



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

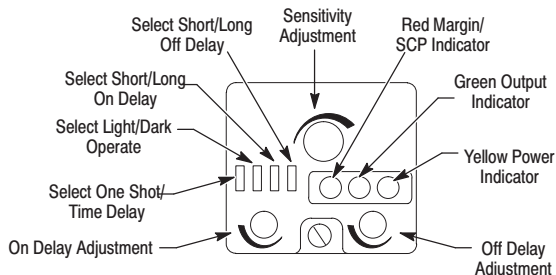
Features

- 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

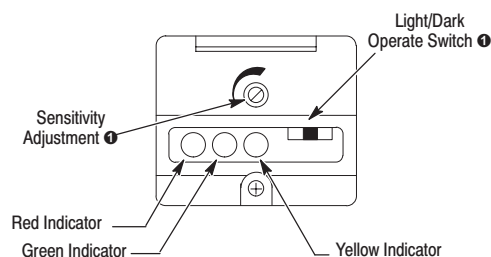
User Interface—Standard Models (Refer to installation instructions for 42GLP and 42GSP versions)

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



① Pushbutton on 42GSP models.

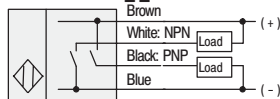
Series 9000

Standard and Timing

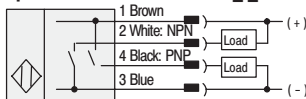
Wiring Diagrams①②

All Models Except Transmitted Beam Source

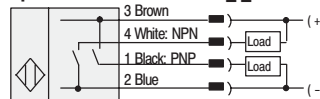
Cable Model: 9__0



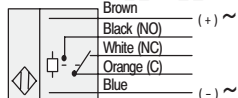
4-pin DC Micro QD Model: 9__0-QD



4-pin DC Mini QD Model: 9__0-QD1



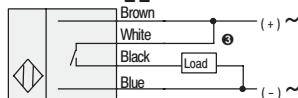
Cable Model: 9__1, 9__2



5-pin AC/DC Mini QD Model: 9__1-QD, 9__2-QD



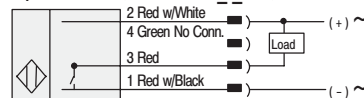
Cable Model: 9__3



AC/DC Mini QD Model: 9__3-QD

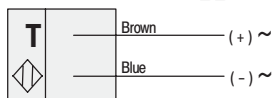


AC/DC Micro QD Model: 9__3-QD1

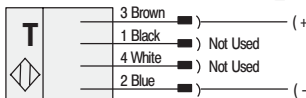


Transmitted Beam Source

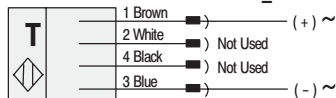
Cable Model: 42GRL-90__



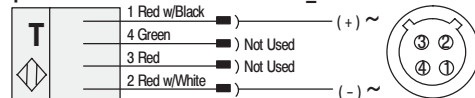
AC/DC Mini QD Model: 42GRL-90__2-QD



DC Micro QD Model: 42GRL-90__0-QD



4-pin DC Micro QD Model: 42GRL-90__3-QD1



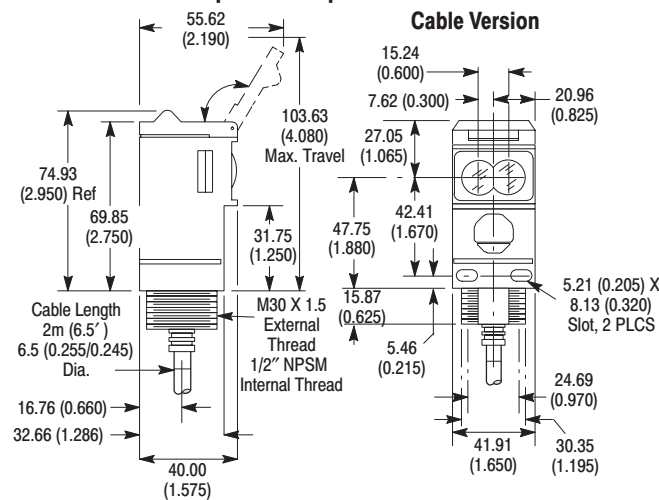
① For Allen-Bradley programmable controller compatible interface, refer to publication 42-2.0.

② Quick-disconnect wiring codes shown are valid for Allen-Bradley cables only.

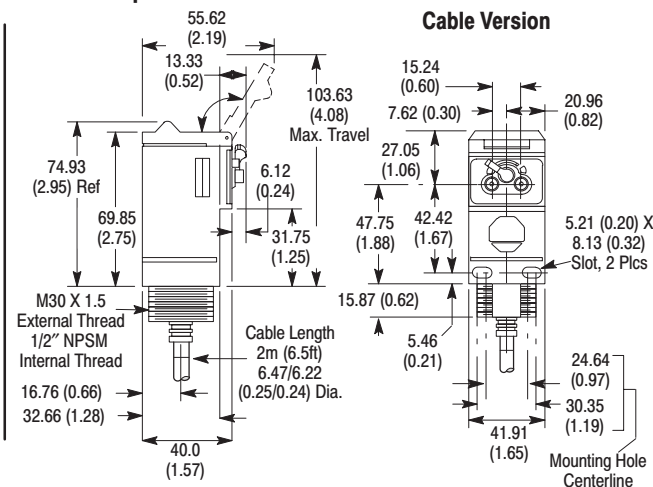
③ Load can be placed on either black or white wire to create sourcing or sinking respectively.

Dimensions—mm (inches)

All Versions Except Fiber Optic

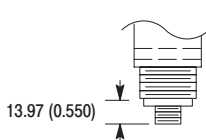


Fiber Optic

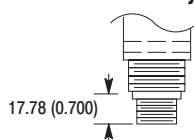


Connector Version

Micro Style



Mini Style

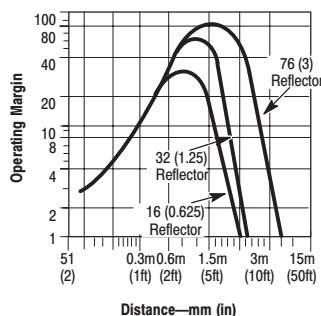


Thread Size

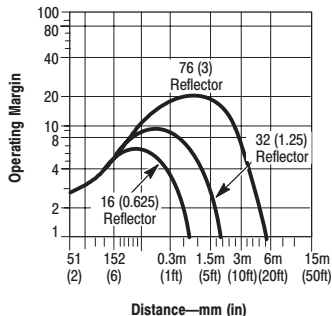
	AC	DC
Micro Style	1/2-20 UNF 2 Keyways	M12 x 1 1 Keyway
Mini Style	7/8-16 UN 1 Keyway	

Typical Response Curve

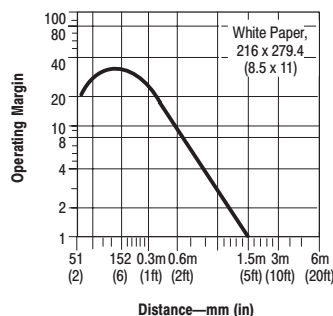
Retroreflective



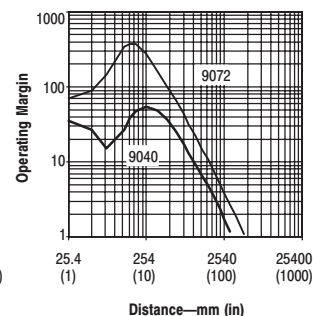
Polarized Retroreflective



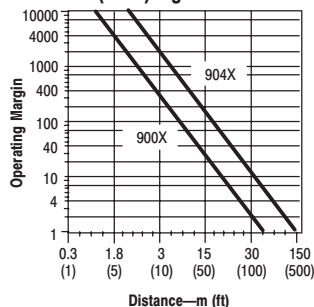
Standard Diffuse



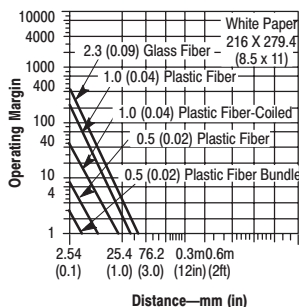
Long Range Diffuse



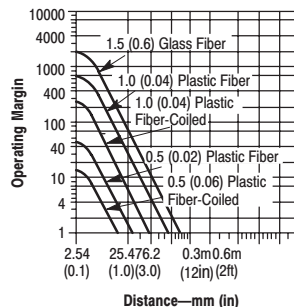
Transmitted Beam with 61m (200ft) Light Source



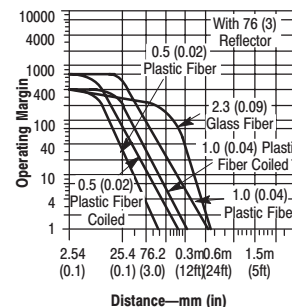
Visible Red Fiber Optic Standard Diffuse



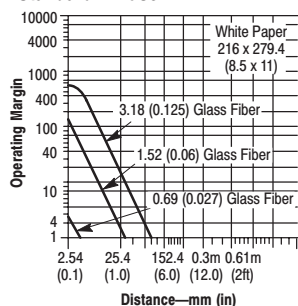
Visible Red Fiber Optic Transmitted Beam



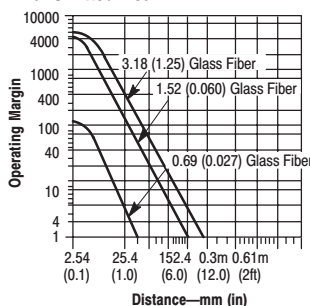
Visible Red Fiber Optic Retroreflective



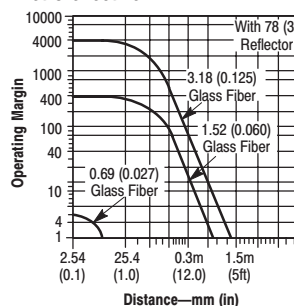
Infrared Fiber Optic Standard Diffuse



Infrared Fiber Optic Transmitted Beam



Infrared Fiber Optic Retroreflective



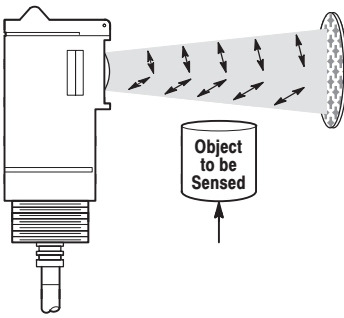
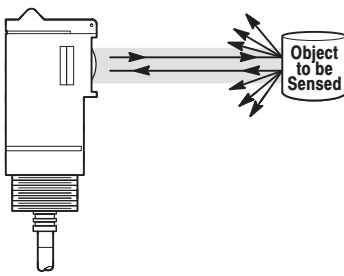
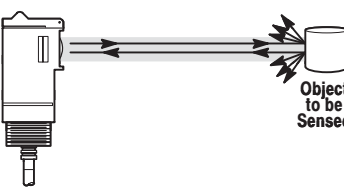
Product Selection for On/Off and Timing Sensors

Sensing Mode	Operating Voltage Supply Current	Sensing Distance	Output Energized	Output Type Capacity Response Time	Connection Type	Catalog Number
Retroreflective Field of View: 1.5° Emitter LED: Visible red 660nm	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	SPDT EM Relay 2A/132V AC 1A/264V AC 1A/150V DC 15ms	2m 300V cable
	5-pin mini	42G⊗U-9001-QD				
	2m 300V cable	42G⊗U-9002				
	45–264V DC/40–264V AC 50/60Hz 15mA	Solid State Isolated N.O. 300mA 2ms	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

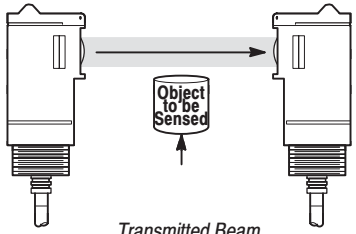
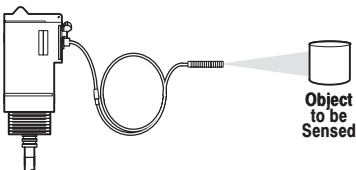
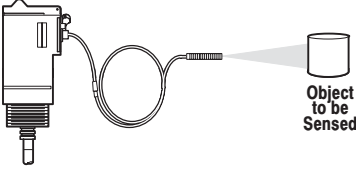
Product Selection for On/Off and Timing Sensors

Sensing Mode	Operating Voltage Supply Current	Sensing Distance	Output Energized	Output Type Capacity Response Time	Connection Type	Catalog Number				
 <i>Polarized Retroreflective</i> Field of View: 1.5° Emitter LED: Visible red 660nm	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			SPDT EM Relay 2A/132V AC 1A/264V AC 1A/150V DC 15ms	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									
 <i>Standard Diffuse</i> Field of View: 3.5° Emitter LED: Infrared 880nm	10–40V DC 30mA	50.8mm (2in) to 1.52m (5ft) to White Paper	Linear pot. Light/Dark Selectable	NPN/PNP 100mA 2ms	2m 300V cable	42GLP-9000				
	10–55V DC/20–40V AC 50/60Hz 40mA				4-pin DC micro	42GLP-9000-QD				
					Teach function Light/Dark Selectable	2m 300V cable	42GSP-9000			
	4-pin DC micro		42GSP-9000-QD							
	70–264V DC/60–264V AC 50/60Hz 15mA			Light/Dark Selectable	NPN/PNP 250mA 2ms	2m 300V cable	42G⊗P-9000			
						4-pin DC micro	42G⊗P-9000-QD			
						4-pin mini	42G⊗P-9000-QD1			
	45–264V DC/40–264V AC 50/60Hz 15mA				SPDT EM Relay 2A/132V AC 1A/264V AC 1A/150V DC 15ms	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			
 <i>LongRangeDiffuse</i> Field of View: 6.5° Emitter LED: Infrared 880nm	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			SPDT EM Relay 2A/132V AC 1A/264V AC 1A/150V DC 15ms	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	42GRP-9070				
					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.

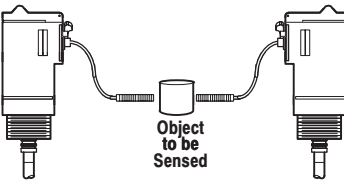
Product Selection (continued)

Sensing Mode	Operating Voltage Supply Current	Sensing Distance	Output Energized	Output Type Capacity Response Time	Connection Type	Catalog Number	
 Transmitted Beam Field of View: 1.5° Emitter LED: Infrared 880nm	10-264V AC/DC 50/60Hz 15mA	25.4mm (1in) to 61m (200ft)	NA Light Source		2m 300V cable	42GRL-9000	
		25.4mm (1in) to 152m (500ft)			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	
	4-pin mini		42GRL-9042-QD				
	4-pin AC micro	42GRL-9043-QD1					
	10-40V DC 25mA	Depends on Light Source	Receiver Light or Dark Output Selectable	NPN and PNP 250mA 5ms	2m -300V cable	42G⊗R-9000	
	70-264V AC/DC, 50/60Hz 10mA				4-pin DC micro	42G⊗R-9000-QD	
4-pin mini					42G⊗R-9000-QD1		
SPDT EM Relay 2A/132V AC, 1A/264V AC 1A/150V DC 23ms					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				
 Visible Red Fiber Optic Emitter LED: Visible red 660nm	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	
					SPDT EM Relay 2A/132V AC, 1A/264V AC 1A/150V DC 15ms	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
	4-pin mini						42G⊗F-9103-QD
	4-pin AC micro	42G⊗F-9103-QD1					
	 Infrared Fiber Optic Emitter LED: Infrared 880nm	10-40V DC 30mA	Depends on Fiber Optic cable	Light/Dark Selectable			NPN/PNP 250mA 2ms
		70-264V AC/DC, 50/60Hz 15mA			4-pin DC micro	42G⊗F-9000-QD	
					SPDT EM Relay 2A/132V AC, 1A/264V AC 1A/150V DC 15ms	2m 300V cable	
5-pin mini						42G⊗F-9002-QD	
45-264V DC/40-264V AC 50/60Hz 15mA					Solid State Isolated N.O. 300mA 2ms	2m 300V cable	
		2m 600V cable				42G⊗F-9003H	
		4-pin mini	42G⊗F-9003-QD				
		4-pin AC micro	42G⊗F-9003-QD1				

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
 Extended Range Infrared Fiber Optic Emitter LED: Infrared 880nm	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)
			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)
			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)

1. Sensing ranges are for fiber optic cables shown. Range will vary with other fiber optic cable types.
2. When using individual fiber optic cable, second port must be blocked with the provided plug (60-2744).
3. 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