

Installation Instructions

PHOTOSWITCH® Bulletin 42CF General Purpose 12mm Cylindrical

IMPORTANT: SAVE THESE INSTRUCTIONS FOR FUTURE USE.

Description

The 42CF is a family of general purpose photoelectric sensors intended for light to medium duty industrial applications. They are packaged in an industry standard 12mm cylindrical housing.

Three possible modes of sensing include transmitted beam, diffuse and polarized retroreflective, allow the 42CF to be used in a variety of complex applications.

Indication of target presence is provided through a discrete NPN or PNP output which is compatible with most measurement and control circuits found in today's factory automation systems. Outputs are short-circuit protected to provide continuous operation even under unexpected conditions.

Features

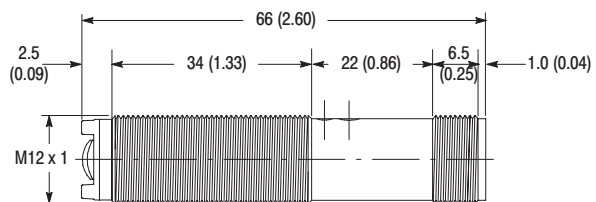
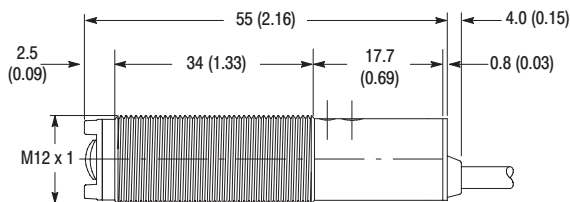
- Short circuit protection
- Reverse polarity protection
- Light status LED Indicator
- NPN or PNP outputs
- L.O. or D.O.
- Teach and remote teach function

General Specifications

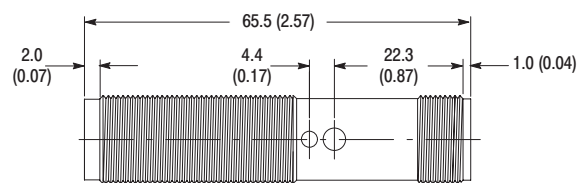
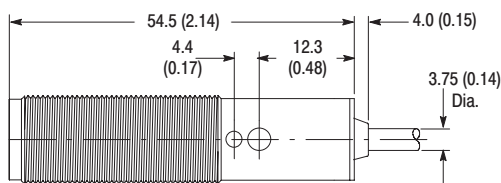
Light Source	Infrared 880nm or visible red 660nm
Unit Protection	Reverse polarity, output short-circuit and overload protection (SCP)
Supply Voltage	10-30V DC
Current Consumption	20mA maximum
Output Type	NPN or PNP
Output Mode	Light or dark operate selectable
Output Rating	100mA
Response Time	Transmitted beam: 2ms Diffuse and polarized retroreflective: 1.25ms
Housing Material	Nickel-plated brass
Lens Material	Acrylic
LED Indicators	Yellow light status LED indicator
Connection Types	2m cable, 4-pin DC micro QD
Optional Accessories	Mounting brackets, reflectors, cordsets
Operating Environment	IP67, Type 1 enclosure
Vibration	10-55Hz, 0.5mm amplitude, Meets or exceeds IEC 60068-2-6
Shock	30g with 11ms pulse duration, Meets or exceeds IEC 60068-2-27
Operating Temperature	-25°C to +70°C (-13°F to +158°F)
Relative Humidity	29 to 90%
Ambient Light Immunity	3000 Lx
Approvals	cULus and CE marked for all applicable directives

Dimensions—mm (inches)

Diffuse and Polarized Retroreflective



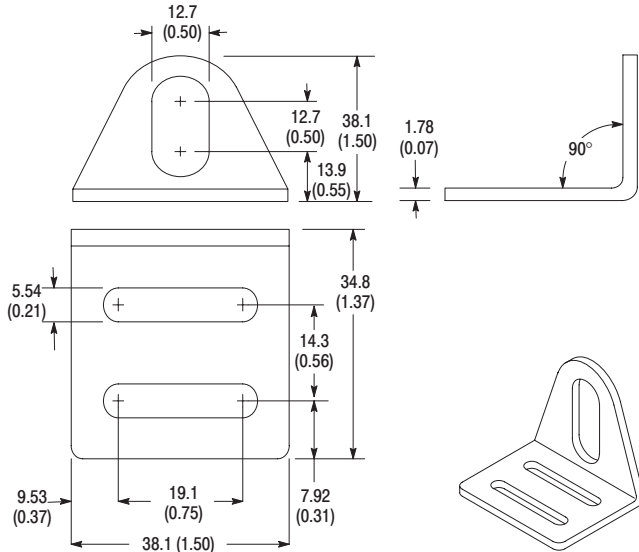
Transmitted Beam



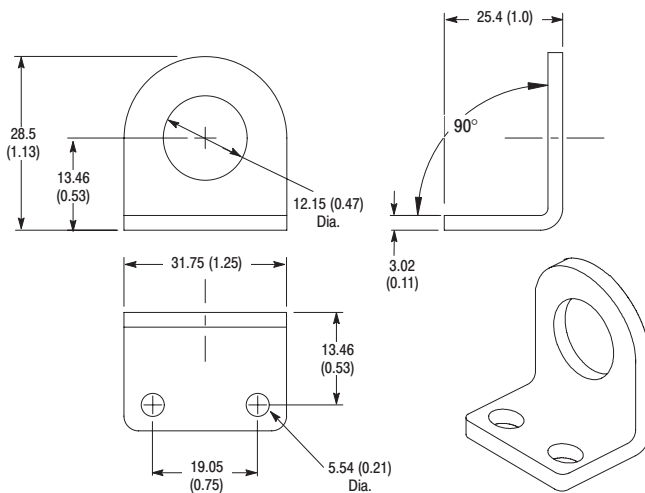
Installation

The Type 42CF Series sensor must be mounted on a firm, stable surface or support. A mounting, which is subject to excessive vibration or shifting may cause intermittent operation. For installation convenience, we offer the following mounting bracket.

Right Angle Bracket #871A-BRN12



Right Angle Bracket #871A-BRF12



Alignment

Polarized Retroreflective

Install the retroreflector so that its surface is perpendicular to the sensor's optical axis. Ensure that distance between the sensor and reflector does not exceed sensor's specifications. Secure sensor in a stable position and select output state (LO or DO). To achieve best alignment, use the following procedure. Sweep the beam on the reflector in the horizontal plane and determine the position the LED indicator turns *On* and then *Off*. Set the beam halfway between both positions. Do the same in the vertical plane. Break the beam with the object to be detected and ensure the LED indicator changes state.

For sensing semi-transparent objects use the fine adjustment feature. Press the teach button, or connect pin 2 (white) to ground for $t > 8$ seconds, until the yellow LED starts flashing. The threshold is set below the detected signal of the hysteresis amplitude. Adjust the sensor vertically and horizontally until the LED switches on constantly or at least until the frequency of the flashes decreases. Secure the sensor in a stable position and ensure that the LED switches off when the beam is interrupted by the target object. A solid LED during both target presence and absence denotes inability to sense a semi-transparent object, another solution must be used.

Transmitted Beam

Using recommended brackets, provisionally mount the emitter and receiver within sensing specifications. Position the sensors so that they coincide with the optical axis as much as possible. To achieve best alignment, use the following procedure. Sweep the beam on the emitter in the horizontal plane and determine the position the LED indicator turns *On* and then *Off*. Set the beam halfway between both positions. Do the same in the vertical plane, and repeat the procedure for the Receiver. Break the beam with the object to be detected and ensure the LED indicator changes state.

Diffuse

Teach

Present target in front of the sensor face within sensing range. Push and release "Teach Button" with target present. Remove and restore the target being detected ensuring that indicator turns on and off.

Solid **yellow** LED represents target presence with 2X margin signal strength. Blinking **yellow** LED represents target presence with signal strength meeting switching threshold but less than 2X margin.

Remote-Teach

A momentary N.O. pushbutton switch must be wired between the white wire and dc common. Present target in front of the sensor face within sensing range. Push and release "Momentary Push Button." Restore and remove the target being detected ensuring that indicator turns on and off.

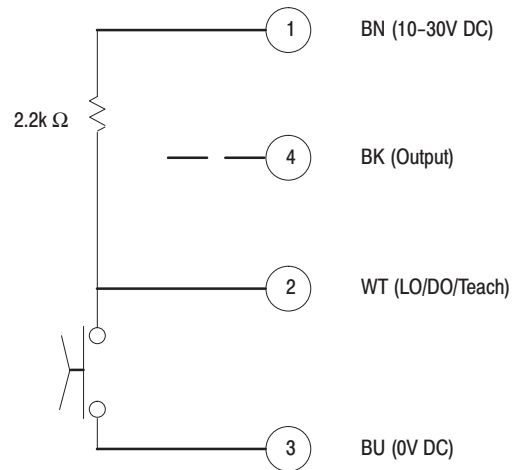
Solid **yellow** LED represents target presence with 2X margin signal strength. Blinking **yellow** LED represents target presence with signal strength meeting switching threshold but less than 2X margin.

Fine Adjustment

To perform fine adjustment with target present push “Teach Button” or “Momentary Push Button” for eight seconds until the yellow LED flashes quickly. The threshold is set to a minimum sensing setting. After teaching the sensor the **yellow** LEDs will flash quickly when target is present and off when absent. A solid LED during target presence denotes inability to use fine adjustment due to misaligned sensor or incompatible target/background properties.

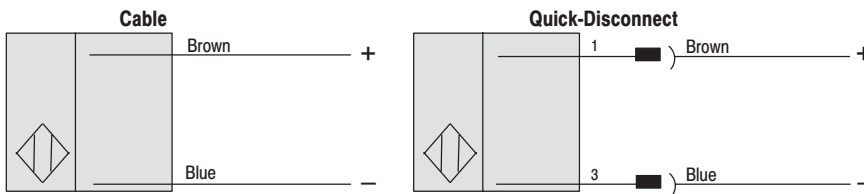
Remote Teach with Dark Operate Mode

To remote teach with the Dark Operate Mode, a 2.2kΩ resistor must be added to avoid short circuits in the power supply when the teach mode is active.

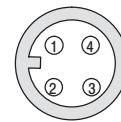


Wiring

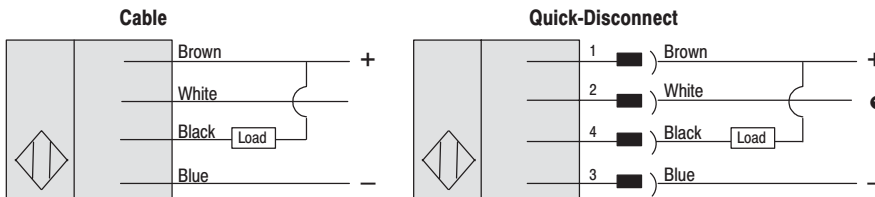
Diffuse, Polarized Retroreflective and Transmitted Beam



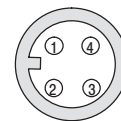
Face View Male Receptacle (Sensor)
DC Micro



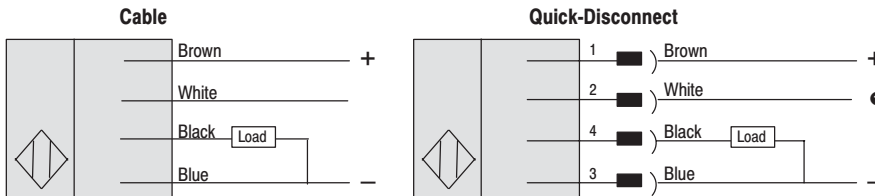
NPN Output



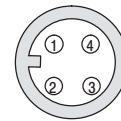
Face View Male Receptacle (Sensor)
DC Micro



PNP Output

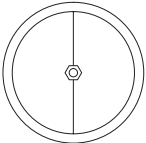


Face View Male Receptacle (Sensor)
DC Micro



- **Polarized retroreflective or transmitted beam:** open circuit (2) & brown (1) conductors together for LO. Tie white (2) & blue (3) conductors together for DO.
- Diffuse:** Open Circuit for LO. Tie white (2) & brown (1) conductors together for DO. Tie white (2) & blue (3) conductors to N.O. Switch for REMOTE TEACH.

Accessories

Description	Catalog Number	
Reflector, 76mm (3in) diameter with center mount hole	92-39	
2m (6.5ft) pico QD Cordset	889D-F4AC-2	