



General Specifications

Light Source	Infrared LED (880nm) and visible red (660nm)
Unit Protection	Overload, short circuit, reverse polarity, false pulse
Supply Voltage	24V DC, 120V AC, 220V AC—see Product Selection on pages R1-59 through R1-62
Current Consumption	See Product Selection on pages R1-59 through R1-62
Output Type	NPN and PNP (DC models) SPDT Relay (AC/DC models) MOSFET (AC/DC models)
Output Mode	Light/Dark operate selectable
Output Rating	250mA @ 40V DC (all DC models except 42GLP and 42GSP) 2A @ 132V AC (SPDT relay models) 1A @ 264V AC (SPDT relay models) 300mA @ 264V AC (MOSFET models)
Max Leakage Current	10µA (DC); 1mA (AC)
Response Time	2ms (NPN and PNP models) 15ms (SPDT Relay models) 2ms (MOSFET models)
Housing Material	Valox®
Lens Material	Acrylic
LED Indicators	See User Interface below
Connection Types	2m 300V cable, 4-pin DC micro QD, 4-pin DC mini, 4-pin AC micro QD, 5-pin DC micro QD
Supplied Accessories	#129-130 mounting kit
Optional Accessories	Mounting brackets, reflectors, cordsets—see page R1-62
Operating Environment	NEMA 3, 4X, 6P, 12, 13 (IP67) 1200psi washdown
Vibration	10-55Hz, 1mm amplitude, Meets or exceeds IEC 60947-5-2
Shock	30g with 1ms pulse duration, Meets or exceeds IEC 60947-5-2
Operating Temperature	-34°C to +70°C (-29°F to +158°F)
Relative Humidity	5...95%
Approvals	UL listed, CSA approved, and CE marked for all applicable directives

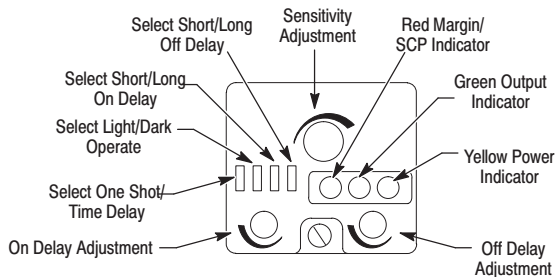
Features

- Harsh duty 30mm package
- Wide selection of sensing modes
- Wide selection of operating modes
- Both DC and AC/DC operation
- Models with teach function
- Standard ON/OFF and timing versions
- Fast response time
- Variety of connection types

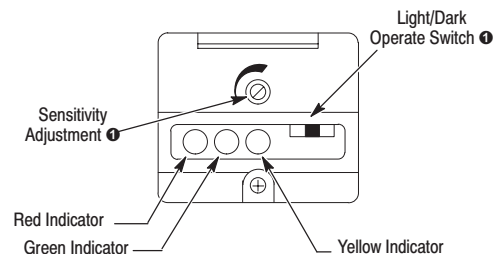
User Interface—Standard Models (Refer to installation instructions for 42GLP and 42GSP versions)

Label	Color	State	Status
Output	Green	OFF	Sensor output de-activated
		ON	Sensor output activated
Margin/SCP	Red	OFF	Margin < 2.5
		ON	Margin > 2.5
		Flashing	Output SCP active
Power	Yellow	OFF	Sensor not powered
		ON	Sensor powered

42GTx Versions—Top View Detail



42GRx Versions—Top View Detail



● Pushbutton on 42GSP models.

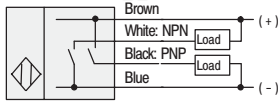
Series 9000

Standard and Timing

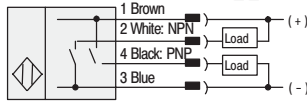
Wiring Diagrams ①②

All Models Except Transmitted Beam Source

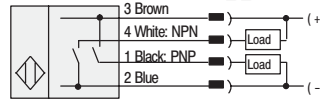
Cable Model: 9_0



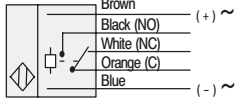
4-pin DC Micro QD Model: 9_0-QD



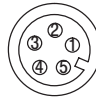
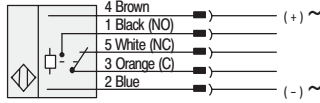
4-pin DC Mini QD Model: 9_0-QD1



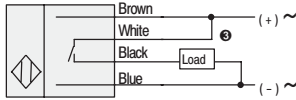
Cable Model: 9_1_9_2



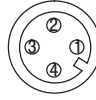
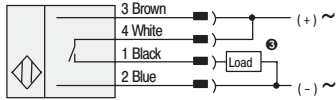
5-pin AC/DC Mini QD Model: 9_1-QD, 9_2-QD



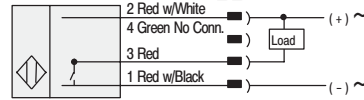
Cable Model: 9_3



AC/DC Mini QD Model: 9_3-QD

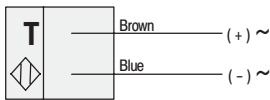


AC/DC Micro QD Model: 9_3-QD1

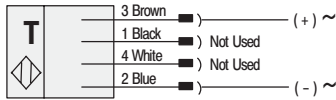


Transmitted Beam Source

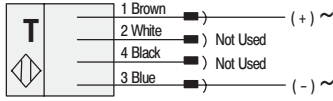
Cable Model: 42GRL-90_



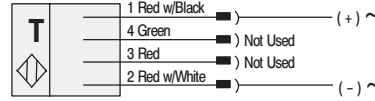
AC/DC Mini QD Model: 42GRL-90_2-QD



DC Micro QD Model: 42GRL-90_0-QD



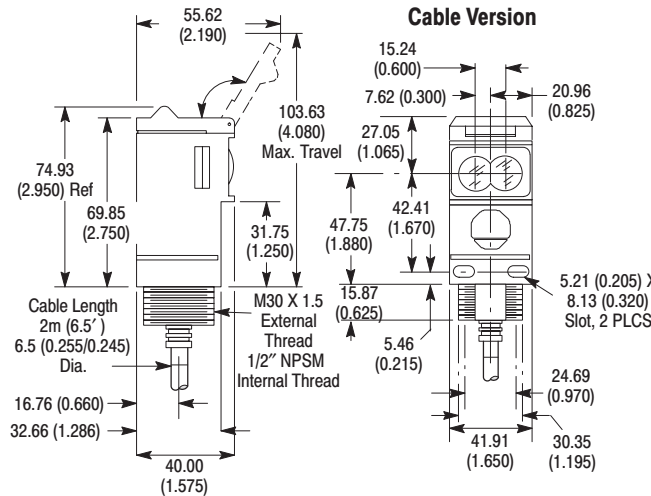
4-pin DC Micro QD Model: 42GRL-90_3-QD1



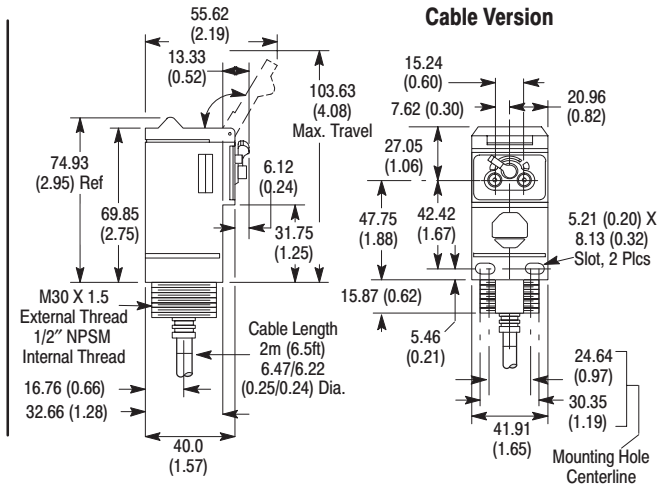
- ① For Allen-Bradley programmable controller compatible interface, refer to publication 42-2.0.
- ② Quick-disconnect wiring codes shown are valid for Allen-Bradley cables only.
- Ⓢ Load can be placed on either black or white wire to create sourcing or sinking respectively.

Dimensions—mm (inches)

All Versions Except Fiber Optic

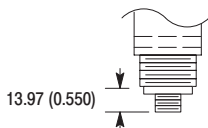


Fiber Optic

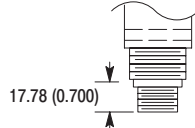


Connector Version

Micro Style



Mini Style

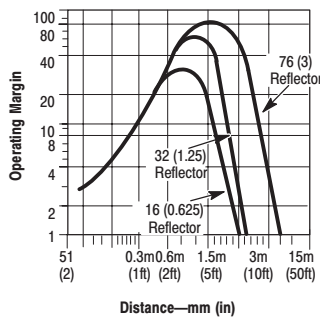


Thread Size

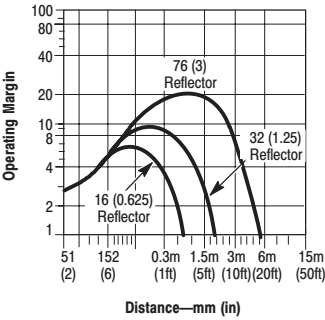
	AC	DC
Micro Style	1/2-20 UNF 2 Keyways	M12 x 1 1 Keyway
Mini Style	7/8-16 UN 1 Keyway	

Typical Response Curve

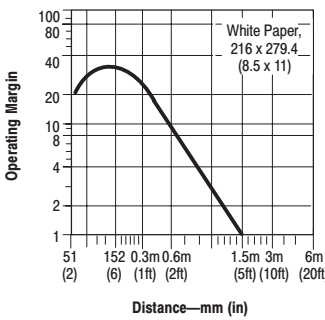
Retroreflective



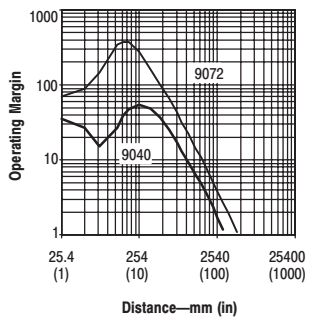
Polarized Retroreflective



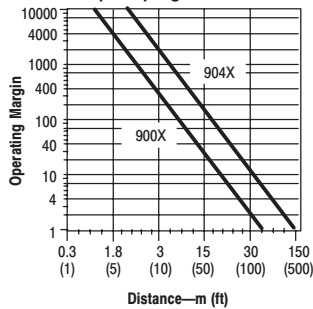
Standard Diffuse



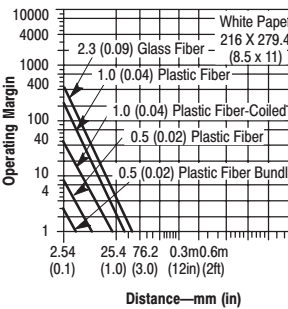
Long Range Diffuse



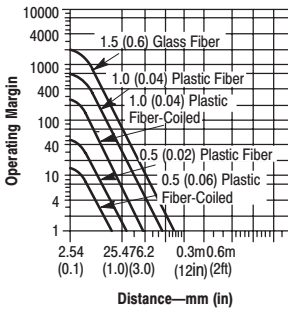
Transmitted Beam with 61m (200ft) Light Source



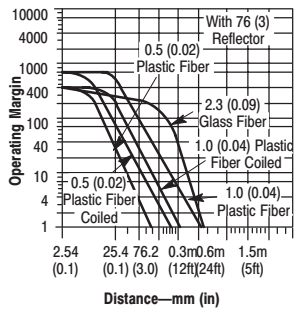
Visible Red Fiber Optic Standard Diffuse



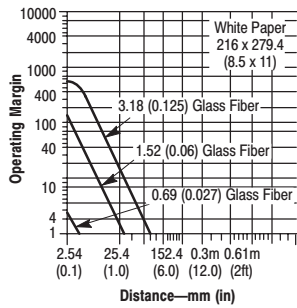
Visible Red Fiber Optic Transmitted Beam



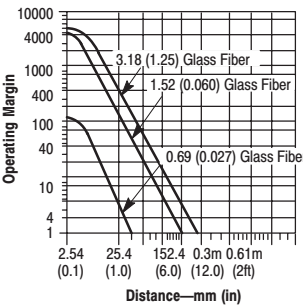
Visible Red Fiber Optic Retroreflective



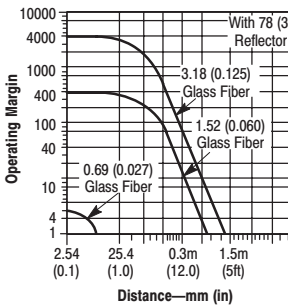
Infrared Fiber Optic Standard Diffuse



Infrared Fiber Optic Transmitted Beam



Infrared Fiber Optic Retroreflective



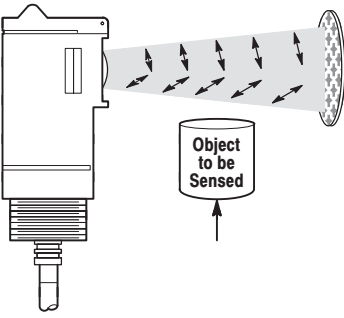
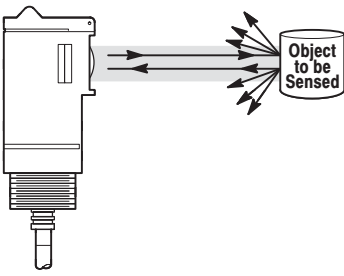
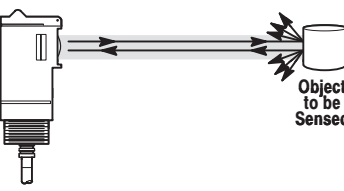
Product Selection for On/Off and Timing Sensors

Sensing Mode	Operating Voltage Supply Current	Sensing Distance	Output Energized	Output Type Capacity Response Time	Connection Type	Catalog Number
<p>Retroreflective</p> <p>Field of View: 1.5° Emitter LED: Visible red 660nm</p>	10-40V DC 30mA	50.8mm (2in) to 9.14m (30ft) with 76mm (3in) Reflector	Light/Dark Selectable	NPN/PNP 250mA 2ms	2m 300V cable	42G⊗U-9000
	10-55V DC/20-40V AC 50-60 Hz 40mA				4-pin DC micro	42G⊗U-9000-QD
					4-pin mini	42G⊗U-9000-QD1
	70-264V AC/DC 50/60Hz 15mA				2m 300V cable	42G⊗U-9001
45-264V DC/40-264V AC 50/60Hz 15mA	5-pin mini	42G⊗U-9001-QD				
		2m 300V cable	42G⊗U-9002			
	5-pin mini	42G⊗U-9002-QD				
	2m 300V cable	42G⊗U-9003				
2m 600V cable	42G⊗U-9003H					
4-pin mini	42G⊗U-9003-QD					
4-pin AC micro	42G⊗U-9003-QD1					

Series 9000

Standard and Timing

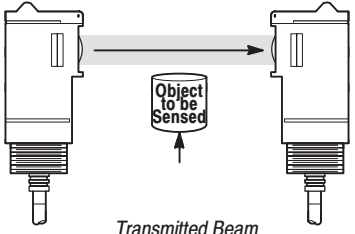
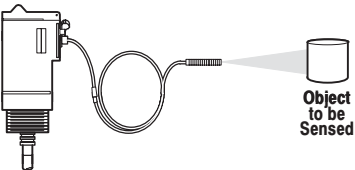
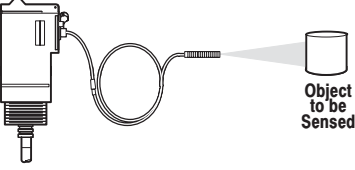
Product Selection for On/Off and Timing Sensors

Sensing Mode	Operating Voltage Supply Current	Sensing Distance	Output Energized	Output Type Capacity Response Time	Connection Type	Catalog Number
 <p>Polarized Retroreflective</p> <p>Field of View: 1.5° Emitter LED: Visible red 660nm</p>	10-40V DC 30mA	50.8mm (2in) to 4.87m (16ft) with 76mm (3in) Reflector	Light/Dark Selectable	NPN/PNP 250mA 2ms	2m 300V cable	42G⊗U-9200
	10-55V DC/20-40V AC 50/60Hz 40mA				4-pin DC micro	42G⊗U-9200-QD
					4-pin mini	42G⊗U-9200-QD1
	70-264V DC/60-264V AC 50/60Hz 15mA			2m 300V cable	42G⊗U-9201	
		5-pin mini		42G⊗U-9201-QD		
	45-264V DC/40-264V AC 50/60Hz 15mA	2m 300V cable		42G⊗U-9202		
		5-pin mini		42G⊗U-9202-QD		
	Solid State Isolated N.O. 300mA 2ms	2m 300V cable		42G⊗U-9203		
		2m 600V cable		42G⊗U-9203H		
		4-pin mini		42G⊗U-9203-QD		
	4-pin AC micro	42G⊗U-9203-QD1				
	 <p>Standard Diffuse</p> <p>Field of View: 3.5° Emitter LED: Infrared 880nm</p>	10-40V DC 30mA		50.8mm (2in) to 1.52m (5ft) to White Paper	Linear pot. Light/Dark Selectable	NPN/PNP 100mA 2ms
10-55V DC/20-40V AC 50/60Hz 40mA		4-pin DC micro	42GLP-9000-QD			
		2m 300V cable	42GSP-9000			
70-264V DC/60-264V AC 50/60Hz 15mA		4-pin DC micro	42GSP-9000-QD			
		2m 300V cable	42G⊗P-9000			
45-264V DC/40-264V AC 50/60Hz 15mA		4-pin DC micro	42G⊗P-9000-QD			
		4-pin mini	42G⊗P-9000-QD1			
Solid State Isolated N.O. 300mA 2ms		2m 300V cable	42G⊗P-9001			
		5-pin mini	42G⊗P-9001-QD			
		2m 300V cable	42G⊗P-9002			
5-pin mini		42G⊗P-9002-QD				
Solid State Isolated N.O. 300mA 2ms		2m 300V cable	42G⊗P-9003			
	2m 600V cable	42G⊗P-9003H				
	4-pin mini	42G⊗P-9003-QD				
4-pin AC micro	42G⊗P-9003-QD1					
 <p>LongRangeDiffuse</p> <p>Field of View: 6.5° Emitter LED: Infrared 880nm</p>	10-40V DC 30mA	50.8mm (2in) to 3.04m (10ft)	Light/Dark Selectable	NPN/PNP 250mA 2ms	2m 300V cable	42GRP-9040
	10-55V DC/20-40V AC 50/60Hz 40mA				4-pin DC micro	42GRP-9040-QD
					4-pin mini	42GRP-9040-QD1
	70-264V AC/DC 50/60Hz 15mA			2m 300V cable	42GRP-9041	
		5-pin mini		42GRP-9041-QD		
	45-264V DC/40-264V AC 50/60Hz 15mA	2m 300V cable		42GRP-9042		
		5-pin mini		42GRP-9042-QD		
	Solid State Isolated N.O. 300mA 2ms	2m 300V cable		42GRP-9043		
		2m 600V cable		42GRP-9043H		
		4-pin mini		42GRP-9043-QD		
	4-pin AC micro	42GRP-9043-QD1				
	10-40V DC 30mA	50.8mm (2in) to 4.2m (14ft)		Light/Dark Selectable	NPN/PNP 250mA 2ms	2m 300V cable
4-pin DC micro		42GRP-9070-QD				
70-264V AC/DC 50/60Hz 15mA	50.8mm (2in) to 4.2m (14ft)	Light/Dark Selectable	SPDT EM Relay 2A/132V AC 1A/264V AC 1A/150V DC 15ms	2m 300V cable	42GRP-9072	
	3m 300V cable	42GRP-9072-3				
5-pin mini	42GRP-9072-QD					

⊗ R for standard (i.e. 42GRU-9000); T for timing (i.e. 42GTU-9000)

Refer to page R1-62 for cordsets and accessories. Refer to page R1-137 for diagnostic versions.

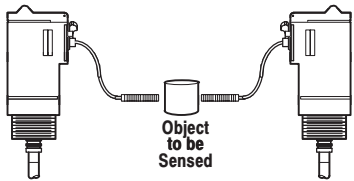
Product Selection (continued)

Sensing Mode	Operating Voltage Supply Current	Sensing Distance	Output Energized	Output Type Capacity Response Time	Connection Type	Catalog Number			
 <p>Transmitted Beam</p> <p>Field of View: 1.5° Emitter LED: Infrared 880nm</p>	10-264V AC/DC 50/60Hz 15mA	25.4mm (1in) to 61m (200ft)	NA Light Source		2m 300V cable	42GRL-9000			
					2m 600V cable	42GRL-9000H			
					4-pin DC micro	42GRL-9000-QD			
		4-pin mini			42GRL-9002-QD				
		2m 300V cable			42GRL-9040				
		4-pin DC micro			42GRL-9040-QD				
	70-264V AC/DC, 50/60Hz 10mA	Depends on Light Source		Receiver Light or Dark Output Selectable		4-pin mini	42GRL-9042-QD		
						4-pin AC micro	42GRL-9043-QD1		
						2m 300V cable	42G⊗R-9002		
						5-pin mini	42G⊗R-9002-QD		
45-264V DC, 40-264V AC 50/60Hz 10mA				Solid State Isolated N.O. 300mA 15ms	2m 300V cable	42GRR-9003			
					2m 600V cable	42GRR-9003H			
					4-pin mini	42GRR-9003-QD			
					4-pin AC micro	42GRR-9003-QD1			
 <p>Visible Red Fiber Optic</p> <p>Emitter LED: Visible red 660nm</p>	10-40V DC 30mA	Depends on Fiber Optic cable	Light/Dark Selectable	NPN/PNP 250mA 2ms	2m 300V cable	42G⊗F-9100			
	70-264V AC/DC 50/60Hz 15mA				4-pin DC micro	42G⊗F-9100-QD			
					2m 300V cable	42G⊗F-9102			
						5-pin mini	42G⊗F-9102-QD		
	45-264V DC/40-264V AC 50/60Hz 15mA						Solid State Isolated N.O. 300mA 2ms	2m 300V cable	42G⊗F-9103
								4-pin mini	42G⊗F-9103-QD
								4-pin AC micro	42G⊗F-9103-QD1
								2m 300V cable	42G⊗F-9000
	 <p>Infrared Fiber Optic</p> <p>Emitter LED: Infrared 880nm</p>				10-40V DC 30mA	Depends on Fiber Optic cable	Light/Dark Selectable	NPN/PNP 250mA 2ms	4-pin DC micro
70-264V AC/DC, 50/60Hz 15mA		2m 300V cable	42G⊗F-9002						
		5-pin mini	42G⊗F-9002-QD						
			2m 300V cable	42G⊗F-9003					
45-264V DC/40-264V AC 50/60Hz 15mA				Solid State Isolated N.O. 300mA 2ms	2m 600V cable				42G⊗F-9003H
					4-pin mini				42G⊗F-9003-QD
					4-pin AC micro				42G⊗F-9003-QD1
					2m 300V cable				42G⊗F-9003

Series 9000

Standard and Timing

Product Selection (continued)

Sensing Mode	Operating Voltage Supply Current	Sensing Distance	Output Energized	Output Type Capacity Response Time	Connection Type	Catalog Number
 <p>Extended Range Infrared Fiber Optic Emitter LED: Infrared 880nm</p>	10–264V AC/DC, 56/60Hz 15mA	See table below.	NA Light Source		2m 300V cable	42GRLF-9040
					4-pin DC micro	42GRLF-9040-QD
	10–40V DC 30mA	See table below.	Light/Dark Selectable	NPN/PNP 250mA 2ms	2m 300V cable	42GRRF-9000
					4-pin DC micro	42GRRF-9000-QD
	70–264V AC/DC, 50/60Hz 15mA			SPDT EM Relay 2A/132V AC, 1A/264V AC 1A/150V DC 15ms	2m 300V cable	42GRRF-9002
					5-pin mini	42GRRF-9002-QD

Typical Sensing Distance—Extended Range Infrared Fiber Optic

Sensing Mode	Sensor	Fiber Optic Cable	Range Extender	Sensing Distance (1X margin)
Transmitted Beam	42GRLF-9040 with individual fiber optic cable	43GT-FAS25SL Individual Fiber Optic Cable, smooth tip	none	914mm (36in)
		43GT-TBB25SL Individual Fiber Optic Cable, with 5/16 inch threaded tip		
		43GT-FAS25SL Individual Fiber Optic Cable, smooth tip	60-1844	6m (20ft)
		43GT-TBB25SL Individual Fiber Optic Cable, with 5/16 inch threaded tip	60-2559	12m (40ft)
		43GT-TBB25SL Individual Fiber Optic Cable, with 5/16 inch threaded tip	60-2323	6m (20ft)
	60-2738	12m (40ft)		
	42GRLF-9040 with bifurcated fiber optic cable	43GR-FAS25SL Bifurcated Fiber Optic Cable, smooth tip	none	1.2m (48in)
		43GR-TBB25SL Bifurcated Fiber Optic Cable, with 5/16 inch threaded tip		
		43GR-FAS25SL Bifurcated Fiber Optic Cable, with smooth tip	60-1844	7.6m (25ft)
		43GR-TBB25SL Bifurcated Fiber Optic Cable, with 5/16 inch threaded tip	60-2559	15.2m (50ft)
43GR-TBB25SL Bifurcated Fiber Optic Cable, with 5/16 inch threaded tip		60-2323	7.6m (25ft)	
60-2738	15.2m (50ft)			

- Sensing ranges are for fiber optic cables shown. Range will vary with other fiber optic cable types.
- When using individual fiber optic cable, second port must be blocked with the provided plug (60-2744).
- Receiver Sensor (42GRRF) requires only individual fiber optic cable.

Cordsets and Accessories

Description	Catalog Number	Description	Catalog Number
1.8m (6ft) 4-pin, Mini QD Cordset	889N-F4AF-6F	32mm (1.25in) Diameter Reflector	92-47
1.8m (6ft) 5-pin, Mini QD Cordset	889N-F5AF-6F	Range Extender	60-1844
2m (6.5ft) 4-pin, DC Micro QD Cordset	889D-F4AC-2	Range Extender	60-2559
2m (6.5ft) 4-pin, AC Micro QD Cordset	889R-F4AEA-2	Range Extender	60-2738
76mm (3in) Diameter Reflector	92-39	Replacement Plug	60-2774