

# Installation Instructions

## Bulletin 42BT Long-Range Background Suppression

**SAVE THESE INSTRUCTIONS FOR FUTURE USE.**  
**Refer to the product catalog pages for additional information.**

### Description

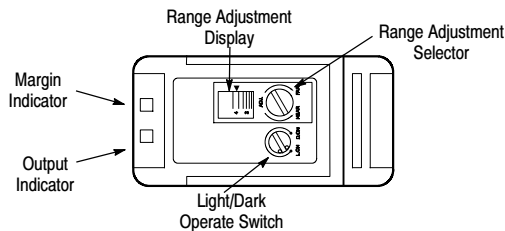
The Allen-Bradley 42BT family of long-range background suppression is designed for the reliable detection of objects while ignoring background reflectivity.

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

### Features

- Visible light source for ease of alignment (1 m models)
- Range indicator allows for an easy readout of the settings
- Adjustable range settings
- Two sensing ranges: 1 m (3.28 ft) and 2 m (6.56 ft)
- Highly visible LED indicators
- Both NPN and PNP Outputs
- Compact IP65 rated enclosure

### Sensor User Interface



#### LED Status

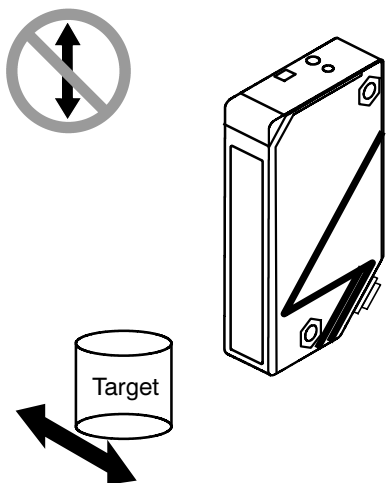
Green	OFF	Low stability. Light intensity below 1.2X
	ON	High stability. Light intensity above 1.2X
Red	OFF	Output OFF
	ON	Output ON <b>1</b>

**1** LED is ON when sensor is in light operate (L.O.) mode and a target is detected, LED is OFF when the sensor is in dark operate (D.O.) mode and the target is detected.

### Specifications

Certifications	cULus and CE marked for all applicable directives		
<b>Environmental</b>			
Operating Environment	IP65		
Operating Temperature [C (F)]	-25...+55° (-13...131°)		
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		
<b>Optical</b>			
	<b>Models</b>	<b>Sensing Range</b>	<b>Light Source</b>
	42BT-B2LBSL-*	0.2...1 m (0.66...3.28 ft)	Visible red (650 nm)
	42BT-B1LBSL-*	0.2...2 m (0.66...6.56 ft)	Infrared (880 nm)
Adjustments	5-turn sensitivity potentiometer		
<b>Electrical</b>			
Voltage	12...24V DC		
Current Consumption	30 mA max		
Sensor Protection	Reverse polarity, short circuit		
<b>Outputs</b>			
Response Time	2 ms max.		
Output Type	PNP or NPN		
Output Mode	Light and dark operate selectable		
Output Current	100 mA max.		
<b>Mechanical</b>			
Housing Material	Polyarilate		
Lens Material	Polyarilate		
Connection Types	2 m cable, 4-pin DC micro (M12) pigtail, 4-pin DC pico (M8) pigtail		
Supplied Accessories	None		
Optional Accessories	Mounting brackets, cordsets		

## Background Suppression Installation Considerations



**Note:** Due to the detection method, targets traveling horizontally to the sensor's optics are detected. Targets traveling vertically may not be accurately detected. For reliable background suppression, a minimum separation distance of 6 mm is recommended between the target and the background.

## Mounting the Sensor

Securely mount the sensor on a firm, stable surface or support. An application which is subject to excessive vibration or shifting may cause intermittent operation. For installation convenience, we offer a wide range of mounting brackets. See the Accessories section for more details.

## 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 (point at which the background will be suppressed) of the sensor.

### Adjustment with Background Present

- Using an instrument screwdriver, adjust the suppression point to its minimum setting by turning the knob counterclockwise until a "click" can be heard.
- The background suppression cutoff point for the 42BT sensor may be set between 200 mm and a maximum of 2 m (depending on the model)
- If a background is present up to the maximum rated distance (1 m for 42BT-B2LBSL-F4 and 2 m for 42BT-B1LBSN-F4), the suppression point should be set just before this background to allow detection of targets up to that point. Do this by rotating the knob clockwise until both indicators (stability and output) turn ON $\odot$ . Then rotate the knob counterclockwise until both LEDs turn OFF $\ominus$ .
- The sensor is now configured to detect targets between the sensor face and the suppression point. Note that the reflectivity of the target and the background will influence the detection capability of the sensor's performance.

$\odot$  Selector switch in light operate (L.O.) mode. For dark operate (D.O.) mode, the stability LED turns ON and output LED turns OFF.

$\ominus$  Selector switch in light operate (L.O.) mode. For dark operate (D.O.) mode, the stability LED turns OFF and output LED turns ON.

### Adjustment with no Background Present

- Using an instrument screwdriver, adjust the suppression point to its minimum setting by turning the knob counterclockwise until a "click" can be heard.
- The background suppression cutoff point for the 42BT sensor may be set between 200 mm and a maximum of 2 m (depending on the model)
- If no background is present up to the maximum rated distance (1 m for 42BT-B2LBSL-F4 and 2 m for 42BT-B1LBSN-F4), the suppression point should be set just after the target to be sensed. Do this by rotating the knob clockwise with the target present until both indicators (stability and output) turn ON $\odot$ . Then rotate the knob counterclockwise until both LEDs turn OFF $\ominus$ . When using this method, ensure that the stability indicator (Green LED) is ON.
- The sensor is now configured to detect targets between the sensor face and the suppression point. Note that the reflectivity of the target and the background will influence the detection capability of the sensor's performance.

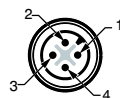
$\odot$  Selector switch in light operate (L.O.) mode. For dark operate (D.O.) mode, the stability LED turns ON and output LED turns OFF.

$\ominus$  Selector switch in light operate (L.O.) mode. For dark operate (D.O.) mode, the stability LED turns OFF and output LED turns ON.

## Wiring Diagrams

Quick disconnect connection is shown in the following diagrams. Pin numbers correspond to male connectors on the sensor.

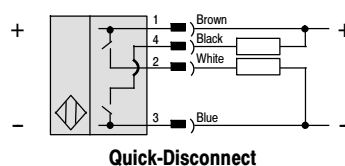
### Micro (M12) Male QD on Pigtail



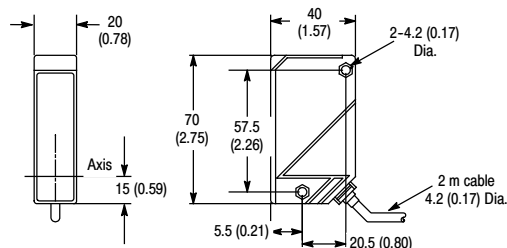
### Pico (M8) Male QD on Pigtail



### NPN and PNP Outputs

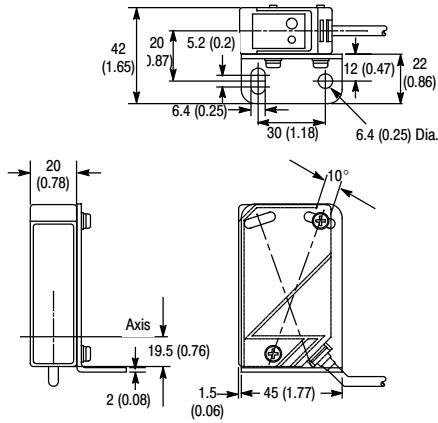


### Approximate Dimensions [mm (in.)]

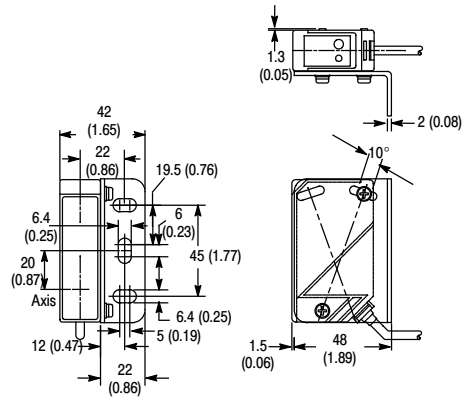


## Accessories [mm (in.)]

### Stainless Steel Vertical Mounting Bracket #61-6738

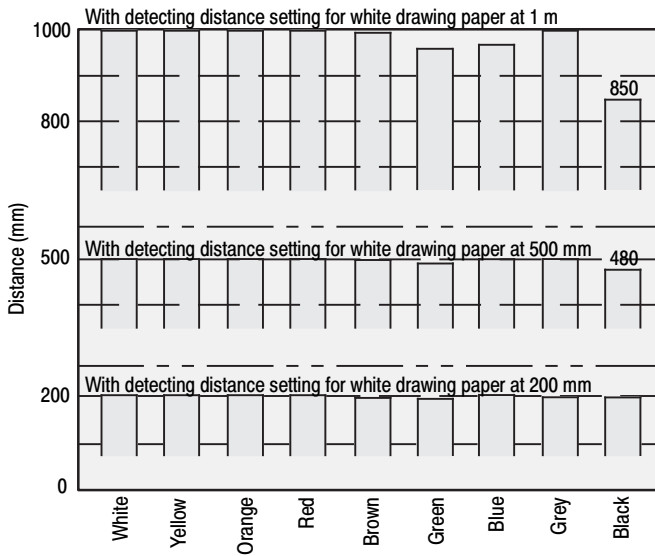


### Stainless Steel Horizontal Mounting Bracket #61-6739



## Typical Response

### 42BT-B2LBSL Background Suppression (1 m) Detection Distance for a 150 x 150 mm Color Target (Matte surface)



### 42BT-B2LBSN Background Suppression (2 m) Detection Distance for a 150 x 150 mm Color Target (Matte surface)

