

# Analog Laser Sensor

Catalog Number 45BRD-8JKB1-D4

**IMPORTANT** Save these instructions for future use.

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## Summary of Changes

This manual contains an update to the sensing beam Laser Class. The Laser Class changed from Class 2 to Class 1.

## Description

The 45BRD sensor analog output sensor is a Class 1 visible red laser sensor that provides exceptional resolution at an economical cost. This sensor uses the triangulation principle for precise measurement and has a small beam spot for small part detection and measurement. The sensor is self-contained in an IP67 enclosure and does not require any external control devices, which add cost and, require additional mounting space.

The 45BRD sensor is easily installed by mounting the sensor so that the target is within the operating range of the sensor. There are no additional adjustments for the sensor and the 0...10V output is scaled linearly over the range of the sensor (45...85 mm [1.77...3.35 in.]).

The 45BRD sensor is an excellent solution for precision noncontact measurement applications including: distance measurement, part profile, thickness measurement, hole depth, warpage, and position.

## Specifications

Attribute	45BRD-8JKB1-D4
Sensing beam	Visible red Class 1 laser, 670 nm
Spot size	<0.8 mm (0.03 in.) beam spot @ 65 mm (2.56 in.)
Sensing range	45...85 mm (1.77...3.35 in.) (blind zone 0...40 mm (0...1.57 in.))
Range of measurement	40 mm (1.57 in.)
Linearity	<1% ≤ 400 μm
Resolution	< 1% ≤ 400 μm
Temperature drift	18 μm/°C
Supply voltage	18...28V DC
Current consumption	≤35 mA @ 24V DC
Circuitry protection	Short circuit, overload, false pulse, transient noise, reverse polarity protection
Output type	Analog Output 0...10V DC
Output rating	3 mA max.
Response time	30 ms
Housing material	Plastic—ABS
Lens material	PMMA
Status indicators	Green: Power; Red: Lens contamination
Connection type	4-pin DC micro, 270° rotatable connector
Supplied accessories	None
Optional accessories	Cordsets, mounting brackets
Operating environment	IP67
Vibration	10...55 Hz, 1.5 mm (0.06 in.) amplitude; 3 planes; meets or exceeds IEC 60947-5-2
Shock	30 g (1.06 oz); 11 ms; meets or exceeds 60947-5-2
Operating temperature	0...45 °C (32...113 °F)
Approvals	UL, c-UL-us, and CE Marked for all applicable directives. For use with any listed (CYLV) cable assembly.

Read and understand the Installation Instructions before operating the sensor. Only qualified personnel can install the 45BRD sensor.

The 45BRD sensor is not a safety component as described by EU machine directives.

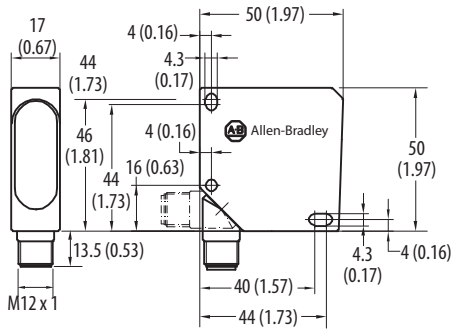
The 45BRD sensor can be mounted such that it is not directed at people (head height) and the beam path is terminated at the end of its functional path.

A laser label has been provided for you to attach to the sensor during installation.

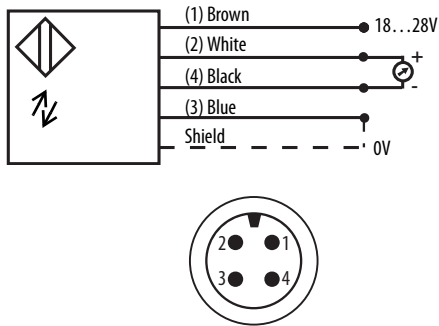
## Features

- Visible red Class 1 laser
- 20 μm (7 x 10<sup>-4</sup> in.) resolution
- 40 mm (1.57 in.) range of measurement
- 0...10V DC analog output
- IP67 enclosure
- 270° rotatable connector
- No user adjustments
- Contamination indicator
- Self-contained sensor

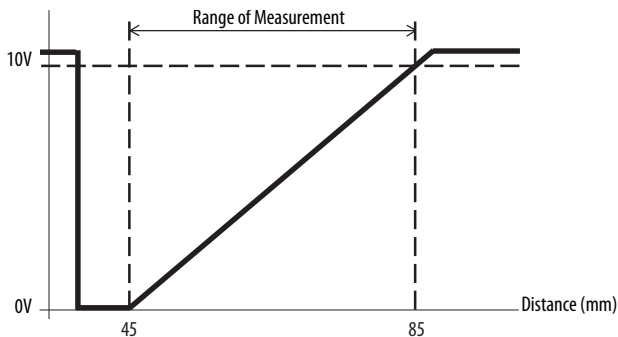
## Dimensions [mm (in.)]



## Wiring Diagram



## Analog Output

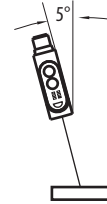


## Sensor Alignment

Position the 45BRD sensor so that the distance from the object to the sensor is within the sensing range of the sensor.

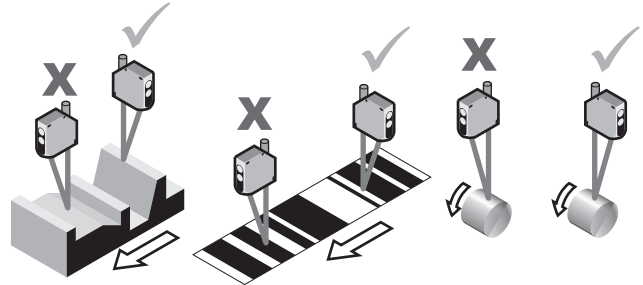
The sensor can be mounted at an angle of approximately 5° for reflective targets as shown in [Figure 1](#).

**Figure 1 - Sensor Alignment**



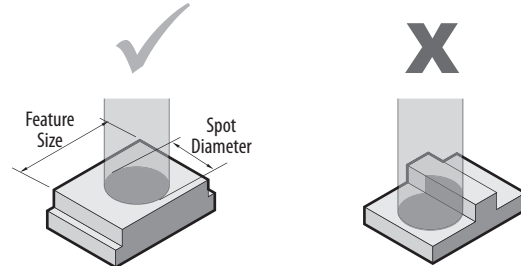
The sensor can be mounted perpendicular to the direction of travel for targets, which have steps, border lines, and round targets ([Figure 2](#)).

**Figure 2 - Mounting Recommendations**



The sensor provides more precision when the spot size is not larger than the feature that is being measured (see [Figure 3](#)).

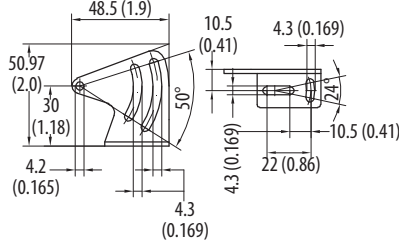
**Figure 3 - Special Considerations**



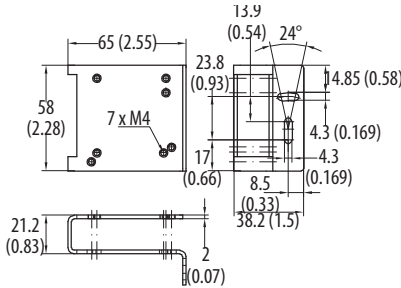
### Mounting

Securely mount the sensor on a firm, stable surface, or support for better operation. A mounting, which is subjected to excessive vibration or shift, can cause intermittent operation. The following mounting brackets are available for installation convenience and sensor protection. Once securely mounted, the sensor can be wired per the attached wiring diagram.

**Figure 4 - Mounting Bracket 45BPD-BKT1 [mm (in.)]**



**Figure 5 - Mounting Bracket 45BPD-BKT2 [mm (in.)]**




### Wiring

The 45BRD sensor is available with a micro quick-disconnect for ease of installation and maintenance. The connector can be rotated up to 270° to accommodate the installation of the sensor and its associated wiring. We recommend the use of the 889 Series of cordsets and patchcords for quick disconnect model sensors. All external wiring can conform to the National Electric Code and all applicable local codes.

### Application Notes

1. The sensor can be powered for approximately five minutes for maximum precision.
2. The sensor indicator is green when the unit is powered.
3. The sensor indicator is red if the lens becomes soiled or contaminated.
4. The precision of the sensor is dependent on the combined errors of linearity, resolution, and temperature drift.

### Accessories

Description	Cat. No.	
2 m (6.5 ft) Micro QD Cordset	889D-F4EC-2	
Mounting Bracket	45BPD-BKT1	—
Protective Mounting Bracket	45BPD-BKT2	—

### Micron Conversions

- 1 μm = 0.001 mm
- 1 μm = 0.000039 in.
- 25.4 μm = 0.001 in. (one thousandth)
- 20 μm = 0.00079 in. (0.79 thousandths)

# Rockwell Automation Support

Use the following resources to access support information.

<b>Technical Support Center</b>	Knowledgebase Articles, How-to Videos, FAQs, Chat, User Forums, and Product Notification Updates.	<a href="https://rockwellautomation.custhelp.com/">https://rockwellautomation.custhelp.com/</a>
<b>Local Technical Support Phone Numbers</b>	Locate the phone number for your country.	<a href="http://www.rockwellautomation.com/global/support/get-support-now.page">http://www.rockwellautomation.com/global/support/get-support-now.page</a>
<b>Direct Dial Codes</b>	Find the Direct Dial Code for your product. Use the code to route your call directly to a technical support engineer.	<a href="http://www.rockwellautomation.com/global/support/direct-dial.page">http://www.rockwellautomation.com/global/support/direct-dial.page</a>
<b>Literature Library</b>	Installation Instructions, Manuals, Brochures, and Technical Data.	<a href="http://www.rockwellautomation.com/global/literature-library/overview.page">http://www.rockwellautomation.com/global/literature-library/overview.page</a>
<b>Product Compatibility and Download Center (PCDC)</b>	Get help determining how products interact, check features and capabilities, and find associated firmware.	<a href="http://www.rockwellautomation.com/global/support/pcdc.page">http://www.rockwellautomation.com/global/support/pcdc.page</a>

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