

Installation Instructions

Bulletin 45BRD Analog Laser Sensor



IMPORTANT: SAVE THESE INSTRUCTIONS FOR FUTURE USE.

Description

The 45BRD analog output sensor is a Class 2 visible red laser sensor that provides exceptional resolution at an economical cost. This sensor utilizes the triangulation principle for precise measurement and has a small beam spot for small part detection and measurement. The sensor is completely self-contained in an IP 67 enclosure and does not require any external control devices which add cost and require additional mounting space.

The 45BRD can be easily set up by mounting the sensor such 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...85mm).

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

Features

- Visible red Class 2 laser
- 20 μm resolution
- 40 mm measuring range
- 0...10V DC analog output
- IP 67 enclosure
- 270° rotatable connector
- No user adjustments
- Contamination indicator
- Self-contained sensor

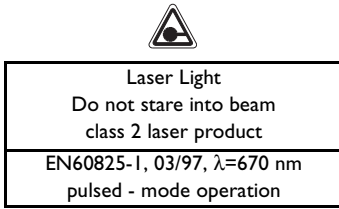
Specifications

Sensing Beam	Visible red Class 2 laser, 670 nm
Spot Size	<0.8 mm beam spot @ 65 mm
Sensing Range	45...85 mm
Measuring Range	40 mm
Linearity	<1%
Resolution	20 μm
Temperature Drift	18 $\mu\text{m}/^\circ\text{C}$
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
LED 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	IP 67
Vibration	10...55 Hz, 1.5 mm amplitude; 3 planes; meets or exceeds IEC 60947-5-2
Shock	30 g; 11 ms; meets or exceeds 60947-5-2
Operating Temperature—C (F)	0...45° (32...113°)
Approvals	UL, cULus and CE marked for all applicable directives

The Installation Instructions should be read and understood before operating the sensor.

The 45BRD sensor should only be installed by qualified personnel.

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

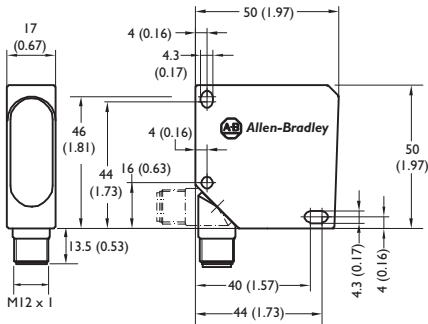


The 45BRD is a Class 2 laser product. There is a natural eye aversion when looking into the laser beam. Do not look directly into the laser beam or suppress the reflex to close your eyes.

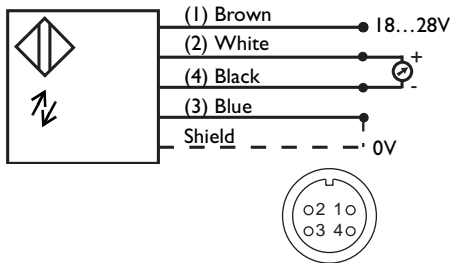
The 45BRD should be mounted such that it is not directed at people (head height) and the beam path is terminated at the end of its functional path.

The laser safety label on the 45BRD sensor should be visible after installation. A second label has been provided in the event that the attached label is covered due to the installation.

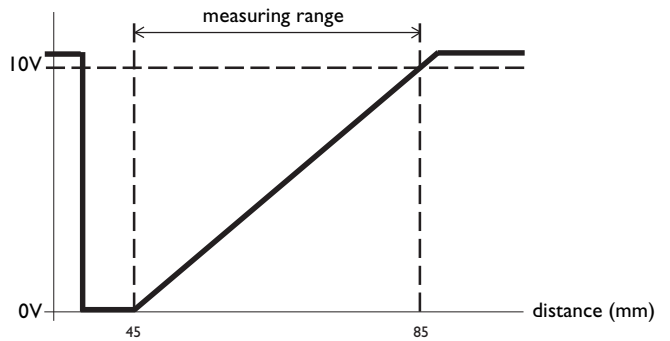
Dimensions--mm (inches)



Wiring Diagram



Analog Output



Sensor Alignment

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

The sensor should be mounted at an angle of approximately 5° for very reflective targets as shown in Figure 1.



Figure 1

The sensor should be mounted perpendicular to the direction of travel for targets which have steps, border lines, and round targets. See Figure 2 below.

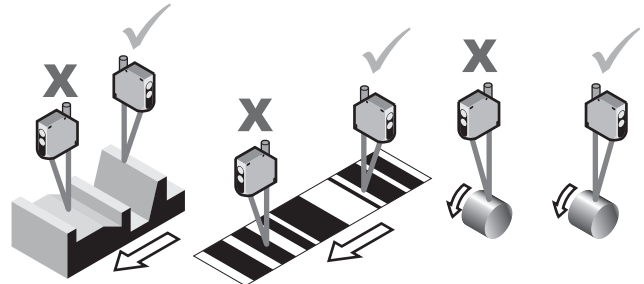


Figure 2

The sensor will provide more precision when the spot size is not larger than the feature that is being measured (see Figure 3).

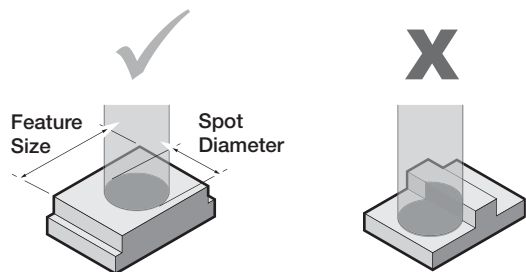


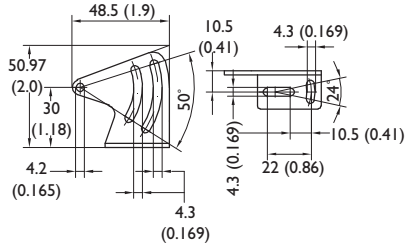
Figure 3

Mounting

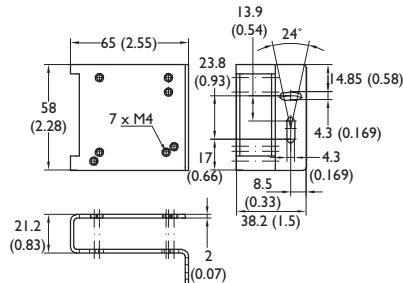
Securely mount the sensor on a firm, stable surface or support for reliable operation. A mounting which is subjected to excessive vibration or shifting may cause intermittent operation. The following mounting brackets are available for installation convenience and sensor protection. Once securely mounted,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

Mounting Bracket Dimensions—mm (inches)

45BPD-BKT1



45BPD-BKT2




Wiring

The 45BRD photoelectric 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. Rockwell Automation recommends the use of the 889 Series of cordsets and patchcords for quick disconnect model sensors. All external wiring should conform to the National Electric Code and all applicable local codes.

Application Notes

1. The sensor should be powered for approximately 5 minutes for maximum precision.
2. The sensor indicator LED is green when the unit is powered.
3. The sensor indicator LED will be 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.	
2m (6.5ft) 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 inches
25.4 μm	=	0.001 inches (one thousandth)
20 μm	=	0.00079 inches (0.79 thousandths)

Publication 75009-267-01(B)
[068-13805]
May 2006