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 BGS-H, BGS-HDL
- Universal voltage type BGS-2V
- Transparent object detection Z3R-Q

### Selection table

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

*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

**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

**Laser type application**
- Meander detection of sheet materials

**LED type application**
- Detection of multi-colored trays
- 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 ø1 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 ≤ 3% (typical value)
A short-range type with a sensing distance of 100 mm that achieves a low hysteresis of ≤ 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 ≤ 5%.

Industry standard size
Mounting hole pitch: 25.4 mm
Features an industry standard pitch of 25.4 mm.
# Specifications

<table>
<thead>
<tr>
<th>Type</th>
<th>Short-range type (laser)</th>
<th>Mid-range type (laser)</th>
<th>Short-range type (LED)</th>
<th>Mid-range type (LED)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NPN</td>
<td>Cable type</td>
<td>BGS-ZL10N</td>
<td>BGS-ZL10N</td>
<td>BGS-Z30N</td>
</tr>
<tr>
<td></td>
<td>Connector type</td>
<td>BGS-ZL10CN</td>
<td>BGS-ZL30CN</td>
<td>BGS-Z10CN</td>
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<tr>
<td>PNP</td>
<td>Cable type</td>
<td>BGS-ZL10P</td>
<td>BGS-ZL10P</td>
<td>BGS-Z30P</td>
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<tr>
<td></td>
<td>Connector type</td>
<td>BGS-ZL10CP</td>
<td>BGS-ZL30CP</td>
<td>BGS-Z10CP</td>
</tr>
<tr>
<td>Sensing distance</td>
<td>5 to 100 mm*1</td>
<td>10 to 300 mm*1</td>
<td>5 to 100 mm*1</td>
<td>10 to 300 mm*1</td>
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<tr>
<td>Adjustable range</td>
<td>20 to 100 mm*1</td>
<td>50 to 300 mm*1</td>
<td>20 to 100 mm*1</td>
<td>50 to 300 mm*1</td>
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<tr>
<td>Light source</td>
<td>Red semiconductor laser</td>
<td>Class 1 (IEC/JIS)*2</td>
<td>Red LED</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wavelength: 650 nm, Max output: 3.5 mW</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spot size (focal length)</td>
<td>Approx. ø1 mm³</td>
<td>Approx. ø1.5 mm³</td>
<td>Approx. ø10 mm</td>
<td>Approx. ø30 mm</td>
</tr>
<tr>
<td></td>
<td>Distance: 100 mm</td>
<td>Distance: 300 mm</td>
<td>Distance: 100 mm</td>
<td>Distance: 300 mm</td>
</tr>
<tr>
<td>Response time</td>
<td>250 µs or less</td>
<td>500 µs or less</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hysteresis</td>
<td>3%</td>
<td>5%</td>
<td>3%</td>
<td>5%</td>
</tr>
<tr>
<td>Distance adjust</td>
<td>4-turn endless potentiometer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indicators</td>
<td>Output indicator (orange)</td>
<td>Laser emission indicator (green)</td>
<td>Output indicator (orange)</td>
<td>Stability indicator (green)</td>
</tr>
<tr>
<td>Control output</td>
<td>NPN/PNP type open collector</td>
<td>Max. 100 mA/30 VDC</td>
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<td></td>
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<tr>
<td>Output mode</td>
<td>Light ON / Dark ON selectable</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Connection type</td>
<td>Cable type: Cable length: 2 m ø3.8 mm / Connector type: M8, 4-pin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rating</td>
<td>Supply voltage</td>
<td>10 to 30 VDC, including 10% ripple (p-p)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current consumption</td>
<td>30 mA or less</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Applicable regulations</td>
<td>EMC directive (2004/108/EC) / FDA regulations (21 CFR 1040.10)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Applicable standards</td>
<td>EN 60947-5-2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Company standards</td>
<td>Noise resistance: Feilen Level 3 cleared</td>
<td></td>
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<td></td>
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<tr>
<td>Ambient temperature/ humidity</td>
<td>-10 to +50°C (no freezing) 35 to 85% RH (no condensation)</td>
<td>-25 to +55°C (no freezing) 35 to 85% RH (no condensation)</td>
<td></td>
<td></td>
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<tr>
<td>Ambient illuminance</td>
<td>Sunlight: 10,000 lx Incandescent lamp: 3,000 lx</td>
<td></td>
<td></td>
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<tr>
<td>Vibration resistance</td>
<td>10 to 55 Hz; double amplitude 1.5 mm; 2 hours in each of the X, Y, and Z directions</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Shock resistance</td>
<td>Approx. 50 G (500 m/s²); 3 times in each of the X, Y, and Z directions</td>
<td>Approx. 100 G (1000 m/s²); 3 times in each of the X, Y, and Z directions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP67</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Material</td>
<td>Housing: ABS (glass fiber filled), Front cover: PMMA</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Weight without cable</td>
<td>Approx. 10 g</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Included accessories</td>
<td>Mounting bracket: BEF-W100-B*4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*1. Using a 100 x 100 mm white sheet of paper.
*2. Classified as Class II in the US FDA standards.
*3. Defined with center strength 1/e² (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.
Laser, standard type BGS-ZL, BGS-Z series

I/O circuit diagram

Laser type: BGS-ZL10□/BGS-ZL30□

- NPN output type
  - Brown: ① 10 to 30 VDC
  - Gray: ② Laser OFF input (equipped to laser types)
  - Black: ④
  - Blue: ③ 0 V

- PNP output type
  - Brown: ① 10 to 30 VDC
  - Gray: ② Laser OFF input
  - Black: ④
  - Blue: ③ 0 V

Connecting

- ① to ③ 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.

⚠️ Warning  Do not look directly at the laser or intentionally shine the laser beam in another person’s eyes.
Laser, standard type BGS-ZL, BGS-Z series

Dimensions

Sensor

- Cable type

  - Laser type: 4-wire × 0.2 mm²
  - LED type: 3-wire × 0.2 mm²
  - Tightening torque: 0.5 N·m or less
  - Material: PVC (vinyl)

- Connector type

  - Laser type: Laser emission indicator (green)
  - LED type: Stability indicator (green)

Connector cable (optional)

- JCN-S, JCN-5S, JCN-10S

- JCN-L, JCN-5L, JCN-10L

Material: PVC (vinyl)
Laser, standard type **BGS-ZL, BGS-Z** series

**Mounting bracket**

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

- **Cable type (when using BEF-W100-B)**

**Optical axis of emitter**

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

- **Mounting bracket**

**Specialized Photoelectric Sensors**

- **Laser Sensing Sensors**
- **BGS Sensors**
  - **BGS-HL, BGS-HDL**
  - **BGS-DL**
  - **BGS-ZL, BGS-Z**
  - **BGS-ZM**
  - **BGS-S, BGS-2S**
  - **BGS-DL (potentiometer type)**

**Tightening torque**: 0.5 N·m or less

- ø3.8 Laser type: 4-wire × 0.2 mm²
- LED type: 3-wire × 0.2 mm²

**M8, 4-pin connector**

- **Optical axis of emitter**

Width: 32.4 mm
Height: 12.4 mm
Depth: 38.2 mm

- **2-M3**
- **4-wire × 0.2 mm²**
- **3-wire × 0.2 mm²**

- **Units**: mm

- **Got Questions?** 1-800-280-6933
Laser, standard type BGS-ZL, BGS-Z series

Typical characteristic data

BGS-ZL10 Laser type

<table>
<thead>
<tr>
<th>Sensing area</th>
<th>Interference area</th>
<th>Spot size</th>
<th>Hysteresis</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>Y (mm)</td>
<td>Spot</td>
<td>Hysteresis</td>
</tr>
<tr>
<td>0</td>
<td>100</td>
<td>ø2.5 mm</td>
<td>0%</td>
</tr>
<tr>
<td>100</td>
<td>150</td>
<td>ø2 mm</td>
<td>1%</td>
</tr>
<tr>
<td>200</td>
<td>250</td>
<td>ø1.5 mm</td>
<td>2%</td>
</tr>
<tr>
<td>300</td>
<td>300</td>
<td>ø1 mm</td>
<td>3%</td>
</tr>
</tbody>
</table>

Material response

BGS-ZL30 Laser type

<table>
<thead>
<tr>
<th>Sensing area</th>
<th>Interference area</th>
<th>Spot size</th>
<th>Hysteresis</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>Y (mm)</td>
<td>Spot</td>
<td>Hysteresis</td>
</tr>
<tr>
<td>0</td>
<td>100</td>
<td>ø3 mm</td>
<td>0%</td>
</tr>
<tr>
<td>100</td>
<td>150</td>
<td>ø2.5 mm</td>
<td>1%</td>
</tr>
<tr>
<td>200</td>
<td>250</td>
<td>ø2 mm</td>
<td>2%</td>
</tr>
<tr>
<td>300</td>
<td>300</td>
<td>ø1.5 mm</td>
<td>3%</td>
</tr>
</tbody>
</table>

Material response