teaching	Order	Diagram	Teaching procedure
	1	<p>The ON point is set as directly in front of the background.</p>	While in a status with no workpiece (background), press the Teaching button until "1 PT" is shown in the display. (Approx. 2 sec.)
2		The current value will be shown in the display, completing distance settings.	

● To adjust threshold using the buttons, press the Up or Down button one time. Doing so will result in the status display showing the threshold, which can be adjusted when flashing by using the Up and Down buttons. Pressing Teaching Mode will result in a return to Run Mode. (Even if Teaching Mode is not pressed, a return to Run Mode will occur after 10 sec.)

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BGS-DL

BGS-ZL, BGS-Z

BGS-ZM

BGS-S, BGS-2S

BGS

BGS-DL (potentiometer type)

Dimensions

Sensor

■ Cable type

(Unit: mm)

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BGS-HDL

BGS-DL

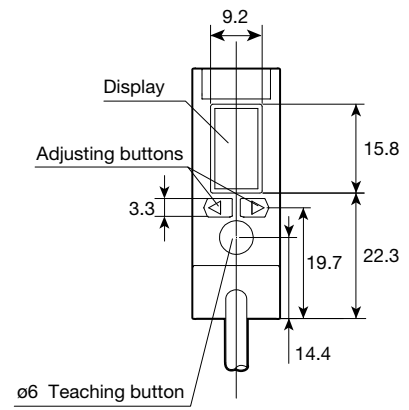
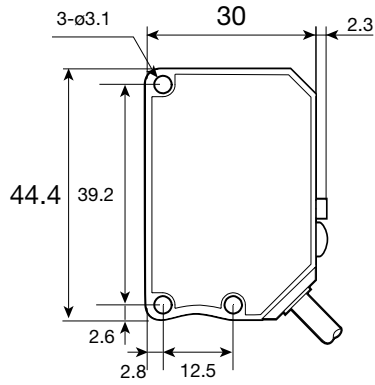
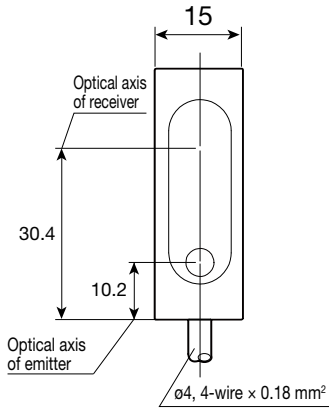
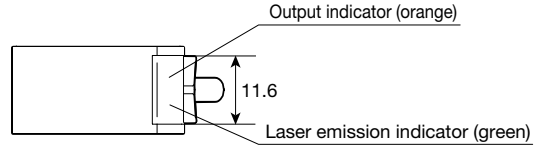
BGS-ZL,
BGS-Z

BGS-ZM

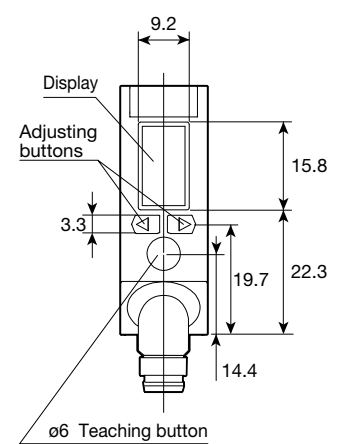
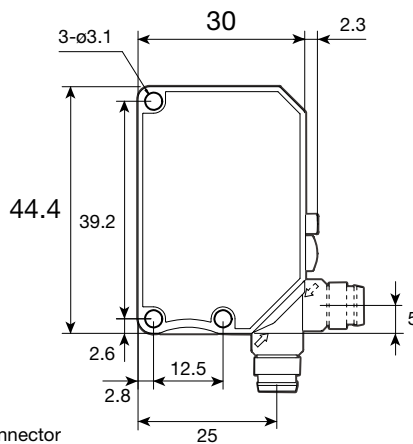
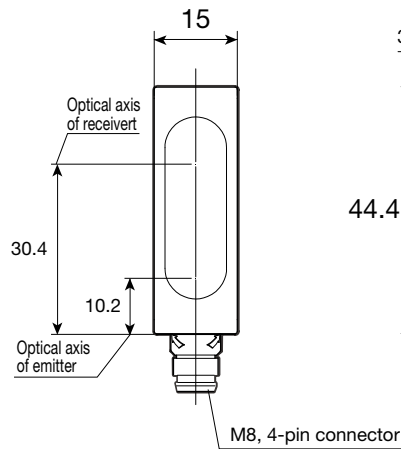
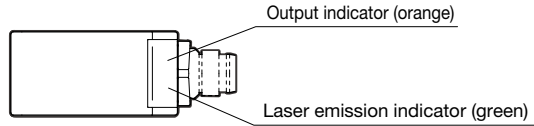
BGS-S,
BGS-2S

BGS

BGS-DL
(potentiometer type)



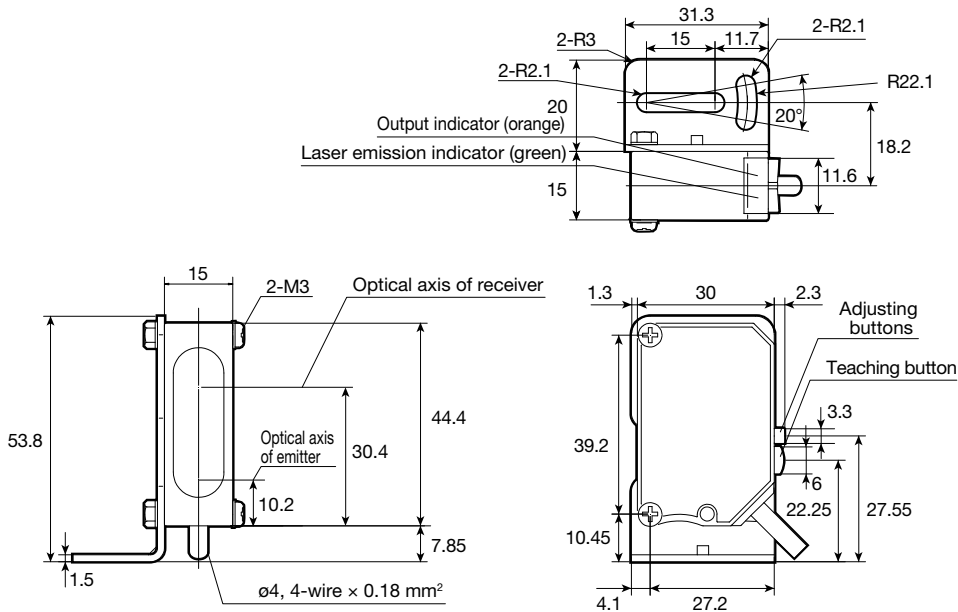
■ Connector type



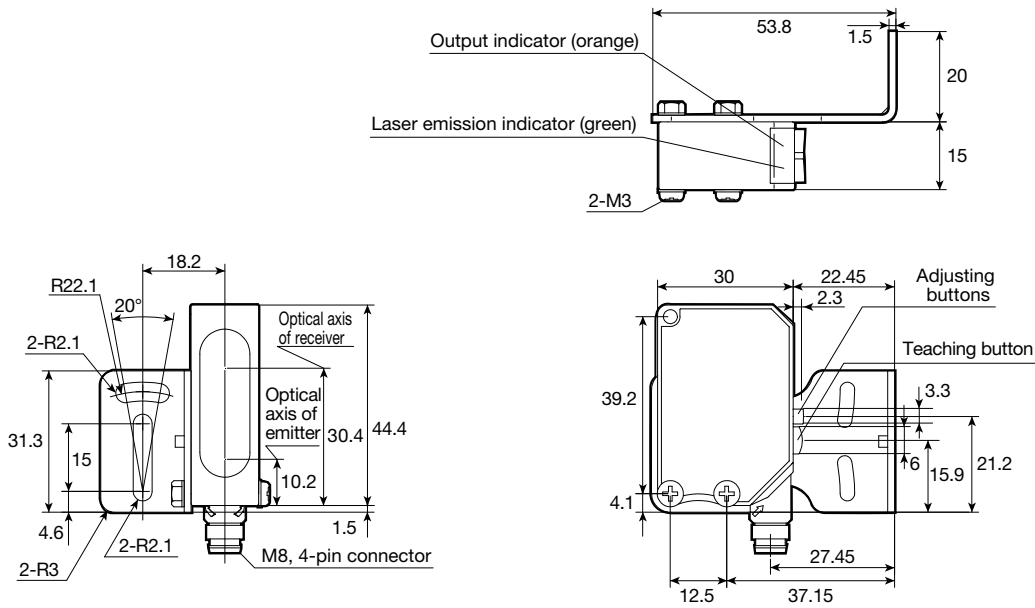
Mounting bracket

(Unit: mm)

■ Cable type



■ Connector type



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BGS

BGS-DL (potentiometer type)

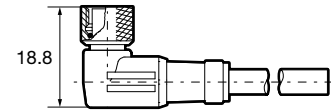
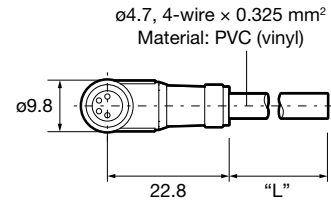
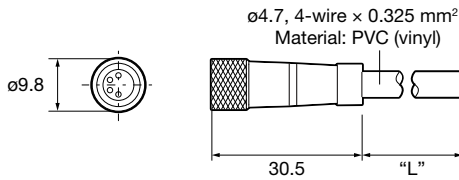
Dimensions

Connector cable (optional)

(Unit: mm)

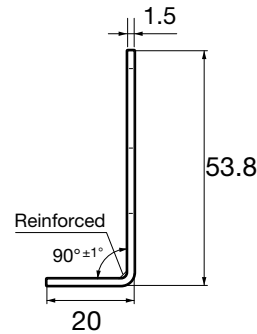
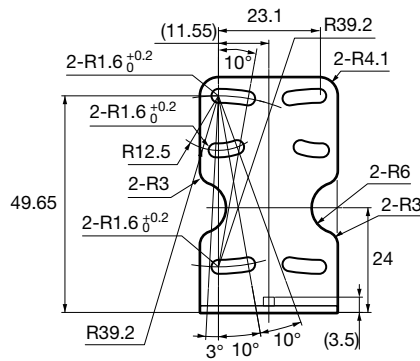
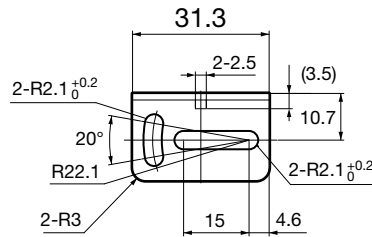
■ JCN-S, JCN-5S, JCN-10S

■ JCN-L, JCN-5L, JCN-10L



Mounting bracket

■ BEF-WK-190 (included)



Notes for sensor usage

This product emits a Class 2 (II) visible laser beam that is compliant with JIS C6802/IEC/FDA laser safety standards. Warning and explanation labels are affixed to the sides of the sensor.



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.

Laser aperture

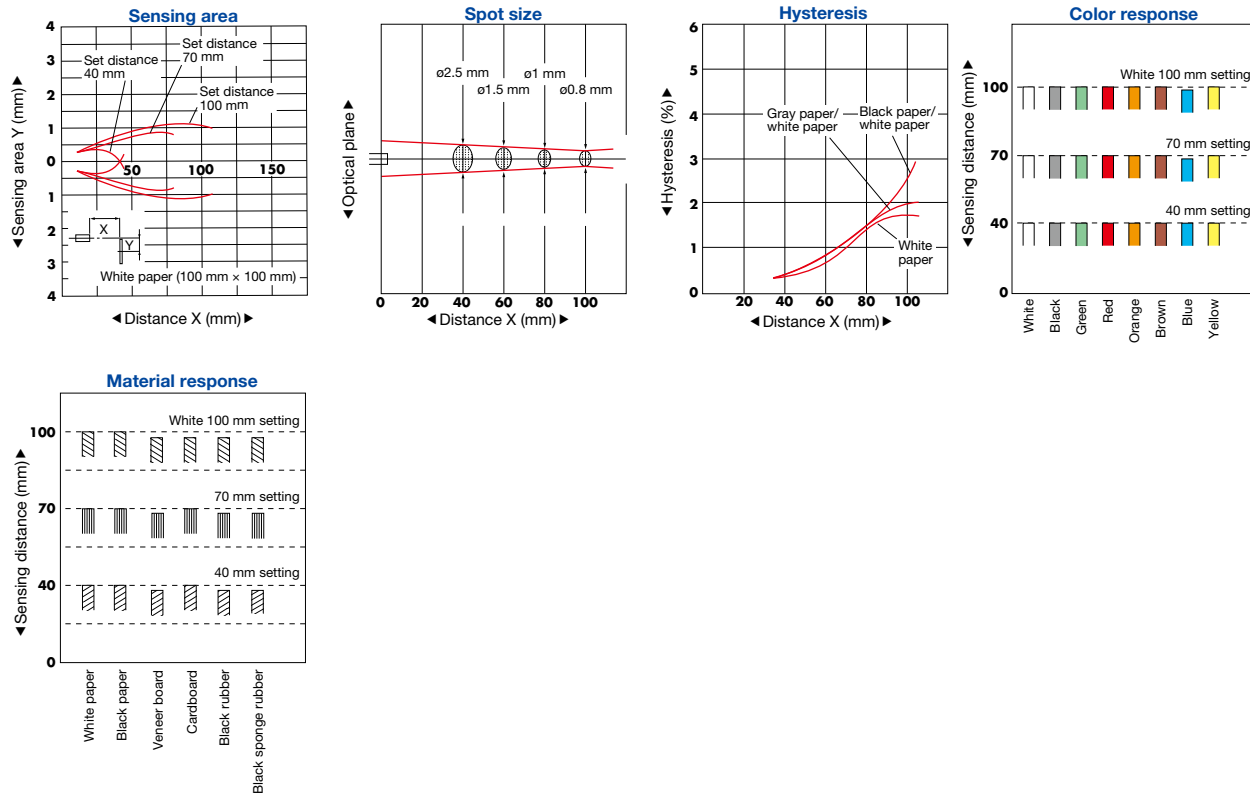


Laser beam
Do not stare into the beam.
Max. output: 1 mW (Pulse width) 300 μs
Wavelength: 650 nm
CLASS 2 LASER PRODUCT
(JIS C 6802-1997)

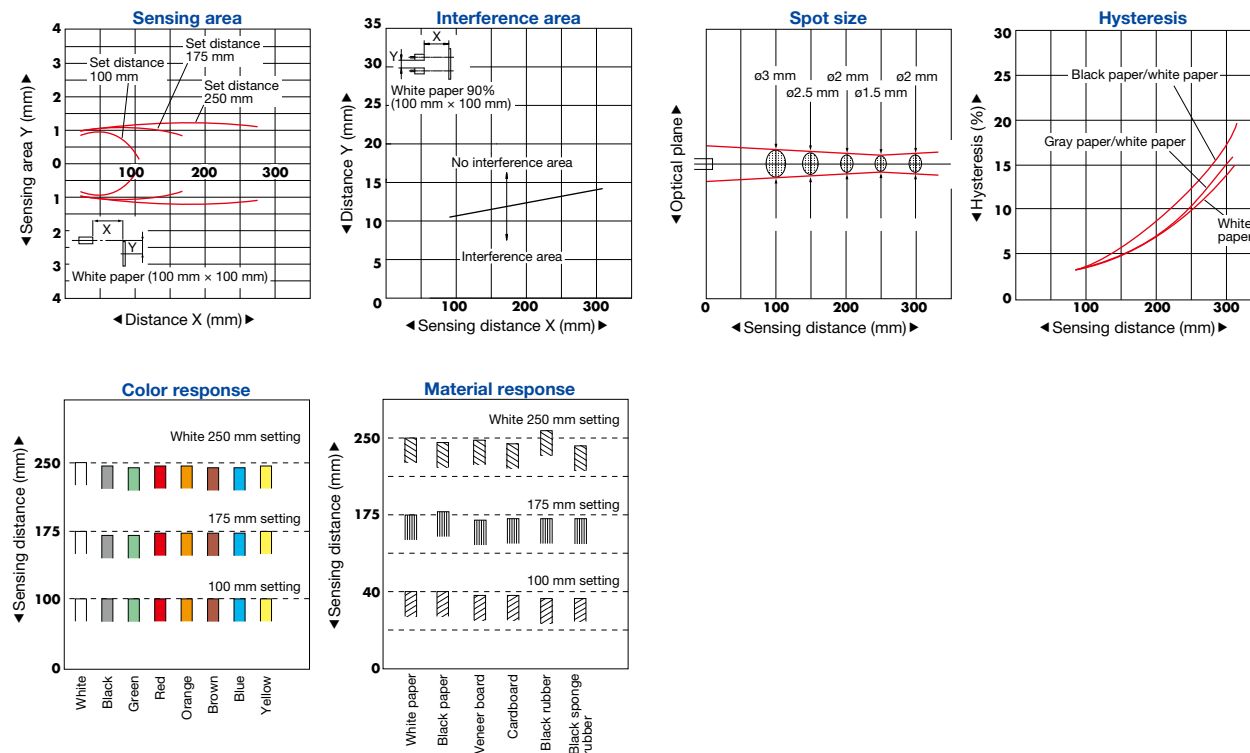
BGS-DL25T
BGS-DL10T

Typical characteristic data

BGS-DL10



BGS-DL25T



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BGS

BGS-DL (potentiometer type)