Installation Instructions

Original Instructions

Allen-Bradley
by ROCKWELL AUTOMATION

42BT Long-Range Background Suppression Photoelectric Sensor

Catalog Numbers 42BT-B1LBSN-*x*, 42BT-B2LBSL-*x*

IMPORTANT Save these instructions for future use.

Summary of Changes

This publication contains the following new or updated information. This list includes substantive updates only and is not intended to reflect all changes.

Topic	Page
Updated Figure 9	3
Updated Specifications	3
Added Declaration of Conformity	3

Description

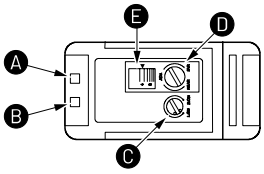
The 42BT family of long-range background suppression is designed for the reliable detection of objects while ignoring background reflectivity.

These sensors also provide consistent detection of objects regardless of color at a specifically taught distance.

Features

- Visible light source for ease of alignment on 1 m (3.3 ft) models
- Range indicator allows for an easy readout of the settings
- Adjustable range settings
- Two sensing ranges: 1 m (3.3 ft) and 2 m (6.6 ft)
- Highly visible status indicators
- Both NPN and PNP outputs
- Compact IP65-rated enclosure

Sensor User Interface



Item	Description
A	Margin status indicator
B	Output status indicator
C	Light operate (LO)/Dark Operate (DO) switch
D	Range adjustment selector
E	Range adjustment display

Status Indicators

Color	State	Description
Green	OFF	Low stability. Light intensity below 1.2X
	ON	High stability. Light intensity above 1.2X
Red	OFF	Output OFF
	ON	Output ON (1)

(1) The status indicator is ON when sensor is in light operate (LO) mode and a target is detected, the status indicator is OFF when the sensor is in dark operate (DO) mode and the target is detected.

Mount the Sensor

Securely mount the sensor on a firm, stable surface or support. An application that is subject to excessive vibration or shifting can cause intermittent operation. For installation convenience, we offer mounting brackets (see Accessories on page 2).

Figure 1 - Installation Considerations



IMPORTANT Due to the detection method, targets that travel horizontally to the sensor's optics are detected. Targets that travel vertically may not be accurately detected. For reliable background suppression, a minimum separation distance of 6 mm (0.24 in.) is recommended between the target and the background.

Sensor Adjustment

Once securely installed, the sensing range of the sensor must be set using the five-turn adjustment knob on the top of the sensor. This knob is used to set the suppression point of the sensor (the point at which the background is suppressed).

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Adjustment with Background Present

1. With an instrument screwdriver, adjust the suppression point to its minimum setting by turning the knob counterclockwise until a click is heard.
2. The background suppression cutoff point for the 42BT sensor can be set between 200 mm (7.9 in.) and a maximum of 2 m (6.6 ft) (depending on the model).
3. If a background is present up to the maximum rated distance (1 m [3.3 ft] for catalog number 42BT-B2LBSL-F4 and 2 m [6.6 ft] for catalog number 42BT-B1LBSN-F4), set the suppression point just before this background to allow detection of targets up to that point.
   a. First, rotate the knob clockwise until both status indicators (stability and output) turn ON. (a)
   b. Then, rotate the knob counterclockwise until both status indicators turn OFF. (b)
4. The sensor is now configured to detect targets between the sensor face and the suppression point.

IMPORTANT The reflectivity of the target and the background influence the detection capability of the sensor. Use the Typical Response Curves to help characterize the performance of the sensor.

Adjustment with No Background Present

1. Using an instrument screwdriver, adjust the suppression point to its minimum setting by turning the knob counterclockwise until a click is heard.
2. The background suppression cutoff point for the 42BT sensor can be set between 200 mm (7.9 in.) and a maximum of 2 m (6.6 ft) (depending on the model).
3. If no background is present up to the maximum rated distance (1 m [3.3 ft] for catalog number 42BT-B2LBSL-F4 and 2 m [6.6 ft] for catalog number 42BT-B1LBSN-F4), set the suppression point just after the target to be sensed.
   a. First, rotate the knob clockwise with the target present until both status indicators (stability and output) turn ON (a).
   b. Then, rotate the knob counterclockwise until both status indicator turn OFF (b). When using this method, verify that the green stability status indicator is ON.
4. The sensor is now configured to detect targets between the sensor face and the suppression point.

IMPORTANT The reflectivity of the target and the background influence the detection capability of the sensor. Use the Typical Response Curves to help characterize the performance of the sensor.

Accessories

Table 1 - Mounting Brackets

Description	Dimensions	Cat. No.
Stainless-steel vertical bracket	Figure 8 on page 3	61-6738
Stainless-steel horizontal bracket	Figure 9 on page 3	61-6739

(a) Selector switch in light operate (LO) mode. For dark operate (DO) mode, the stability status indicator turns ON and output status indicator turns OFF.

(b) Selector switch in light operate (LO) mode. For dark operate (DO) mode, the stability status indicator turns OFF and output status indicator turns ON.

Wiring Diagrams

The quick-disconnect connector is shown in the following diagrams. The pin numbers correspond to plug connectors on the sensor.

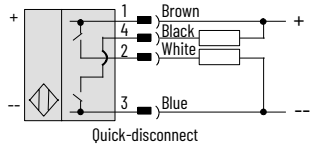
Figure 2 - Micro (M12) Plug QD on Pigtail



Figure 3 - Pico (M8) Plug QD on Pigtail



Figure 4 - NPN and PNP Outputs



Typical Response Curves

The following diagrams show the detection distance for a 150 x 150 mm (5.9 x 5.9 in.) color target (matte surface).

Figure 5 - Cat. No. 42BT-B2LBSL-x — Background Suppression 1 m (3.3 ft)

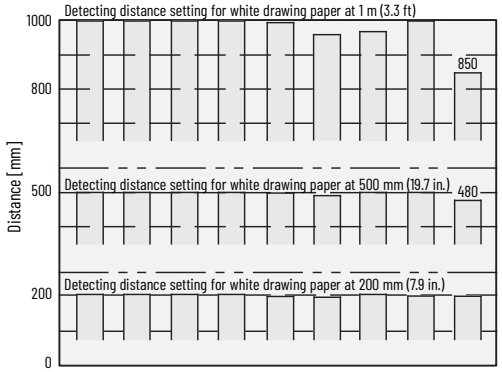
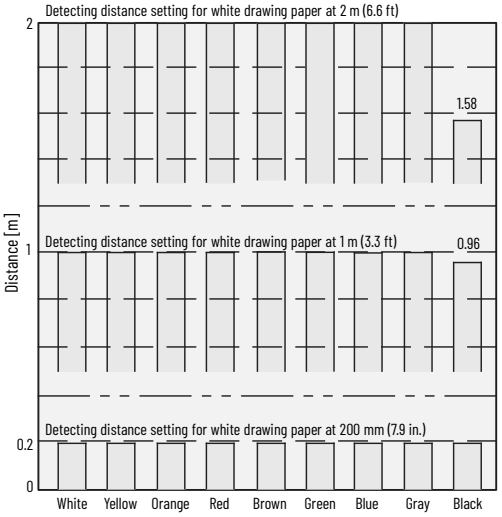


Figure 6 - Cat. No. 42BT-B1LBSN-x — Background Suppression 2 m (6.6 ft)



Approximate Dimensions

Figure 7 - Background Suppression Sensor [mm (in.)]

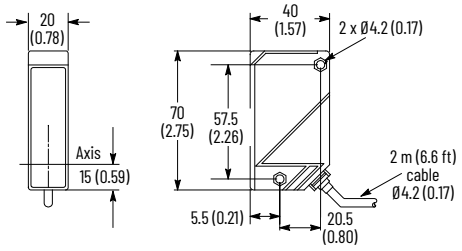
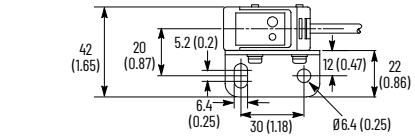


Figure 8 - Cat. No. 61-6738 — Stainless-steel Vertical Mounting Bracket [mm (in.)]



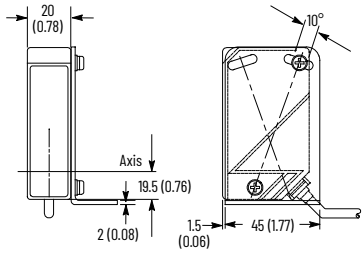
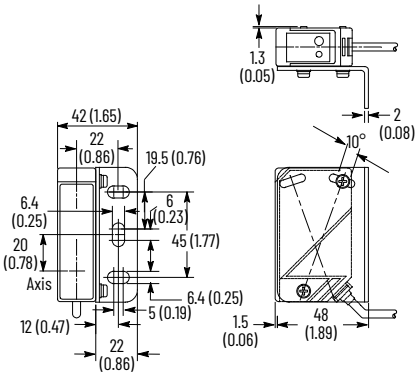


Figure 9 - Cat. No. 61-6739 — Stainless-steel Horizontal Mounting Bracket [mm (in.)]



Specifications

Attribute	42BT-B1LBSN-x (1)	42BT-B2LBSL-x (1)
Environmental		
Certifications	cULus Listed, CE Marked for all applicable directives, and UKCA Marked for all applicable regulations	
Operating environment	IP65	
Operating temperature	-25…+55 °C (-13…+131 °F)	
Vibration	10…55Hz, 1.5 mm amplitude; meets or exceeds IEC 60947-5-2	
Shock	30 g with 1 ms pulse duration, meets or exceeds IEC 60947-5-2	
Relative humidity	35…85%	
Ambient light immunity	• Incandescent light: 3000 lux • Sunlight: 10,000 lux	
Optical		
Light Source	0.2…2 m (0.66…6.56 ft)	0.2…1 m (0.66…3.28 ft)
Sensing Range	Infrared (870 nm)	Visible red (650 nm)
Adjustments	5-turn sensitivity potentiometer	
Electrical		
Voltage	12…24V DC	
Current consumption, max	30 mA	
Protection type	Reverse polarity, short circuit	
Outputs		
Response time, max	2 ms	
Output type	PNP or NPN	
Output function	Selectable light and dark operate	
Output current, max	100 mA	
Mechanical		
Material	• Housing: Polyarilate • Lens: Polyarilate	
Optional Accessories	Mounting brackets, cordsets	

(1) For connection types, replace the x with: A2 for 2 m (6.6 ft) cable; F4 for 4-pin DC micro QD on 152 mm (6 in.) pigtail; and Y4 for 4-pin pico QD on 152 mm (6 in.) pigtail

Declaration of Conformity

CE Conformity

Rockwell Automation declares that the products that are shown in this document conform with the 2014/30/EU Electromagnetic Compatibility Directive (EMC) and that the respective standards and/or technical specifications have been applied.

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Waste Electrical and Electronic Equipment (WEEE)



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Rockwell Automation maintains current product environmental compliance information on its website at rok.auto/pec.

Rockwell Otomasyon Ticaret A.Ş. Kar Plaza İş Merkezi E Blok Kat:6 34752 İçerenköy, İstanbul, Tel: +90 (216) 5698400 EEE Yönetmeliğine Uygundur

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AMERICAS: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000
EUROPE/MIDDLE EAST/AFRICA: Rockwell Automation NV, Pegasus Park, De Kleetlaan 12a, 1831 Diegem, Belgium, Tel: (32) 2663 0600
ASIA PACIFIC: Rockwell Automation SEA Pte Ltd, 2 Corporation Road, #04-05, Main Lobby, Corporation Place, Singapore 618494, Tel: (65) 6510 6608
UNITED KINGDOM: Rockwell Automation Ltd., Pitfield, Kiln Farm, Milton Keynes, MK11 3DR, United Kingdom, Tel: (44)(1908) 838-800

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Publication 42BT-IN001C-EN-P - December 2025 | Supersedes Publication 42BT-IN001B-EN-P - November 2010
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