



### Description

The 42BC photoelectric sensor offers high performance background suppression performance at sensing ranges up to 2m (6.6ft). This type of sensing capability is desirable in applications where standard transmitted beam or retroreflective sensing is not practical due to no easy access to both sides of the target or when economics is a major factor.

The 42BC photoelectric sensor uses a triangulation method to mechanically adjust the sensing angle, thereby, ensuring reliable detection of the target while ignoring the background. Using the sensitivity adjustment on the top cover, the desired sensing range can be dialed in to meet the specific application.

The 42BC is available in either a 1m (3.3ft) or 2m (6.6ft) sensing range. For applications where the sensing distances are much shorter use of the RightSight background suppression sensor is recommended. These sensors offer a fixed 50mm (2in) and 100mm (4in) sensing range. Similar long range sensing distances may be solved with the 42BT photoelectric sensor also. This sensor provides a smaller package style for space critical installations.

### General Specifications

<b>Unit Protection</b>	Output short circuit (SS version only), reverse polarity, false pulse, transient noise
<b>Supply voltage</b>	12–24V DC
<b>Current Consumption</b>	30mA maximum
<b>Output Type</b>	NPN and PNP (DC version) SPST N.O. relay (AC version)
<b>Output Mode</b>	Light/dark operate selectable
<b>Output Rating</b>	100mA@24V DC 3A@240V AC
<b>Response Time</b>	20ms maximum (DC version) 30ms maximum (AC version)
<b>Housing Material</b>	Polycarbonate
<b>Lens Material</b>	Acrylic
<b>LED Indicators</b>	See User Interface on page 1–130
<b>Connection Types</b>	Screw terminal, 16 AWG (1.3mm <sup>2</sup> )
<b>Supplied Accessories</b>	Right angle mounting bracket
<b>Optional Accessories</b>	Cordsets, mounting brackets—see Section 5
<b>Operating Environment</b>	NEMA 1, 12, 13 IP65 (IEC529)
<b>Vibration</b>	10–55Hz, 1mm amplitude, Meets or exceeds IEC 60947–5–2
<b>Shock</b>	30g with 1ms pulse duration, Meets or exceeds IEC 60947–5–2
<b>Operating Temperature</b>	–25°C to +55°C (–13°F to +131°F)
<b>Relative Humidity</b>	5...85%
<b>Approvals</b>	UL listed, CSA certified, and CE marked for all applicable directives

### Features

- Long range background suppression diffuse sensing mode
- Adjustable range settings
- Slim housing style
- Highly visible LED Indicators
- Screw terminal connections
- Both NPN and PNP outputs (DC)
- SPST relay output (AC)
- Short-circuit protected outputs

### General Information

- Wiring Diagrams . . . . . page 1–130
- Dimensions . . . . . page 1–130

### Sensing Modes

- Background Suppression . . . . . page 1–131

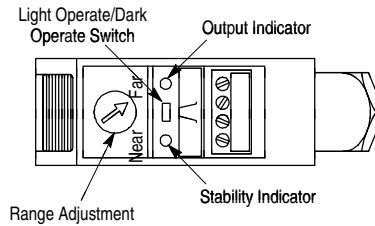
### Accessories

- Quick-Disconnect Cables . . . . . page 5–1
- Mounting Assemblies . . . . . page 1–316
- Replacement Cover . . . . . page 1–321

# 42BC Long Range Background Suppression

## User Interface Panel

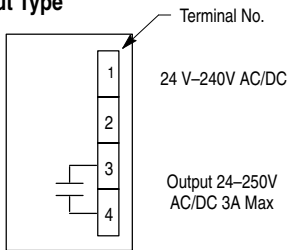
Label	Color	State	Status
Margin	Green	OFF	0.8>margin>1.2
		ON	0.8<margin<1.2
Output	Red	OFF	Output not activated
		ON	Output activated



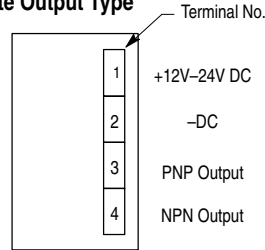
## Wiring Diagrams

### Terminal Version

#### Relay Output Type

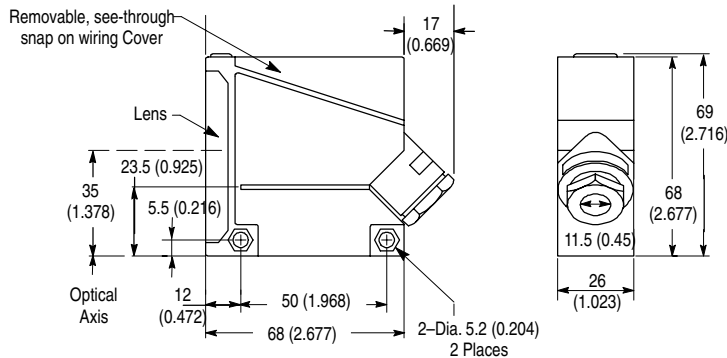


#### Solid State Output Type



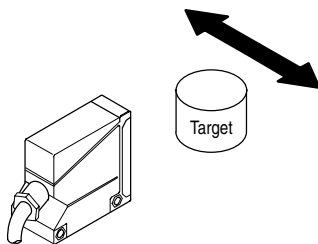
**Note:** Details regarding connection of Allen-Bradley Bulletin 42BC photoelectric sensors to Allen-Bradley Programmable Controllers can be found in publication 42-2.0.

## Dimensions—mm (inches)



### Detection Direction

Due to the detection method, the sensor must be positioned such that the target passes in the direction illustrated.



Motion in up/down direction cannot be detected.

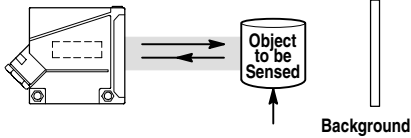
### Minimum Sensing Distances

#### Near Setting

2.5% black 8cm (3.15in) at 2X margin  
 100% white 3cm (1.18in) at 2X margin

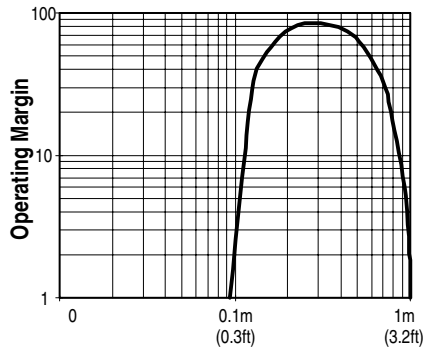
#### Far Setting

2.5% black 20cm (7.9in) at 2X margin  
 100% white 4cm (1.57in) at 2X margin



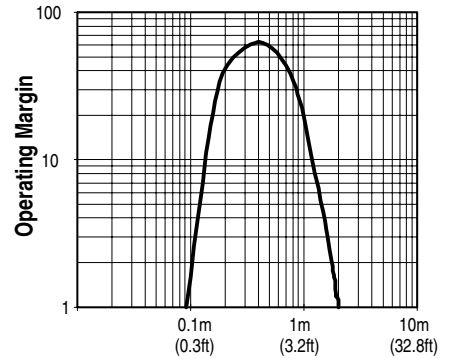
**Typical Response Curves**

**1m Background Suppression**



Operating Distance

**2m Background Suppression**



Operating Distance

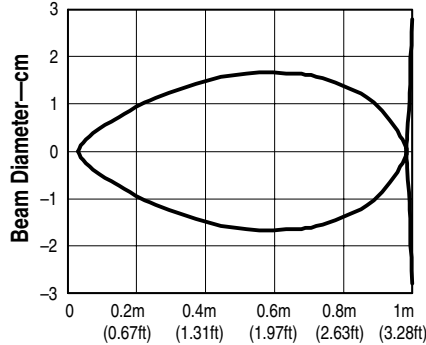
**Specifications**

Field of View	3.5°
Minimum Sensing Distance	30mm (1.2in)
Emitter LED	Infrared 880nm

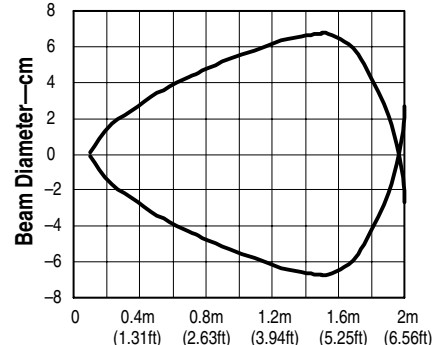
**QD Cordsets and Accessories**

DC Micro QD Cordset, Straight, 4-pin, 2m	<b>889D-F4AC-2</b>
AC Micro QD Cordset, Straight, 4-pin, 2m	<b>889R-F4AEA-2</b>
Pico QD Cordset, Straight, 4-pin, 2m	<b>889P-F4AB-2</b>
Other Cordsets Available	5-1, 5-44, 5-52
Mounting Assemblies	1-316

**Beam Patterns**



Operating Distance



Operating Distance

**Selection Guide**

Operating Voltage Supply Current	Sensing Distance	Output Energized	Output Type Capacity Response Time	Max Leakage Current	Connection Type	Catalog Number
12-24V DC ±10% 30mA	1m (3.3ft)	Light/Dark Selectable	NPN/PNP Selectable 100mA 20ms	0.5mA	Screw terminals accepts up to (2) 16AWG (1.3mm sq.) conductors	<b>42BC-B1LBAL-T4</b>
	2m (6.6ft)					<b>42BC-B1LBAN-T4</b>
24-240V AC/DC ±10% 30mA (DC) 15mA (AC)	1m (3.3ft)		S.P.S.T. N.O. Relay 3A (250V AC, 750VA) 3A (30V DC, 90W) 30ms	—		<b>42BC-B1CRAL-T4</b>
	2m (6.6ft)		<b>42BC-B1CRAN-T4</b>			

Allen-Bradley Parts