



Description

The 42CA is a family of general purpose photoelectric sensors intended for light to medium duty industrial applications. They are packaged in an industry standard 18mm cylindrical housing.

Five possible modes of sensing include transmitted beam, diffuse, retroreflective, polarized retroreflective, and background suppression, allowing the 42CA to be used in a variety of complex applications.

Presence of target 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.

As an alternative to the 18mm cylindrical package, Rockwell Automation/Allen Bradley offers the RightSight™ photoelectric sensor. That product provides a right angle design to conserve space in many applications. Refer to page 1–31 for further information on this product.

General Specifications

| | |
|-------------------------------|--|
| Light Source | Infrared 880nm or visible red 650nm |
| Unit Protection | Reverse polarity, output short-circuit and overload protection (SCP) |
| Supply voltage | 10–30V DC |
| Current Consumption | 30mA maximum |
| Output Type | NPN or PNP |
| Output Mode | Light or dark operate selectable |
| Output Rating | 100mA |
| Response Time | 2ms (0.5ms for background suppression) |
| Housing Material | PBT |
| Lens Material | PMMA 8N 33701 ROHM |
| LED Indicators | Yellow-output |
| Connection Types | 2m cable, 4-pin DC micro QD |
| Supplied Accessories | 18mm fastening nuts |
| Optional Accessories | Mounting brackets, reflectors, cordsets |
| Operating Environment | IP67 |
| Vibration | 10–55Hz, 0.5mm amplitude, Meets or exceeds IEC 60947-5-2 |
| Shock | 30g with 11ms pulse duration, Meets or exceeds IEC 60947-5-2 |
| Operating Temperature | -25°C to +70°C (-13°F to +158°F) |
| Ambient Light Immunity | 3000 Lx |
| Approvals | CE marked for all applicable directives |

Features

- 18mm industry standard package
- Wide selection of sensing modes
- 24V DC operation
- NPN or PNP outputs
- Fast response time
- Variety of connection types

General Information

Typical Wiring Diagrams . . . page 1–62
Dimensions page 1–62

Sensing Modes

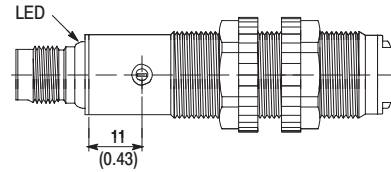
Retroreflective page 1–63
Polarized Retroreflective . . . page 1–64
Standard Diffuse page 1–65
Background Suppression . . . page 1–66
Transmitted Beam page 1–67

Accessories

Quick-Disconnect Cables . . . page 7–1
Mounting Assemblies page 1–375
Reflectors, Reflective Tape page 1–386

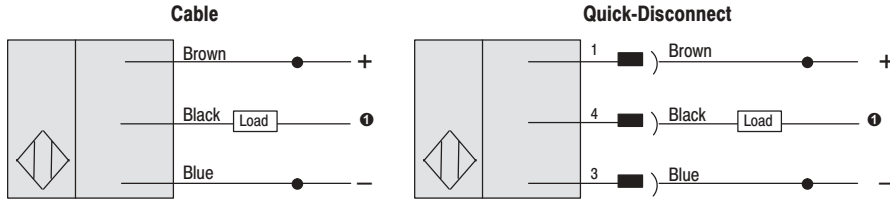
User Interface

| Label | Color | State | Status |
|--------|--------|-------|----------------------------|
| Output | Orange | OFF | Sensor output de-activated |
| | | ON | Sensor output activated |



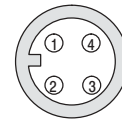
Wiring Diagrams

Diffuse, Retroreflective, Polarized Retroreflective

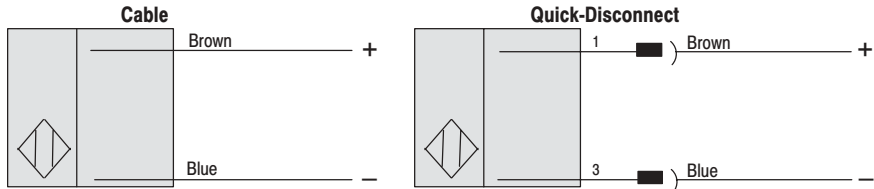


⊙ For NPN type tie the load to Brown (+). For PNP type tie the load to Blue (-).

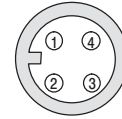
Face View Male Receptacle (Sensor) DC Micro



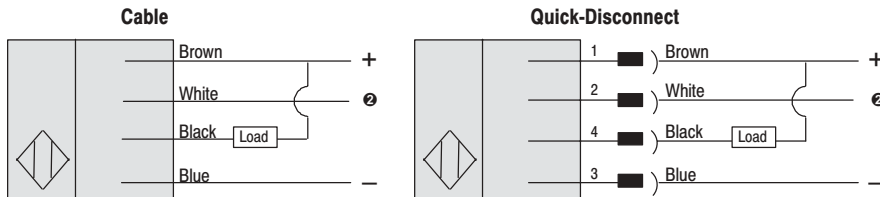
Background Suppression, Transmitted Beam



Face View Male Receptacle (Sensor) DC Micro

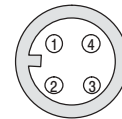


NPN Output

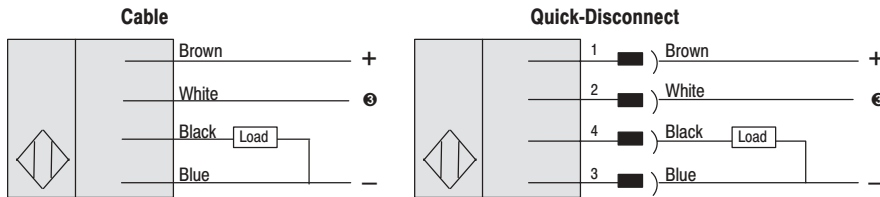


⊙ Tie white (2) and brown (1) conductors together for LO. Tie white (2) and blue (3) conductors together for DO.

Face View Male Receptacle (Sensor) DC Micro

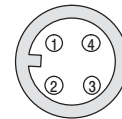


PNP Output

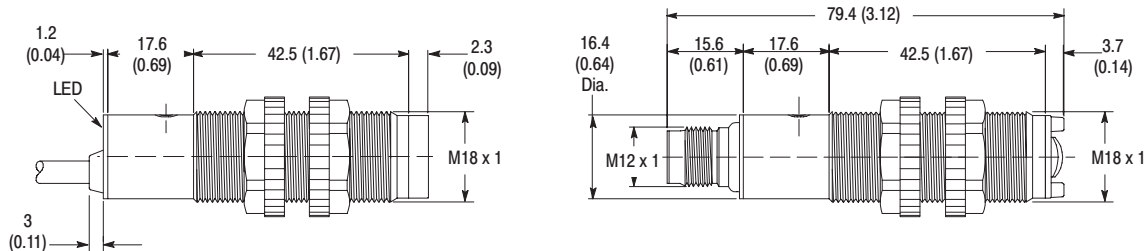


⊙ Tie white (2) and brown (1) conductors together for LO. Tie white (2) and blue (3) conductors together for DO.

Face View Male Receptacle (Sensor) DC Micro

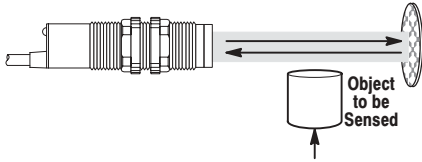


Dimensions—mm (inches)



42CA Retroreflective

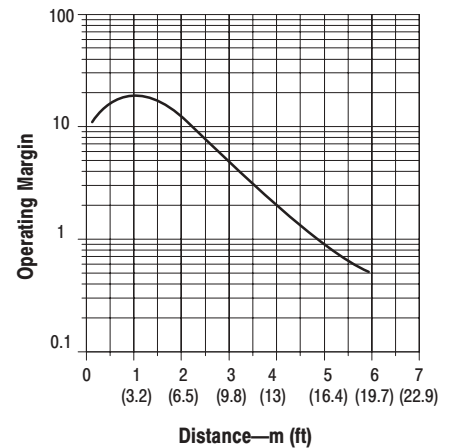
General Purpose 18mm Cylindrical Style



QD Cordsets and Accessories

| Description | Catalog/Page Number |
|--------------------------------|---------------------|
| DC Micro QD Cordset, 4-pin, 2m | 889D-F4AC-2 |
| Other Cordsets Available | 7-1 |
| Mounting Assemblies | 1-375 |
| Reflectors, Reflective Tape | 1-386 |

Typical Response Curve



Specifications

| | |
|---------------|----------------|
| Field of View | 1.9° |
| Emitter LED | Infrared 880nm |

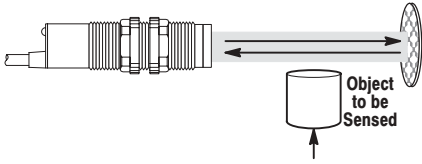
Product Selection

| Operating Voltage Supply Current | Sensing Distance @ 2X Margin | Output Energized | Output Type Capacity Response Time | Max Leakage Current | Connection Type | Catalog Number |
|-------------------------------------|---------------------------------|------------------|--|---------------------|-------------------|----------------|
| 10-30V DC 30mA | 3mm (0.12in) to 4m (13.2ft) | Light | NPN 100mA 4ms | <10µA | 2m 300V cable | 42CA-U1JNB-A2 |
| | | Dark | | | 4-pin DC micro QD | 42CA-U1JNB-D4 |
| | | Light | PNP 100mA 4ms | | 2m 300V cable | 42CA-U1KNB-A2 |
| | | Dark | | | 4-pin DC micro QD | 42CA-U1KNB-D4 |
| | | Light | PNP 100mA 4ms | | 2m 300V cable | 42CA-U1JPB-A2 |
| | | Dark | | | 4-pin DC micro QD | 42CA-U1JPB-D4 |
| | | Light | PNP 100mA 4ms | | 2m 300V cable | 42CA-U1KPB-A2 |
| | | Dark | | | 4-pin DC micro QD | 42CA-U1KPB-D4 |

Allen-Bradley Automation

42CA Polarized Retroreflective

General Purpose 18mm Cylindrical Style



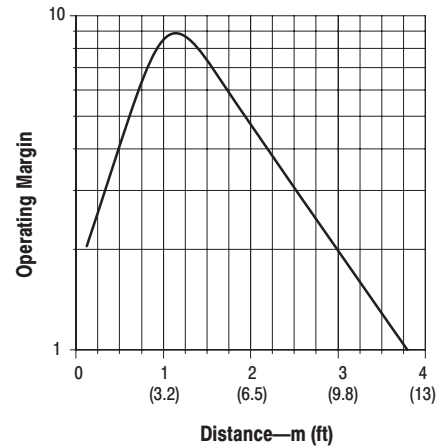
QD Cordsets and Accessories

| Description | Catalog/Page Number |
|--------------------------------|---------------------|
| DC Micro QD Cordset, 4-pin, 2m | 889D-F4AC-2 |
| Other Cordsets Available | 7-1 |
| Mounting Assemblies | 1-375 |
| Reflectors, Reflective Tape | 1-386 |

Specifications

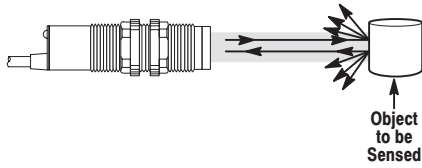
| | |
|---------------|-------------------|
| Field of View | 1.8° |
| Emitter LED | Visible red 660nm |

Typical Response Curve



Product Selection

| Operating Voltage Supply Current | Sensing Distance @ 2X Margin | Output Energized | Output Type Capacity Response Time | Max Leakage Current | Connection Type | Catalog Number |
|-------------------------------------|------------------------------------|---------------------|--|---------------------------|-------------------|----------------|
| 10-30V DC 30mA | 3mm (0.12in) to 3m (9.9ft) | Light | NPN 100mA 2ms | <10µA | 2m 300V cable | 42CA-P2JNB-A2 |
| | | | | | 4-pin DC micro QD | 42CA-P2JNB-D4 |
| | | Dark | | | 2m 300V cable | 42CA-P2KNB-A2 |
| | | | | | 4-pin DC micro QD | 42CA-P2KNB-D4 |
| | | Light | PNP 100mA 2ms | | 2m 300V cable | 42CA-P2JPB-A2 |
| | | | | | 4-pin DC micro QD | 42CA-P2JPB-D4 |
| | | Dark | | | 2m 300V cable | 42CA-P2KPB-A2 |
| | | | | | 4-pin DC micro QD | 42CA-P2KPB-D4 |



QD Cordsets and Accessories

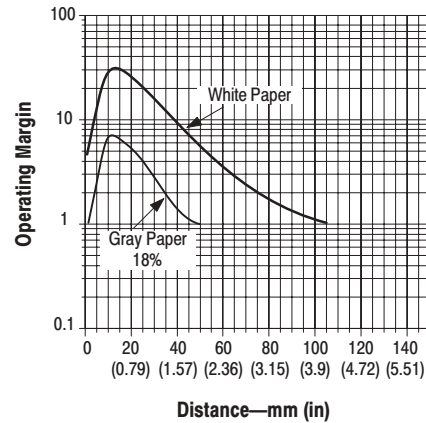
| Description | Catalog/Page Number |
|--------------------------------|---------------------|
| DC Micro QD Cordset, 4-pin, 2m | 889D-F4AC-2 |
| Other Cordsets Available | 7-1 |
| Mounting Assemblies | 1-375 |

Specifications

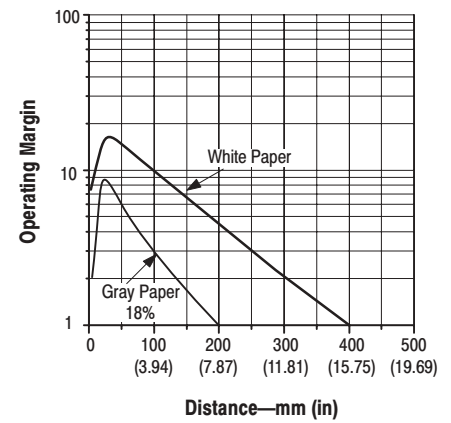
| | |
|---------------|----------------|
| Field of View | 6.6° |
| Emitter LED | Infrared 880nm |

Typical Response Curve

100mm



400mm

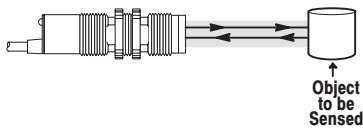


Product Selection

| Operating Voltage Supply Current | Sensing Distance @ 1X Margin | Output Energized | Output Type Capacity Response Time | Max Leakage Current | Connection Type | Catalog Number | |
|-------------------------------------|--|--|--|---------------------|---------------------|-------------------|----------------|
| 10-30V DC 30mA | 0 to 100mm (3.9in) (Adjustable) | Light | NPN 100mA 2ms | <10µA | 2m 300V cable | 42CA-D1JNAE-A2 | |
| | | Dark | | | 4-pin DC micro QD | 42CA-D1JNAE-D4 | |
| | | Light | PNP 100mA 2ms | | 2m 300V cable | 42CA-D1KNAE-A2 | |
| | | Dark | | | 4-pin DC micro QD | 42CA-D1KNAE-D4 | |
| | | 0 to 400mm (13.6in) (Adjustable) | Light | | NPN 100mA 2ms | 2m 300V cable | 42CA-D1JPAE-A2 |
| | | | Dark | | | 4-pin DC micro QD | 42CA-D1JPAE-D4 |
| | | | Light | | PNP 100mA 2ms | 2m 300V cable | 42CA-D1KPAE-A2 |
| | | | Dark | | | 4-pin DC micro QD | 42CA-D1KPAE-D4 |
| | 0 to 400mm (13.6in) (Adjustable) | | Light | NPN 100mA 2ms | 2m 300V cable | 42CA-D1JNAJ-A2 | |
| | | | Dark | | 4-pin DC micro QD | 42CA-D1JNAJ-D4 | |
| | | | Light | PNP 100mA 2ms | 2m 300V cable | 42CA-D1KNAJ-A2 | |
| | | | Dark | | 4-pin DC micro QD | 42CA-D1KNAJ-D4 | |
| | | 0 to 400mm (13.6in) (Adjustable) | Light | NPN 100mA 2ms | 2m 300V cable | 42CA-D1JPAJ-A2 | |
| | | | Dark | | 4-pin DC micro QD | 42CA-D1JPAJ-D4 | |
| | | | Light | PNP 100mA 2ms | 2m 300V cable | 42CA-D1KPAJ-A2 | |
| | | | Dark | | 4-pin DC micro QD | 42CA-D1KPAJ-D4 | |

42CA Background Suppression

General Purpose 18mm Cylindrical Style



QD Cordsets and Accessories

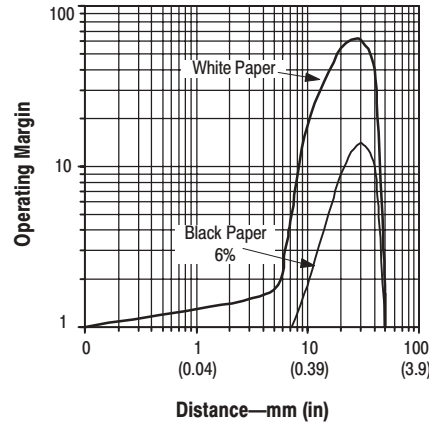
| Description | Catalog/Page Number |
|--------------------------------|---------------------|
| DC Micro QD Cordset, 4-pin, 2m | 889D-F4AC-2 |
| Other Cordsets Available | 7-1 |
| Mounting Assemblies | 1-375 |

Specifications

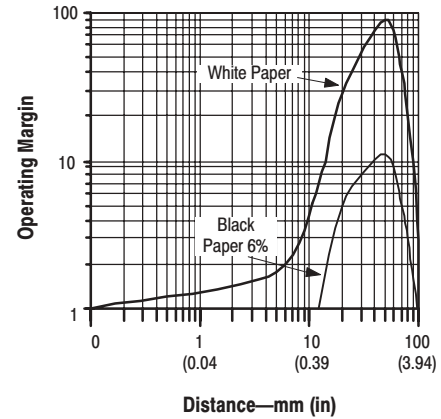
| | |
|---------------|-----------------------------|
| Field of View | 50mm = 5.7° 100mm = 3.4° |
| Emitter LED | Visible red 660nm |

Typical Response Curve

50mm



100mm

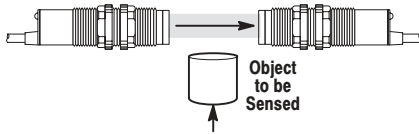


Product Selection

| Operating Voltage Supply Current | Sensing Distance @ 1X Margin | Output Energized | Output Type Capacity Response Time | Max Leakage Current | Connection Type | Catalog Number |
|-------------------------------------|---------------------------------|--------------------------|--|---------------------|-------------------|----------------|
| 10-30V DC 30mA | 50mm (1.97in) | Light/Dark Selectable | NPN 100mA 0.5ms | <10µA | 2m 300V cable | 42CA-B2LNBC-A2 |
| | | | | | 4-pin DC micro QD | 42CA-B2LNBC-D4 |
| | | | PNP 100mA 0.5ms | | 2m 300V cable | 42CA-B2LPBC-A2 |
| | | | | | 4-pin DC micro QD | 42CA-B2LPBC-D4 |
| | 100mm (3.9in) | | NPN 100mA 0.5ms | | 2m 300V cable | 42CA-B2LNBE-A2 |
| | | | | | 4-pin DC micro QD | 42CA-B2LNBE-D4 |
| | | | PNP 100mA 0.5ms | | 2m 300V cable | 42CA-B2LPBE-A2 |
| | | | | | 4-pin DC micro QD | 42CA-B2LPBE-D4 |

42CA Transmitted Beam

General Purpose 18mm Cylindrical Style

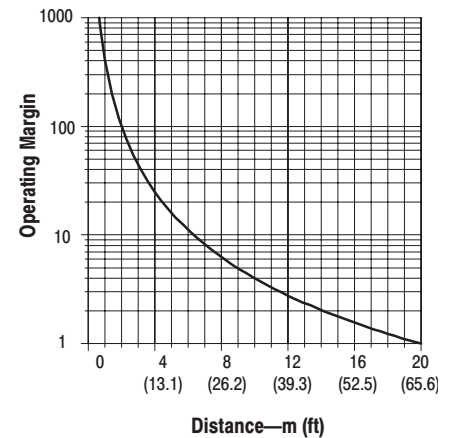


Light Sources and Receivers must be ordered separately. Any light source is compatible with any receiver.

QD Cordsets and Accessories

| Description | Catalog/Page Number |
|--------------------------------|---------------------|
| DC Micro QD Cordset, 4-pin, 2m | 889D-F4AC-2 |
| Other Cordsets Available | 7-1 |
| Mounting Assemblies | 1-375 |

Typical Response Curve



Specifications

| | |
|---------------|----------------|
| Field of View | 1.6° |
| Emitter LED | Infrared 880nm |

Product Selection for Light Sources

| Operating Voltage Supply Current | Sensing Distance | Output Type Capacity Response Time | Max Leakage Current | Connection Type | Catalog Number |
|-------------------------------------|--|--|---------------------------|-------------------|----------------|
| 10-30V DC 25mA | 3mm (0.12in) to 8m (26.2ft) (Adjustable) | — | — | 2m 300V cable | 42CA-E1EZB-A2 |
| | | | | 4-pin DC micro QD | 42CA-E1EZB-D4 |

Product Selection for Receivers

| Operating Voltage Supply Current | Output Energized | Output Type Capacity Response Time | Max Leakage Current | Connection Type | Catalog Number |
|-------------------------------------|--------------------------|--|---------------------------|-------------------|----------------|
| 10-30V DC 25mA | Light/Dark Selectable | NPN 100mA 2ms | 0.1µA | 2m 300V cable | 42CA-R1LNA-A2 |
| | | | | 4-pin DC micro QD | 42CA-R1LNA-D4 |
| | | PNP 100mA 2ms | | 2m 300V cable | 42CA-R1LPA-A2 |
| | | | | 4-pin DC micro QD | 42CA-R1LPA-D4 |

Allen-Bradley Automation