



RightSight DC model with short 18 mm base

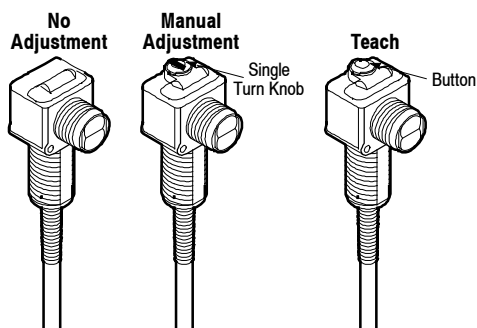
Features

- Compact right angle housing
- Flexible 18 mm mounting options
- 1200 psi washdown rating
- Non-adjustable, adjustable and teach versions
- 360° visible LED indicators
- Reverse polarity protection
- Short-circuit protected outputs
- Fast 1 ms response time (DC)
- False pulse protection
- Variety of output types
- Laser models available (see page 1-108)

Specifications

Environmental	
Certifications	UL Listed, CSA Certified and CE Marked for all applicable directives
Operating Environment	NEMA 4X, 6P, IP67 (IEC 529); 1200 psi (8270 kPa) washdown, IP69K
Operating Temperature [C (F)]	-25...+70° (-13...+158°) ≤ 132V AC/DC -25...+55° (-13...+131°) ≥ 132V AC/DC
Vibration	10...55 Hz, 1 mm amplitude, meets or exceeds IEC 60068-2-6
Shock	30 g with 1 ms pulse duration, meets or exceeds IEC 60068-2-27
Relative Humidity	5...95% (noncondensing)
Ambient Light Immunity	Incandescent light 5000 lux
Optical	
Sensing Modes	Retroreflective, polarized retroreflective, diffuse, background suppression, sharp cutoff, fixed focus, fiber optic, transmitted beam
Sensing Range	See Product Selection table on page 1-34
Field of View	See Product Selection table on 1-34
Light Source	Visible red LED (660 nm) or infrared LED (880 nm)
LED Indicators	See User Interface below
Adjustments	Sensitivity potentiometer, teach button, or fixed by cat. no.
Electrical	
Voltage	10.8...30V DC, 21.6...264V AC
Current Consumption	35 mA max (DC), 25 mA max (AC)
Sensor Protection	False pulse, reverse polarity, overload, short circuit
Outputs	
Response Time	1 ms (4 ms for transmitted beam) DC models 8.3 ms (16.6 ms for transmitted beam) AC models
Output Type	PNP or NPN by cat. no., PNP and NPN, N-MOSFET
Output Mode	Complementary light or dark operate, light or dark operate by cat. no.
Output Current	100 mA
Output Leakage Current	0.1 mA max (DC); 0.4 mA max (AC)
Mechanical	
Housing Material	Mindel
Lens Material	Acrylic
Cover Material	Udel
Connection Types	2 m cable, 4-pin DC micro (M12) QD, 4-pin pico (M8) QD
Supplied Accessories	18 mm fastening nuts
Optional Accessories	See mounting brackets, reflectors, and cordsets on page 1-39

User Interface



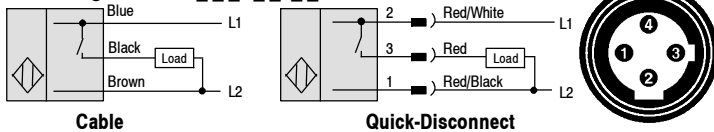
Color	State	Status—Nonteach Version	Status—Teach Version
Yellow	OFF	Output de-energized	Output de-energized
	ON	Output energized	Output energized
	Flashing	SCP active	NA
Orange	OFF	Margin < 2.5	Normal operation
	ON	Margin > 2.5	Teach mode active
	Flashing	Output SCP active (AC models only)	Teach mode active or output SCP active
Green	OFF	Sensor not powered, SCP active, output active	Sensor not powered
	ON	Sensor powered	Sensor powered
	Flashing	NA	Unstable margin condition or output SCP active

Note: For DC models output and margin LEDs alternate flashing when SCP active.

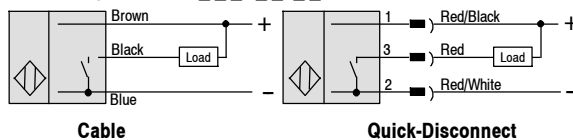
Wiring Diagrams ①②

21.6...264V AC/DC Sensors

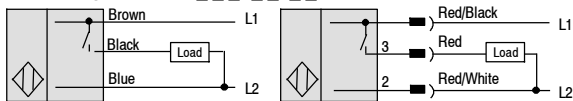
AC Wiring for 42EF- C - Models



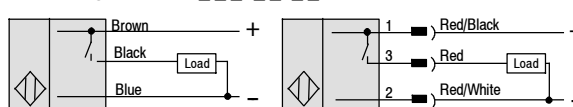
DC Wiring for 42EF- C - Models



AC Wiring for 42EF- F - Models

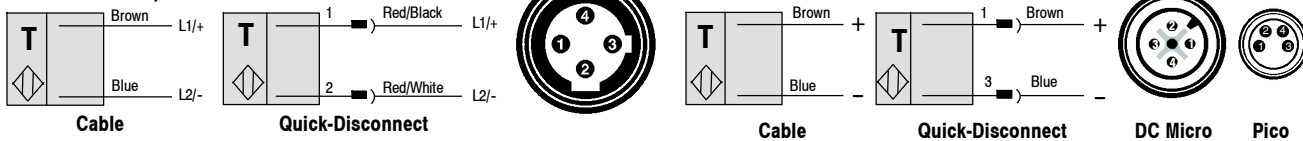


DC Wiring for 42EF- F - Models



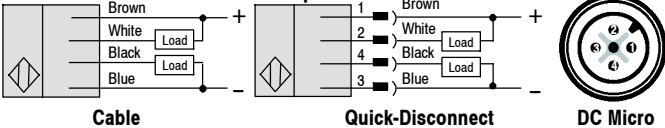
Transmitted Beam Source

21.6...264V AC/DC

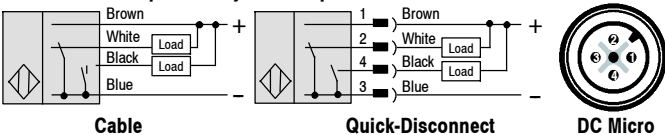


10.8...30V DC Sensors

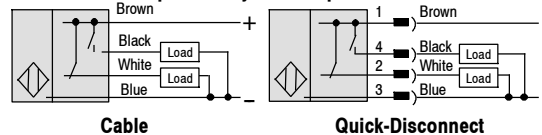
Models with Dual NPN and PNP Outputs



Models with Complementary NPN Outputs



Models with Complementary PNP Outputs

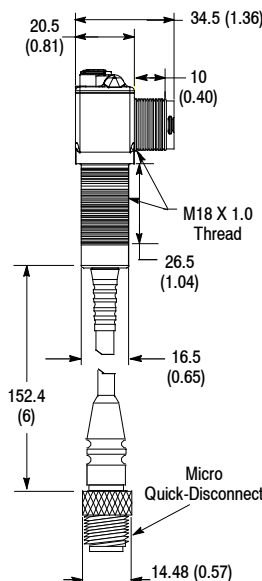


① For Rockwell Automation programmable controller compatible interface, refer to publication 42-2.0.

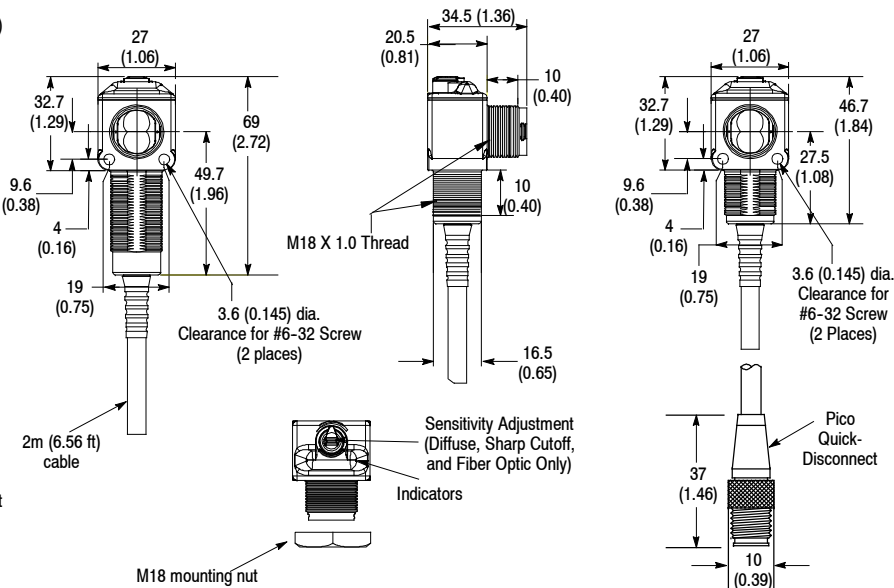
② All wire colors on quick-disconnect models refer to Rockwell Automation cordsets.

Approximate Dimensions [mm (in.)]

AC/DC and DeviceNet Models



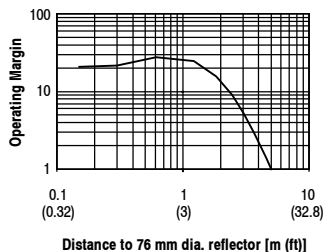
DC Models



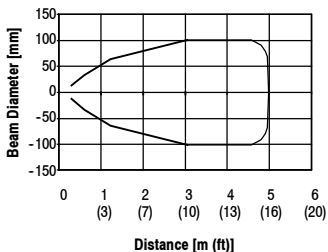
Note: All sensors supplied with one M18 mounting nut (Cat. No. 75012-097-01) except fiber optic models which come with two M18 mounting nuts (Cat. No. 75012-025-01).

Typical Response Curve

Retroreflective

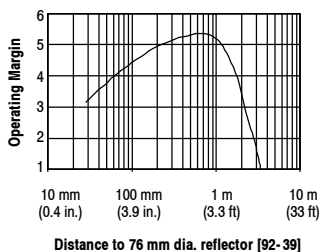


Beam Pattern

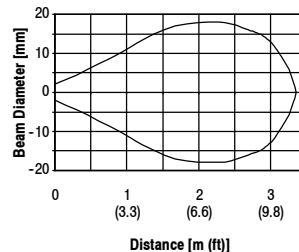


Typical Response Curve

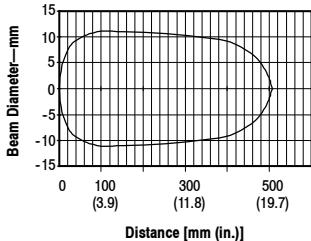
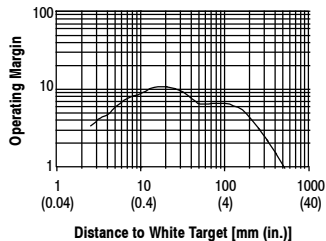
Polarized Retroreflective



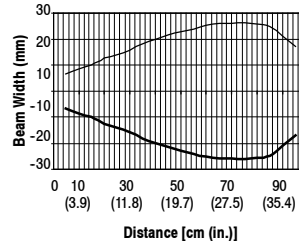
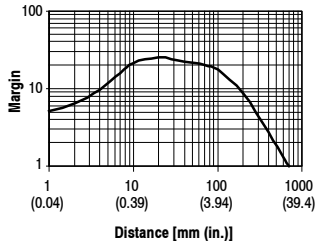
Beam Pattern



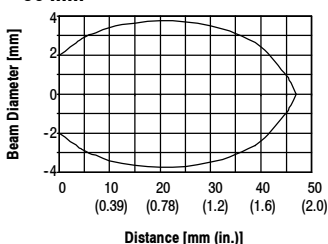
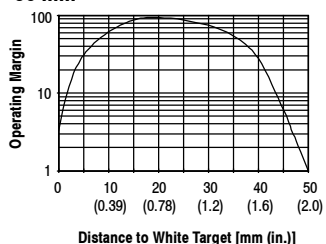
Standard Diffuse—Nonteach



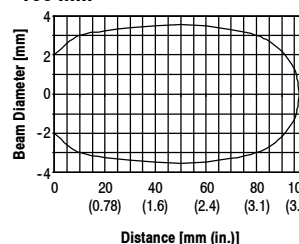
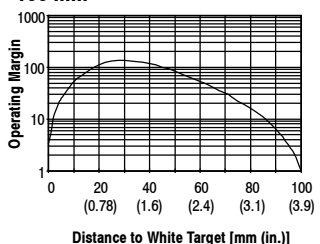
Standard Diffuse—Teach



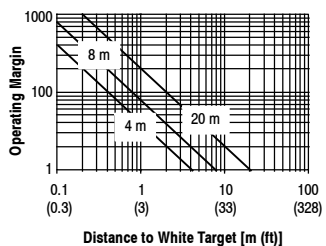
Background Suppression 50 mm



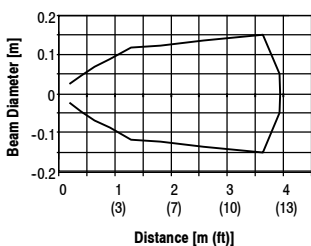
Background Suppression 100 mm



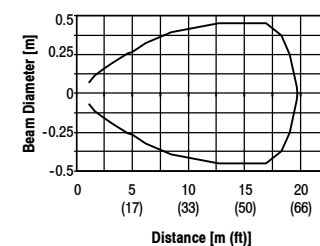
Transmitted Beam



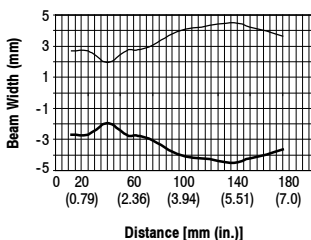
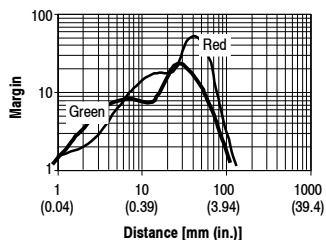
4 m Receiver Models



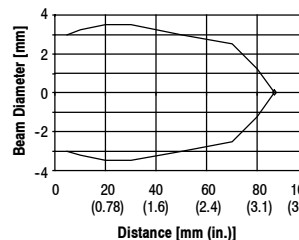
Transmitted Beam 20 m Receiver Models



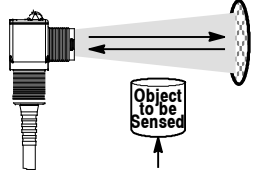
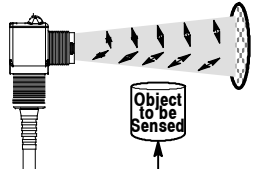
Fixed Focus



Sharp Cutoff Diffuse



Product Selection

Sensing Mode	Current @ Voltage	Sensing Distance	Adjustment Type	Output Energized	Output Type/ Capacity Response Time	Connection Type	Cat. No.	
 <p>Retroreflective Field of View: 2.5° Emitter LED: Visible red 660 nm</p>	35 mA @ 10.8...30V DC	25 mm...4.5 m (1 in...14.7 ft)	No Adjustment	Dark Operate	NPN and PNP 100 mA 1 ms	2 m 300V cable	42EF-U2KBB-A2	
				Light Operate		4-pin DC micro	42EF-U2KBB-F4	
				Dark Operate		2 m 300V cable	42EF-U2JBB-A2	
				Light Operate		4-pin DC micro	42EF-U2JBB-F4	
	15 mA @ 21.6...264V AC/DC	N-MOSFET* 100 mA 8.3 ms	Dark Operate	2 m 300V cable	42EF-U2SCB-A2			
			Light Operate	4-pin AC micro	42EF-U2SCB-G4			
			Dark Operate	2 m 300V cable	42EF-U2RCB-A2			
			Light Operate	4-pin AC micro	42EF-U2RCB-G4			
 <p>Polarized Retroreflective Field of View: 1.5° Emitter LED: Visible red 660 nm</p>	35 mA @ 10.8...30V DC	25 mm...3 m (1 in...9.8 ft)	No Adjustment	Dark Operate	NPN and PNP 100 mA 1 ms	2 m 300V cable	42EF-P2KBB-A2	
				Light Operate		4-pin DC micro	42EF-P2KBB-F4	
				Complementary Light and Dark Operate		NPN 100 mA 1 ms	2 m 300V cable	42EF-P2MNB-A2
							4-pin DC micro	42EF-P2MNB-F4
					PNP 100 mA 1 ms	4-pin pico QD	42EF-P2MNB-Y4	
						2 m 300V cable	42EF-P2MPB-A2	
				4-pin DC micro	42EF-P2MPB-F4			
				4-pin pico QD	42EF-P2MPB-Y4			
	15 mA @ 21.6...264V AC/DC	N-MOSFET 100 mA 8.3 ms	Dark Operate	2 m 300V cable	42EF-P2SCB-A2			
			Light Operate	4-pin AC micro	42EF-P2SCB-G4			
			Complementary Light and Dark Operate	NPN 100 mA 1 ms	2 m 300V cable	42EF-P2RCB-A2		
					4-pin AC micro	42EF-P2RCB-G4		
				PNP 100 mA 1 ms	2 m 300V cable	42EF-P2RCB-A2		
					4-pin AC micro	42EF-P2RCB-G4		

① P-MOSFET models are available. Refer to www.ab.com/sensors.

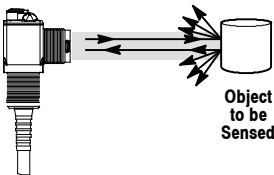
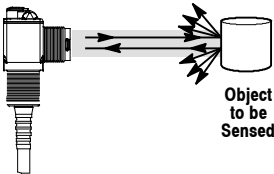
ATTENTION



P-MOSFET models have a lower in-rush current threshold for short-circuit protection than N-MOSFET. Therefore, they may be susceptible to false trigger of short-circuit protection due to induced noise.

Refer to page 1-39 for cordsets and accessories.

Product Selection (continued)

Sensing Mode	Current @ Voltage	Sensing Distance	Adjustment Type	Output Energized	Output Type/ Capacity Response Time	Connection Type	Cat. No.
 <p>Standard Diffuse Field of View: 5° Emitter LED: Infrared 880 nm</p>	35 mA @ 10.8...30V DC	3...500 mm (0.12...20 in.)	Single-Turn Knob	Dark Operate	NPN and PNP 100 mA 1 ms	2 m 300V cable	42EF-D1KBAK-A2
				Light Operate		4-pin DC micro	42EF-D1KBAK-F4
	30 mA @ 10.8...30V DC	3...700 mm (0.12...27.6 in.)	Teach Button	Light Operate	NPN and PNP 100 mA 1 ms	2 m 300V cable	42EF-D1JBCK-A2
				Dark Operate		4-pin DC micro	42EF-D1JBCK-F4
	35 mA @ 10.8...30V DC	3...500 mm (0.12...20 in.)	Single-Turn Knob	Complementary Light and Dark Operate	NPN 100 mA 1 ms	2 m 300V cable	42EF-D1MNAK-A2
						4-pin DC micro	42EF-D1MNAK-F4
	15 mA @ 21.6...264V AC/DC				PNP 100 mA 1 ms	4-pin pico QD	42EF-D1MNAK-Y4
						2 m 300V cable	42EF-D1MPAK-A2
					N-MOSFET* 100 mA 8.3 ms	4-pin DC micro	42EF-D1MPAK-F4
						4-pin pico QD	42EF-D1MPAK-Y4
					Light Operate	2 m 300V cable	42EF-D1RCAK-A2
						4-pin AC micro	42EF-D1RCAK-G4
				Dark Operate	2 m 300V cable	42EF-D1SCAK-A2	
					4-pin AC micro	42EF-D1SCAK-G4	
 <p>Sharp Cutoff Diffuse Field of View: 7° Emitter LED: Infrared 880 nm</p>	25 mA @ 10.8...30V DC	3...130 mm (0.12...5 in.)	Single-Turn Knob	Dark Operate	NPN and PNP 100 mA 1 ms	2 m 300V cable	42EF-S1KBA-A2
				Light Operate		4-pin DC micro	42EF-S1KBA-F4
				Complementary Light and Dark Operate		2 m 300V cable	42EF-S1JBA-A2
						4-pin DC micro	42EF-S1JBA-F4
	PNP 100 mA 1 ms	2 m 300V cable	42EF-S1MPA-A2				
		4-pin DC micro	42EF-S1MPA-F4				
	NPN 100 mA 1 ms	4-pin pico QD	42EF-S1MPA-Y4				
		2 m 300V cable	42EF-S1MNA-A2				
	4-pin DC micro	42EF-S1MNA-F4					
		4-pin pico QD	42EF-S1MNA-Y4				
	Light Operate	2 m 300V cable	42EF-S1RCA-A2				
		4-pin AC micro	42EF-S1RCA-G4				
Dark Operate	2 m 300V cable	42EF-S1SCA-A2					
	4-pin AC micro	42EF-S1SCA-G4					

* P-MOSFET models are available. Refer to www.ab.com/sensors.

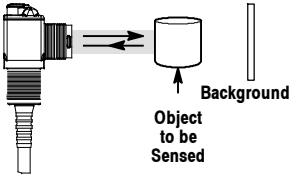
ATTENTION



P-MOSFET models have a lower in-rush current threshold for short-circuit protection than N-MOSFET. Therefore, they may be susceptible to false trigger of short-circuit protection due to induced noise.

Refer to page 1-39 for cordsets and accessories.

Product Selection (continued)

Sensing Mode	Current @ Voltage	Sensing Distance	Adjustment Type	Output Energized	Output Type/ Capacity Response Time	Connection Type	Cat. No.
 <p>Background Suppression</p> <p>Field of View: 50 mm (2 in.); 20° 100 mm (3.9 in.); 8° Emitter LED: Infrared 880 nm</p>	35 mA @ 10.8...30V DC	50 mm (1.97 in.)	No Adjustment	Dark Operate	NPN and PNP 100 mA 1 ms	2 m 300V cable	42EF-B1KBBC-A2
				Light Operate		4-pin DC micro	42EF-B1KBBC-F4
				Dark Operate		2 m 300V cable	42EF-B1JBBC-A2
		Light Operate		4-pin DC micro		42EF-B1JBBC-F4	
		Dark Operate		2 m 300V cable		42EF-B1KBBE-A2	
		Light Operate		4-pin DC micro		42EF-B1KBBE-F4	
		100 mm (3.94 in.)		2 m 300V cable	42EF-B1JBBE-A2		
				4-pin DC micro	42EF-B1JBBE-F4		
				2 m 300V cable	42EF-B1MNBC-A2		
	3...50 mm (0.12...2 in.)	NPN 100 mA 1 ms	4-pin DC micro	42EF-B1MNBC-F4			
			4-pin pico QD	42EF-B1MNBC-Y4			
			2 m 300V cable	42EF-B1MPBC-A2			
		PNP 100 mA 1 ms	4-pin DC micro	42EF-B1MPBC-F4			
			4-pin pico QD	42EF-B1MPBC-Y4			
			2 m 300V cable	42EF-B1MNBE-A2			
	4-pin DC micro	42EF-B1MNBE-F4					
		4-pin pico QD		42EF-B1MNBE-Y4			
			3...100 mm (0.12...3.9 in.)	NPN 100 mA 1 ms	2 m 300V cable	42EF-B1MPBE-A2	
PNP 100 mA 1 ms	4-pin DC micro				42EF-B1MPBE-F4		
	4-pin pico QD	42EF-B1MPBE-Y4					
	No Adjustment	PNP-FET 100 mA 8.3 ms		Light Operate	2 m 300V cable	42EF-B1RFBC-A2	
Dark Operate				4-pin AC micro	42EF-B1RFBC-G4		
Light Operate				2 m 300V cable	42EF-B1SFBC-A2		
Dark Operate		4-pin AC micro	42EF-B1SFBC-G4				
Light Operate		2 m 300V cable	42EF-B1RFBE-A2				
Dark Operate		4-pin AC micro	42EF-B1RFBE-G4				
15 mA @ 21.6...132V AC/DC	3...50 mm (0.12...2 in.)	No Adjustment	Light Operate	N-MOSFET❶ 100 mA 8.3 ms	2 m 300V cable	42EF-B1RCBC-A2	
			Dark Operate		4-pin AC micro	42EF-B1RCBC-G4	
			Light Operate		2 m 300V cable	42EF-B1SCBC-A2	
	3...100 mm (0.12...3.9 in.)		Dark Operate	4-pin AC micro	42EF-B1SCBC-G4		
			Light Operate	2 m 300V cable	42EF-B1RCBE-A2		
			Dark Operate	4-pin AC micro	42EF-B1RCBE-G4		
15 mA @ 21.6...264V AC/DC	3...50 mm (0.12...2 in.)	No Adjustment	Light Operate	N-MOSFET❶ 100 mA 8.3 ms	2 m 300V cable	42EF-B1SCBE-A2	
			Dark Operate		4-pin AC micro	42EF-B1SCBE-G4	
			Light Operate		2 m 300V cable	42EF-B1RCBE-A2	
	3...100 mm (0.12...3.9 in.)		Dark Operate	4-pin AC micro	42EF-B1RCBE-G4		
			Light Operate	2 m 300V cable	42EF-B1SCBE-A2		
			Dark Operate	4-pin AC micro	42EF-B1SCBE-G4		

❶ P-MOSFET models are available. Refer to www.ab.com/sensors.

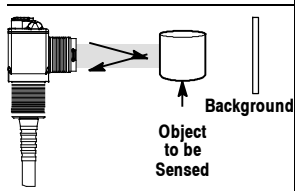
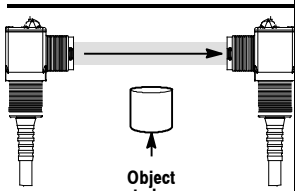
ATTENTION



P-MOSFET models have a lower in-rush current threshold for short-circuit protection than N-MOSFET. Therefore, they may be susceptible to false trigger of short-circuit protection due to induced noise.

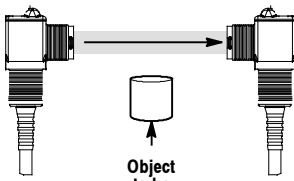
Refer to page 1-39 for cordsets and accessories.

Product Selection (continued)

Sensing Mode	Current @ Voltage	Sensing Distance	Adjustment Type	Output Energized	Output Type/ Capacity Response Time	Connection Type	Cat. No.
 <p>Fixed Focus Diffuse Spot Size: 4 mm Emitter LED: Visible red (660 nm)</p>	10.8...30V DC @ 30 mA max.	Red LED 43 mm (1.69 in.)	Teach Button	Light Operate	NPN and PNP 100 mA 1 ms	2 m 300V cable	42EF-F2JBC-A2
						4-pin DC micro	42EF-F2JBC-F4
				Dark Operate		2 m 300V cable	42EF-F2KBC-A2
						4-pin DC micro	42EF-F2KBC-F4
 <p>Transmitted Beam Field of View: 7° Emitter LED: Infrared 880nm</p>	10.8...30V DC 25 mA	Depends on Receiver	NA	NA	NA	2 m 300V cable	42EF-E1EZB-A2
	21.6...264V AC/DC 15 mA					4-pin DC micro	42EF-E1EZB-F4
						4-pin pico QD	42EF-E1EZB-Y4
						2 m 300V cable	42EF-E1QZB-A2
						4-pin AC micro	42EF-E1QZB-G4

Refer to page 1-39 for cordsets and accessories.

Product Selection for Receivers

Sensing Mode	Current @ Voltage	Sensing Distance [m (ft)]	Adjustment Type	Output Energized	Output Type/ Capacity Response Time	Connection Type	Cat. No.
 <p>Object to be Sensed</p> <p>Transmitted Beam</p> <p>Field of View: 7° Emitter LED: Infrared 880nm (See Note 2.)</p>	25 mA @ 10.8...30V DC	20 m (65.6 ft)	No Adjustment	Dark Operate	NPN and PNP 100 mA 4 ms	2 m 300V cable	42EF-R9KBB-A2
				Light Operate		4-pin DC micro	42EF-R9KBB-F4
		Dark Operate		4 m (13.1 ft)		2 m 300V cable	42EF-R9JBB-A2
		Light Operate				4-pin DC micro	42EF-R9JBB-F4
		Dark Operate		8 m (26.25 ft)		2 m 300V cable	42EF-R9KBBV-A2
		Light Operate				4-pin DC micro	42EF-R9KBBV-F4
		Dark Operate		4 m (13 ft)		2 m 300V cable	42EF-R9JBBV-A2
		Light Operate				4-pin DC micro	42EF-R9JBBV-F4
		Dark Operate		8 m (26.25 ft)		2 m 300V cable	42EF-R9KBBT-A2
		Light Operate				4-pin DC micro	42EF-R9KBBT-F4
		Dark Operate		20 m (65.6 ft)		2 m 300V cable	42EF-R9JBBT-A2
		Light Operate				4-pin DC micro	42EF-R9JBBT-F4
	15 mA @ 21.6...264V AC/DC	Complementary Light and Dark Operate	4 m (13 ft)	NPN 100 mA 4 ms	2 m 300V cable	42EF-R9MNBV-A2	
				PNP 100 mA 4 ms	4-pin DC micro	42EF-R9MNBV-F4	
					4-pin DC pico	42EF-R9MNBV-Y4	
			8 m (26.25 ft)	NPN 100 mA 4 ms	2 m 300V cable	42EF-R9MPBV-A2	
				PNP 100 mA 4 ms	4-pin DC micro	42EF-R9MPBV-F4	
					4-pin DC pico	42EF-R9MPBV-Y4	
			20 m (65.6 ft)	NPN 100 mA 4 ms	2 m 300V cable	42EF-R9MNB-T-A2	
				PNP 100 mA 4 ms	4-pin DC micro	42EF-R9MNB-T-F4	
					4-pin DC pico	42EF-R9MNB-T-Y4	
			4 m (13 ft)	N-MOSFETⓘ 100 mA 16.6 ms	2 m 300V cable	42EF-R9MNB-A2	
					4-pin DC micro	42EF-R9MNB-F4	
					4-pin DC pico	42EF-R9MNB-Y4	
8 m (26.25 ft)	N-MOSFETⓘ 100 mA 16.6 ms	2 m 300V cable	42EF-R9MPB-A2				
		4-pin DC micro	42EF-R9MPB-F4				
		4-pin DC pico	42EF-R9MPB-Y4				
20 m (65.6 ft)	N-MOSFETⓘ 100 mA 16.6 ms	2 m 300V cable	42EF-R9MNB-A2				
		4-pin AC micro	42EF-R9MPB-G4				
		4-pin AC micro	42EF-R9MPB-Y4				
4 m (13 ft)	N-MOSFETⓘ 100 mA 16.6 ms	2 m 300V cable	42EF-R9SCBV-A2				
		4-pin AC micro	42EF-R9SCBV-G4				
		4-pin AC micro	42EF-R9SCBV-A2				
8 m (26.25 ft)	N-MOSFETⓘ 100 mA 16.6 ms	2 m 300V cable	42EF-R9SCBT-A2				
		4-pin AC micro	42EF-R9SCBT-G4				
		4-pin AC micro	42EF-R9SCBT-A2				
20 m (65.6 ft)	N-MOSFETⓘ 100 mA 16.6 ms	2 m 300V cable	42EF-R9SCB-A2				
		4-pin AC micro	42EF-R9SCB-G4				
		4-pin AC micro	42EF-R9SCB-A2				

ⓘ P-MOSFET models are available. Refer to www.ab.com/sensors.

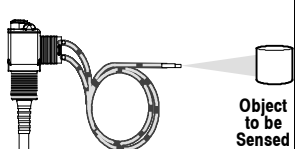
ATTENTION



P-MOSFET models have a lower in-rush current threshold for short-circuit protection than N-MOSFET. Therefore, they may be susceptible to false trigger of short-circuit protection due to induced noise.

Refer to page 1-39 for cordsets and accessories.

Product Selection (continued)

Sensing Mode	Current @ Voltage	Sensing Distance	Adjustment Type	Output Energized	Output Type/ Capacity Response Time	Connection Type	Cat. No.	
 <p>Large Aperture Fiber Optic (See Note 3.)</p> <p>Field of View: Depends on Glass Fiber Optic cable selected</p> <p>Emitter LED: Infrared 880nm</p>	35 mA @ 10.8...30V DC	Depends on Glass Fiber Optic cable selected	Single-Turn Knob	Dark Operate	NPN and PNP 100 mA 1 ms	2 m 300V cable	42EF-G1KBA-A2	
				Light Operate		4-pin DC micro	42EF-G1KBA-F4	
				Complementary Light and Dark Operate	NPN 100 mA 1 ms	2 m 300V cable	42EF-G1MNA-A2	
						4-pin DC micro	42EF-G1MNA-F4	
					PNP 100 mA 1 ms	4-pin pico	42EF-G1MNA-Y4	
						2 m 300V cable	42EF-G1MPA-A2	
	15 mA @ 21.6...264V AC/DC				Light Operate	N-MOSFET 100 mA 8.3 ms	4-pin AC micro	42EF-G1RCA-G4
					Dark Operate		2 m 300V cable	42EF-G1SCA-A2
					4-pin AC micro	42EF-G1RCA-A2		
					4-pin AC micro	42EF-G1SCA-G4		

ⓘ P-MOSFET models are available. Refer to www.ab.com/sensors.

ATTENTION



P-MOSFET models have a lower in-rush current threshold for short-circuit protection than N-MOSFET. Therefore, they may be susceptible to false trigger of short-circuit protection due to induced noise.

Note 1: For color registration mark applications, refer to light source selection guide at www.ab.com/sensors.

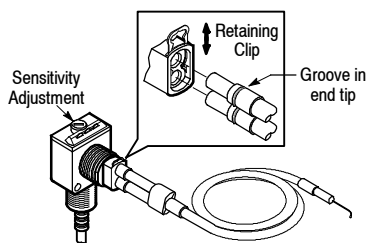
Note 2: For maximum performance, transmitted beam sources should be combined with matched operating voltage receivers, i.e., AC/DC source with AC/DC receiver or DC source with DC receiver. Reduced operating distance and margin will result from mixed operating voltage pairs.

Note 3: For use with glass fiber optic cables. See page 1-231 for more information.

Cordsets and Accessories

Description	Cat. No.	Description	Cat. No.	Description	Cat. No.
DC Micro QD Cordset, Straight, 4-pin, 2 m	889D-F4AC-2	76 mm (3 in.) Diameter Reflector	92-39	Apertures, 1 mm Slot	60-2660
AC Micro QD Cordset, Straight, 4-pin, 2 m	889R-F4AEA-2	32 mm (1.25 in.) Diameter Reflector	92-47	Apertures, 2 mm Slot	60-2661
Pico QD Cordset, Straight, 4-pin, 2 m	889P-F4AB-2	Mounting Bracket Swivel/Tilt	60-2649	Apertures, 4 mm Slot	60-2662
				Aperture Set	60-2659
Bifurcated Fiber Optic Cable—38 mm (1.5 in.) typical range	43GR-TBB25SL	Individual Fiber Optic Cable—457 mm (18 in.) typical range	43GT-FAS25SL		
Bifurcated Fiber Optic Cable—21 mm (0.8 in.) typical range	43GR-TFS10ML	Individual Fiber Optic Cable—152 mm (6 in.) typical range	43GT-TFS10ML		

Glass Fiber Optic Cables





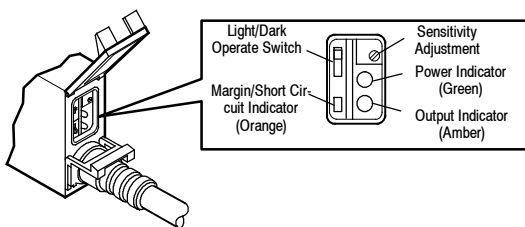
Specifications

Environmental	
Certifications	UL, CSA and CE Marked for all applicable directives
Operating Environment	NEMA 4X, 6P, IP67, 1200 psi (8270 kPa) washdown
Operating Temperature [C (F)]	-20...+70° (-4...+158°)
Vibration	10...55 Hz, 1 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	5...95%
Optical	
Sensing Modes	Retrotreflective, polarized retroreflective, diffuse, wide angle diffuse, fixed focus diffuse, transmitted beam, fiber optic
Sensing Range	See Product Selection table on page 1-45
Field of View	See Product Selection table on page 1-45
Light Source	Visible red LED (660 nm), infrared LED (880 nm)
LED Indicators	See User Interface below
Adjustments	Multi-turn potentiometer
Electrical	
Voltage	10.8...30V DC, 21.6...250V AC/DC
Current Consumption	30 mA max. (DC)
Sensor Protection	Overload, short circuit, reverse polarity, false pulse
Outputs	
Response Time	See Product Selection table on page 1-45
Output Type	PNP and NPN (DC), MOSFET (AC/DC)
Output Mode	Light operate or dark operate selectable
Output Current	100 mA @ 30V DC max
Output Leakage Current	0.1 mA max (DC), 1.7 mA (AC/DC)
Mechanical	
Housing Material	Noryl 190X
Lens Material	Acrylic
Connection Types	2 m cable (24 AWG), 4-pin DC micro (M12) QD, 3-pin AC micro (M12)
Supplied Accessories	75012-097-01 18 mm locknut
Optional Accessories	See mounting brackets, reflectors, and cordsets on page 1-47

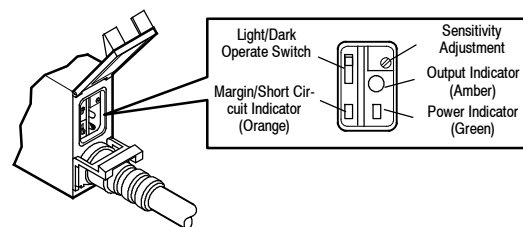
Features

- Compact rectangular size with standard 18 mm mounting nose
- Visible indicators for power, output, and 2.5X margin/short circuit
- Short circuit protection in all versions, including two-wire universal voltage versions
- False pulse protection
- Switch selectable light or dark operation
- Access to sensor adjustments through captive cover that does not require tools for access
- Eight sensing modes available
- Rated to withstand high temperature 1200 psi washdowns
- 300 μs high speed DC versions
- No tools are required to attach fiber optic cables to either glass or plastic fiber optic sensors

User Interface



NOTE: The power indicator will turn off when the output indicator is on. The cat. no. for the Rear Snap Cover is 60-2679.

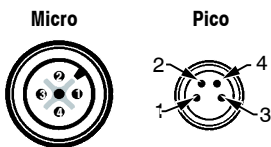
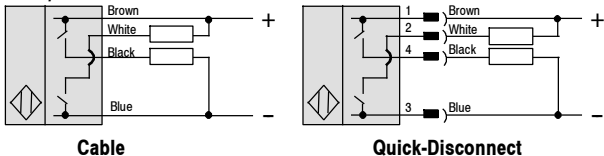


NOTE: The power indicator will turn off when the output indicator is on. The cat. no. for the Rear Snap Cover is 60-2679.

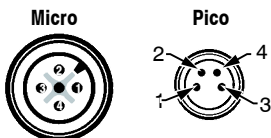
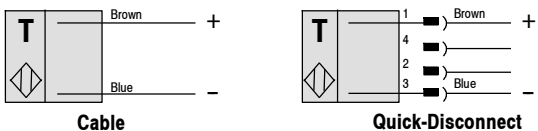
Wiring Diagrams ①②

11...30V DC Sensors

NPN/PNP

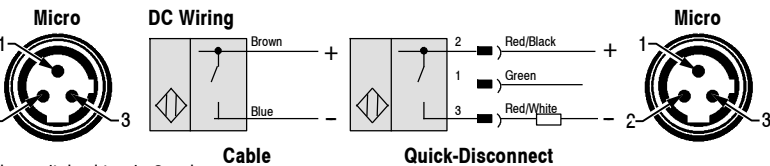
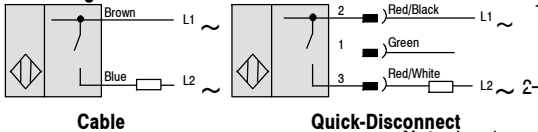


Transmitted Beam Source

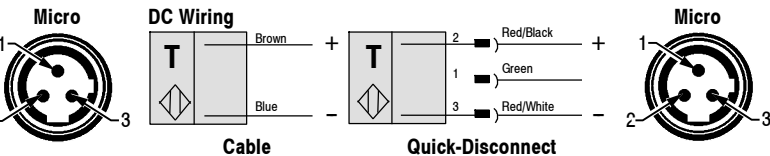
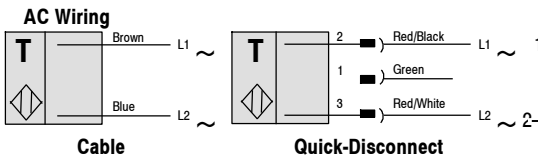


22...250V AC/DC Sensors

AC Wiring



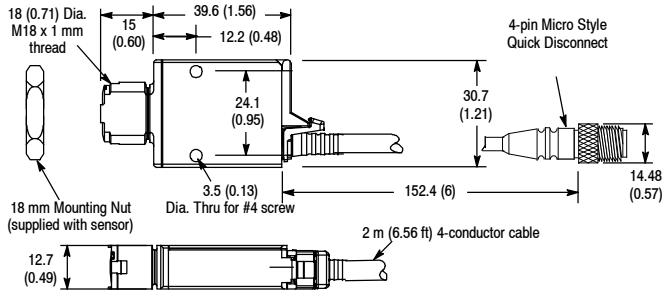
Transmitted Beam Source



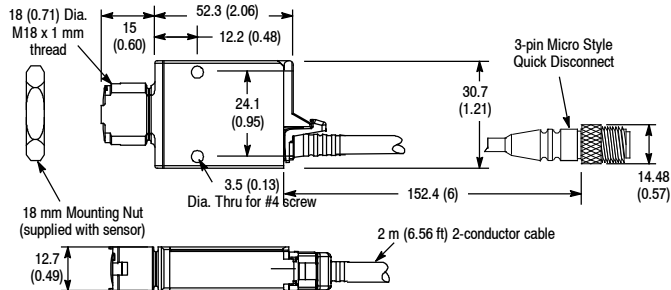
- ① For Rockwell Automation programmable controller compatible interface, refer to *PHOTOSWITCH® Photoelectric Sensors and Programmable Controller Interface Manual* at www.ab.com/literature.
- ② Quick-disconnect wiring codes shown are valid for Rockwell Automation cables only.

Approximate Dimensions [mm (in.)]

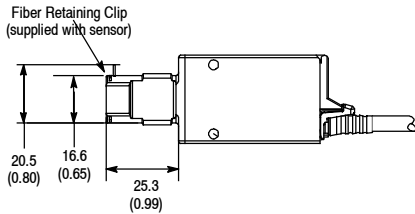
DC Sensors



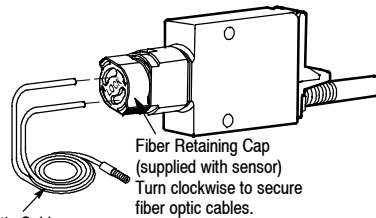
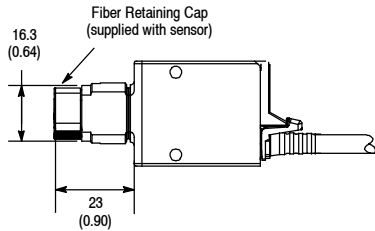
AC/DC Sensors



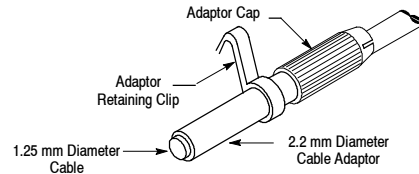
Infrared Glass Fiber Optic Sensors



Visible Red Plastic Fiber Optic Sensors



Plastic Fiber Optic Cable
2.2 mm (0.09 in.) jacket diameter on control end tip



Special Glass Fiber Optic cables are also available with 2.2 mm (0.09 in.) diameter control end tips.

NOTE: Cat. No. 61-6731 adaptors are required for smaller fiber optic cables with jacket diameters of 1.25 mm (0.05 in.).

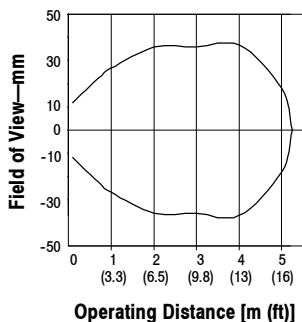
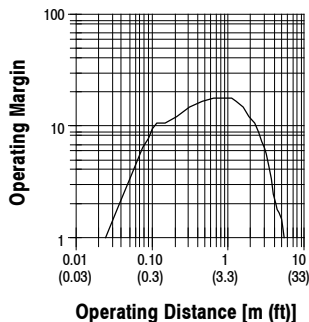
Typical Response Curve

Beam Pattern

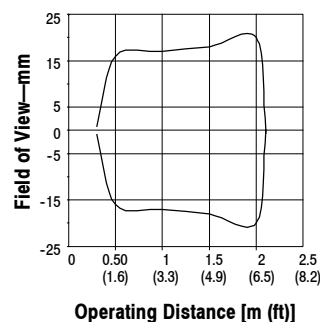
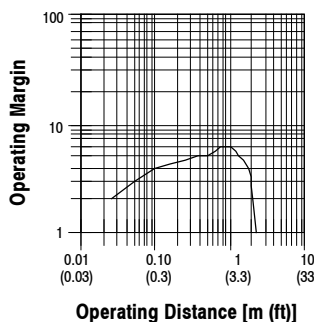
Typical Response Curve

Beam Pattern

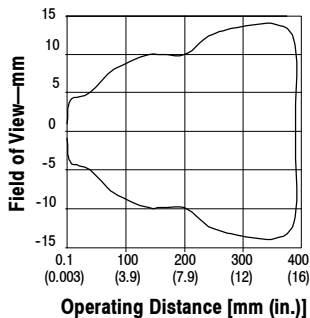
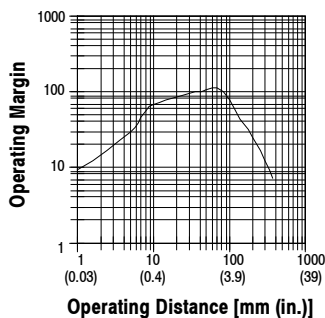
Retroreflective



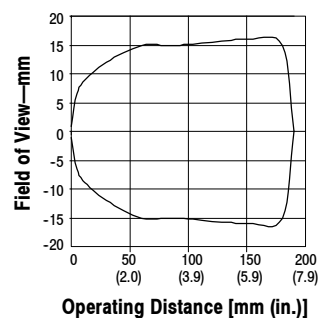
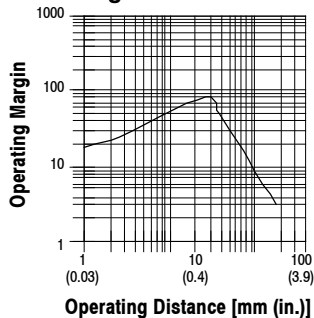
Polarized Retroreflective



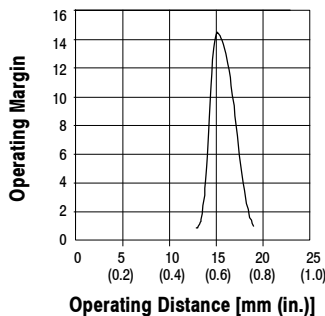
Standard Diffuse



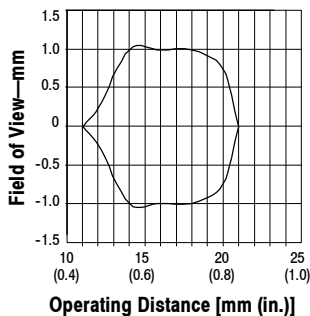
Wide Angle Diffuse



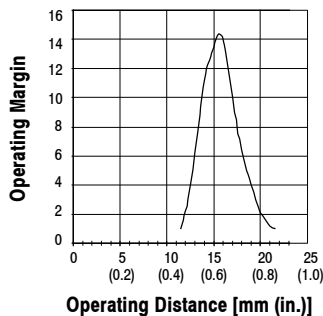
Fixed Focus Diffuse
16 mm Red LED



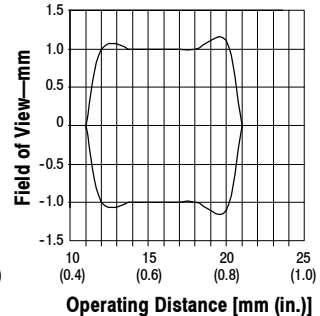
16 mm Red LED



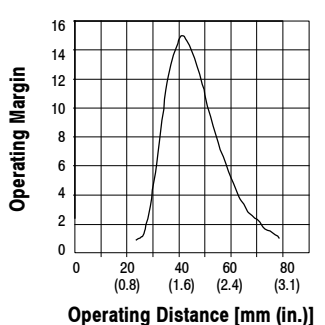
Fixed Focus Diffuse
16 mm Green LED



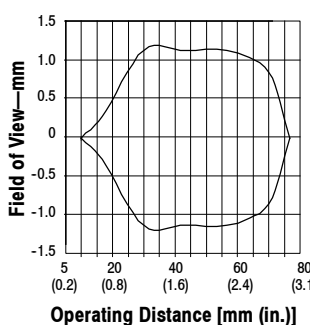
16 mm Green LED



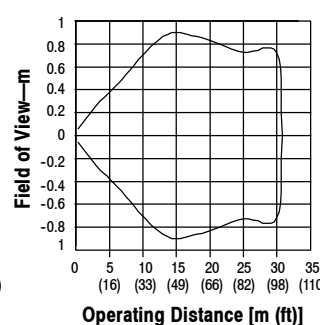
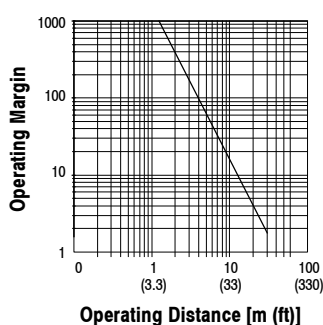
Fixed Focus Diffuse
43 mm Red LED



43 mm Red LED

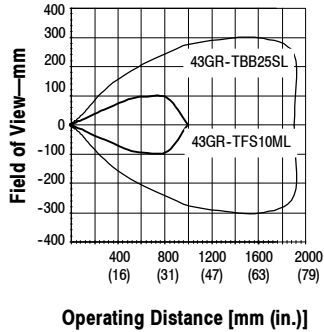
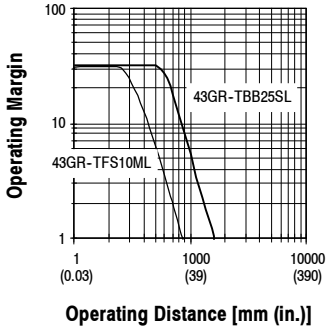


Transmitted Beam



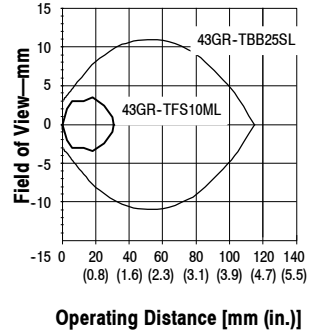
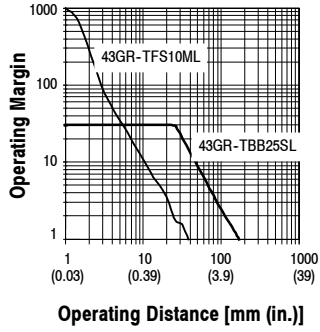
Typical Response Curve Beam Pattern

Large Aperture Fiber Optic
Retroreflective (using 3 in. dia. reflector)

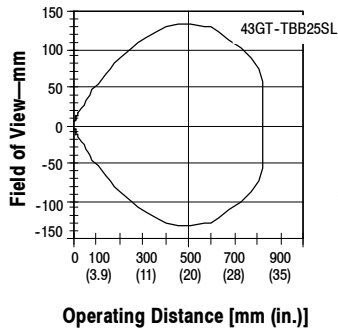
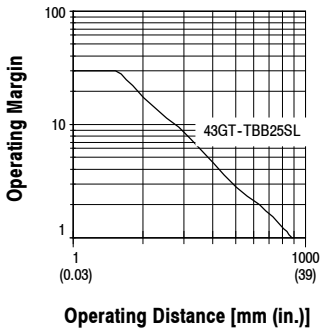


Typical Response Curve Beam Pattern

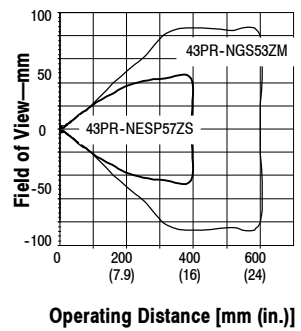
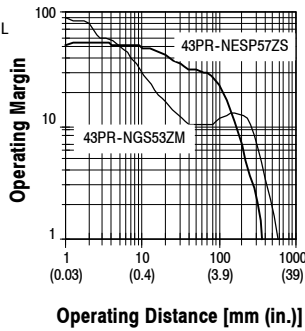
Large Aperture Fiber Optic
Diffuse



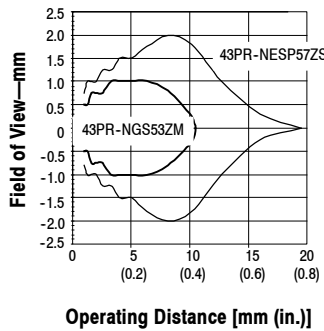
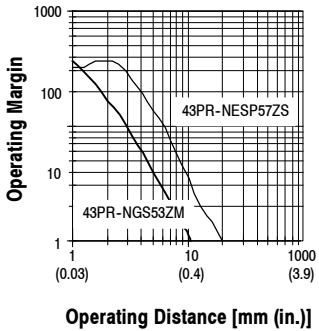
Large Aperture Fiber Optic
Transmitted Beam



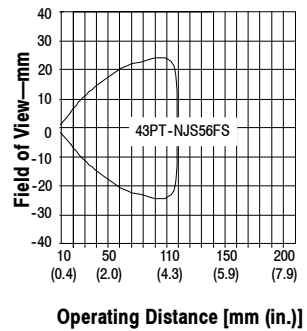
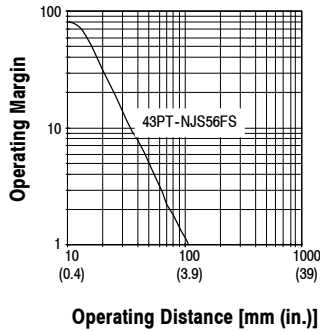
Small Aperture Fiber Optic
Retroreflective (using 3 in. dia. reflector)



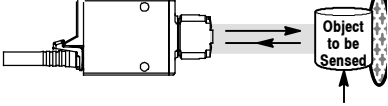
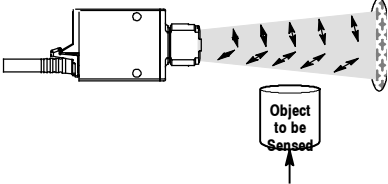
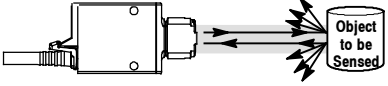
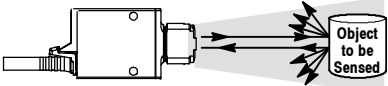
Small Aperture Fiber Optic
Diffuse



Small Aperture Fiber Optic
Transmitted Beam

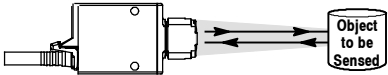
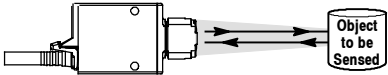
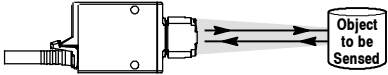
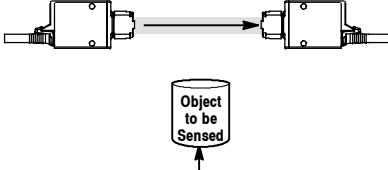


Product Selection

Sensing Mode	Operating Voltage Supply Current	Sensing Distance	Output Energized	Output Type Capacity Response Time	Connection Type	Cat. No.
 <p><i>Retroreflective</i></p> <p>Field of View: 1.5° Emitter LED: Visible red 660 nm</p>	10.8...30V DC 35 mA	25 mm...5 m (0.98 in...16.4 ft)	Light/Dark Selectable	NPN/PNP 100 mA 1 ms	2 m 300V cable	42KL-U2LB-A2
		21.6...250V AC/DC			25 mm...2.5 m (0.98 in...8.2 ft)	4-pin DC micro
	4-pin pico QD					42KL-U2LB-Y4
	Power MOSFET 2-wire 100 mA 8.3 ms			2 m 300V cable		42KL-U2LQ-A2
		4-pin DC micro		42KL-U2LQ-F4		
		4-pin pico QD		42KL-U2LQ-Y4		
 <p><i>Polarized Retroreflective</i></p> <p>Field of View: 1.5° Emitter LED: Visible red 660 nm</p>	10.8...30V DC 35 mA	25 mm...2 m (0.98 in...6.6 ft)	Light/Dark Selectable	NPN/PNP 100 mA 1 ms	2 m 300V cable	42KL-P2LB-A2
		21.6...250V AC/DC			25 mm...1 m (0.98 in...3.3 ft)	4-pin DC micro
	4-pin pico QD					42KL-P2LB-Y4
	Power MOSFET 2 wire 100 mA 8.3 ms			2 m 300V cable		42KL-P2LQ-A2
		4-pin DC micro		42KL-P2LQ-F4		
		4-pin pico QD		42KL-P2LQ-Y4		
 <p><i>Standard Diffuse</i></p> <p>Field of View: 5° Emitter LED: Infrared 880 nm</p>	10.8...30V DC 35 mA	1...380 mm (0.04...15 in.)	Light/Dark Selectable	NPN/PNP 100 mA 1 ms	2 m 300V cable	42KL-D1LB-A2
		21.6...250V AC/DC			1...190 mm (0.04...7.5 in.)	4-pin DC micro
	4-pin pico QD					42KL-D1LB-Y4
	Power MOSFET 2 wire 100 mA 8.3 ms			2 m 300V cable		42KL-D1LQ-A2
		4-pin DC micro		42KL-D1LQ-F4		
		4-pin pico QD		42KL-D1LQ-Y4		
 <p><i>Wide Angle Diffuse</i></p> <p>Field of View: 18° Emitter LED: Infrared 880 nm</p>	10.8...30V DC 35 mA	1...180 mm (0.04...7.0 in.)	Light/Dark Selectable	NPN/PNP 100 mA 1 ms	2 m 300V cable	42KL-W1LB-A2
		21.6...250V AC/DC			1...90 mm (0.04...3.5 in.)	4-pin DC micro
	4-pin pico QD					42KL-W1LB-Y4
	Power MOSFET 2 wire 100 mA 8.3 ms			2 m 300V cable		42KL-W1LQ-A2
		4-pin DC micro		42KL-W1LQ-F4		
		4-pin pico QD		42KL-W1LQ-Y4		

Refer to page 1-47 for cordsets and accessories.

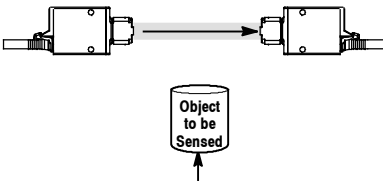
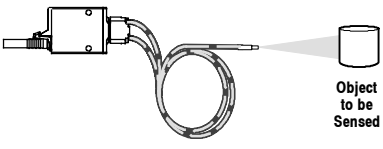
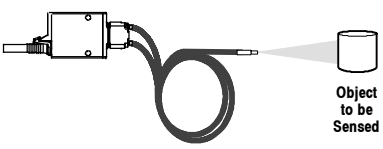
Product Selection (continued)

Sensing Mode	Operating Voltage Supply Current	Sensing Distance	Output Energized	Output Type Capacity Response Time	Connection Type	Cat. No.	
 <p>Fixed Focus Diffuse</p> <p>Emitter LED: Visible red (660 nm) ①</p>	10.8...30V DC 35 mA	16 mm (0.63 in.)	Light/Dark Selectable	NPN/PNP 100 mA 1 ms	2 m 300V cable	42KL-F2LBS-A2	
					4-pin DC micro	42KL-F2LBS-F4	
					4-pin pico QD	42KL-F2LBS-Y4	
	21.6...250V AC/DC			NPN/PNP 100 mA 300 µs	2 m 300V cable	42KL-F2LBSQ-A2	
					4-pin DC micro	42KL-F2LBSQ-F4	
					4-pin pico QD	42KL-F2LBSQ-Y4	
 <p>Fixed Focus Diffuse</p> <p>Emitter LED: Visible green (525 nm) ①</p>	10.8...30V DC 35 mA	43 mm (1.7 in.)	Light/Dark Selectable	NPN/PNP 100 mA 1 ms	2 m 300V cable	42KL-F3LBS-A2	
					4-pin DC micro	42KL-F3LBS-F4	
					4-pin pico QD	42KL-F3LBS-Y4	
	21.6...250V AC/DC			NPN/PNP 100 mA 300 µs	2 m 300V cable	42KL-F3LBSQ-A2	
					4-pin DC micro	42KL-F3LBSQ-F4	
					4-pin pico QD	42KL-F3LBSQ-Y4	
 <p>Fixed Focus Diffuse</p> <p>Emitter LED: Visible red (660 nm)</p>	10.8...30V DC 35 mA	43 mm (1.7 in.)	Light/Dark Selectable	NPN/PNP 100 mA 1 ms	2 m 300V cable	42KL-F2LBL-A2	
					4-pin DC micro	42KL-F2LBL-F4	
					4-pin pico QD	42KL-F2LBL-Y4	
	21.6...250V AC/DC			NPN/PNP 100 mA 300 µs	2 m 300V cable	42KL-F2LBLQ-A2	
					4-pin DC micro	42KL-F2LBLQ-F4	
					4-pin pico QD	42KL-F2LBLQ-Y4	
 <p>Transmitted Beam Light Source</p> <p>Field of View: 7°</p> <p>Emitter LED: Infrared 880 nm</p>	10.8...30V DC 35 mA	1...30 m (98 ft)	—	—	2 m 300V cable	42KL-E1EZB-A2	
	21.6...250V AC/DC 5 mA				4-pin DC micro	42KL-E1EZB-F4	
					4-pin pico QD	42KL-E1EZB-Y4	
	10.8...30V DC 35 mA	1...10 m (33 ft)	—	—	—	2 m 300V cable	42KL-E1QZB-A2
						3-pin AC micro	42KL-E1QZB-G3
						4-pin DC micro	42KL-E1EZBQ-F4
	10.8...30V DC 35 mA	1...10 m (33 ft)	—	—	—	4-pin pico QD	42KL-E1EZBQ-Y4

① For color registration mark applications, refer to light source selection guide at www.ab.com/sensors.

Refer to page 1-47 for cordsets and accessories.

Product Selection (continued)

Sensing Mode	Operating Voltage Supply Current	Sensing Distance	Output Energized	Output Type Capacity Response Time	Connection Type	Cat. No.
 <p>Transmitted Beam Receiver</p> <p>Field of View: 7° Emitter LED: Infrared 880 nm</p>	10.8...30V DC 25 mA	30 m (98 ft)	Light/Dark Selectable	NPN/PNP 100 mA 1 ms	2 m 300V cable	42KL-RLB-A2
	21.6...250V AC/DC				4-pin DC micro	42KL-RLB-F4
					4-pin pico QD	42KL-RLB-Y4
	10.8...30V DC 25 mA	10 m (33 ft)	Light/Dark Selectable	NPN/PNP 100 mA 900 µs	2 m 300V cable	42KL-RLBQ-A2
	21.6...250V AC/DC				4-pin DC micro	42KL-RLBQ-F4
					4-pin pico QD	42KL-RLBQ-Y4
 <p>Large Aperture Fiber Optic</p> <p>Field of View: Depends on Fiber Optic cable selected Emitter LED: Infrared 880 nm</p>	10.8...30V DC 35 mA	Depends on Fiber Optic cable selected	Light/Dark Selectable	NPN/PNP 100 mA 1 ms	2 m 300V cable	42KL-G1LB-A2
	21.6...250V AC/DC				4-pin DC micro	42KL-G1LB-F4
					4-pin pico QD	42KL-G1LB-Y4
					NPN/PNP 100 mA 300 µs	2 m 300V cable
	4-pin DC micro					42KL-G1LBQ-F4
	4-pin pico QD					42KL-G1LBQ-Y4
 <p>Small Aperture Plastic Fiber Optic</p> <p>Field of View: Depends on Fiber Optic cable selected Emitter LED: Visible red 660nm</p>	10.8...30V DC 35 mA	Depends on Fiber Optic cable selected	Light/Dark Selectable	NPN/PNP 100 mA 1 ms	2 m 300V cable	42KL-L2LB-A2
	21.6...250V AC/DC 15 mA				4-pin DC micro	42KL-L2LB-F4
					4-pin pico QD	42KL-L2LB-Y4
					NPN/PNP 100 mA 300 µs	2 m 300V cable
	4-pin DC micro					42KL-L2LBQ-F4
	4-pin pico QD					42KL-L2LBQ-Y4
Power MOSFET 2-wire 100 mA 8.3 ms	2 m 300V cable	42KL-L2TC-A2				
	3-pin AC micro	42KL-L2TC-G3				

⊗ For fiber optic selection guide, see pages 1-231.

Cordsets and Accessories

Description	Cat. No.	Description	Cat. No.	Description	Cat. No.
DC Micro QD Cordset, Straight, 4-pin, 2 m	889D-F4AC-2	Pico QD Cordset, Straight, 4-pin, 2 m	889P-F4AB-2	32 mm (1.25 in.) Diameter Reflector	92-47
AC Micro QD Cordset, Straight, 3-pin, 2 m	889R-F3AEA-2	76 mm (3 in.) Diameter Reflector	92-39		

Transmitted Beam—Maximum Operating Distance with Apertures

Aperture Slot Size	Maximum Range		Cat. No.
	Standard Speed	High Speed	
1 mm	2.1 m (6.9 ft)	0.7 m (2.3 ft)	60-2673
2 mm	10.5 m (34.5 ft)	3.5 m (11.4 ft)	60-2674
4 mm	18.6 m (61.0 ft)	6.1 m (20.1 ft)	60-2675
1, 2, 4 mm kit	—	—	60-2676



Features

- Narrow 27 mm deep housing
- 18 mm nose and through-hole mounting options
- LED indicators with 360° visibility
- No user adjustments required
- Multiple sensing modes
- Low voltage 24V DC operation
- Variety of connection types

Specifications

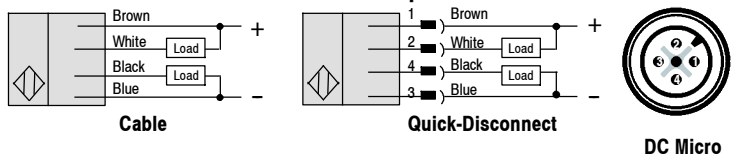
Environmental	
Certifications	cULus and CE Marked for all applicable directives
Operating Environment	NEMA 12, IP51
Operating Temperature [C (F)]	0...+50° (32...+122°)
Vibration	10...55 Hz, 1 mm amplitude, meets or exceeds IEC 60947-5-2
Shock	30 g with 1 ms pulse duration, meets or exceeds IEC 60947-5-2
Relative Humidity	5...95%
Optical	
Sensing Modes	Diffuse, polarized retroreflective, wide angle, sharp cutoff
Sensing Range	See Product Selection table on page 1-51
Field of View	See Product Selection table on page 1-51
Light Source	Visible red LED (660 nm), infrared LED (880 nm)
LED Indicators	See User Interface below
Adjustments	None
Electrical	
Voltage	10...30V DC
Current Consumption	35 mA max
Sensor Protection	Overload, short circuit, reverse polarity, false pulse
Outputs	
Response Time	10 ms
Output Type	PNP or NPN by cat. no., both PNP and NPN models
Output Mode	Light or dark operate by cat. no.
Output Current	100 mA @ 30V DC max
Output Leakage Current	0.1 mA max
Mechanical	
Housing Material	Valox®
Lens Material	Acrylic
Connection Types	2 m cable (24 AWG), 4-pin DC micro (M12) QD
Supplied Accessories	75012-097-01 18 mm locknut
Optional Accessories	See mounting brackets, reflectors, and cordsets on page 1-51

User Interface

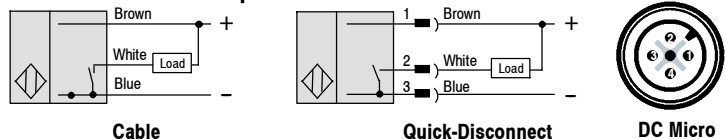
Label	Color	State	Status
Output	Yellow	OFF	Sensor output de-activated
		ON	Sensor output activated
Margin	Red	OFF	Margin < 1.2
		ON	Margin > 1.2
Power	Green	OFF	Sensor not powered
		ON	Sensor powered

Wiring Diagrams①

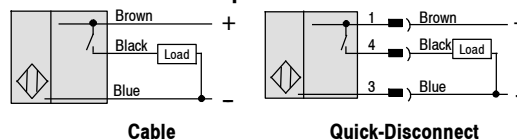
Models with Dual NPN and PNP Outputs



Models with NPN Outputs



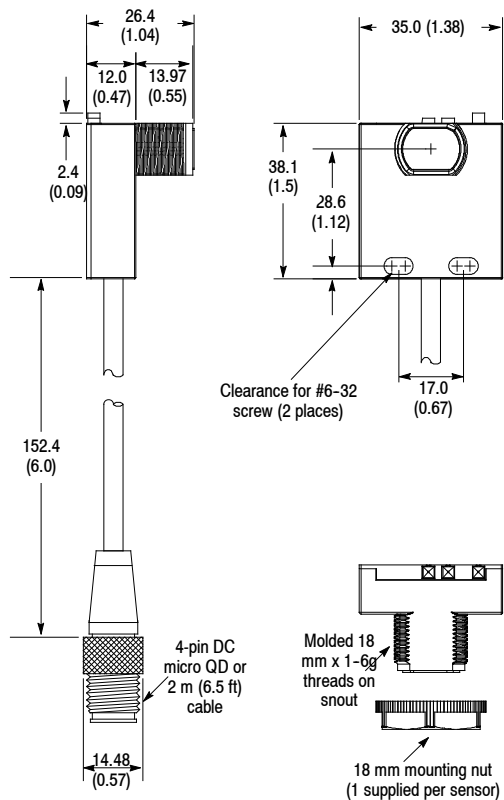
Models with PNP Outputs



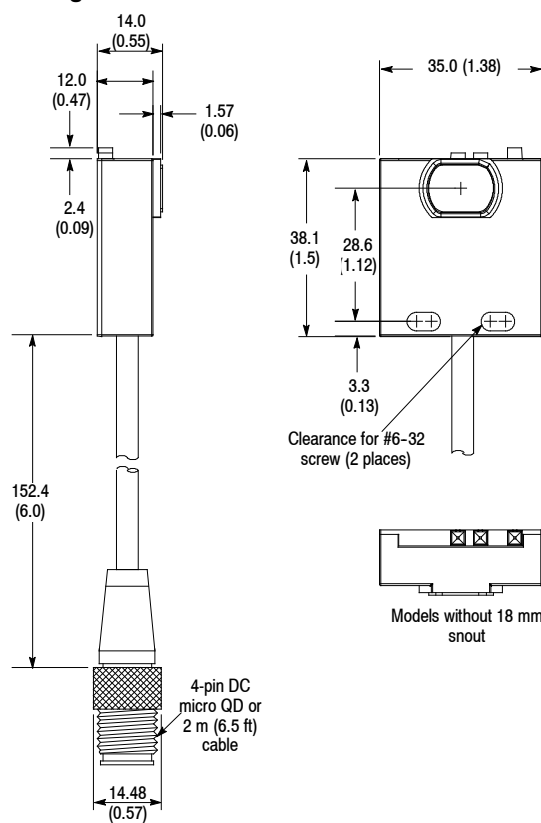
① All wire colors on quick-disconnect models refer to Rockwell Automation 889D cordsets.

Approximate Dimensions [mm (in.)]

Polarized Retroreflective and Standard Diffuse Models



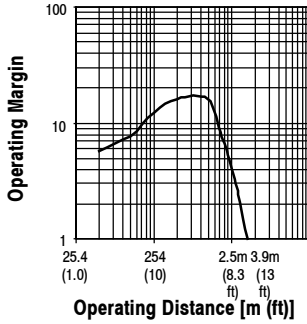
Wide Angle Diffuse Models



Note: All sensors except wide angle diffuse models are supplied with one M18 mounting nut (Cat. No. 75012-097-01).

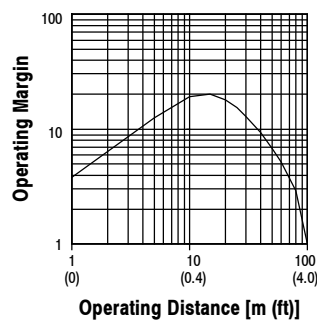
Typical Response Curve

Polarized Retroreflective

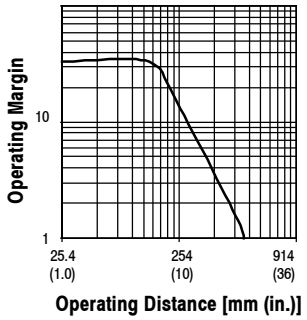


Typical Response Curve

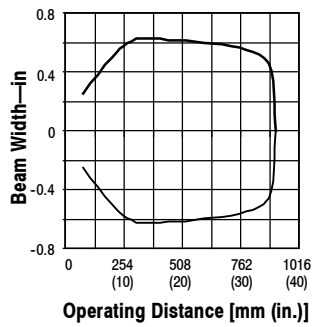
Sharp Cutoff Diffuse



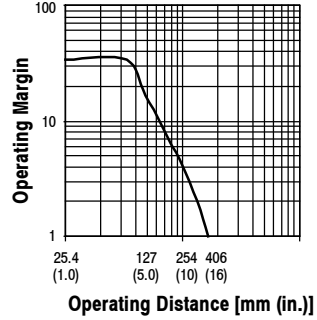
Standard Diffuse



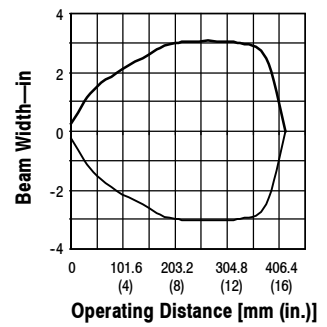
Beam Pattern



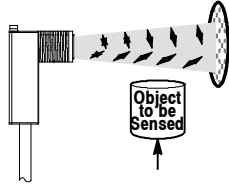
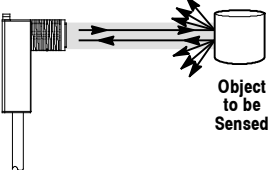
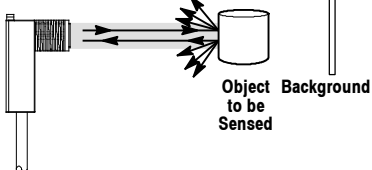
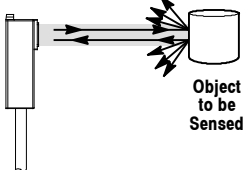
Wide Angle Diffuse



Beam Pattern



Product Selection

Sensing Mode	Operating Voltage/ Current	Sensing Distance	Output Energized	Output Type/ Capacity Response Time	Connection Type	Cat. No.		
 <p><i>Polarized Retroreflective</i></p> <p>Field of View: 1.5° Emitter LED: Visible red 660 nm</p>	10...30V DC 35 mA	25 mm...1.5 m (1 in...4.9 ft)	Dark Operate	NPN and PNP 100 mA 10 ms	2 m 300V cable	44RSP-2KBE1-A2		
					4-pin DC micro	44RSP-2KBE1-F4		
			Light Operate		2 m 300V cable	44RSP-2JBE3-A2		
					4-pin DC micro	44RSP-2JBE3-F4		
		Dark Operate	2 m 300V cable		44RSP-2KBE3-A2			
			4-pin DC micro		44RSP-2KBE3-F4			
		Light Operate	NPN/100 mA 10 ms		25 mm...3 m (1 in...9.8 ft)		2 m 300V cable	44RSP-2JNE3-A2
							4-pin DC micro	44RSP-2JNE3-F4
			PNP/100 mA 10 ms			3-pin Molex	44RSP-2JNE3-Z6	
				2 m 300V cable	44RSP-2JPE3-A2			
				4-pin DC micro	44RSP-2JPE3-F4			
 <p><i>Standard Diffuse</i></p> <p>Field of View: 5° Emitter LED: Infrared 880 nm</p>	10...30V DC 35 mA	3...380 mm (0.12...15 in.)	Light Operate	NPN/100 mA 10 ms	2 m 300V cable	44RSD-1JNC38-A2		
						4-pin DC micro	44RSD-1JNC38-F4	
						PNP/100 mA 10 ms	2 m 300V cable	44RSD-1JPC38-A2
							4-pin DC micro	44RSD-1JPC38-F4
 <p><i>Sharp Cutoff Diffuse</i></p> <p>Field of View: 5° Emitter LED: Infrared 880 nm</p>	10...30V DC 35 mA	3...100 mm (0.12...4 in.)	Light Operate	NPN/100 mA 10 ms	2 m 300V cable	44RSS-1JNB1-A2		
						4-pin DC micro	44RSS-1JNB1-F4	
 <p><i>Wide Angle Diffuse</i></p> <p>Field of View: Approx. 60° Emitter LED: Infrared 880 nm</p>	10...30V DC 35 mA	3...200 mm (0.12...7.8 in.)	Light Operate	NPN/100 mA 10 ms	2 m 300V cable	44RSW-1JNC20-A2		
						4-pin DC micro	44RSW-1JNC20-F4	
						PNP/100 mA 10 ms	2 m 300V cable	44RSW-1JPC20-A2
							4-pin DC micro	44RSW-1JPC20-F4

Cordsets and Accessories

Description	Cat. No.	Description	Cat. No.
DC Micro QD Cordset, Straight, 4-pin, 2 m	889D-F4AC-2	Right Angle Mounting Bracket	60-2657
76 mm (3 in.) Diameter Reflector	92-39	Mounting Screws (not supplied)	2 x #6-32
32 mm (1.25 in.) Diameter Reflector	92-47		

42CA

18 mm Cylindrical



Description

The 42CA 18 mm cylindrical family of general purpose photoelectric sensors is intended for light to medium duty industrial applications.

The 42CA family provides an indication if the sensor operation is unstable. An indicator flashes if the signal level is too close to the detection threshold. This helps for easy alignment of the sensor and forewarns against detection of a background.

Features

- 18 mm industry standard enclosure
- Extended range high-speed models
- Patented ASIC design offers linear sensitivity adjustment, stability indication and excellent noise immunity
- Two LED indicators provide status of power, output, unstable operation and short-circuit protection
- Complementary light and dark

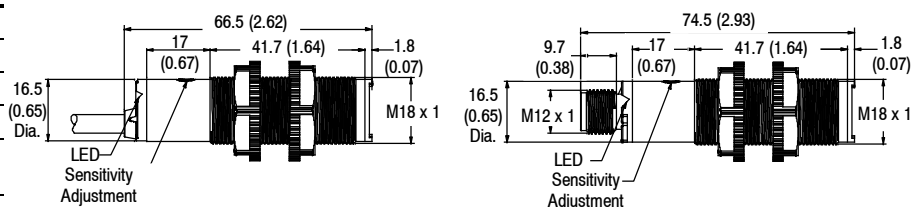
Specifications

Environmental	
Certifications	cULus and CE Marked for all applicable directives
Operating Environment	IP67
Operating Temperature [C (F)]	-25...+70° (-13...+158°)
Vibration	10...55 Hz, 1 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	5...95% (noncondensing)
Ambient Light Immunity	Incandescent light 5000 lux
Optical	
Sensing Modes	Retroreflective, polarized retroreflective, diffuse, background suppression, transmitted beam
Sensing Range	See Product Selection table on page 1-55
Light Source	Visible red LED (660 nm) or infrared LED (880 nm)
LED Indicators	Green and yellow, see User Interface below
Adjustments	Sensitivity potentiometer on select models
Electrical	
Voltage	10...30V DC
Current Consumption	30 mA max
Sensor Protection	Reverse polarity, overload, short circuit
Outputs	
Response Time	See Product Selection table on page 1-55
Output Type	PNP or NPN by cat. no.
Output Mode	Complementary light or dark operate, selectable light or dark operate for background suppression models
Output Current	100 mA
Output Leakage Current	10 µA max
Mechanical	
Housing Material	PBT
Lens Material	PMMA
Connection Types	2 m cable, 4-pin DC micro (M12) QD
Supplied Accessories	18 mm fastening nuts
Optional Accessories	See mounting brackets, reflectors, and cordsets on page 1-56

User Interface

LED Color	State	Status
Yellow	OFF	Output de-energized❶
	ON	Output energized❶
Green	OFF	Power is OFF
	ON	Power is ON
	Flashing (6 Hertz)	Unstable (0.5 < Margin < 2)
	Flashing (1.5 Hertz)	Output short-circuit protection active

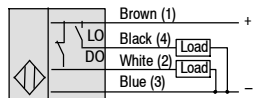
Approximate Dimensions [mm (in.)]



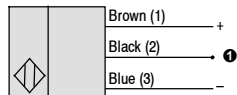
❶ Black wire or pin 4 of connector.

Wiring Diagrams

PNP Models with Complementary Outputs

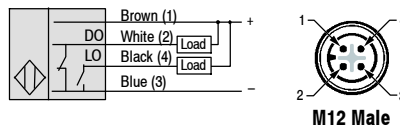


Transmitted Beam Emitter



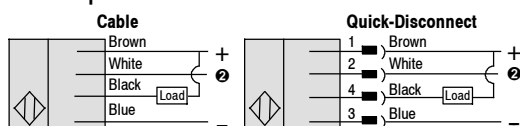
① For normal operation, black wire (pin 2) needs no connection. To disable light source, connect black wire (pin 2) to -V.

NPN Models with Complementary Outputs

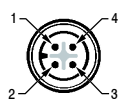


Additional Wiring Options for Background Suppression and Transmitted Beam

NPN Output

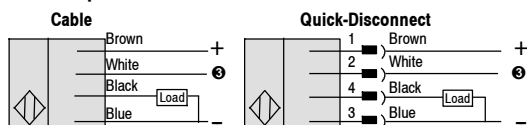


Face View Male Receptacle (Sensor) DC Micro

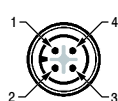


② Open circuit or tie white (2) and brown (1) conductors together for L.O. Tie white (2) and blue (3) conductors together for D.O.

PNP Output



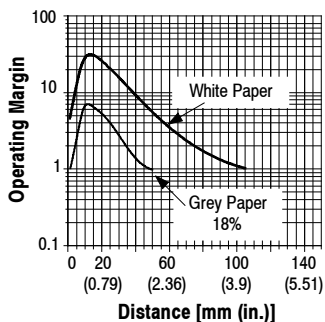
Face View Male Receptacle (Sensor) DC Micro



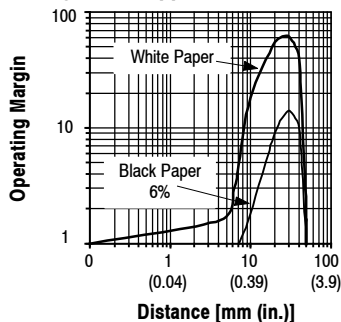
③ Tie white (2) and brown (1) conductors together for L.O. Open circuit or tie white (2) and blue (3) conductors together for D.O.

Typical Response Curves

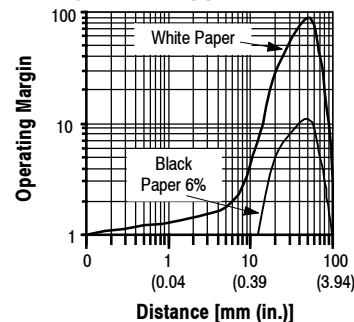
Standard Diffuse [100 mm]



Background Suppression [50 mm]

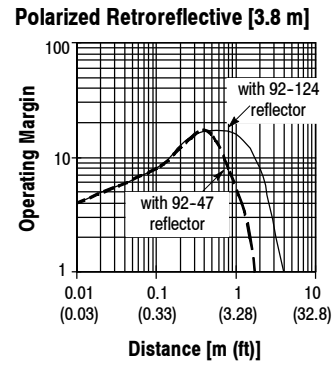
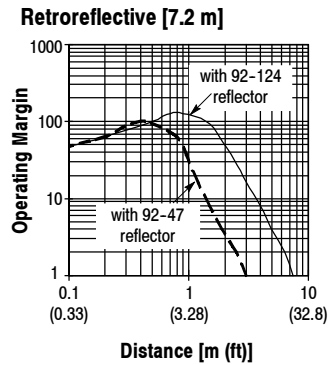
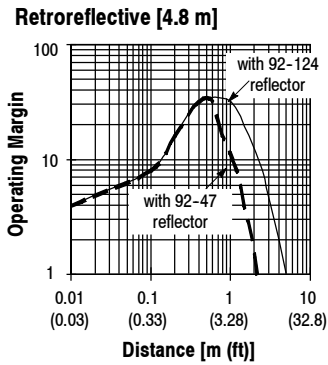


Background Suppression [100 mm]

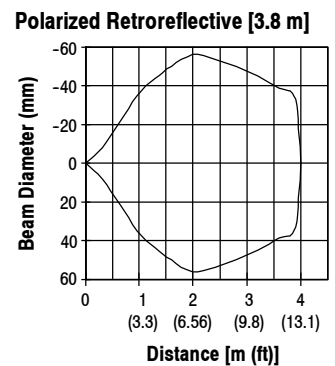
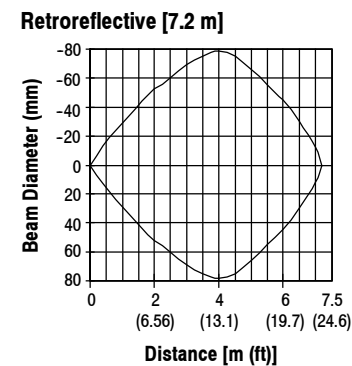
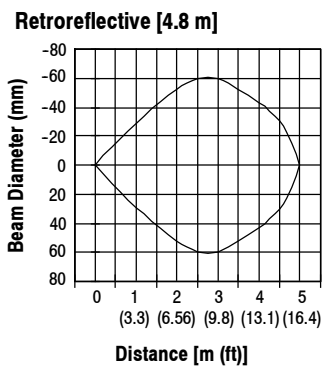


Typical Response Curves (continued)

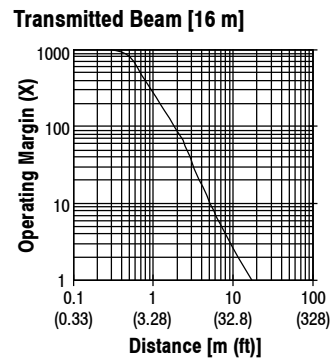
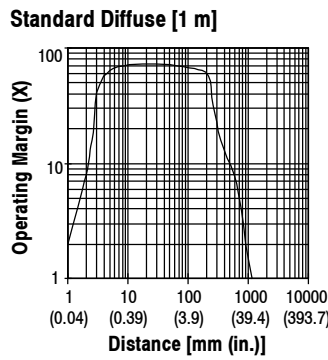
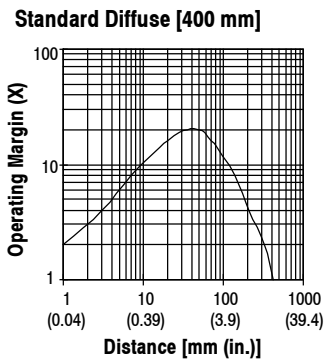
Operating Margin



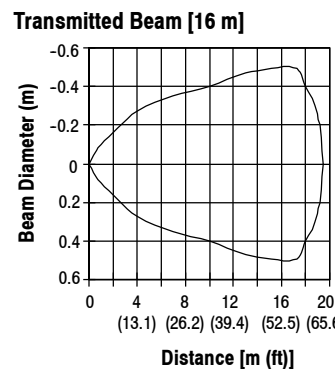
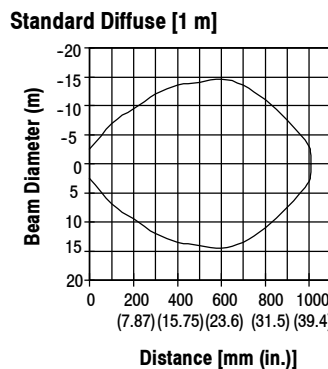
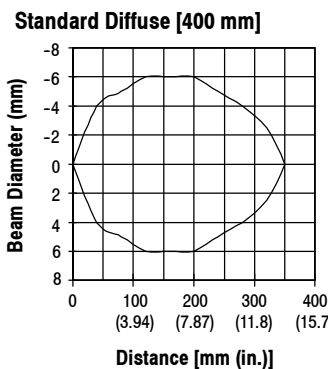
Beam Pattern



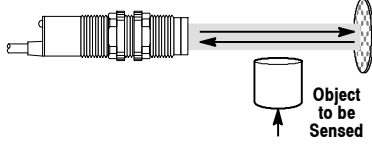
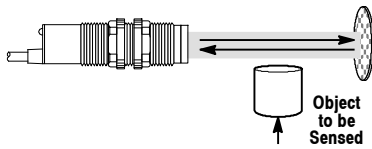
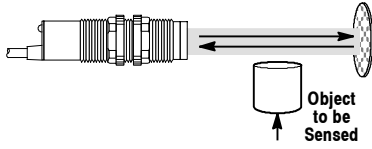
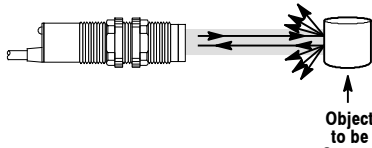
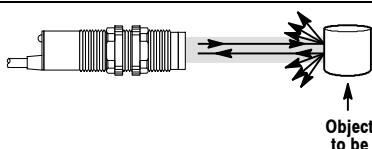
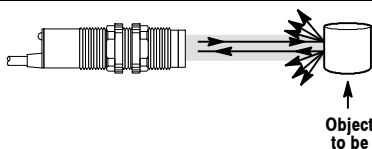
Operating Margin



Beam Pattern



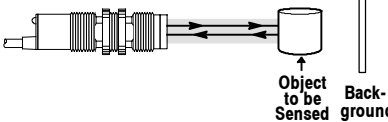
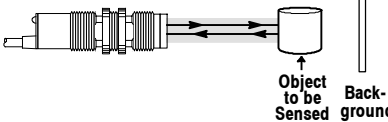
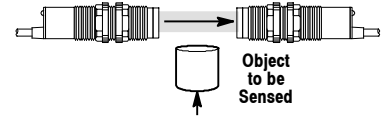
Product Selection

Sensing Mode	Operating Voltage Supply Current	Sensing Distance	Output Energized	Output Type/ Response Time	Sensitivity Adjust	Cat. No.❶
 <p>Retroreflective Field of View: 1.2° Emitter LED: Visible red 660 nm</p>	10...30V DC 25 mA max.	2 mm...4.8 m (0.08 in...15.7 ft)	Complementary light and dark operate	NPN 100 mA 1 ms	No adjustment	42CA-U2MNB-D4
				PNP 100 mA 1 ms	No adjustment	42CA-U2MPB-D4
 <p>Retroreflective Field of View: 1.2° Emitter LED: Visible red 660 nm</p>	10...30V DC 25 mA max.	2 mm...7.2 m (0.08 in...23.6 ft)	Complementary light and dark operate	NPN 100 mA 0.5 ms	Single turn potentiometer	42CA-U2MNA-D4
				PNP 100 mA 0.5 ms	Single turn potentiometer	42CA-U2MPA-D4
 <p>Polarized Retroreflective Field of View: 1.3° Emitter LED: Visible red 660 nm</p>	10...30V DC 25 mA max.	2 mm...3.8 m (0.08 in...12.5 ft)	Complementary light and dark operate	NPN 100 mA 1 ms	No adjustment	42CA-P2MNB-D4
				PNP 100 mA 1 ms	No adjustment	42CA-P2MPB-D4
 <p>Standard Diffuse Field of View: 3° Emitter LED: Infrared 880 nm</p>	10...30V DC 30 mA max.	0...100 mm (0...3.94 in.)	Complementary light and dark operate	NPN 100 mA 1 ms	Single turn potentiometer	42CA-D1MNAE-D4❷
				PNP 100 mA 1 ms	Single turn potentiometer	42CA-D1MPAE-D4❷
 <p>Standard Diffuse Field of View: 7.5° Emitter LED: Infrared 880 nm</p>	10...30V DC 25 mA max.	0...400 mm (0...15.7 in.)	Complementary light and dark operate	NPN 100 mA 1 ms	Single turn potentiometer	42CA-D1MNAJ-D4
				PNP 100 mA 1 ms	Single turn potentiometer	42CA-D1MPAJ-D4
 <p>Standard Diffuse Field of View: 5° Emitter LED: Infrared 880 nm</p>	10...30V DC 30 mA max.	0...1000 mm (0...39.4 in.)	Complementary light and dark operate	NPN 100 mA 0.5 ms	Single turn potentiometer	42CA-D1MNAL-D4
				PNP 100 mA 0.5 ms	Single turn potentiometer	42CA-D1MPAL-D4

❶ Suffix -D4 denotes 4-pin DC micro connection type. For 2 m cable without QD replace suffix -D4 with -A2 (e.g. 42CA-P2MPB-A2).

❷ Refer to www.ab.com/sensors for updated information.

Product Selection (continued)

Sensing Mode	Operating Voltage Supply Current	Sensing Distance	Output Energized	Output Type/ Response Time	Sensitivity Adjust	Cat. No.❶
 <p>Background Suppression</p> <p>Field of View: 5.7°</p> <p>Emitter LED: Visible red 660 nm</p>	10...30V DC 30 mA max.	50 mm (1.97 in.)	Selectable light or dark operate	NPN 100 mA 0.5 ms	No adjustment	42CA-B2LNBC-D4❷
				PNP 100 mA 0.5 ms	No adjustment	42CA-B2LPBC-D4❷
 <p>Background Suppression</p> <p>Field of View: 3.4°</p> <p>Emitter LED: Visible red 660 nm</p>	10...30V DC 30 mA max.	100 mm (3.94 in.)	Selectable light or dark operate	NPN 100 mA 0.5 ms	No adjustment	42CA-B2LNBE-D4❷
				PNP 100 mA 0.5 ms	No adjustment	42CA-B2LPBE-D4❷
 <p>Transmitted Beam</p> <p>Field of View: 1.5°</p> <p>Emitter LED: Infrared 880 nm</p>	10...30V DC 30 mA max.	3 mm...16 m (0.12 in...52.5 ft)	NA infrared light source	NA	No adjustment	42CA-E1EZB1-D4
	10...30V DC 25 mA max.		NPN 100 mA 1 ms	Single turn potentiometer	42CA-R1MNA1-D4	
			PNP 100 mA 1 ms	Single turn potentiometer	42CA-R1MPA1-D4	

❶ Suffix -D4 denotes 4-pin DC micro connection type. For 2 m cable without QD replace suffix -D4 with -A2 (e.g. 42CA-P2MPB-A2).

❷ Refer to www.ab.com/sensors for updated information.

Cordsets and Accessories

Cordset		Accessories			
Description	Cat. No.	Description	Cat. No.	Description	Cat. No.
DC Micro QD Cordset, 4-pin, 2 m	889D-F4AC-2	Mounting Bracket	60-2657	Reflector	92-124
Right Angle DC Micro QD Cordset, 4-pin, 2 m	889D-R4AC-2	Straight Mounting Bracket	60-2656	Reflector	92-47
		Snap-Clamp Mounting Bracket	871A-SCBP18		
		Right Angle Mounting Bracket	60-2654		



Features

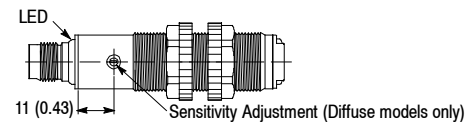
- 18 mm industry standard package
- Wide selection of sensing modes
- 30V DC operation
- NPN or PNP outputs
- Fast response time
- Variety of connection types
- Laser models available (see page 1-115)

Specifications

Environmental	
Certifications	cULus and CE Marked for all applicable directives
Operating Environment	IP67
Operating Temperature [C (F)]	-25...+70° (-13...+158°)
Vibration	10...55 Hz, 1 mm amplitude, meets or exceeds IEC 60068-2-6
Shock	30 g with 1 ms pulse duration, meets or exceeds IEC 60068-2-27
Relative Humidity	5...95%
Ambient Light Immunity	Incandescent light 3000 lux
Optical	
Sensing Modes	Retroreflective, polarized retroreflective, diffuse, background suppression, transmitted beam
Sensing Range	See Product Selection table on page 1-60
Field of View	See Product Selection table on page 1-60
Light Source	Visible red LED (660 nm) or infrared LED (880 nm)
LED Indicators	Yellow LED for output indication
Adjustments	Sensitivity potentiometer (diffuse models only)
Electrical	
Voltage	10...30V DC
Current Consumption	30 mA max
Sensor Protection	Reverse polarity, overload, short circuit
Outputs	
Response Time	2 ms (0.5 ms for background suppression)
Output Type	PNP or NPN by cat. no.
Output Mode	Complementary light operate or dark operate, selectable light operate or dark operate for background suppression models
Output Current	100 mA
Output Leakage Current	10 µA max
Mechanical	
Housing Material	Nickel-plated brass
Lens Material	PMMA/PC
Connection Types	2 m cable, 4-pin DC micro (M12) QD
Supplied Accessories	18 mm fastening nuts
Optional Accessories	See mounting brackets, reflectors, and cordsets on page 1-61

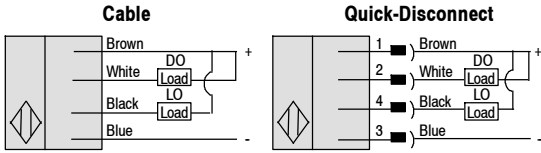
User Interface Panel

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

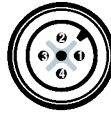


Wiring Diagrams

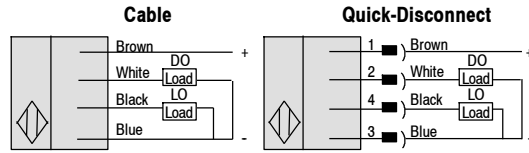
Diffuse
NPN Output



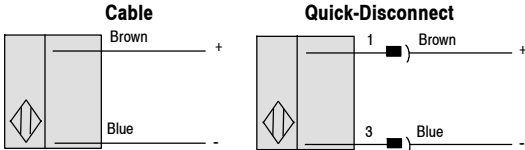
Face View Male
Receptacle (Sensor)
DC Micro



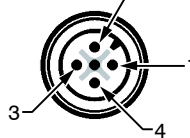
PNP Output



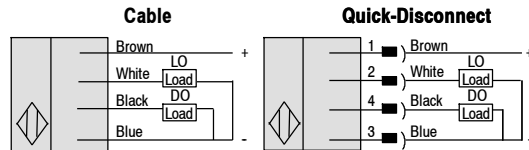
Transmitted Beam, Retroreflective, Polarized Retroreflective



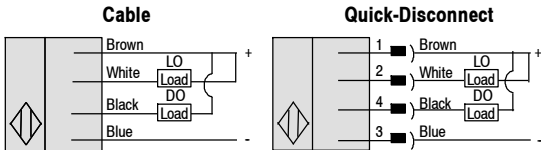
Face View Male
Receptacle (Sensor)
DC Micro



PNP Output

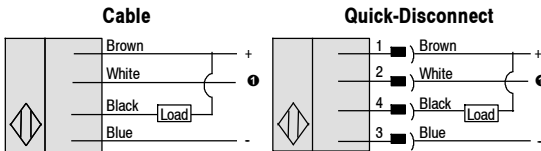


NPN Output

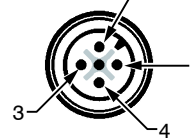


Background Suppression

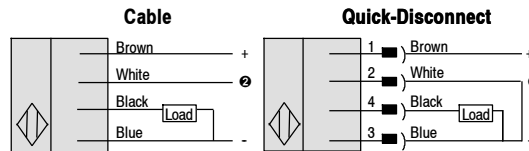
NPN Output



Face View Male
Receptacle (Sensor)
DC Micro

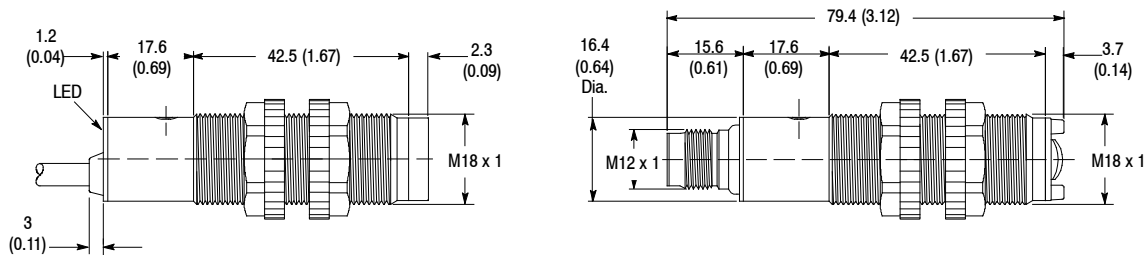


PNP Output



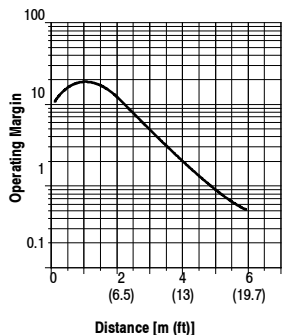
- ❶ Open circuit or tie white (2) and brown (1) conductors together for L.O. Tie white (2) and blue (3) conductors together for D.O.
- ❷ Tie white (2) and brown (1) conductors together for L.O. or tie white (2) and blue (3) conductors together for D.O.

Approximate Dimensions [mm (in.)]

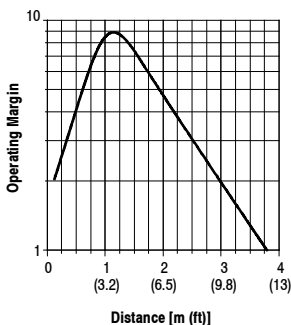


Typical Response Curve

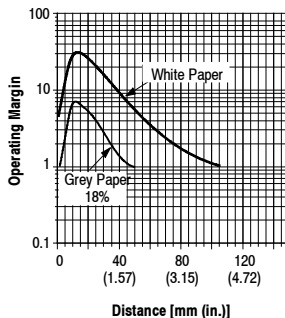
Retroreflective



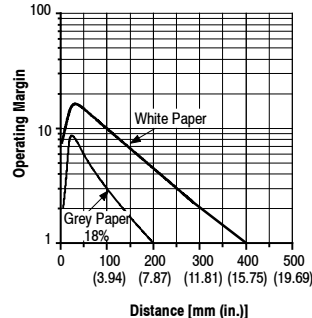
Polarized Retroreflective



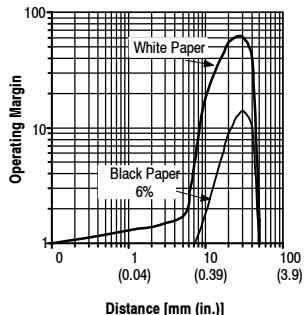
Standard Diffuse 100 mm



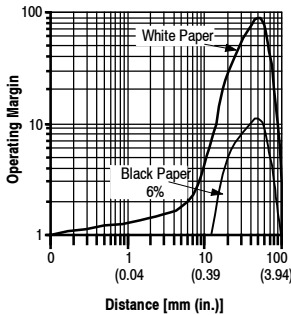
Standard Diffuse 400 mm



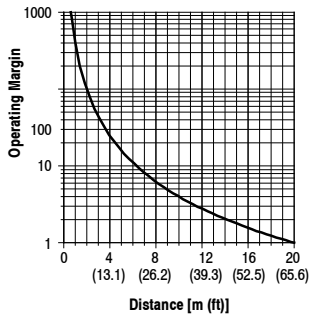
Background Suppression 50 mm



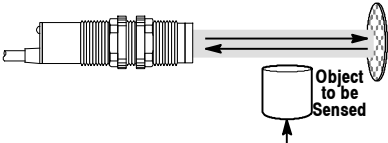
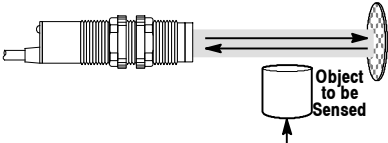
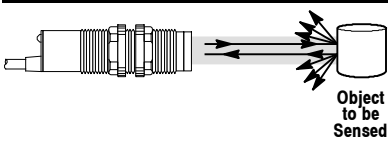
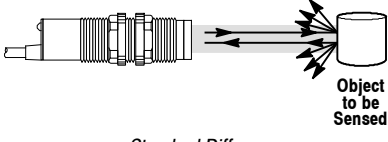
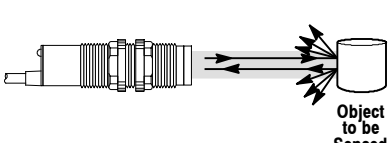
Background Suppression 100 mm



Transmitted Beam

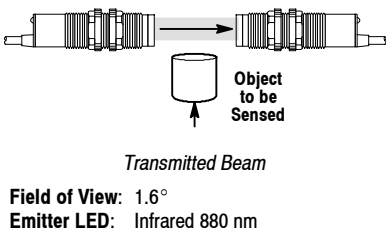


Product Selection

Sensing Mode	Operating Voltage Supply Current	Sensing Distance @ 1X Margin	Output Energized	Output Type Capacity Response Time	Connection Type	Cat. No.
 <p>Retroreflective</p> <p>Field of View: 1.9°</p> <p>Emitter LED: Infrared 880 nm</p>	10...30V DC 30 mA	3 mm...4 m (0.12 in... 13.2 ft)	LO/DO Complementary	NPN 100 mA 4 ms	2 m 300V cable	42CM-U1MNB-A2
					4-pin DC micro	42CM-U1MNB-D4
				PNP 100 mA 4 ms	2 m 300V cable	42CM-U1MPB-A2
					4-pin DC micro	42CM-U1MPB-D4
 <p>Polarized Retroreflective</p> <p>Field of View: 1.8°</p> <p>Emitter LED: Visible red 660 nm</p>	10...30V DC 30 mA	3 mm...3 m (0.12 in...9.9 ft)	LO/DO Complementary	NPN 100 mA 4 ms	2 m 300V cable	42CM-P2MNB-A2
					4-pin DC micro	42CM-P2MNB-D4
				PNP 100 mA 4 ms	2 m 300V cable	42CM-P2MPB-A2
					4-pin DC micro	42CM-P2MPB-D4
 <p>Standard Diffuse</p> <p>Field of View: 6.6°</p> <p>Emitter LED: Visible Red 660 nm</p>	10...30V DC 30 mA	100 mm (3.9 in.) (Adjustable)	LO/DO Complementary	NPN 100 mA 2 ms	2 m 300V cable	42CM-D2MNAE-A2
					4-pin DC micro	42CM-D2MNAE-D4
				PNP 100 mA 2 ms	2 m 300V cable	42CM-D2MPAE-A2
					4-pin DC micro	42CM-D2MPAE-D4
 <p>Standard Diffuse</p> <p>Field of View: 6.6°</p> <p>Emitter LED: Infrared 880 nm</p>	10...30V DC 30 mA	400 mm (13.6 in.) (Adjustable)	LO/DO Complementary	NPN 100 mA 2 ms	2 m 300V cable	42CM-D1MNAL-A2
					4-pin DC micro	42CM-D1MNAL-D4
				PNP 100 mA 2 ms	2 m 300V cable	42CM-D1MPAL-A2
					4-pin DC micro	42CM-D1MPAL-D4
 <p>Background Suppression</p> <p>Field of View: 50 mm = 5.7° 100 mm = 3.4°</p> <p>Emitter LED: Visible red 660 nm</p>	10...30V DC 30 mA	50 mm (1.97 in.)	L.O./D.O. Selectable	NPN 100 mA 0.5 ms	2 m 300V cable	42CM-B2LNBC-A2
					4-pin DC micro	42CM-B2LNBC-D4
				PNP 100 mA 0.5 ms	2 m 300V cable	42CM-B2LPBC-A2
					4-pin DC micro	42CM-B2LPBC-D4
		100 mm (3.9 in.)		NPN 100 mA 0.5 ms	2 m 300V cable	42CM-B2LNBE-A2
					4-pin DC micro	42CM-B2LNBE-D4
				PNP 100 mA 0.5 ms	2 m 300V cable	42CM-B2LPBE-A2
					4-pin DC micro	42CM-B2LPBE-D4

Refer to page 1-61 for cordsets and accessories.

Product Selection (continued)

Sensing Mode	Operating Voltage Supply Current	Sensing Distance	Output Energized	Output Type Capacity Response Time	Connection Type	Cat. No.
 <p>Field of View: 1.6° Emitter LED: Infrared 880 nm</p>	10...30V DC 25 mA	3 mm...20 m (0.12 in... 65.6 ft)	NA Light Source		2 m 300V cable	42CM-E1EZB-A2
					4-pin DC micro	42CM-E1EZB-D4
			L.O./D.O. Complementary	NPN 100 mA 2 ms	2 m 300V cable	42CM-R1MNB-A2
					4-pin DC micro	42CM-R1MNB-D4
			PNP 100 mA 2 ms	2 m 300V cable	42CM-R1MPB-A2	
				4-pin DC micro	42CM-R1MPB-D4	

Cordsets and Accessories

Cordset		Accessories			
Description	Cat. No.	Description	Cat. No.	Description	Cat. No.
DC Micro QD Cordset, 4-pin, 2 m	889D-F4AC-2	Mounting Brackets	60-2657	Reflectors	92-39
DC Micro QD Cordset, 4-pin, 2 m	889D-F4AC-2	Mounting Brackets	60-2649	Mounting Brackets	60-2664
		Snap-Clamp Mounting Brackets	871A-SCBP18		

42CF

12 mm Metal Cylindrical



Features

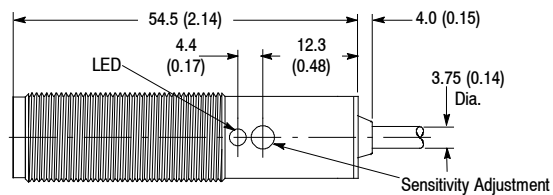
- 12 mm industry standard package
- Wide selection of sensing modes
- 30V DC operation
- NPN or PNP outputs
- Fast response time
- Variety of connection types
- Local teach button
- Accepts remote (diffuse and polarized retroreflective only) teach input

Specifications

Environmental	
Certifications	cULus and CE Marked for all applicable directives
Operating Environment	IP67
Operating Temperature [C (F)]	-25...+70° (-13...+158°)
Vibration	10...55 Hz, 1 mm amplitude, meets or exceeds IEC 60068-2-6
Shock	30 g with 1 ms pulse duration, meets or exceeds IEC 60068-2-27
Relative Humidity	5...95%
Ambient Light Immunity	Incandescent light 3000 lux
Optical	
Sensing Modes	Polarized retroreflective, standard diffuse, transmitted beam
Sensing Range	See Product Selection table on page 1-64
Field of View	See Product Selection table on page 1-64
Light Source	Visible red LED (660 nm) or infrared LED (880 nm)
LED Indicators	Yellow LED for output indication
Adjustments	Sensitivity potentiometer
Electrical	
Voltage	10...30V DC
Current Consumption	30 mA max
Sensor Protection	Reverse polarity, overload, short circuit
Outputs	
Response Time	2 ms (transmitted beam), 1.25 ms (diffuse and polarized retroreflective)
Output Type	PNP or NPN by cat. no.
Output Mode	Selectable light operate or dark operate
Output Current	100 mA
Output Leakage Current	10 µA max
Mechanical	
Housing Material	Nickel plated brass
Lens Material	Acrylic
Connection Types	2 m cable, 4-pin DC micro (M12) QD
Optional Accessories	See mounting brackets, reflectors, and cordsets on page 1-64

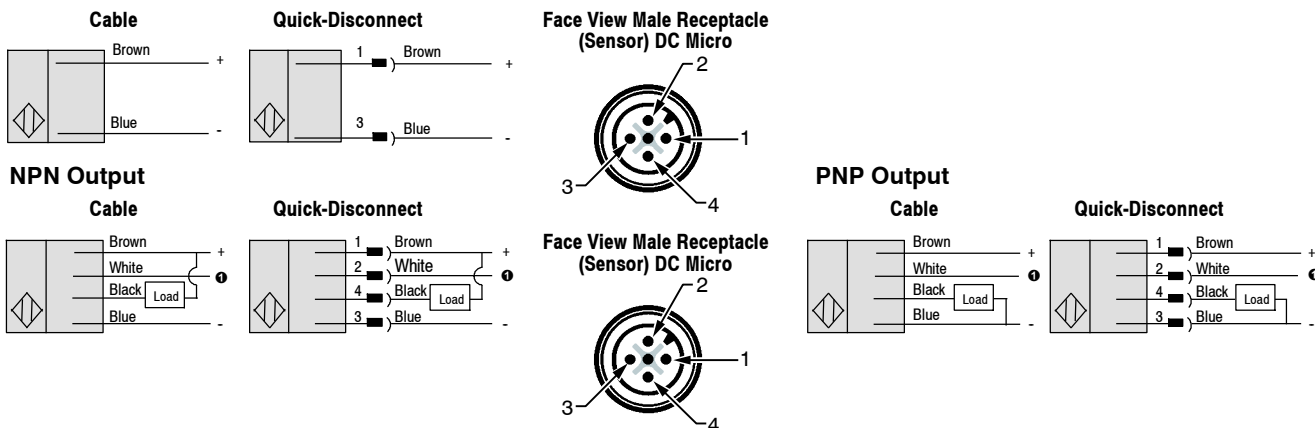
User Interface Panel

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



Wiring Diagrams

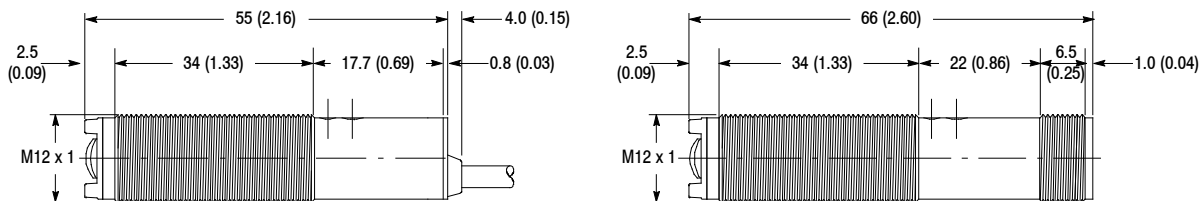
Diffuse, Polarized Retroreflective and Transmitted Beam



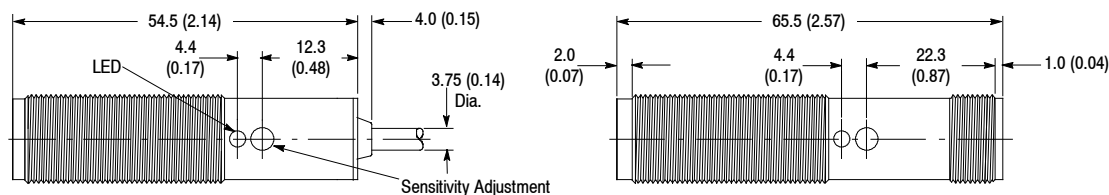
- **Polarized retroreflective:** Open circuit for dark operate. Connect white (2) and brown (1) together for light operate. Connect white (2) and blue (3) together for remote teach.
- **Diffuse:** Open circuit for light operate. Connect white (2) and brown (1) together for dark operate. Connect white (2) and blue (3) together for remote teach.
- **Transmitted beam:** Open circuit for dark operate. Connect white (2) and brown (1) together for light operate. Connect white (2) and blue (3) together for dark operate. This model does not have remote teach.

Approximate Dimensions [mm (in.)]

Diffuse and Polarized Retroreflective

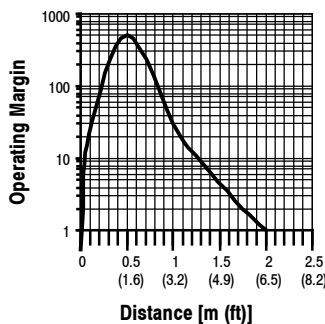


Transmitted Beam

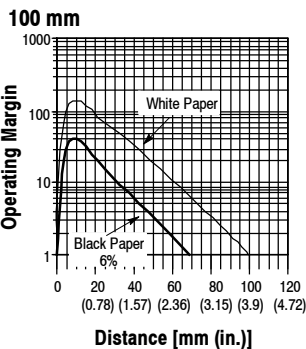


Typical Response Curve

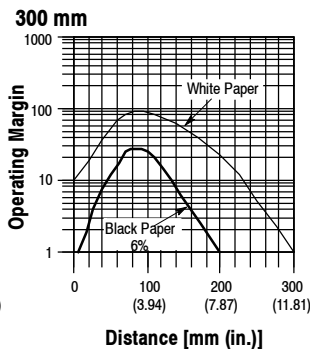
Polarized Retroreflective



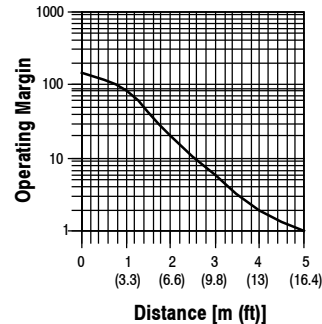
Standard Diffuse



Standard Diffuse



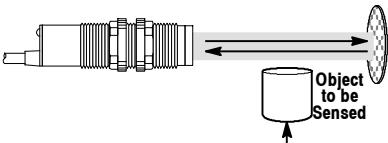
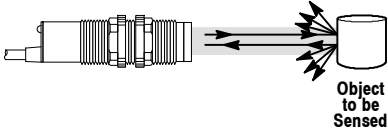
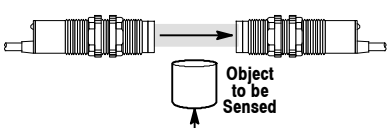
Transmitted Beam



42CF

12 mm Metal Cylindrical

Product Selection

Sensing Mode	Operating Voltage Supply Current	Sensing Distance @ 1X Margin	Output Energized	Output Type Capacity Response Time	Connection Type	Cat. No.
 <p><i>Polarized Retroreflective</i></p> <p>Field of View: 2.3° Emitter LED: Visible red 660 nm</p>	10...30V DC 30 mA	3 mm...2 m (0.12 in...6.5 ft)	L.O./D.O. Selectable	NPN 100 mA 1.25 ms	2 m 300V cable	42CF-P2LNA1-A2
					4-pin DC micro	42CF-P2LNA1-D4
				PNP 100 mA 1.25 ms	2 m 300V cable	42CF-P2LPA1-A2
					4-pin DC micro	42CF-P2LPA1-D4
 <p><i>Standard Diffuse</i></p> <p>Field of View: 11.4° (100 mm) 5.3° (300 mm) Emitter LED: Infrared 880 nm</p>	10...30V DC 30 mA	0...100 mm (0...3.9 in.) (adjustable)	L.O./D.O. Selectable	NPN 100 mA 1.25 ms	2 m 300V cable	42CF-D1LNA1-A2
					4-pin DC micro	42CF-D1LNA1-D4
		PNP 100 mA 1.25 ms		2 m 300V cable	42CF-D1LPA1-A2	
				4-pin DC micro	42CF-D1LPA1-D4	
		NPN 100 mA 1.25 ms		0...300 mm (0...12.2 in.) (adjustable)	2 m 300V cable	42CF-D1LNA2-A2
					4-pin DC micro	42CF-D1LNA2-D4
PNP 100 mA 1.25 ms	2 m 300V cable	42CF-D1LPA2-A2				
	4-pin DC micro	42CF-D1LPA2-D4				
 <p><i>Transmitted Beam</i></p> <p>Field of View: 1.4° Emitter LED: Infrared 880 nm</p>	10...30V DC 25 mA	3 mm...4 m (0.12 in... 13.2 ft)	L.O./D.O. Selectable	—	2 m 300V cable	42CF-E1EZB-A2
	10...30V DC 20 mA				4-pin DC micro	42CF-E1EZB-D4
				NPN 100 mA 2 ms	2 m 300V cable	42CF-R1LNB1-A2
	4-pin DC micro				42CF-R1LNB1-D4	
	PNP 100 mA 2 ms			2 m 300V cable	42CF-R1LPB1-A2	
		4-pin DC micro		42CF-R1LPB1-D4		

Cordsets and Accessories

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