Allen-Bradley

Cylindrical Photoelectric Sensors

Bulletin Numbers 42CA, 42CF, 42CM, 42CS

LISTEN. THINK. SOLVE.®

42CA 18 mm Plastic Cylindrical Sensor

Features

Plastic cylindrical 18 mm sensors include the following features:

- Plastic 18 mm industry standard enclosure
- Extended range high-speed models
- Complementary light and dark operate
- Patented ASIC design offers linear sensitivity adjustment, stability indication, and excellent noise immunity
- Two highly visible LEDs help operators confirm proper sensor operation
- IP67 rated enclosure

Available Models

- Retroreflective
- Polarized retroreflective
- Standard diffuse
- Fixed background suppression
- Transmitted beam

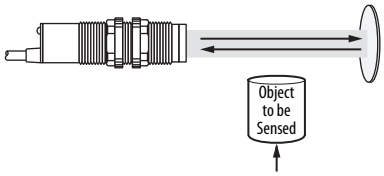
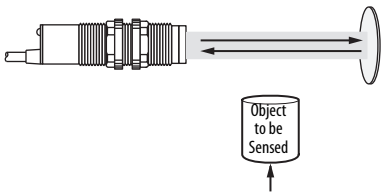
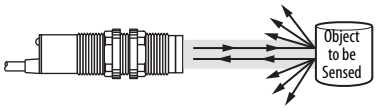
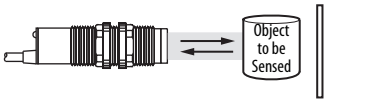
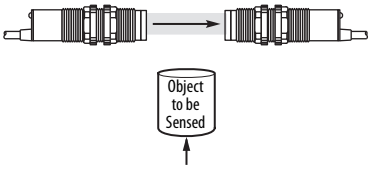
Table 1 - Specifications

Certifications	c-UL-us Listed and CE Marked for all applicable directives
Shock	30 g with 11 ms pulse duration, meets or exceeds IEC 600947-5-2
Vibration	10…55 Hz, 1 mm amplitude, meets or exceeds IEC 600947-5-2
Environmental	
Enclosure type rating	IP67
Operating temperature	-25…+70 °C (-13…+158 °F)
Relative humidity	5…95% (noncondensing)
Ambient light immunity	Incandescent light 5000 lux
User Interface	
Indicator LEDs	Orange: Output status Green: Power, short circuit, and margin
Electrical	
Operating voltage	10…30V DC
Current consumption	30 mA max
Protection type	Short circuit, reverse polarity, false pulse, overload
Outputs	
Output type	See Table 3 on page 3.
Output function	Light operate and dark operate
Load current	100 mA
Leakage current	0.1 mA (DC), max
Mechanical	
Housing material	Polybutylene terephthalate (PBT)
Lens material	Polymethyl methacrylate (PMMA)
Connection type	2 m cable, 4-pin DC micro (M12) integral QD
Supplied accessories	Two 18 mm fastener nuts

Table 2 - Optical and Response Time Characteristics

Attribute	Sensing Mode				
	Retroreflective	Polarized Retroreflective	Diffuse	Background Suppression	Transmitted Beam
Field of View	1.2°	1.3°	3° 7.5° 5°	5.7° 3.4°	1.5°
Spot Size	102 mm @ 4.8 m 168 mm @ 7.2 m	92 mm @ 3.8 m	5 mm @ 100 mm 67 mm @ 400 mm 89 mm @ 1 m	6 mm @ 50 mm 6 mm @ 100 mm	420 mm @ 16 m
Light Source	Visible red 660 nm		Infrared	Visible red 660 nm	Infrared
Response Time	1 ms (4.8 m) 1 ms (7.2 m)	1 ms	1 ms	0.5 ms	2 ms (0.5 ms for background suppression)

Table 3 - Product Selection

Sensing Mode	Light Source	Sensing Distance	Sensitivity Adjustment	Output Function	Output Type	Cat. No.[1]
Retroreflective 	Visible red 660 nm	0.002…4.8 m (0.0…15.7 ft)	No adjustment	Light and dark operate	NPN	42CA-U2MNB-D4
					PNP	42CA-U2MPB-D4
		0.002…7 m (0.0…23 ft)	Single-turn potentiometer		NPN	42CA-U2MNA-D4
					PNP	42CA-U2MPA-D4
Polarized Retroreflective 	Visible red 660 nm	0.002…3.8 m (0.0…12.5 ft)	No adjustment	Light and dark operate	NPN	42CA-P2MNB-D4
					PNP	42CA-P2MPB-D4
Diffuse 	Infrared	0…100 mm (0…3.9 in.)	Single-turn potentiometer	Light and dark operate	NPN	42CA-D1MNAE-D4
					PNP	42CA-D1MPAE-D4
		0…400 mm (0…15.7 in.)			NPN	42CA-D1MNAJ-D4
					PNP	42CA-D1MPAJ-D4
		0…1 m (0…39.4 in.)			NPN	42CA-D1MNAL-D4
					PNP	42CA-D1MPAL-D4
Background Suppression 	Visible red 660 nm	50 mm (2 in.)	No adjustment	Light and dark operate	NPN	42CA-B2LNBC-D4
					PNP	42CA-B2LPBC-D4
		100 mm (3.9 in.)			NPN	42CA-B2LNBE-D4
					PNP	42CA-B2LPBE-D4
Transmitted Beam 	Infrared	0.003…16 m (0.01…52.5 ft)	No adjustment	— (Emitter)	—	42CA-E1EZB1-D4
				Selectable light or dark operate	NPN	42CA-R1MNA1-D4
					PNP	42CA-R1MPA1-D4
Recommended standard 4-pin DC micro (M12) quick-disconnect cordset						889D-F4AC-2
Recommended reflector						92-47

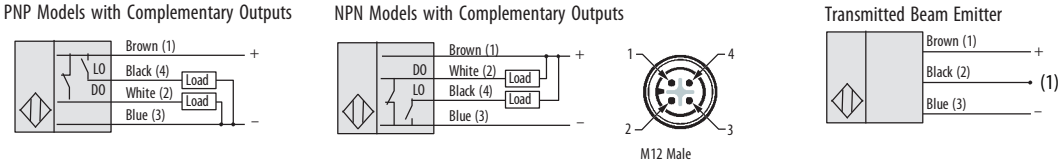
(1) Connection Options: The -D4 suffix describes a 4-pin DC micro (M12) quick-disconnect connector. For additional connection options, replace the -D4 suffix with -A2 for a 2 m cable without quick-disconnect connection (for example, 42CA-P2MPB-A2).

Table 4 - User Interface Panel

LED Color	State	Status
Yellow	Off	Output is de-energized [1]
	On	Output is energized [1]
Green	Off	Power is off
	On	Power is on
	Flashing (6 Hz)	Unstable (0.5 < Margin < 2)
	Flashing (1.5 Hz)	Output short-circuit protection active

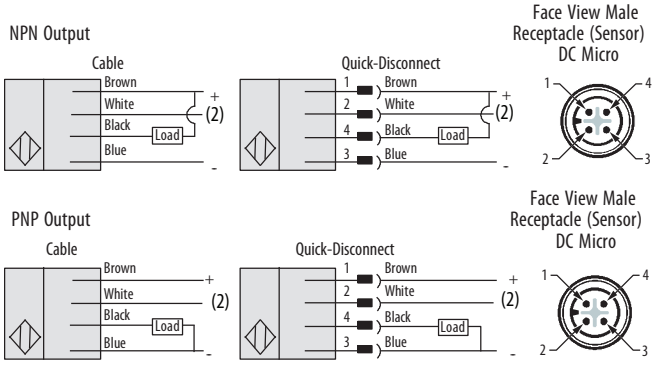
(1) Black wire or pin 4 of connector.

Figure 1 - Retroreflective, Polarized Retroreflective, Diffuse, and Transmitted Beam Wiring Diagrams



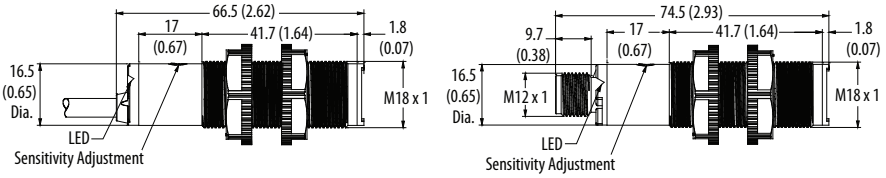
(1) For normal operation, black wire (pin 2) needs no connection. To disable light source, connect black wire (pin 2) to -V.

Figure 2 - Background Suppression Wiring Diagrams



(2) Open circuit or tie white (2) and brown (1) conductors together for L.O. Tie white (2) and blue (3) conductors together for D.O.

Figure 3 - Approximate Dimensions [mm (in.)]



Typical Response Curves

Figure 4 - Standard and Background Suppression

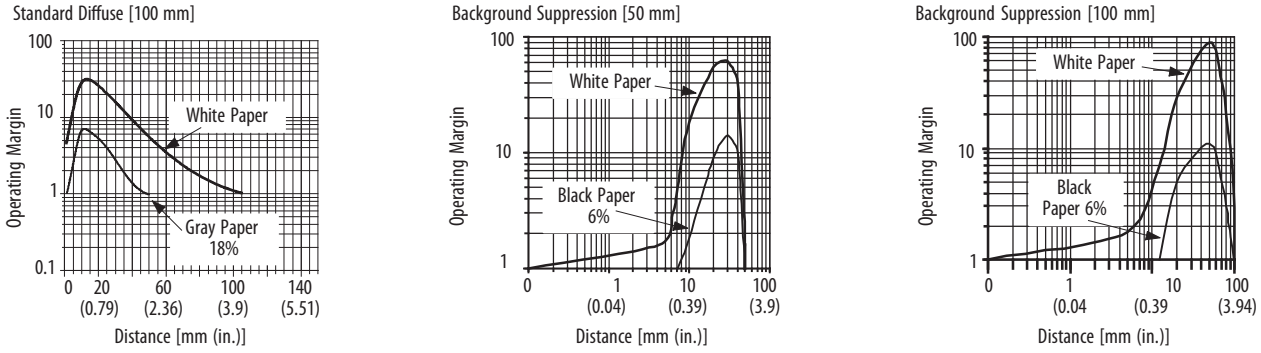
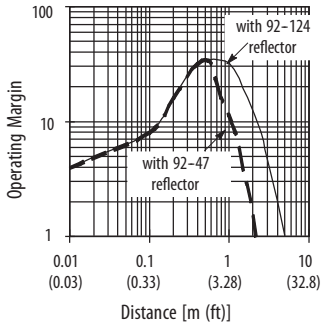
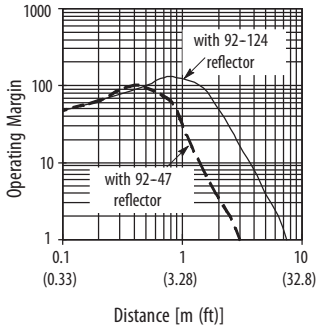


Figure 5 - Operating Margin

Retroreflective [4.8 m]



Retroreflective [7.2 m]



Polarized Retroreflective [3.8 m]

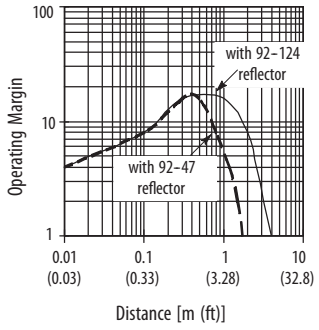
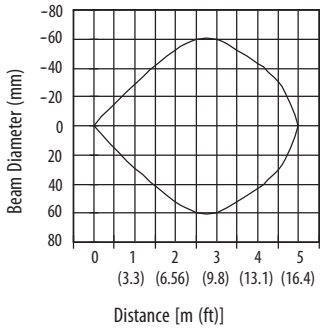
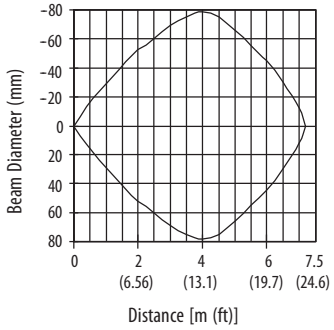


Figure 6 - Beam Pattern

Retroreflective [4.8 m]



Retroreflective [7.2 m]



Polarized Retroreflective [3.8 m]

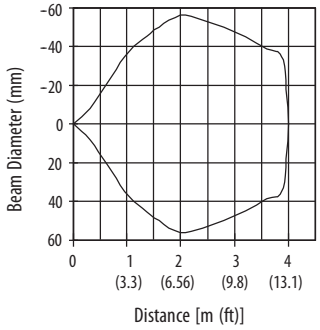
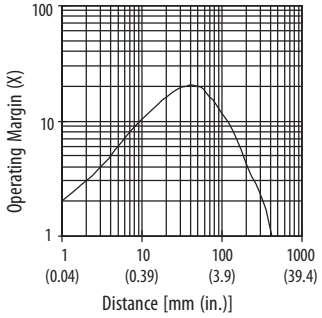
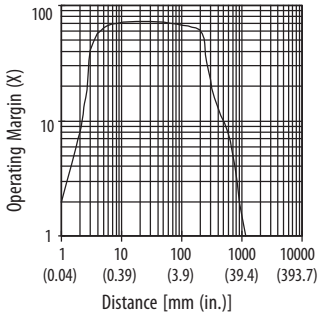


Figure 7 - Operating Margin

Standard Diffuse [400 mm]



Standard Diffuse [1 m]



Transmitted Beam [16 m]

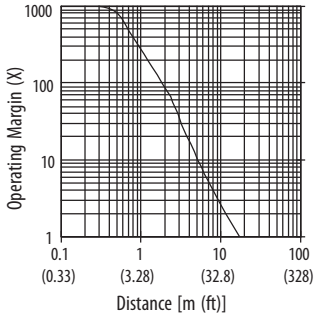
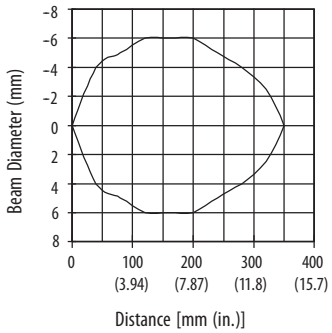
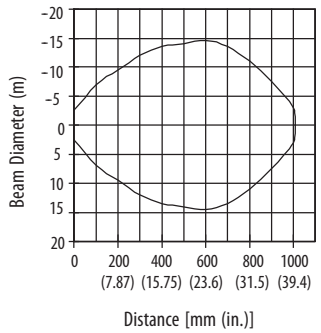


Figure 8 - Beam Pattern

Standard Diffuse [400 mm]



Standard Diffuse [1 m]



Transmitted Beam [16 m]

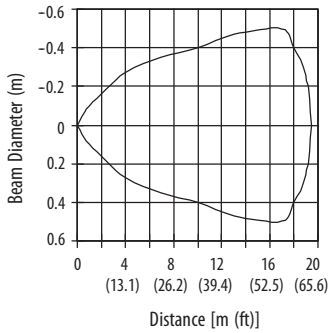


Table 5 - Cordsets and Accessories

Description	Cat. No.
DC micro QD cordset, straight, 4-pin, 2 m	889D-F4AC-2
DC micro QD cordset, right angle, 4-pin, 2 m	889D-R4AC-2
Mounting bracket, snap-clamp	871A-SCBP18
Mounting bracket, right angle	60-2657
Mounting bracket, swivel/tilt	60-2649
Mounting bracket, straight	60-2656
76 mm (3 in.) diameter reflector	92-39
32 mm (1.25 in.) diameter reflector	92-47

42CF 12 mm Metal Cylindrical Sensor

Features

Metal 12 mm cylindrical sensors include the following features:

- Metal 12 mm industry-standard enclosure
- Teach button simplifies sensitivity setup
- Selectable light and dark operate outputs provide added flexibility
- Remote teach for diffuse and polarized retroreflective model
- IP67 rated enclosure

Available Models

- Polarized retroreflective
- Standard diffuse
- Transmitted beam

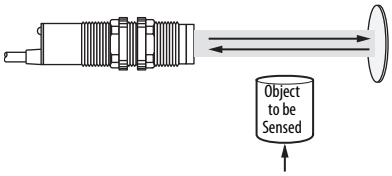
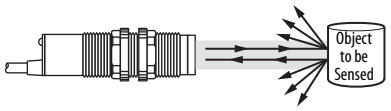
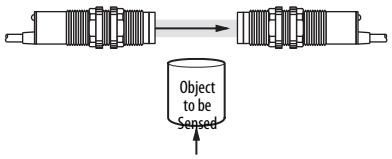
Table 6 - Specifications

Certifications	c-UL-us Listed and CE Marked for all applicable directives
Shock	30 g with 1 ms pulse duration, meets or exceeds IEC 600947-5-2
Vibration	10…55 Hz, 1 mm amplitude, meets or exceeds IEC 600947-5-2
Environmental	
Enclosure type rating	IP67
Operating temperature	-25…+70 °C (-13…+158 °F)
Relative humidity	5…95% (noncondensing)
Ambient light immunity	Incandescent light 3000 lux
User Interface	
Indicator LED	Orange LED for output indication
Electrical	
Operating voltage	10…30V DC
Current consumption	30 mA max
Protection type	False pulse, reverse polarity, short circuit
Outputs	
Output type	See Table 8 on page 8.
Output function	Selectable light or dark operate
Load current	100 mA
Leakage current	0.1 µA (DC) max [??10 µA, max??]
Mechanical	
Housing material	Nickel-plated brass
Lens material	Acrylic
Connection type	2 m cable, 4-pin DC micro (M12) QD
Supplied accessories	Two 12 mm fastening nuts

Table 7 - Optical and Response Time Characteristics

Attribute	Sensing Mode		
	Polarized Retroreflective	Diffuse	Transmitted Beam
Field of View	2.3°	11.4° for 100 mm 5.3° for 300 mm	1.4°
Spot Size	88 mm @ 2 m	11.4° for 100 mm 29.5 mm @ 300 mm	53.3 mm @ 2 mm
Light Source	Visible red 660 nm	Infrared 880 nm	Infrared 880 nm
Response Time	1.25 ms	1.25 ms	2 ms

Table 8 - Product Selection

Sensing Mode	Light Source	Sensing Distance	Sensitivity Adjustment	Output Function	Output Type	Cat. No.(1)
Polarized Retroreflective 	Visible red 660 nm	0.025…2 m (0.08…6.5 ft)	Push button	Selectable light or dark operate	NPN	42CF-P2LNA1-D4
					PNP	42CF-P2LPA1-D4
Diffuse 	Infrared 880 nm	1…100 mm (0…3.9 in.)	Push button	Selectable light or dark operate	NPN	42CF-D1LNA1-D4
					PNP	42CF-D1LPA1-D4
		1…300 mm (0…12.2 in.)			NPN	42CF-D1LNA2-D4
					PNP	42CF-D1LPA2-D4
Transmitted Beam 	Infrared 880 nm	2 m (6.6 ft)	No adjustment	— (Emitter)	—	42CF-E1EZB-D4
				Selectable light or dark operate	NPN	42CF-R1LNB1-D4
					PNP	42CF-R1LPB1-D4
Recommended standard 4-pin DC micro (M12) quick-disconnect cordset						889D-F4AC-2
Recommended reflector						92-39

(1) Connection Options: The -D4 suffix describes a 4-pin DC micro (M12) quick-disconnect connector. For additional connection options, replace the -D4 suffix with: -A2 for a 2 m cable without quick-disconnect connection (for example, 42CF-P2LPA-A2).

Table 9 - User Interface Panel

LED Color	State	Status
Orange	Off	Sensor output is de-activated
	On	Sensor output is activated

Figure 9 - Diffuse, Polarized Retroreflective, and Transmitted Beam Wiring Diagrams

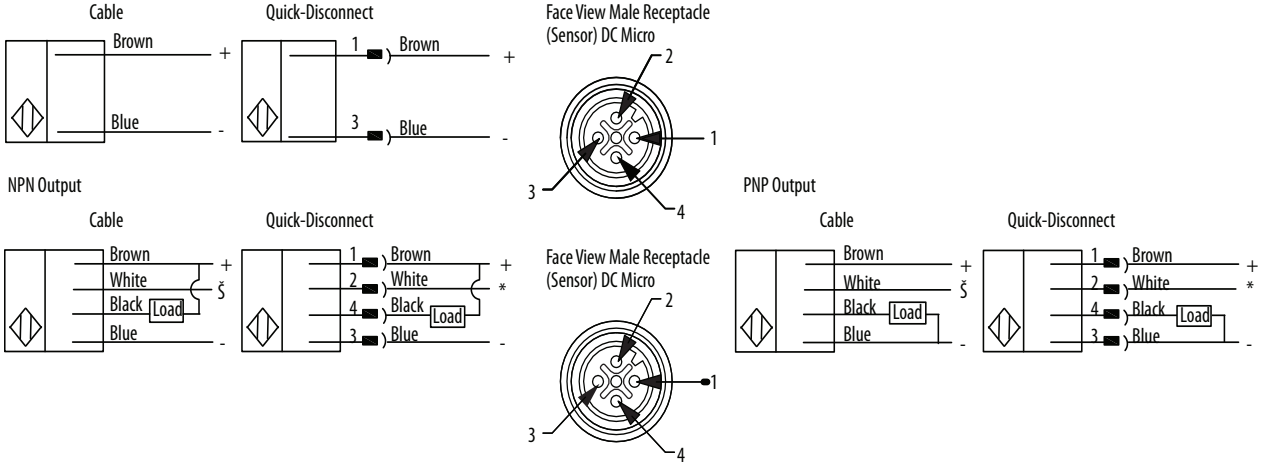


Figure 10 - Approximate Dimensions [mm (in.)]

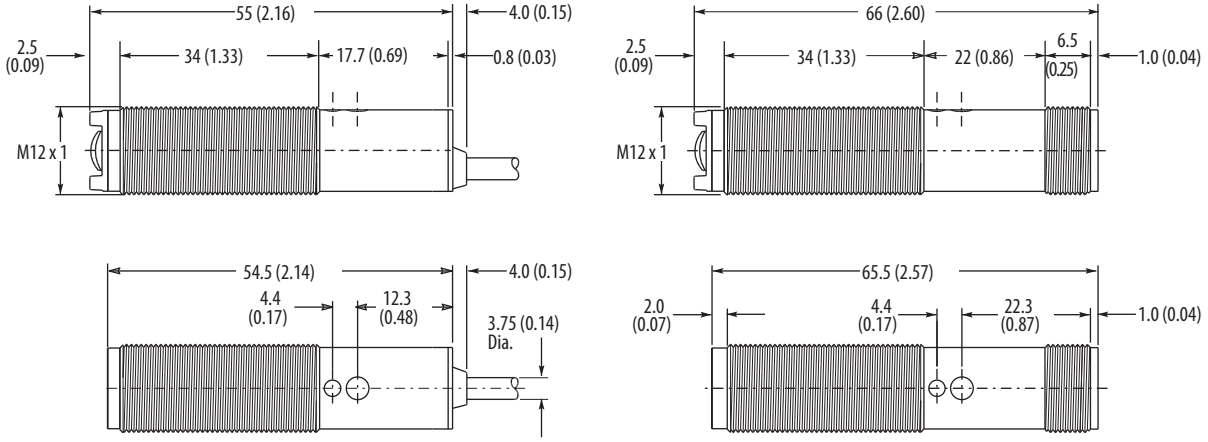


Figure 11 - Typical Response Curves

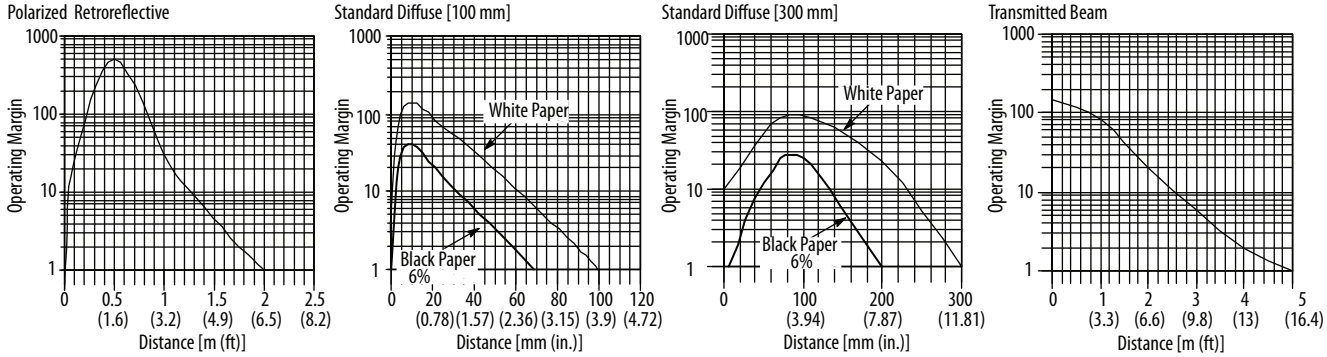


Table 10 - Cordsets and Accessories

Description	Cat. No.
DC Micro QD Cordset, Straight, 4-pin, 2 m	889D-F4AC-2
Mounting Bracket	871A-BRNR
Snap-clamp Mounting Bracket	871A-SCBP12
Reflectors	92-39

42CM 18 mm Metal Cylindrical Sensor

Features

Metal 18 mm cylindrical sensors include the following features:

- Metal 18 mm industry-standard enclosure
- Visible red and Class 1 eye safe laser beam in laser models
- Small spot size in laser models verifies the detection of small objects
- Complementary light and dark operate outputs provide added flexibility
- IP67 rated enclosure

Available Models

The following standard models are available:

- Retroreflective
- Polarized retroreflective
- Standard diffuse
- Background suppression
- Transmitted beam

The following laser models are available:

- Polarized retroreflective
- Standard diffuse
- Transmitted beam

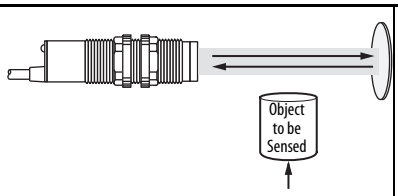
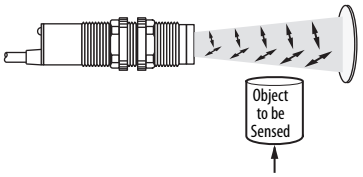
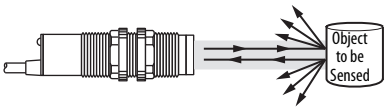
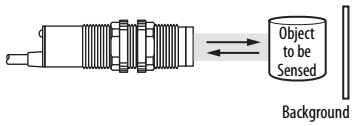
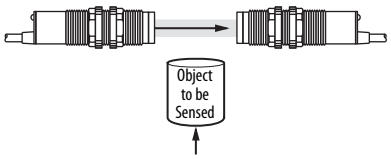
Table 11 - Specifications

Certifications	c-UL-us Listed and CE Marked for all applicable directives
Shock	30 g with 11 ms pulse duration, meets or exceeds IEC 600947-5-2
Vibration	10…55 Hz, 0.5 mm amplitude, meets or exceeds IEC 600947-5-2
Environmental	
Enclosure type rating	IP67
Operating temperature	-25…+70 °C (-13…+158 °F)
Relative humidity	5…95% (noncondensing)
Ambient light immunity	Incandescent light 5000 lux
User Interface	
Standard model indicator LED	Orange
Electrical	
Current consumption	30 mA max
Protection type	Short circuit, reverse polarity, false pulse, overload
Outputs	
Output type	See Table 13.
Output function	Light operate and dark operate, selectable light operate and dark operate
Load current	100 mA
Leakage current	<10 µA DC
Mechanical	
Housing material	Nickel-plated brass
Lens material	Acrylic
Connection type	2 m cable, 4-pin DC micro (M12) QD
Supplied accessories	Mounting brackets, reflectors, cordsets; 18 mm fastener nuts

Table 12 - Optical and Response Time Characteristics

Attribute	Sensing Mode							
	Standard					Laser		
	Retroreflective	Polarized Retroreflective	Diffuse	Background Suppression	Transmitted Beam	Polarized Retroreflective	Diffuse	Transmitted Beam
Response Time	4 ms	4 ms	2 ms	0.5 ms	2 ms (0.5 ms for background suppression)	—		
Field of View	1.9°	1.8°	6.6°	5.7°	1.6°	—		
Light Source	Infrared 880 nm	Visible red 660 nm		Class 1 laser 650 nm	Infrared 880 nm	Class 1 laser 650 nm		

Table 13 - Product Selection

Sensing Mode	Light Source	Sensing Distance	Sensitivity Adjustment	Output Function	Output Type	Cat. No.(1)
Retroreflective 	Infrared 880 nm	0.003…4 m (0.009…13.2 ft)	No adjustment	Light and dark operate	NPN	42CM-U1MNB-D4
					PNP	42CM-U1MPB-D4
Polarized Retroreflective 	Visible red 660 nm	0.003…3 m (0.009…9.8 ft)	No adjustment	Light and dark operate	NPN	42CM-P2MNB-D4
					PNP	42CM-P2MPB-D4
	Class 1 laser 650 nm	0.003…30 m (0.009…98 ft)	Teach button	Light and dark operate	NPN	42CM-P8MNB-D4
					PNP	42CM-P8MPB-D4
Diffuse 	Visible red 660 nm	3…100 mm (0.12…3.9 in.)	Potentiometer	Light and dark operate	NPN	42CM-D2MNAE-D4
		3…400 mm (0.12…15.7 in.)			PNP	42CM-D2MNAE-D4
		3…100 mm (0.12…3.9 ft)			NPN	42CM-D2MPAE-D4
		3…400 mm (0.12…15.7 in.)			PNP	42CM-D2MPAE-D4
	Class 1 laser 650 nm	3…300 mm (0.12…11.8 in.)	Teach button		NPN	42CM-D8MNA-D4
					PNP	42CM-D8MPA-D4
Background Suppression 	Class 1 laser Visible red 660 nm	50 mm (2 in.)	No adjustment	Selectable light or dark operate	NPN	42CM-B2LNBC-D4
		100 mm (3.9 in.)				42CM-B2LNBE-D4
		50 mm (2 in.)			PNP	42CM-B2LPBC-D4
		100 mm (3.9 in.)				42CM-B2LPBE-D4
Transmitted Beam 	Infrared 880 nm	0…20 m (0…65.6 ft)	No adjustment	— (Emitter)	—	42CM-E1EZB-D4
	Class 1 laser 650 nm	3…50 m (9.8…164 ft)			PNP	42CM-E8EZB-D4
	Infrared 880 nm or Visible red 660 nm	3…20 m (9.8…65.6 ft)	No adjustment	Light and dark operate	NPN	42CM-R1MNB-D4
					PNP	42CM-R1MPB-D4
		3…50 m (9.8…164 ft)	Potentiometer		NPN	42CM-R8MNB-D4
					PNP	42CM-R8MPB-D4
Recommended standard 4-pin DC micro (M12) quick-disconnect cordset						889D-F4AC-2

(1) Connection Options: The -D4 suffix describes a 4-pin DC micro (M12) quick-disconnect connector. For additional connection options, replace the -D4 suffix with: -A2 for a 2 m cable without quick-disconnect connection (for example, 42CA-P2MPB-A2).

Table 14 - User Interface Panel-42CM Standard Models

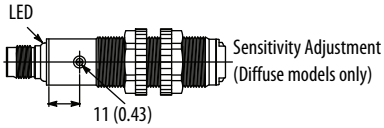
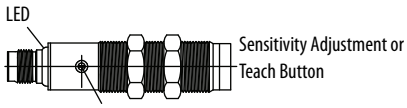
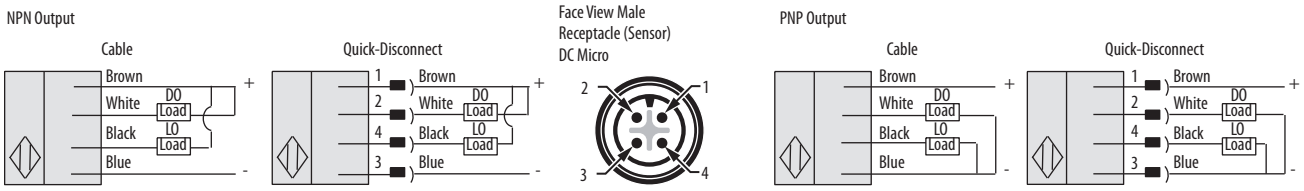
42CM Standard Models	LED Color	State	Status
	Yellow	Off	Sensor output is de-activated
		On	Sensor output is activated

Table 15 - User Interface Panel-42CM Laser Models

42CM Laser Models	LED Color	State	Status	L.O. Output	D.O. Output
	Orange	Off	Dark condition	Off	On
		Flashing(1)	Light condition (excess gain < 2)	On	Off
		On	Light condition (excess gain > 2)	On	Off
	Green	On	Output	—	—

(1) Transmitted beam receivers do not have a flashing (low margin) state.

Figure 12 - Diffuse Wiring Diagrams



(1) Black open circuit to enable laser. Tie black to blue/V- to disable laser.
(2) Pin2/white open circuit to enable laser. Tie pin2/white to blue/V- to disable laser.

Figure 13 - Transmitted Beam (42CM Standard), Retroreflective, Polarized Retroreflective Wiring Diagrams

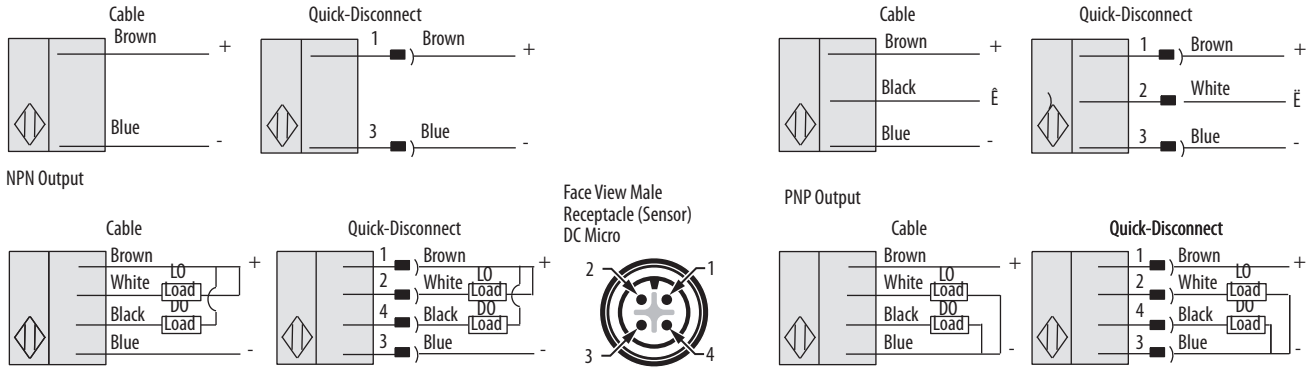


Figure 14 - Background Suppression (42CM Standard Only) Wiring Diagrams

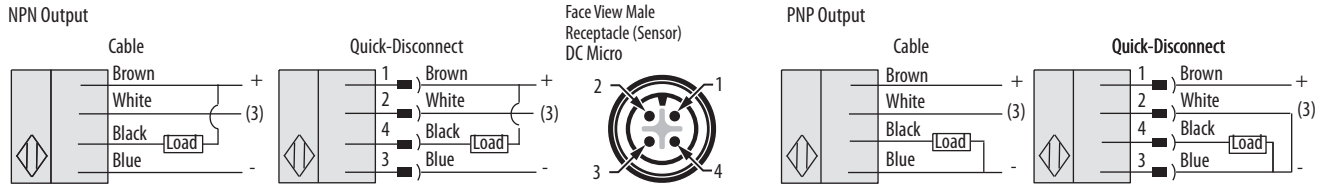


Figure 15 - Approximate Dimensions [mm (in.)]

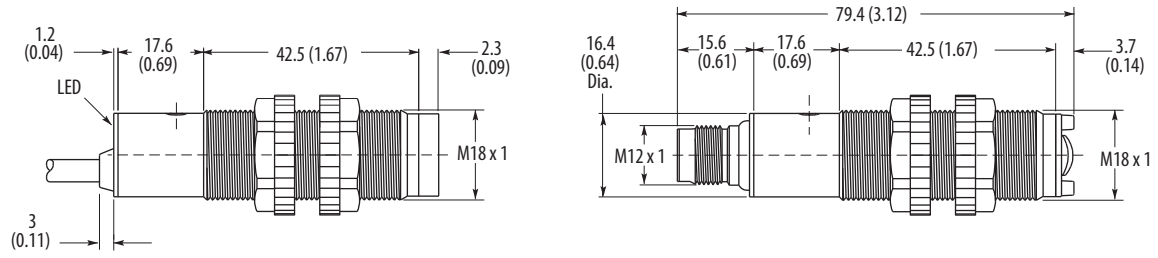
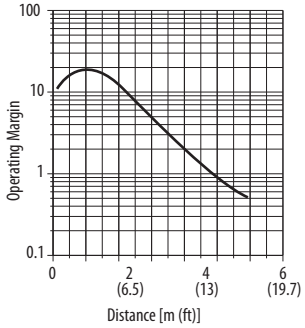
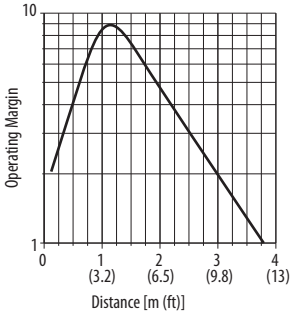


Figure 16 - Typical Response Curves

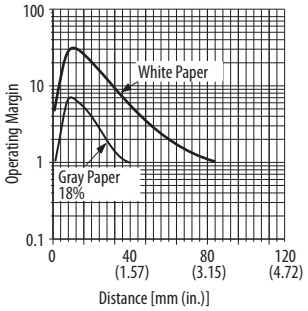
Retroreflective



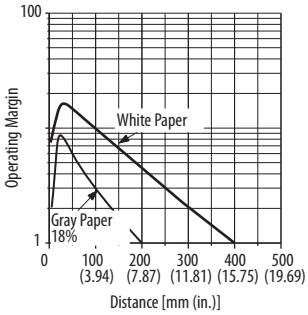
Polarized Retroreflective



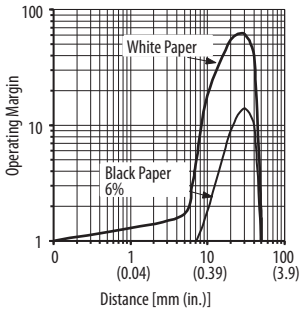
Standard Diffuse [100 mm]



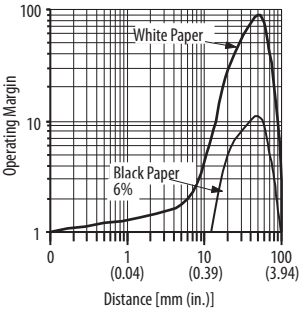
Standard Diffuse [400 mm]



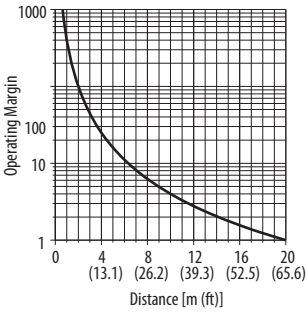
Background Suppression [50 mm]



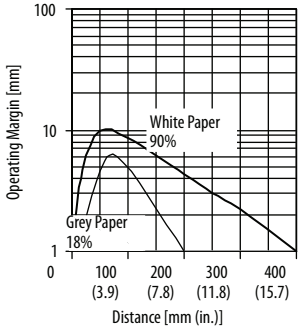
Background Suppression [100 mm]



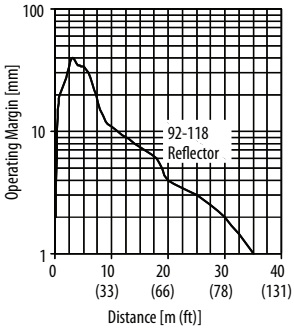
Transmitted Beam



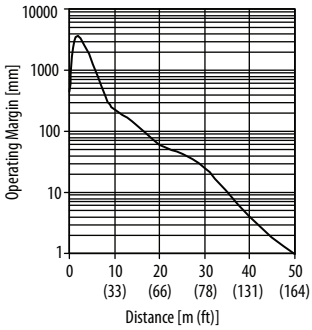
Diffuse



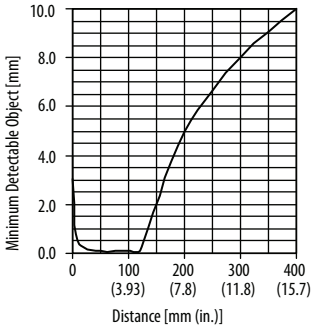
Laser Polarized Retroreflective



Transmitted Beam



Standard Diffuse



Polarized Retroreflective

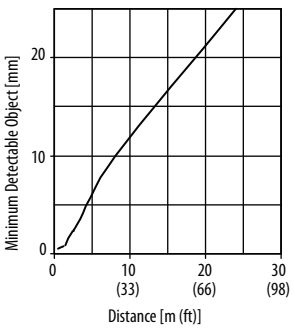


Table 16 - Cordsets and Accessories

Description	Cat. No.
DC micro QD cordset, straight, 4-pin, 2 m	889D-F4AC-2
DC micro QD cordset, right angle, 4-pin, 2 m	889D-R4AC-2
Mounting bracket, snap-clamp	871A-SCBP18
Mounting bracket, right angle	60-2657
Mounting bracket, swivel/tilt	60-2649
Mounting bracket, straight	60-2656
76 mm (3 in.) diameter reflector	92-39
32 mm (1.25 in.) diameter reflector	92-47

42CS 18 mm Stainless Steel Cylindrical Sensor

Features

Stainless steel 18 mm cylindrical sensors include the following features:

- Patented ferromagnetic teach for easy sensor programming
- Extended temperature operating range -25...+85 °C (-13...+185 °F)
- Clean design minimizes the accumulation of undesired particles that allow for a fast and easy cleanup
- 18 mm stainless steel 316L enclosure with laser etched markings
- Two teach modes: standard and precision
- Complementary light and dark operate outputs
- Teach lockout feature helps prevent unauthorized users from changing the settings
- Clear object detection models available
- Input to disable light source on transmitted beam emitter
- IP69K, ECOLAB, and Johnson Diversey rated

Available Models

- Retroreflective
- Polarized retroreflective
- Standard diffuse
- Background suppression
- Transmitted beam

Table 17 - Specifications

Certifications	c-UL-us Listed and CE Marked for all applicable directives
Shock	30 g with 1 ms pulse duration, meets or exceeds IEC 600947-5-2
Vibration	10…55 Hz, 1 mm amplitude, meets or exceeds IEC 600947-5-2
Environmental	
Enclosure type rating	IP69K, ECOLAB, and Johnson Diversey rated
Operating temperature	-25…+85 °C (-13…+185 °F)
Relative humidity	5…95% (noncondensing)
Ambient light immunity	5000 lux (incandescent light) and 10000 lux (sunlight)
Optical	
Light source	Visible red (660 nm) or infrared (880 nm)
Sensitivity adjustment	Ferromagnetic teach
User Interface	
Indicator LEDs	Green: Power/margin Orange: Output
Electrical	
Operating voltage	10…30V DC
Current consumption	35 mA max
Protection type	Short circuit, transient noise, reverse polarity
Outputs	
Output type	See Table 19.
Output function	Light operate and dark operate
Load current	100 mA
Leakage current	10 µA DC, max
Mechanical	
Housing material	316L stainless steel
Lens material	PMMA
Connection type	4-pin DC Micro (M12) QD
Supplied accessories	Stainless steel teach rod, mounting nuts (threaded models only)
Optional accessories	Mounting brackets, cordsets, reflectors

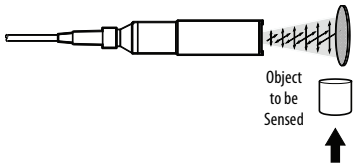
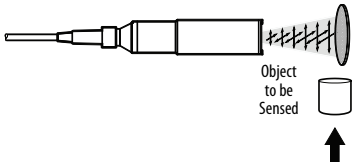
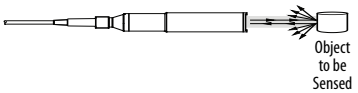
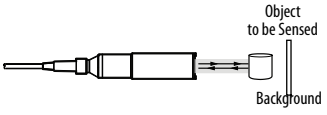
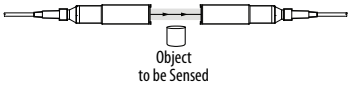
Table 18 - Optical and Response Time Characteristics

Attribute	Sensing Mode				
	Polarized Retroreflective	Clear Object Detection	Diffuse	Background Suppression	Transmitted Beam
Field of View	3°	3°	100 mm = 6° 400 mm = 6° 800 mm = 8°	9° for 100 mm	4°

Table 18 - Optical and Response Time Characteristics

Attribute	Sensing Mode				
	Polarized Retroreflective	Clear Object Detection	Diffuse	Background Suppression	Transmitted Beam
Spot Size	190 mm @ 4 m	153 mm @ 1 m	100 mm = 10.4 mm 400 mm = 48.3 mm 800 mm = 127 mm	16 mm @ 100 m	640 mm @ 20 m
Light Source	Visible red 660 nm		100 mm = Visible red 660 nm 400 mm = Infrared 880 nm 800 mm = Infrared 880 nm	Visible red 660 nm	Infrared 880 nm
Response Time	1 ms	1 ms	1 ms	1 ms	1 ms

Table 19 - Product Selection

Sensing Mode		Light Source	Sensing Distance	Sensitivity Adjustment	Output Function	Output Type	Cat. No. (1)
Polarized Retroreflective		Visible red 660 nm	0.1…4 m (0.33…13.1 ft)	No adjustment	Light and dark operate	NPN	42CSS-P2MNB1-D4
						PNP	42CSS-P2MPB1-D4
Clear Object Detection		Visible red 660 nm	0.05…1 m (0.16…3.28 ft)	Ferromagnetic teach	Light and dark operate	NPN	42CSS-C2MNA1-D4
						PNP	42CSS-C2MPA1-D4
Diffuse		Visible red 660 nm	0…100 mm (0…3.94 in.)	Ferromagnetic teach	Light and dark operate	NPN	42CSS-D2MNA1-D4
						PNP	42CSS-D2MPA1-D4
		Infrared 880 nm	0…400 mm (0…15.7 in.)	Ferromagnetic teach		NPN	42CSS-D1MNA2-D4
						PNP	42CSS-D1MPA2-D4
			0…800 mm (0…31.5 in.)			NPN	42CSS-D1MNA3-D4
						PNP	42CSS-D1MPA3-D4
Background Suppression		Visible red 660 nm	60…100 mm (2.4…3.9 in.)	Ferromagnetic teach	Light and dark operate	NPN	42CSS-B2MNA1-D4
						PNP	42CSS-B2MPA1-D4
Transmitted Beam		Infrared 880 nm	0…20 m (0…65.6 ft)	No adjustment	— (Emitter)	—	42CSS-E1EZB1-D4
					Light and dark operate	NNP	42CSS-R9MNB1-D4
						PNP	42CSS-R9MPB1-D4

(1) The prefix 42CSS denotes smooth enclosure. For threaded models replace the 42CSS with 42CST (for example, 42CST-P2MPB1-D4).

IMPORTANT All sensor models are rated for 10…30V DC and can drive loads requiring up to 100 mA.

Table 20 - User Interface

LED Color	State	Status
Green	Off	Teach function is locked
	On	Teach function is enabled
	Flashing (8 Hz)	Short circuit

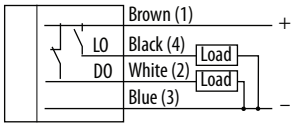
Table 20 - User Interface

LED Color	State	Status
Yellow	Off	Output de-energized
	On	Output energized(1)
	Flashing (3 Hz)	Output energized (margin < 2)(1)

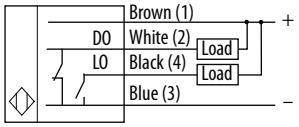
(1) Pin 4 of micro (M12) QD. L.O. for diffuse and background suppression. D.O. for polarized retroreflective and transmitted beam.

Figure 17 - Diffuse and Background Suppression Wiring Diagrams

PNP Models with Complementary Outputs



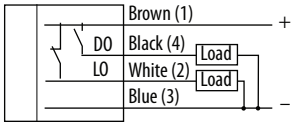
NPN Models with Complementary Outputs



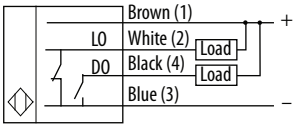
(2) For normal operation, white wire (pin 2) needs no connection. To disable light source, connect white wire (pin 2) to +V.

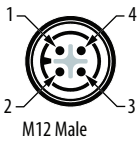
Figure 18 - Polarized Retroreflective, Clear Object, and Transmitted Beam Receiver Wiring Diagrams

PNP Models with Complementary Outputs

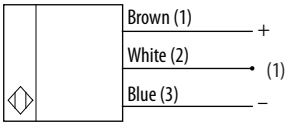


NPN Models with Complementary Outputs





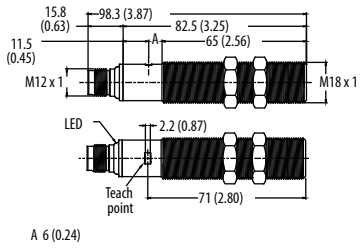
Transmitted Beam Emitter



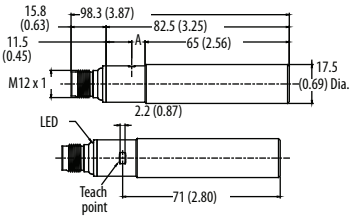
(1) For normal operation, white wire (pin 2) needs no connection. To disable light source, connect white wire (pin 2) to +V.

Figure 19 - Approximate Dimensions [mm (in.)]

Threaded Barrel Models



Smooth Barrel Models



60-BCS-18B—Mounting Bracket

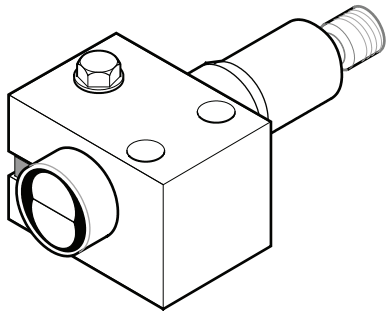
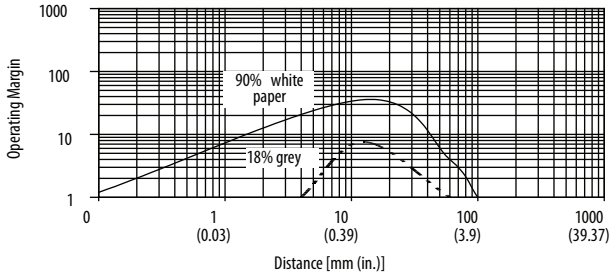
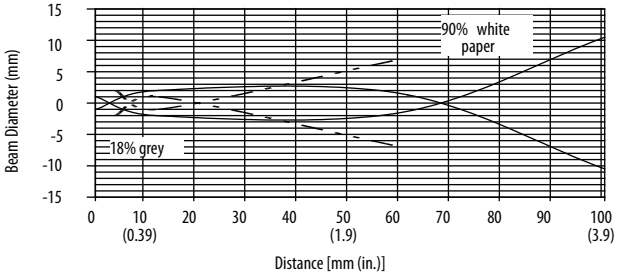


Figure 20 - Typical Response Curves

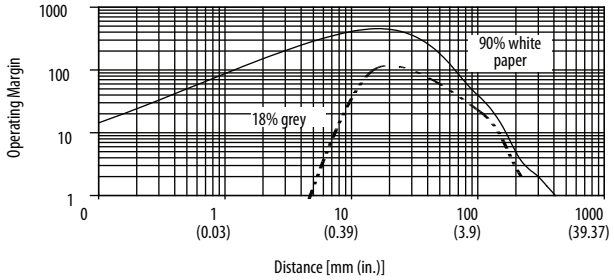
Standard Diffuse [100 mm]



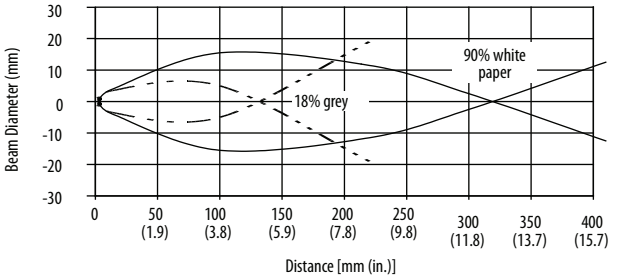
Beam Pattern [100 mm]



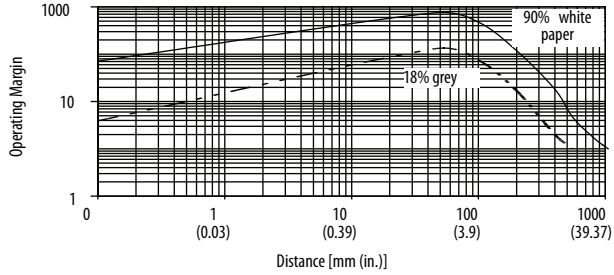
Standard Diffuse [400 mm]



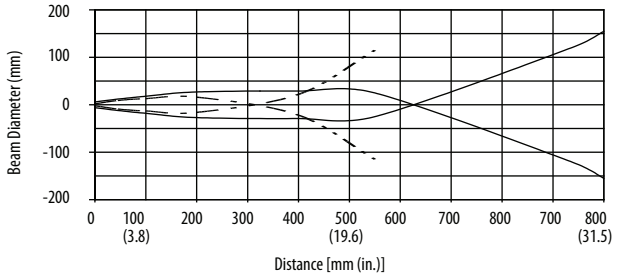
Beam Pattern [400 mm]



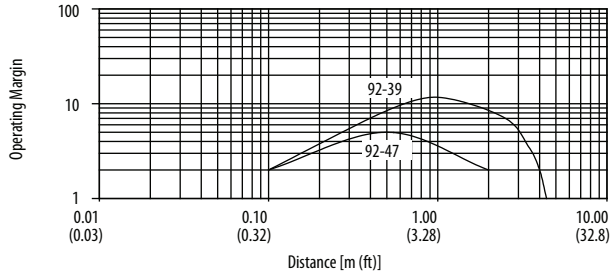
Standard Diffuse [800 mm]



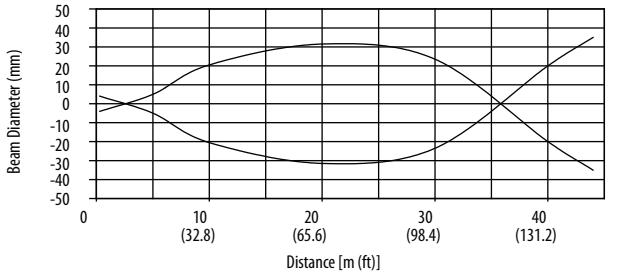
Beam Pattern [800 mm]



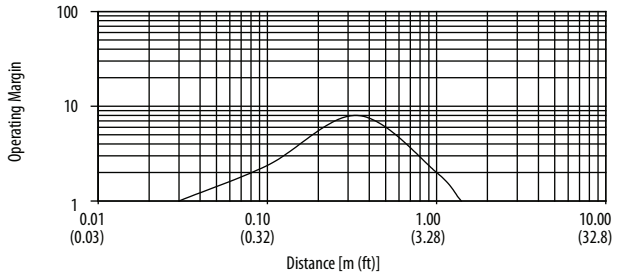
Polarized Retroreflective [4 m]



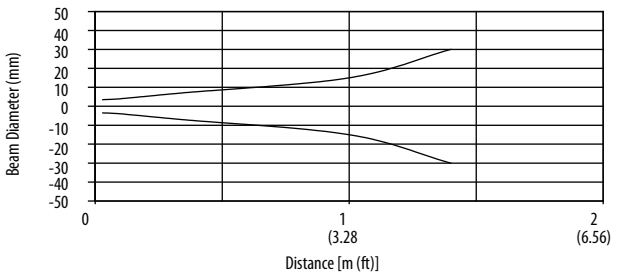
Beam Pattern [4 m]



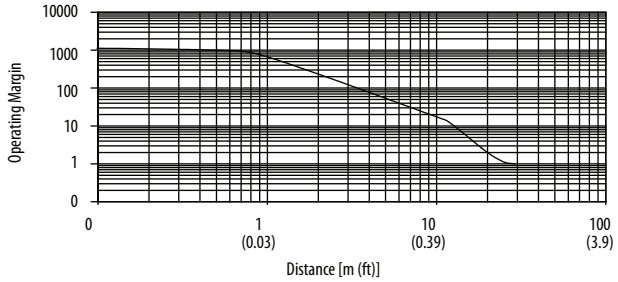
Clear Object [1 m]



Beam Pattern [1 m]



Transmitted Beam [20 m]



Beam Pattern [20 m]

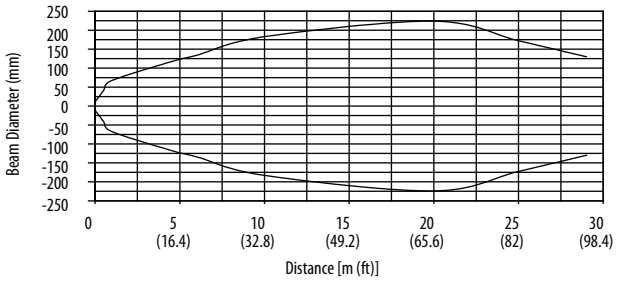


Table 21 - Cordsets and Accessories

Description	Cat. No.
DC Micro (M12) QD Cordset, 4-pin	889DS-F4AC-2
DC Micro (M12) QD Patchcord, 4-pin	889D-F4ACDM-2
Block mounting bracket for smooth barrel housing	60-BCS-18B
Straight mounting bracket for threaded models	60-2656
Right angle mounting bracket for threaded models	60-2657

Rockwell Automation Support Notes:

Use the following resources to access support information.

Technical Support Center	Knowledgebase Articles, How-to Videos, FAQs, Chat, User Forums, and Product Notification Updates.	www.rockwellautomation.com/knowledgebase
Local Technical Support Phone Numbers	Locate the phone number for your country.	www.rockwellautomation.com/global/support/get-support-now.page
Direct Dial Codes	Find the Direct Dial Code for your product. Use the code to route your call directly to a technical support engineer.	www.rockwellautomation.com/global/support/direct-dial.page
Literature Library	Installation Instructions, Manuals, Brochures, and Technical Data.	www.rockwellautomation.com/literature
Product Compatibility and Download Center (PCDC)	Get help determining how products interact, check features and capabilities, and find associated firmware.	www.rockwellautomation.com/global/support/pcdc.page

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Rockwell Automation maintains current product environmental information on its website at http://www.rockwellautomation.com/rockwellautomation/about-us/sustainability-ethics/product-environmental-compliance.page.

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