

# B5W-LB series

Light Convergent Reflective Sensor

## Light Convergent Reflective Type for Reduced Color and Material Susceptibility Reliable Detection of Shiny, Black or Transparent objects



- <Robustness of color>
  - Stable detection of shiny, black or transparent objects
  - Unaffected by backgrounds, meaning only the intended object is sensed accurately.
- <Robustness of the distance>
  - A wide sensing range to allow object shifting
- Robust design resistant to ambient lights
- Analog voltage output and digital output models are available
- 55 mm and 10 mm sensing distances are available



Be sure to read Safety Precautions on page 7.

## Model Number Legend

B5W-LB- ☐ ☐ ☐ ☐ -☐  
1. 2. 3. 4. 5.

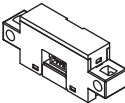
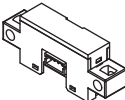
- |                    |                                   |                                       |                         |                                        |
|--------------------|-----------------------------------|---------------------------------------|-------------------------|----------------------------------------|
| 1. Size            | 2. Maximum sensing distance       | 3. Output                             | 4. Degree of protection | 5. Minimum number of deliverable units |
| 1: Super miniature | Super miniature                   | 0: Analog voltage                     | 1: Not supported        | 1: 1 piece                             |
| 2: Miniature       | 1: 10 mm<br>Miniature<br>1: 55 mm | 1: NPN / Light-ON<br>2: NPN / Dark-ON | 2: Supported            |                                        |

B  
5  
W  
L  
B

## Ordering Information

### Sensors (Dimensions→P.6)

☐ infrared

| Sensing method              | Appearance                                                                          | Size            | Connecting method | Output type           | Sensing distance                    | Operating mode | Model        | Minimum number of deliverable units (Unit: pieces) |
|-----------------------------|-------------------------------------------------------------------------------------|-----------------|-------------------|-----------------------|-------------------------------------|----------------|--------------|----------------------------------------------------|
| Light Convergent Reflective |  | Super miniature | Connector         | NPN open collector    | <div><div></div>2 to 10 mm *</div>  | Light-ON       | B5W-LB1112-1 | 1                                                  |
|                             | Dark-ON                                                                             | B5W-LB1122-1    |                   |                       |                                     |                |              |                                                    |
|                             |  | Miniature       |                   | Analog voltage output | <div><div></div>10 to 55 mm *</div> | Light-ON       | B5W-LB2112-1 |                                                    |
|                             |                                                                                     |                 |                   |                       |                                     | Dark-ON        | B5W-LB2122-1 |                                                    |
|                             |  |                 |                   |                       | ---                                 | B5W-LB2101-1   |              |                                                    |

\* White paper

## Ratings and Specifications

## Digital output models

| Sensing method                              |             | Light Convergent Reflective                                                                                                                                                          |              |              |                         |              |
|---------------------------------------------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------|-------------------------|--------------|
| Item                                        | Model       | NPN output                                                                                                                                                                           | B5W-LB1112-1 | B5W-LB1122-1 | B5W-LB2112-1            | B5W-LB2122-1 |
| Sensing distance                            | White paper | 2 to 10 mm                                                                                                                                                                           |              |              | 10 to 55 mm             |              |
|                                             | Black paper | 3 to 8 mm                                                                                                                                                                            |              |              | 10 to 40 mm             |              |
| Non-sensing distance (White paper)          |             | 20 mm min.                                                                                                                                                                           |              |              | 85mm min.               |              |
| Minimum detectable object (reference value) |             | 0.05 mm dia.                                                                                                                                                                         |              |              | 0.15 mm dia.            |              |
| Differential travel                         |             | 20% max.                                                                                                                                                                             |              |              |                         |              |
| Light source (wavelength)                   |             | Infrared LED (850 nm)                                                                                                                                                                |              |              |                         |              |
| Power supply voltage                        |             | 24 VDC ±10%, including 10% ripple (p-p)                                                                                                                                              |              |              |                         |              |
| Current consumption                         |             | 15 mA max. (at 26.4 VDC)                                                                                                                                                             |              |              | 20mA max. (at 26.4 VDC) |              |
| Operating mode                              |             | Light-ON                                                                                                                                                                             | Dark-ON      |              | Light-ON                | Dark-ON      |
| Control output                              |             | Load power supply voltage: 26.4 VDC, load current: 50 mA max.<br>Residual voltage; 0.8 V max. at 50 mA load current and 0.32 V at 10 mA load current,<br>Open collector output (NPN) |              |              |                         |              |
| Indicator                                   |             | Not supported                                                                                                                                                                        |              |              |                         |              |
| Response time                               |             | Operate/reset: 1 ms max.                                                                                                                                                             |              |              |                         |              |
| Ambient illumination                        |             | Incandescent lamp: 3,000 lx max., Sunlight: 10,000 lx max.                                                                                                                           |              |              |                         |              |
| Ambient temperature range                   |             | Operating: -10 to +60°C, Storage: -25 to +80°C (with no icing or condensation)                                                                                                       |              |              |                         |              |
| Vibration resistance                        |             | 10 to 55 Hz, 1.5-mm double amplitude for 2 h each in X, Y, and Z directions                                                                                                          |              |              |                         |              |
| Shock resistance                            |             | 500 m/s <sup>2</sup> for 3 times each in X, Y, and Z directions                                                                                                                      |              |              |                         |              |
| Degree of protection                        |             | IEC IP50 (not including terminals)                                                                                                                                                   |              |              |                         |              |
| Connecting method                           |             | Connector models                                                                                                                                                                     |              |              |                         |              |
| Weight (unit only)                          |             | Approx 1.6 g                                                                                                                                                                         |              |              | Approx 3.4 g            |              |
| Material                                    | Case        | Polycarbonate (PC)                                                                                                                                                                   |              |              |                         |              |
|                                             | Lens        | Acrylic (PMMA)                                                                                                                                                                       |              |              |                         |              |
|                                             | Cover       | Polycarbonate (PC)                                                                                                                                                                   |              |              |                         |              |

## I/O Circuit Diagrams

## NPN output

| Model                                                                                    | Operating mode | Timing charts | Output circuit |
|------------------------------------------------------------------------------------------|----------------|---------------|----------------|
| <b>B5W-LB1112-1</b><br><b>B5W-LB1122-1</b><br><b>B5W-LB2112-1</b><br><b>B5W-LB2122-1</b> | Light-ON<br>ON |               |                |
|                                                                                          | Dark-ON<br>ON  |               |                |