

FA Series Laser Photoelectric Sensors



M18 (18 mm) plastic - DC

- 14 models available
- Diffuse, polarized reflective, and through-beam models with long sensing distances
- Plastic housing
- Axial cable or M12 quick-disconnect models
- NPN or PNP, complementary N.O./N.C. outputs
- IP67 rated



FA Series Photoelectric Sensors Selection Chart									
Part Number	Price	Sensing Range	Output State	Logic	Connection	Wiring	Dimensions	Characteristic Curves	
Diffuse									
FAL4-BN-0A	\$107.00	300mm (11.81in)	Complementary N.O./N.C.	NPN	2m (6.5) axial cable	Diagram 1	Figure 1	Chart 1	
FAL4-BP-0A	\$108.00			PNP	2m (6.5) axial cable	Diagram 2	Figure 1	Chart 1	
FAL4-BN-0E	\$108.00			NPN	M12 (12mm) connector	Diagram 1	Figure 2	Chart 1	
FAL4-BP-0E	\$108.00			PNP	M12 (12mm) connector	Diagram 2	Figure 2	Chart 1	
Polarized reflective*									
FALN-BN-0A	\$108.00	20m (65.61ft) with RL110	Complementary N.O./N.C.	NPN	2m (6.5) axial cable	Diagram 1	Figure 1	Chart 2	
FALN-BP-0A	\$108.00	30m (98.43ft) with RL201		PNP	2m (6.5) axial cable	Diagram 2	Figure 1	Chart 2	
FALN-BN-0E	\$108.00			NPN	M12 (12mm) connector	Diagram 1	Figure 2	Chart 2	
FALN-BP-0E	\$108.00			PNP	M12 (12mm) connector	Diagram 2	Figure 2	Chart 2	
Through-beam**									
FALD-BN-0A	Receiver	\$37.50	50m (164.04ft)	Complementary N.O./N.C.	NPN	2m (6.5) axial cable	Diagram 1	Figure 1	Chart 3
FALD-BP-0A	Receiver	\$37.50			PNP	2m (6.5) axial cable	Diagram 2	Figure 1	Chart 3
FALD-BN-0E	Receiver	\$37.50			NPN	M12 (12mm) connector	Diagram 1	Figure 2	Chart 3
FALD-BP-0E	Receiver	\$37.50			PNP	M12 (12mm) connector	Diagram 2	Figure 2	Chart 3
FALH-X0-0A	Emitter	\$75.00			Receiver dependent	2m (6.5) axial cable	Diagram 3	Figure 1	Chart 3
FALH-X0-0E	Emitter	\$75.00				M12 (12mm) connector	Diagram 3	Figure 2	Chart 3

*Purchase reflectors separately.

**Purchase one receiver and one emitter for a complete set.

Wiring diagrams

Diagram 1

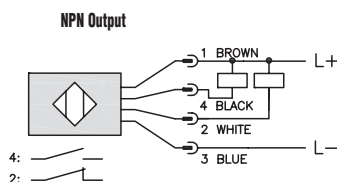


Diagram 2

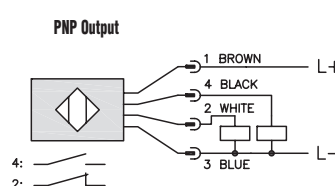
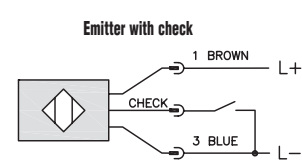


Diagram 3



2-meter Axial Cable version: check is black
M12 Connector: check is Pin 2 (white)

Connector



Switching Element Function		
	Thru-Beam and Reflective Models	Diffuse Models
Light-on	N.C.	N.O.
Dark-on	N.O.	N.C.

Note: N.O. = Signal ON when emitter is NOT sensing receiver.

N.C. = Signal ON when emitter is sensing receiver.

FA Series Laser Photoelectric Sensors

Specifications	Diffuse Models	Reflective Models	Through-Beam Models
Type	Diffuse reflection	Polarized reflection ³	Through-beam ⁴
Sensing Distance	300mm ¹	20m with RL110 reflector ² 30m with RL201 reflector	50m
Light Spot Diameter	1 mm @100 mm	15 mm @ 800 mm	22x5 mm @ 20 m
Emission	Visible red Class 1 Laser (650nm); see note below		
Sensitivity	Adjustable		
Output Type	NPN or PNP - Complementary NO/NC		
Operating Voltage	10-30 VDC		
No-load Supply Current	≤30mA	≤20mA	≤25mA
Operating (Load) Current	≤100mA		
Off-state (Leakage) Current	≤10μA		
Voltage Drop	2V max at 100mA		
Switching Frequency	800Hz		1kHz
Ripple	≤10%		
Time Delay Before Availability (tv)	200ms		
Short-Circuit Protection	Yes, switch autoresets after load is removed		
Operating Temperature	-15 to 55°C (5° to 131°F)		
Protection Degree (DIN 40050)	IEC IP67		
LED Indicators/Switch Status	Yellow (output energized) Green (power ON)		Receiver: Yellow (output energized) Emitter: Green (power ON)
Housing Material	Polybutylene Terephthalate (PBT)		
Lens Material	Polycarbonate (PC)		
Shock/Vibration	See terminology section		
Tightening Torque	1 Nm (0.737 lb-ft)		
Weight	200g (7.05 oz)		
Connectors	2m (6.5') axial cable; M12 (12mm) connector. Two lock nuts included.		
Agency Approvals	UL E187310, CE		
1With 100x100mm white matte paper			
2 With standard Ø84mm RL110 reflector			
3Purchase reflector separately.			
4An emitter (FALH) and receiver (FALD) pair must be ordered for a complete sensor set.			

IMPORTANT NOTE

Class 1 Laser Product

Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice Number 50, dated July 26, 2001.

Note: FA-L sensors are equipped with a visible red light laser diode and are classified as CLASS 1 LASER DEVICES. According to the CEIEN60825-1 norms, the class 1 laser devices are safe in operating conditions that can be reasonably foreseen. The FA-L sensors emit visible laser light impulses with a maximum peak power of 0.4 milliwatt. The laser output maximum power level is checked through a circuit that is always working, so it can detect any single failure. The FA-L Class 1 laser always emits a beam of intense and very concentrated light. The intentional and prolonged observation of this light can cause eye problems. As a result, it is advisable, where possible, to install the laser sensors so the beam cannot exceed the operating area. Avoid laser beam contact with eyes.

FA Series Laser Photoelectric Sensors

Dimensions

mm

Figure 1

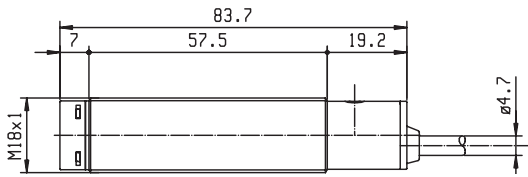
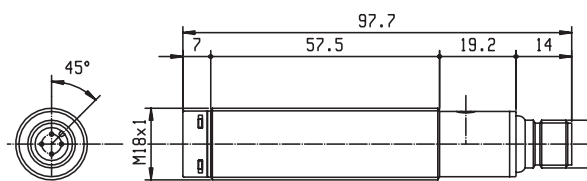


Figure 2



Characteristic curves

Chart 1 (Diffuse)

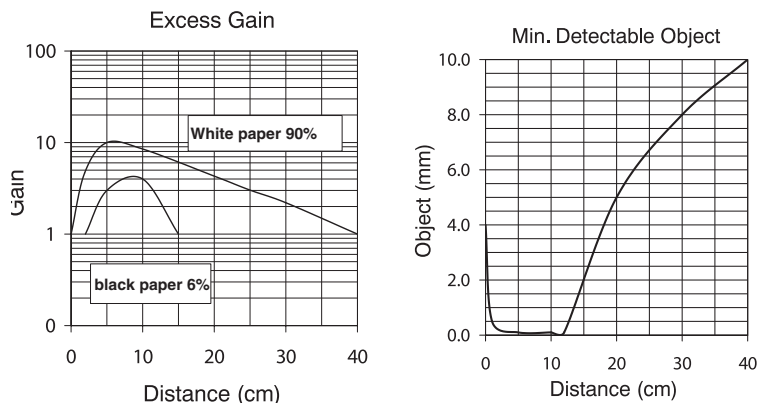


Chart 2 (Polarized Reflective)

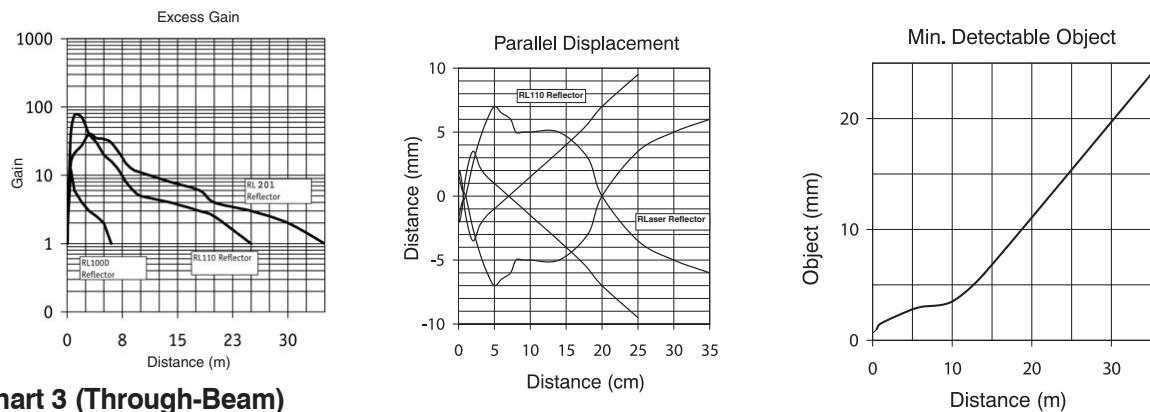
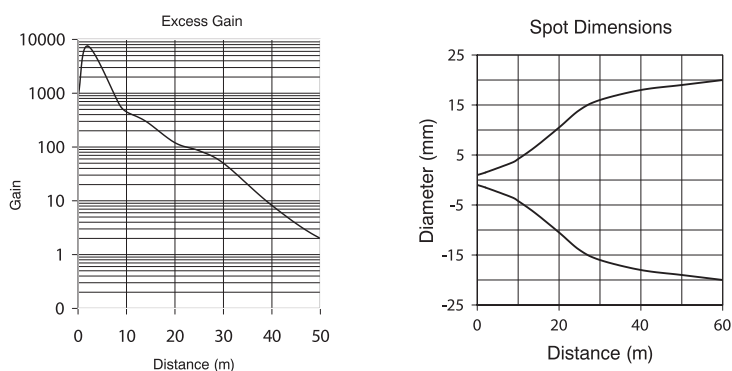


Chart 3 (Through-Beam)



Sensor Cables and Connectors

Cables with quick-disconnect plugs

- Industry standard axial and right-angle M8/M12 screw-lock connectors with open leads. The cables listed can be used with patch cables
- 2m, 3m, 5m, 7m, 10m and 15m cable lengths

- PVC (polyvinyl chloride) jacket for typical industrial applications
- PUR (polyurethane) jacket for oily and direct sunlight applications
- IP67 rated

M8 Quick-Disconnect Cables (Pico, Nano)						
Part Number	Price	Length	Poles	Connector	Jacket	Dimensions
M8 Quick-Disconnects						
CD08-0A-020-A1	\$8.25	2m (6.5 ft.)	3	Axial female	PVC	Figure 1
CD08-0A-020-C1	\$8.25	2m (6.5 ft.)	3	Right-angle female	PVC	Figure 2
CD08-0A-050-A1	\$10.50	5m (16.4 ft.)	3	Axial female	PVC	Figure 4
CD08-0C-050-A1	\$11.25	5m (16.4 ft.)	3	Axial female	PUR	Figure 3
CD08-0A-050-C1	\$10.50	5m (16.4 ft.)	3	Right-angle female	PVC	Figure 5
CD08-0C-050-C1	\$11.25	5m (16.4 ft.)	3	Right-angle female	PUR	Figure 5
CD08-0A-070-A1	\$13.00	7m (23 ft.)	3	Axial female	PVC	Figure 1
CD08-0A-070-C1	\$13.00	7m (23 ft.)	3	Right-angle female	PVC	Figure 2

M12 Quick-Disconnect Cables (Euro, Micro DC-Single Key)						
Part Number	Price	Length	Poles	Connector	Jacket	Dimensions
M12 Quick-Disconnects						
CD12M-0B-050-A1*	\$10.50	5m (16.4 ft)	3	Axial female	PVC	Figure 8
CD12M-0D-050-A1*	\$12.50	5m (16.4 ft)	3	Axial female	PUR	Figure 9
CD12M-0B-050-C1*	\$10.50	5m (16.4 ft)	3	Right-angle female	PVC	Figure 10
CD12M-0D-050-C1*	\$12.50	5m (16.4 ft)	3	Right-angle female	PUR	Figure 11
CD12L-0B-020-A0	\$8.25	2m (6.5 ft)	4	Axial female	PVC	Figure 6
CD12L-0B-020-C0	\$8.25	2m (6.5 ft)	4	Right-angle female	PVC	Figure 7
CD12M-0B-070-A1	\$13.00	7m (23 ft)	4	Axial female	PVC	Figure 6
CD12M-0B-070-C1	\$13.00	7m (23 ft)	4	Right-angle female	PVC	Figure 7
7000-12221-2141000	\$15.00	10m (32.8 ft)	4	Axial female	PVC	Figure 13
7000-12221-2141500	\$20.00	15m (49.2 ft)	4	Axial female	PVC	Figure 13
7000-12341-2141000	\$15.00	10m (32.8 ft)	4	Right-angle female	PVC	Figure 14
7000-12341-2141500	\$20.00	15m (49.2 ft)	4	Right-angle female	PVC	Figure 14
7000-12241-2150300	\$9.50	3m (9.8 ft)	5	Axial female	PVC	Figure 15
7000-12241-2150500	\$12.00	5m (16.4 ft)	5	Axial female	PVC	Figure 15
7000-12241-2151000	\$18.00	10m (32.8 ft)	5	Axial female	PVC	Figure 15
7000-12361-2150300	\$9.50	3m (9.8 ft)	5	Right-angle female	PVC	Figure 16
7000-12361-2150500	\$12.00	5m (16.4 ft)	5	Right-angle female	PVC	Figure 16
7000-12361-2151000	\$18.00	10m (32.8 ft)	5	Right-angle female	PVC	Figure 16
7000-17041-2950300	\$22.00	3m (9.8 ft)	8	Axial female	PUR	Figure 17
7000-17041-2950500	\$27.00	5m (16.4 ft)	8	Axial female	PUR	Figure 17
7000-17041-2951000	\$42.00	10m (32.8 ft)	8	Axial female	PUR	Figure 17
7000-17061-2950300	\$22.00	3m (9.8 ft)	8	Right-angle female	PUR	Figure 18
7000-17061-2950500	\$27.00	5m (16.4 ft)	8	Right-angle female	PUR	Figure 18
7000-17061-2951000	\$42.00	10m (32.8 ft)	8	Right-angle female	PUR	Figure 18
7000-19041-7050300	\$34.00	3m (9.8 ft)	12	Axial female	PUR	Figure 19
7000-19041-7050500	\$41.00	5m (16.4 ft)	12	Axial female	PUR	Figure 19
7000-19041-7051000	\$60.00	10m (32.8 ft)	12	Axial female	PUR	Figure 19
7000-19061-7050300	\$34.00	3m (9.8 ft)	12	Right-angle female	PUR	Figure 20
7000-19061-7050500	\$41.00	5m (16.4 ft)	12	Right-angle female	PUR	Figure 20
7000-19061-7051000	\$60.00	10m (32.8 ft)	12	Right-angle female	PUR	Figure 20

* Note: Do not use with sensors that require 4-pole cables.



CD08-0A-020-C1 and -A1 shown



CD08-0A-050-C1 and -A1 shown



CD12L-0B-020-A0 and -C0 shown



CD12M-0B-050-C1 and -A1 shown



7000-12221-2141000



7000-12241-2150500



7000-17041-2951000



7000-19041-7050500

Company
Information

Terminal Blocks

Power
Distribution
Blocks

Wiring
Accessories

ZIPLink
Connection
System

Multi-wire
Connectors

Sensor Cables
and Connectors

M12 Junction
Blocks

Panel Interface
Connectors

Wiring Duct

Cable Ties

Wire

Bulk
Multi-conductor
Cables

Wire
Management
Products

Power Supplies

DC Converters

Transformers
and Filters

Circuit Protection

Tools

Test
Equipment

Enclosures

Enclosure
Climate Control

Safety: Electrical
Components

Safety: Protective
Wear

Terms and
Conditions

Sensor Cables and Connectors

Shielded M12 Cables with quick-disconnect plugs

- Industry standard axial and right-angle M12 screw-lock connectors with open leads
- Braided shield located inside the cord jacket and connected to the coupling nut
- 5m and 10m cable lengths
- PUR (polyurethane) jacket for oily and direct sunlight applications
- IP67 rated



7000-17121-2941000



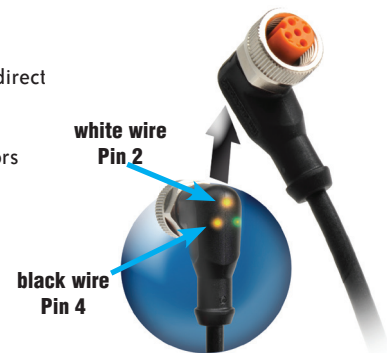
7000-17141-2940500

Shielded M12 Quick-Disconnect Cables (Euro, Micro DC-Single Key)

Part Number	Price	Length	Poles	Connector	Jacket	Dimensions
M12 Quick-Disconnects (shielded)						
7000-13201-3310500	\$19.00	5m (16.4 ft)	4	Axial female	PUR	Figure 21
7000-13201-3311000	\$29.00	10m (32.8 ft)	4	Axial female	PUR	Figure 21
7000-13261-3310500	\$19.00	5m (16.4 ft)	4	Right-angle female	PUR	Figure 22
7000-13261-3311000	\$29.00	10m (32.8 ft)	4	Right-angle female	PUR	Figure 22
7000-13221-3490500	\$22.00	5m (16.4 ft)	5	Axial female	PUR	Figure 23
7000-13221-3491000	\$34.00	10m (32.8 ft)	5	Axial female	PUR	Figure 23
7000-13281-3490500	\$22.00	5m (16.4 ft)	5	Right-angle female	PUR	Figure 24
7000-13281-3491000	\$34.00	10m (32.8 ft)	5	Right-angle female	PUR	Figure 24
7000-17121-2940500	\$36.00	5m (16.4 ft)	8	Axial female	PUR	Figure 25
7000-17121-2941000	\$55.00	10m (32.8 ft)	8	Axial female	PUR	Figure 25
7000-17141-2940500	\$36.00	5m (16.4 ft)	8	Right-angle female	PUR	Figure 26
7000-17141-2941000	\$55.00	10m (32.8 ft)	8	Right-angle female	PUR	Figure 26

Cables with LED and quick-disconnect plugs

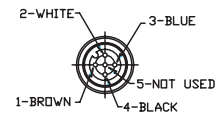
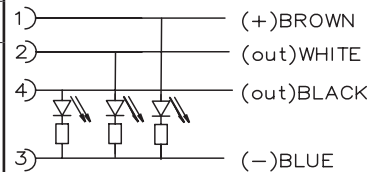
- Industry standard M12 right angle female plug with open leads
- These cables can be used with patch cables.
- 2m, 5m and 10m cable lengths
- PUR (polyurethane) jacket for oily and direct sunlight applications
- IP67 /IP68 / IP69K, II rated
- LED indication for 10-36 VDC PNP sensors only



M12 Quick-Disconnect Cables with LED Indicator (Euro, Micro DC-Single Key)

Part Number	Price	Length	Poles	Connector	LED	Jacket	Dimensions
M12 Quick-Disconnects							
EVC178*	\$11.00	2m (6.5 ft)	4	Right-angle female	Yes	PUR	Figure 12
EVC179*	\$11.50	5m (16.4 ft)	4	Right-angle female	Yes	PUR	Figure 12
EVC180*	\$14.00	10m (32.8 ft)	4	Right-angle female	Yes	PUR	Figure 12
<p>*Note: LED for 10 to 36 VDC PNP devices only. Do not use with NPN or analog output devices. Do not use when white wire (Pin 2) is used for selection of a sensor function. Do not use when emitter has check function.</p>							

LED Models' Wiring



Sensor Cables and Connectors

Cable Specifications					
Specification	M8		M12		
			CD Series		7000 Series (unshielded)
Length	2m (6.5 ft) / 7m (23 ft)	5m (16.4 ft)	2m (6.5 ft) / 7m (23 ft)	5m (16.4 ft)	3m (9.8 ft) / 5m (16.4 ft) / 10m (32.8 ft) / 15m (49.2 ft)
Nominal Voltage	50 VAC/75 VDC	60 VAC/VDC	250 VAC/VDC		30 VAC/VDC; 125 VAC/VDC; 250 VAC/VDC
Max Current	4A		4A		3/4 pin: 250 VAC/VDC, 4A 5 pin: 125 VAC/VDC, 4A 8 pin: 30 VAC/VDC, 2A 12 pin: 30 VAC/VDC, 1.5A
LED Current Loading	N/A				
Protection Degree	IP67	IP65 / IP68 / IP69K	IP67	PVC: IP68 PUR: IP68 / IP69K	IP67
Material Nut	Nickel plated brass				Nickel plated Zinc
Housing Material	Polyurethane (PUR) or Polyvinyl-chloride (PVC)				
Contacts Material	Gold plated Copper-Tin Alloy (CuSn)				Gold plated brass
Tightening Torque	0.5 Nm	≤ 0.4 Nm	0.5 Nm	≤ 0.4 Nm	0.6 Nm
Conductors Cross Section (AWG)	0.25 mm ² (24 AWG)	0.25 mm ² (24 AWG)	0.25 mm ² (24 AWG)	0.34 mm ² (22 AWG)	4 x 0.34 mm ² (4 x 22 AWG) 5 x 0.34 mm ² (5 x 22 AWG) 8 x 0.25 mm ² (8 x 24 AWG) 12 x 0.14 mm ² (12 x 26 AWG)
Ø Outer Cable	5mm	PVC: 4mm PUR: 4mm	5mm	PVC: 4.2 mm PUR: 4.3 mm	PVC: 5 - 5.2 mm PUR: 6.0 mm
Temperature Range	-25° to +80°C (-13° to 176°F)	-25° to 90°C (-13° to 194°F)	-25° to +80°C (-13° to 176°F)	PVC: -30° to 70°C (-22° to 158°F) PUR: -50° to 90°C (-58° to 194°F)	PVC: -25° to +70°C (-13° to 158°F) PUR: -25° to +85°C (-13° to 185°F)
Environmental	N/A	Halogen/Silicone free	N/A	Halogen/Silicone free	N/A
Function Display Power LED	N/A				
Switching Status LED	N/A				
Drag Chain (Roller Cable Tray) Suitability	Bending Radius	min. 10 x cable diameter			
	Bending Cycles	N/A			
	Travel Speed	N/A			
	Torsional Strain	N/A			
Agency Approvals	RoHS				RoHS (UL E325311 8/12 pole)

Company Information

Terminal Blocks

Power Distribution Blocks

Wiring Accessories

ZIPLink Connection System

Multi-wire Connectors

Sensor Cables and Connectors

M12 Junction Blocks

Panel Interface Connectors

Wiring Duct

Cable Ties

Wire

Bulk Multi-conductor Cables

Wire Management Products

Power Supplies

DC Converters

Transformers and Filters

Circuit Protection

Tools

Test Equipment

Enclosures

Enclosure Climate Control

Safety: Electrical Components

Safety: Protective Wear

Terms and Conditions

Sensor Cables and Connectors

Cable Specifications		
Specification	M12 7000 Series (shielded)	M12 with LED
Length	5m (16.4 ft) / 10m (32.8 ft)	2m (6.5 ft) / 5m (16.4 ft) / 10m (32.8 ft)
Nominal Voltage	30 VAC/VDC / 60 VAC/VDC	10 to 36 VDC
Max Current	2A / 4A	4A
LED Current Loading	N/A	10 V input Brown wire LED: 1.7 mA White and/or Black LED: 0.9 mA 36V input Brown wire LED: 7.3 mA White and/or Black LED: 4.7 mA
Protection Degree	IP67	IP67 / IP68 / IP69K
Material Nut	Nickel plated Zinc	Nickel plated Brass
Jacket Material	Polyurethane (PUR)	
Housing Material	Polyurethane (PUR)	
Contacts Material	Gold plated Brass	
Tightening Torque	0.6 Nm	0.6 to 1.5 Nm
Conductors Cross Section (AWG)	4 x 0.34 mm ² (4 x 22 AWG) 5 x 0.34 mm ² (5 x 22 AWG) 8 x 0.25 mm ² (8 x 24 AWG)	4 x 0.34 mm ² (4 x 22 AWG)
Ø Outer Cable	4/5 pole: 5.9 mm 8 pole: 7mm	5mm
Temperature Range	-25° to +80°C (-13° to 176°F)	-25° to +90°C (-13° to 194°F)
Function Display Power LED	N/A	Green
Switching Status LED	N/A	2 x Yellow
Drag Chain (Roller Cable Tray) Suitability	Bending Radius	min. 10 x cable diameter
	Bending Cycles	N/A
	Travel Speed	Max. 3.3 m/s for a horizontal travel length of 5 meters and max. accelera- tion of 5 m/s ²
	Torsional Strain	±180°/m
Agency Approvals	RoHS	UL File E191684, RoHS

UL Reference	
Part Number	Mini-Series Female Cord Connectors Series M12, UL Catalog Number
EVC178	ADOAH043MSS0002H04
EVC179	ADOAH043MSS0005H04
EVC180	ADOAH043MSS0010H04
Note: Shown in UL file under Mini-series Female Cord Connectors using catalog number	

Sensor Cables and Connectors

Dimensions

mm [inches]

Figure 1

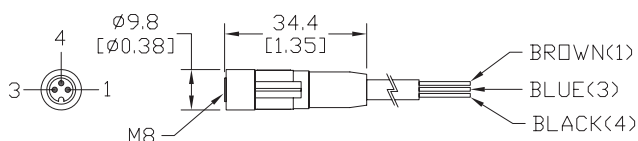


Figure 2

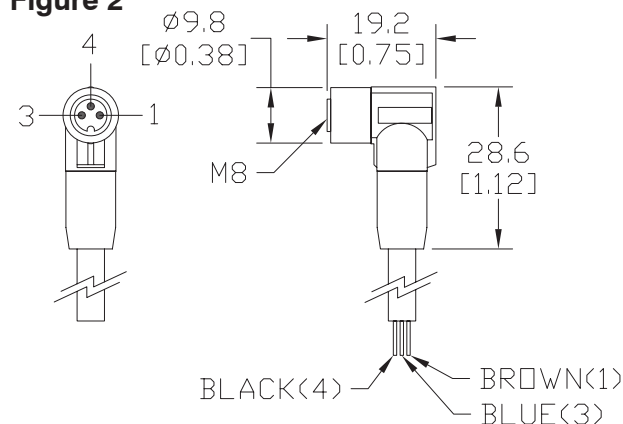


Figure 3

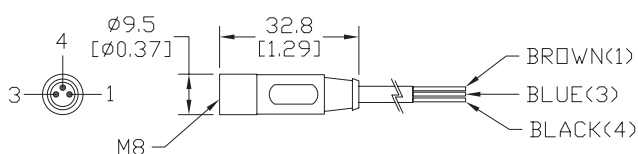


Figure 4

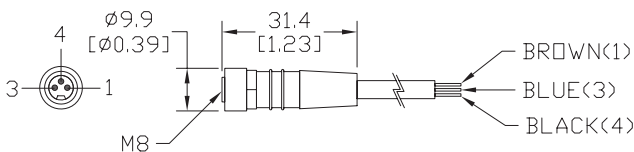


Figure 5

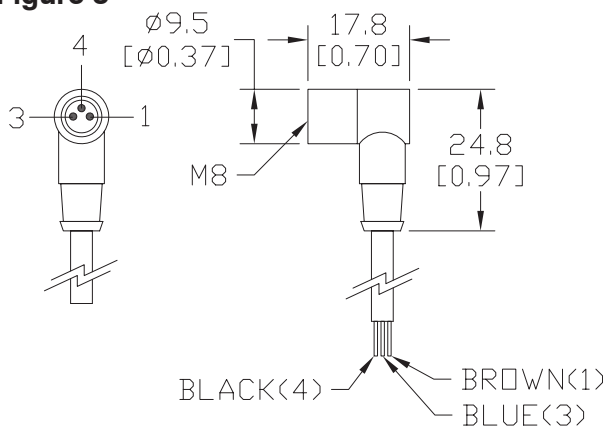


Figure 6

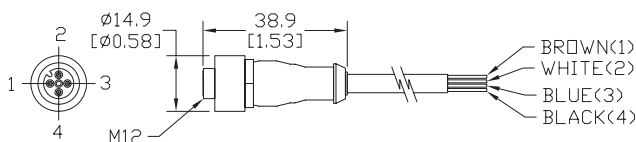


Figure 7

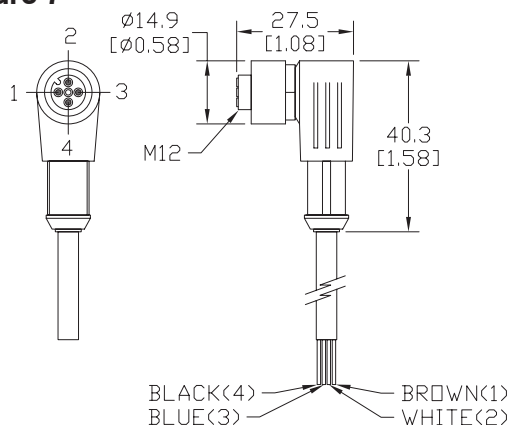
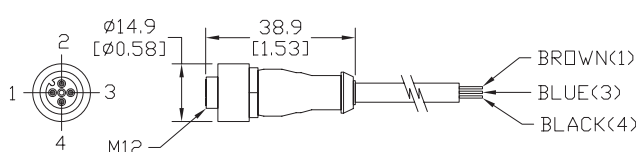


Figure 8



Sensor Cables and Connectors

Dimensions

mm [inches]

Figure 9

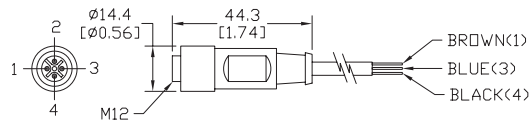


Figure 10

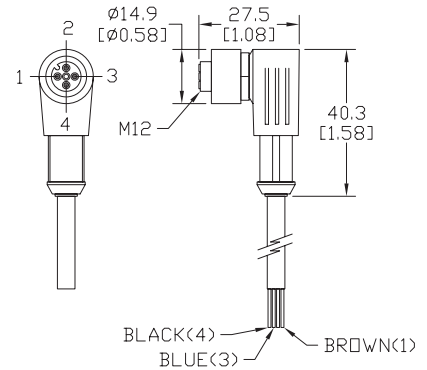


Figure 11

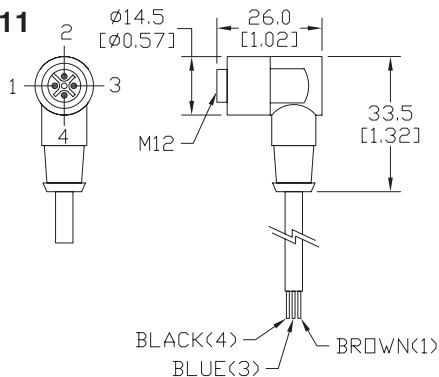


Figure 12

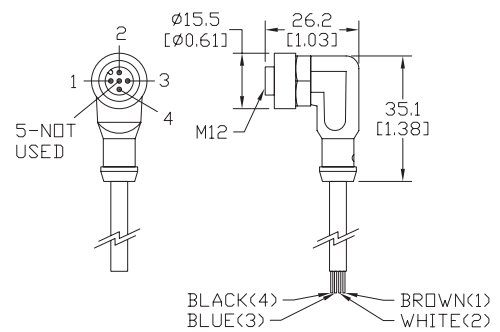


Figure 13

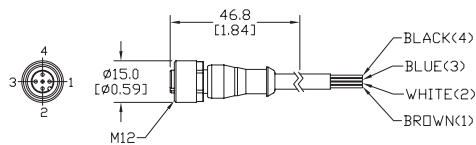


Figure 15

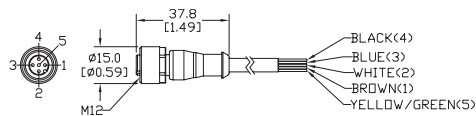


Figure 14

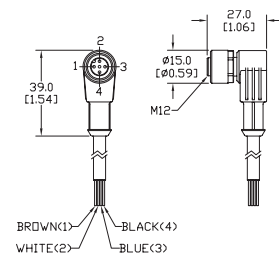
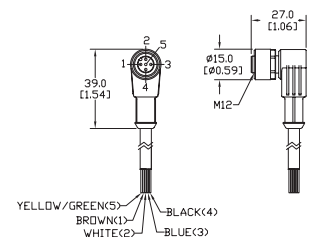


Figure 16



Sensor Cables and Connectors

Dimensions

mm [inches]

Figure 17

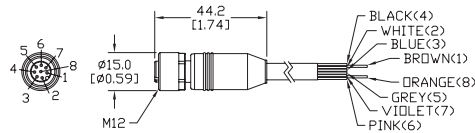


Figure 19

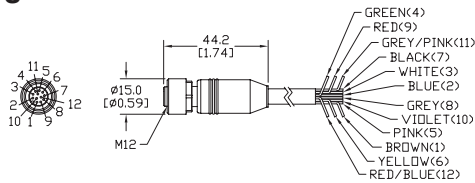


Figure 21

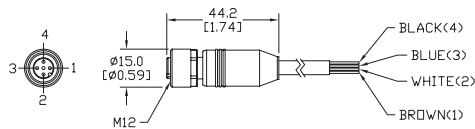


Figure 23

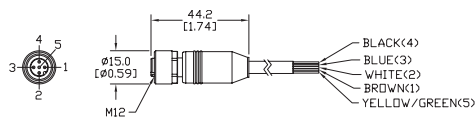


Figure 25

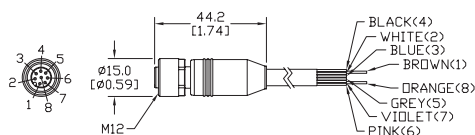


Figure 18

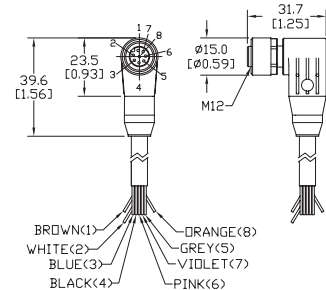


Figure 20

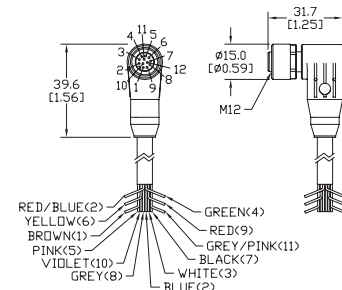


Figure 22

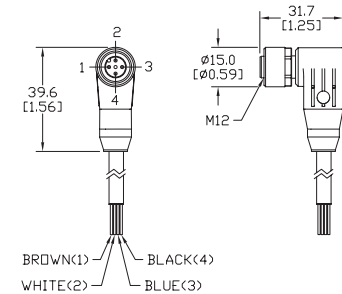


Figure 24

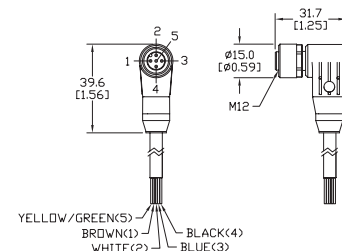
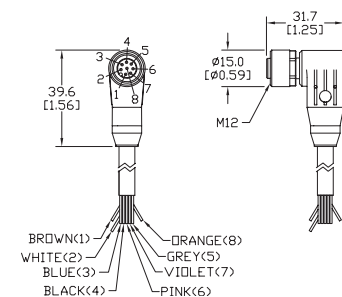


Figure 26



Sensor Cables and Connectors

Patch cables with quick-disconnect plugs on each end



Available patch cables include:

- Industry standard M8 and M12 screw-lock connectors
- One male and one female connector
- Axial and right-angle connector models

- 1m and 3m cable lengths
- PVC (polyvinyl chloride) jacket for typical industrial applications
- IP67 rated

M8 Patch Cables with Quick-Disconnect on Each End (Pico, Nano)						
Part Number	Price	Length	Poles	Connectors	Jacket	Dimensions
M8 Quick-Disconnect Patch Cables						
CDP08-0A-010-AA	\$8.25	1m (3.28 ft)	3	2 Axial - One male and one female connector	PVC	Figure 1
CDP08-0A-010-BB	\$8.25	1m (3.28 ft)	3	2 Right-angle - One male and one female connector	PVC	Figure 3
CDP08-0A-030-AA	\$10.00	3m (9.84 ft)	3	2 Axial - One male and one female connector	PVC	Figure 2
CDP08-0A-030-BB	\$8.25	3m (9.84 ft)	3	2 Right-angle - One male and one female connector	PVC	Figure 3

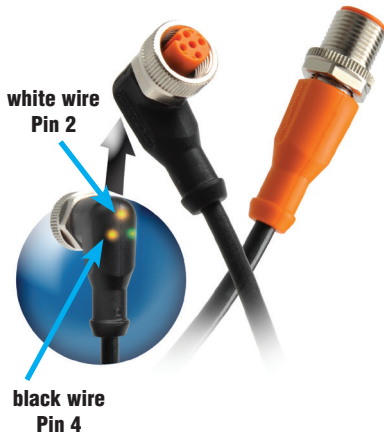
M12 Patch Cables with Quick-Disconnect on Each End (Euro, Micro DC-Single Key)						
Part Number	Price	Length	Poles	Connectors	Jacket	Dimensions
M12 Quick-Disconnect Patch Cables						
CDP12-0B-010-AA	\$8.25	1m (3.28 ft.)	4	2 Axial - One male and one female connector	PVC	Figure 4
CDP12-0B-010-BB	\$8.25	1m (3.28 ft.)	4	2 Right-angle - One male and one female connector	PVC	Figure 5
CDP12-0B-030-AA	\$8.25	3m (9.84 ft.)	4	2 Axial - One male and one female connector	PVC	Figure 4
CDP12-0B-030-BB	\$10.00	3m (9.84 ft.)	4	2 Right-angle - One male and one female connector	PVC	Figure 5
7000-40041-2150100	\$12.00	1m (3.28 ft.)	5	2 Axial - One male and one female connector	PVC	Figure 7
7000-40041-2150300	\$15.00	3m (9.84 ft.)	5	2 Axial - One male and one female connector	PVC	Figure 7

Patch Cables with LED

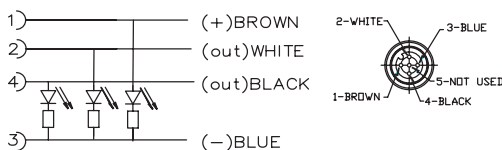
Available patch cables with LED include:

- Right-angle M12 female plug with LED indication on one end and axial male plug on the other end
- 0.3m, 0.6m, 1m, 2m, 5m, and 10m cable lengths

- PUR (polyurethane) jacket for oily and direct sunlight applications
- IP67 / IP68 / IP69K, II rated
- LED indication for 10 -36 VDC PNP sensors only



LED Models' Wiring



M12 Patch Cables with LED Indicator (Euro, Micro DC-Single Key)							
Part Number	Price	Length	Poles	Connectors	LED	Jacket	Dimensions
M12 Patch Cables							
EVC322*	\$11.00	0.3m (0.98 ft)	4	Right-angle female, axial male	Yes	PUR	Figure 6
EVC323*	\$12.00	0.6m (1.97 ft)	4	Right-angle female, axial male	Yes	PUR	Figure 6
EVC324*	\$12.50	1m (3.28 ft)	4	Right-angle female, axial male	Yes	PUR	Figure 6
EVC325*	\$14.50	2m (6.5 ft)	4	Right-angle female, axial male	Yes	PUR	Figure 6
EVC326*	\$17.00	5m (16.4 ft)	4	Right-angle female, axial male	Yes	PUR	Figure 6
EVC327*	\$21.50	10m (32.8 ft)	4	Right-angle female, axial male	Yes	PUR	Figure 6

***Note: LED for 10 to 36 VDC PNP devices only.**
Do not use with NPN or analog output devices.
Do not use when white wire (Pin 2) is used for selection of a sensor function.
Do not use when emitter has check function.

Sensor Cables and Connectors

Cable Specifications			
Specification	M8	M12	M12 with LED
Length	1m (3.28 ft.) / 3m (9.84 ft.)		0.3m (0.98 ft.) / 0.6m (1.97 ft.) / 1m (3.28 ft.) 2m (6.5 ft.) / 5m (16.4 ft.) / 10m (32.8 ft.)
Nominal Voltage	60 VAC/VDC	125 VAC/VDC 250 VAC/VDC	10 to 36 VDC
Max Current	4A		4A
LED Current Consumption	N/A		10V input Brown wire LED: 1.7 mA White and/or Black LED: 0.9 mA 36V input Brown wire LED: 7.3 mA White and/or Black LED: 4.7 mA
Protection Degree	IEC IP67		IEC IP67/IP68/IP69K
Material Nut	Nickel plated brass	Zinc pressure die casting surface (Ni4-6), Nickel plated brass	Nickel plated brass
Jacket Material	PolyVinyl Chloride (PVC)		Polyurethane (PUR)
Housing Material	Polyurethane (PUR)		Connector: Orange PUR, Socket: Black PUR
Contacts Material	Copper-tin(CuSn) plated brass		Gold plated brass
Conductors Cross Section (AWG)	0.34 mm ²		0.34 mm ² (22 AWG)
Tightening Torque	0.5 Nm	0.6 Nm, 0.5 Nm	Plug: 0.6 to 1.5 Nm (take into account the maximum value of the counterpart) Socket: 0.6 to 1.5 Nm
Ø Outer Cable	5mm	5.2 mm, 5mm	5mm
Temperature Range	-25° to +70°C (-13° to 158°F)		-25° to +90°C (-13° to 194°F)
Function Display LED	N/A		Green
Switching Status LED	N/A		2 x Yellow
Drag Chain (Roller Cable Tray) Suitability	Bending Radius	min. 10 x cable diameter	
	Bending Cycles	>5 million	
	Travel Speed	N/A	Max. 3.3 m/s for a horizontal travel length of 5 m and max. acceleration of 5 m/s ²
	Torsional Strain	N/A	±180°/m
Agency Approvals	RoHS		UL File E191684, RoHS

UL Reference	
Part Number	Cable Assemblies Series M12, UL Catalog Number
EVC322	VDOAH043MSS00.3H04STGH040MSS
EVC323	VDOAH043MSS00.6H04STGH040MSS
EVC324	VDOAH043MSS0001H04STGH040MSS
EVC325	VDOAH043MSS0002H04STGH040MSS
EVC326	VDOAH043MSS0005H04STGH040MSS
EVC327	VDOAH043MSS0010H04STGH040MSS
Note: Shown in UL file under Cable Assemblies using catalog number	

Sensor Cables and Connectors

Dimensions mm [inches]

Figure 1

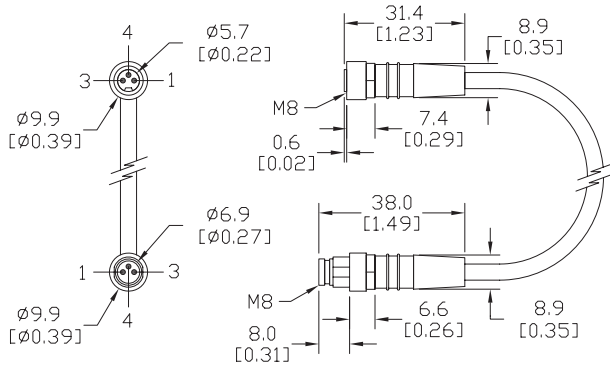


Figure 2

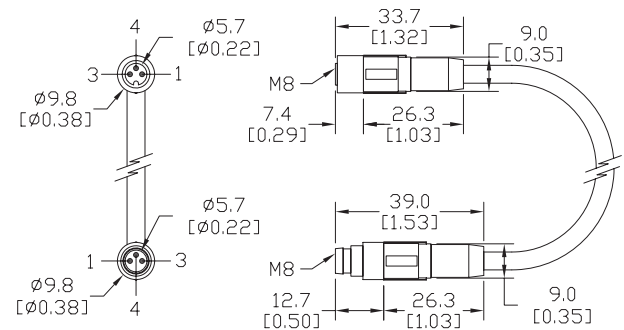


Figure 3

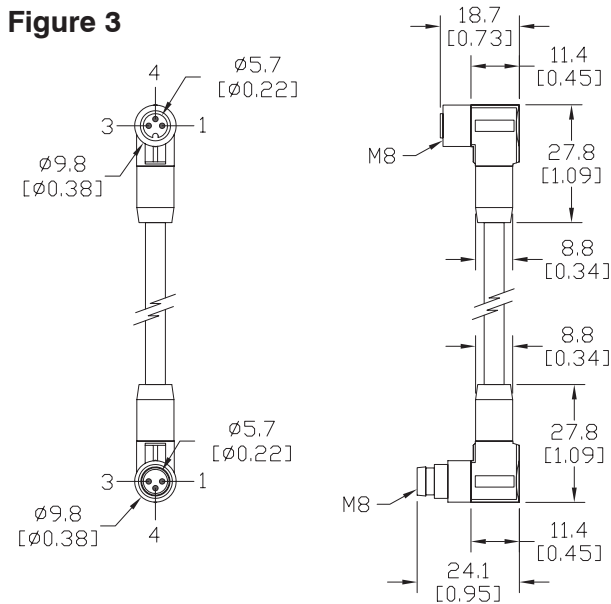


Figure 4

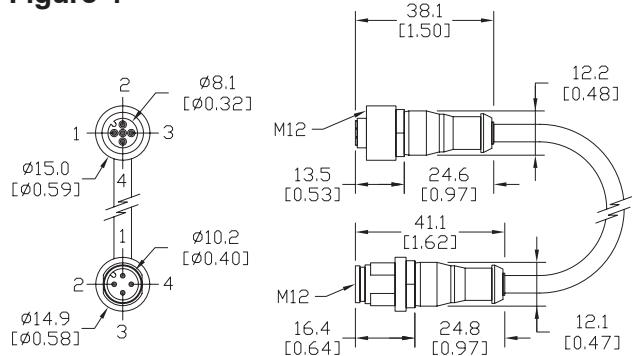


Figure 6

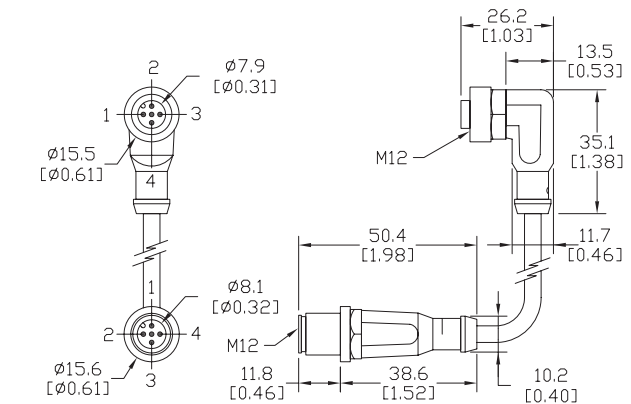


Figure 5

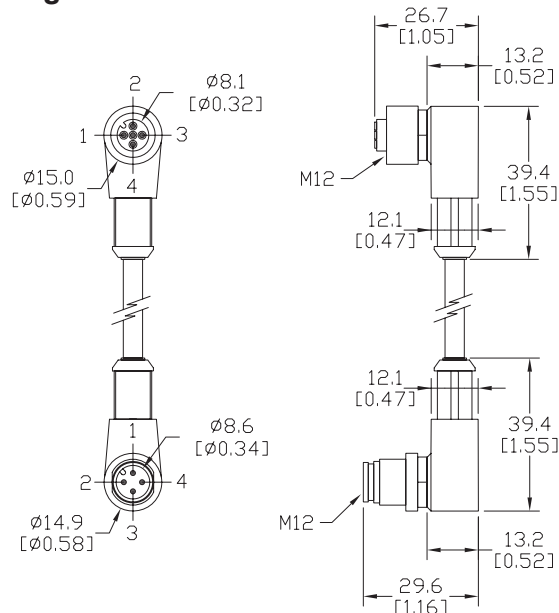
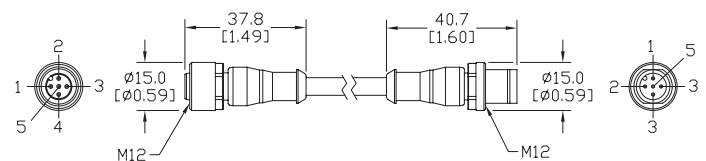


Figure 7



Sensor Cables and Connectors

Cables with quick-disconnect plugs for Sensor Models



Do not use extension cables with the cables listed below. The physical pin configurations do not match.

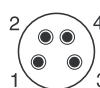
Available cables include:

- Industry standard M8 screw-lock connectors
- Axial and right-angle connector models
- 2m, 5m and 10m cable lengths
- PVC (polyvinyl chloride) jacket for typical industrial applications
- IP68 rated

M8 Cables with Quick-Disconnect						
Part Number	Price	Length	Poles	Connectors	Jacket	Dimensions
M8 Quick-Disconnects						
CD08-0G-020-A1	\$8.75	2m (6.56 ft.)	4	Axial female	PVC	Figure 1
CD08-0W-020-C1	\$8.75	2m (6.56 ft.)	4	Right-angle female	PVC	Figure 2
CD08-0G-050-A1	\$10.50	5m (16.4 ft.)	4	Axial female	PVC	Figure 1
CD08-0W-050-C1	\$10.50	5m (16.4 ft.)	4	Right-angle female	PVC	Figure 2
CD08-0G-100-A1	\$13.25	10m (32.8 ft.)	4	Axial female	PVC	Figure 1
CD08-0W-100-C1	\$13.25	10m (32.8 ft.)	4	Right-angle female	PVC	Figure 2

Use these cables if the sensor pin configuration looks like the connector pin-out below.

M8 Connector



Dimensions (mm)

Cable Specifications	M8
Length	2m (6.56 ft.) 5m (16.4 ft.) 10m (32.8 ft.)
Nominal Voltage	30VAC/30VDC
Nominal Current	4A
Protection Degree	IEC IP67
Contact Body Material	ABS
Housing Material	PUR
Contacts Material	CuSn
Conductors Section	0.25 mm ²
Ø Outer Cable	4.5 mm
Temperature Range	-5° to +70°C (23° to 158°F)

Figure 1

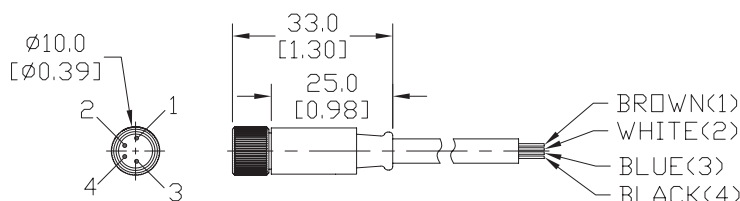
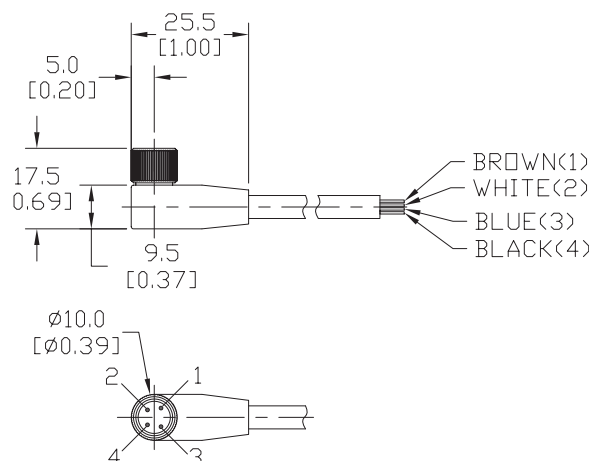


Figure 2



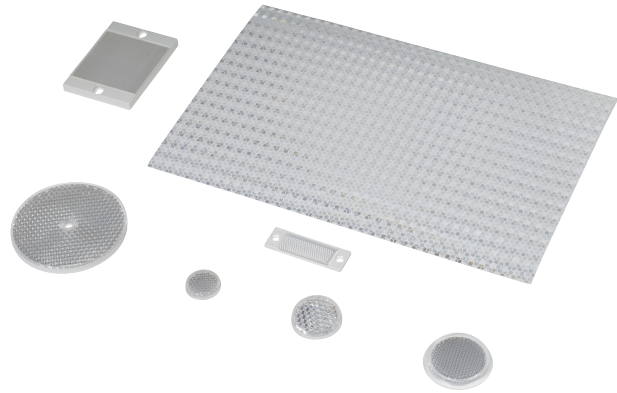
Reflectors

RL series reflectors for polarized reflective photoelectric sensors (all models)

- Suitable for use with polarized light photoelectric sensors
- Shapes and sizes for most applications
- Miniature types for close mounting in multiple sensor installations
- Single hole, dual hole and self-adhesive mounting types available
- Single and 10-packs available

Installation notes

- Keep the reflector surface clean to ensure peak detection performance. This is especially true when the maximum sensing range is being used. Clean using a damp cloth.
- When selecting a reflector, it is important to consider the ambient conditions it will be exposed to. Dusty or high humidity conditions may reduce the sensing range as much as 90%.
- Reflectors should be positioned at a 90° angle to the optical axis with a tolerance of $\pm 15^\circ$.



Specifications

Model	Price	Quantity	Dimensions	Degree of Protection	Mounting	Materials
RL102	\$35.00	10 per pack	Ø25mm [0.98 in]	IEC IP67	Customer-supplied adhesive or other mounting method required	
RL102-1	\$3.75	1 per pack				
RL103	\$40.00	10 per pack	Ø34.5mm [1.36 in]			
RL103-1	\$4.25	1 per pack				
RL104	\$40.00	10 per pack	Ø46mm [Ø1.81 in]			
RL104-1	\$4.25	1 per pack				
RL105	\$35.00	10 per pack	90 x 40mm [3.54 x 1.58 in]		two Ø4.3 mm holes	Reflective face: PMMA Polymethylmethacrylate (acrylic); base material: ABS (Acrylonitrile-butadiene-styren)
RL105-1	\$3.75	1 per pack				
RL106G	\$40.00	10 per pack	182 x 42mm [7.17 x 1.65 in]		two Ø6 mm holes	
RL106G-1	\$4.25	1 per pack				
RL110	\$18.00	10 per pack	Ø84mm [3.31 in]		one Ø5 mm hole	
RL110-1	\$2.00	1 per pack				
RL116	\$18.00	10 per pack	41 x 60mm [3.54 x 2.36 in]		two M3 holes	
RL116-1	\$2.00	1 per pack				
RL100DA4	\$32.50	1 per pack	200 x 300mm [7.87 x 11.81 in]		Self-adhesive	Paper (Acrylic tape with micro prism)
RL100DC4	\$10.00	1 per pack	50 x 300mm [1.97 x 11.81 in]			
RL100DQ1	\$7.50	1 per pack	100 x 100mm [3.94 x 3.94 in]			
RL111G	\$52.00	10 per pack	22.5 x 47mm [0.89 x 21.85 in]		two M3 slots	Reflective face: PMMA Polymethylmethacrylate (acrylic); base material: ABS (Acrylonitrile-butadiene-styren)
RL111G-1	\$6.00	1 per pack				
RL112G	\$40.00	10 per pack	19 x 73mm [0.75 x 2.87 in]			
RL112G-1	\$4.25	1 per pack				
RL113G	\$46.00	10 per pack	51.4 x 60.3mm [2.02 x 2.37 in]		two M4 slots	
RL113G-1	\$5.00	1 per pack				

Not recommended for applications involving moist air environments or water immersion.

Reflectors

RL series reflectors for polarized reflective laser photoelectric sensors (FALN series)

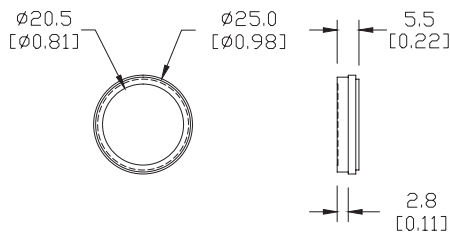
- Suitable for use with polarized light laser photoelectric sensors
- Sizes for most applications
- Miniature types for close mounting in multiple sensor installations
- Single and 5-packs available

Specifications						
Model	RL201	RL201-1	RL203	RL203-1	RL204	RL204-1
Price	\$27.00	\$7.00	\$27.00	\$6.50	\$27.00	\$5.75
Quantity (per package)	5	1	5	1	5	1
Dimensions	60mm x 82mm 2.36 in x 3.23 in		19mm x 60mm 0.75 in x 2.36 in		20mm x 32mm 0.80 in x 1.26 in	
Degree of Protection ¹	IEC IP67					
Mounting	two Ø 0.4 mm holes		two Ø 0.4 mm holes		two Ø 0.3 mm holes	
Materials	Acrylic/polycarbonate					
1 Not recommended for applications involving moist air environments or water immersion.						

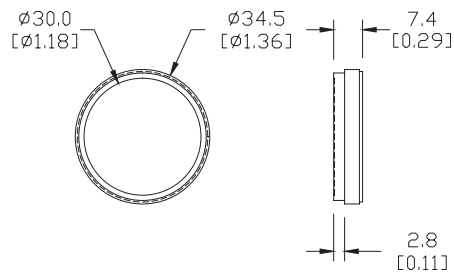
Dimensions

mm [inches]

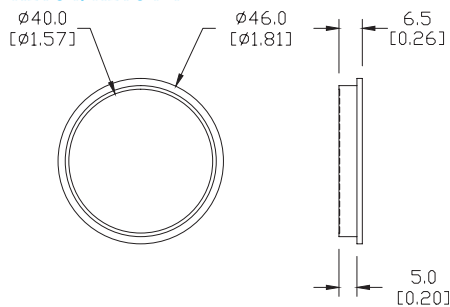
RL102/RL102-1



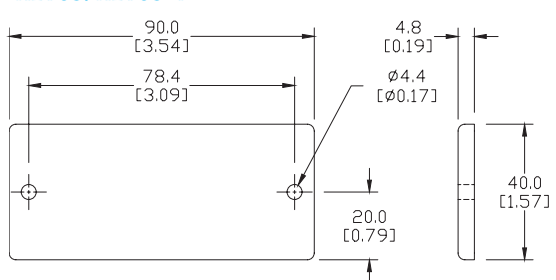
RL103/RL103-1



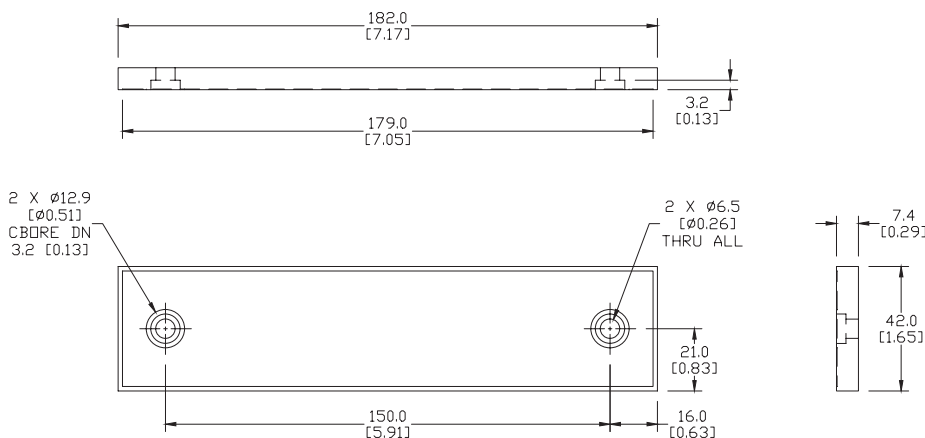
RL104/RL104-1



RL105/RL105-1



RL106G/RL106G-1



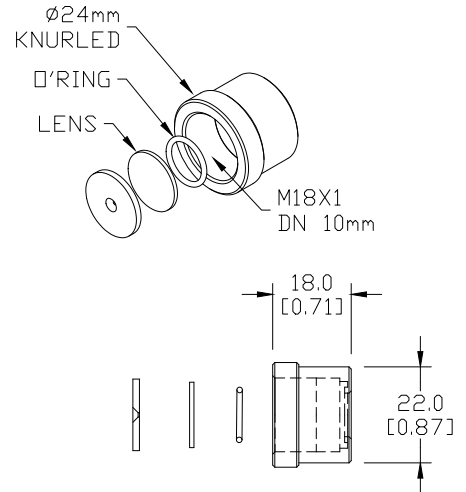
Shutters and Adapters

ST0S1 through ST0S8 shutters for M18 (18mm) through-beam sensors (SSE / SSR)

- Reduces the emitted beam, allowing the detection of small targets
- Shutter consists of an aluminum cap and aperture with an o-ring and glass lens, which can screw onto the optical head of either the emitter or receiver

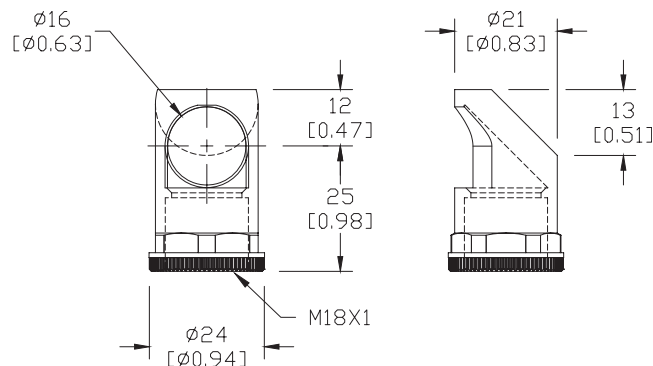
Sensing Distance (when used with SSE / SSR Model photoelectric switches)					
Model	ST0S1	ST0S2	ST0S4	ST0S6	ST0S8
Price	\$13.50	\$13.50	\$13.50	\$13.50	\$9.50
Ø x shutter (mm)	1	2	4	6	8
Distance (m)	N/A	N/A	1.5	3.5	6.5
object (mm)	N/A	N/A	2	3	4

Table shows sensing distance and minimal detectable object.



ST03 right-angle M18 (18mm) beam adapter

Beam Adapters		
Part Number	Price	Description
ST03	\$13.50	For use with M18 retroreflective and through-beam photoelectric switches (not for use with diffuse reflection sensors). Allows 90° light detection using an internal mirror set at 45° to the optical axis. Sensitivity loss is about 20-30%.



Accessories: Mounting Brackets

ST12A axial bracket

For mounting M12 (12mm) sensors. Has two mounting holes (use 3mm screws) and allows the rotation of an optical axis for right-beam angle adapter sensors.



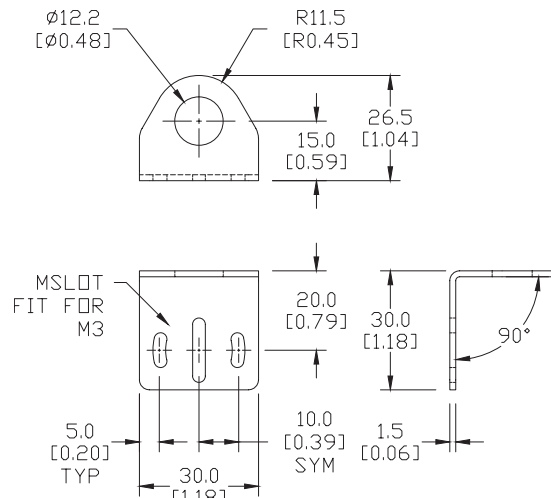
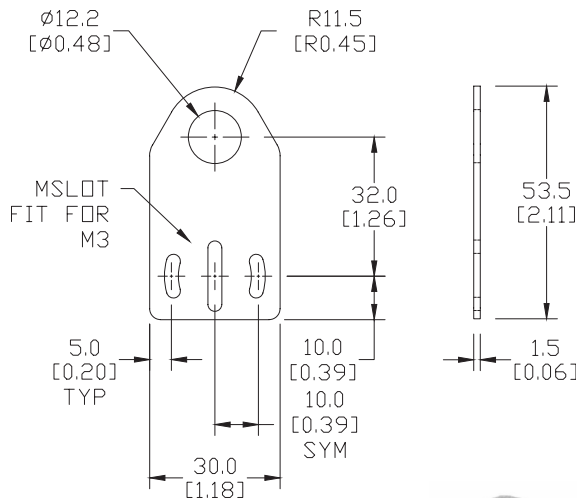
ST12C right-angle bracket

Angular mounting bracket for use with M12 (12mm) sensors. Has two mounting holes (use 3mm screws) and allows the rotation of an optical axis for axial sensors.



Brackets		
Part Number	Price	Description
ST12A	\$2.00	Metal axial bracket for 12mm sensors, 1/pk
ST12A7W	\$6.00	316L stainless steel axial bracket for 12mm sensors, 1/pk

Brackets		
Part Number	Price	Description
ST12C	\$2.00	Metal right angle bracket for 12mm sensors, 1/pk
ST12C7W	\$6.00	316L stainless steel right angle bracket for 12mm sensors, 1/pk



ST18A axial bracket

Mounting bracket for M18 (18mm) sensors. Has two mounting holes (use 4mm screws) and allows the rotation of an optical axis for right-beam angle adapter sensors.



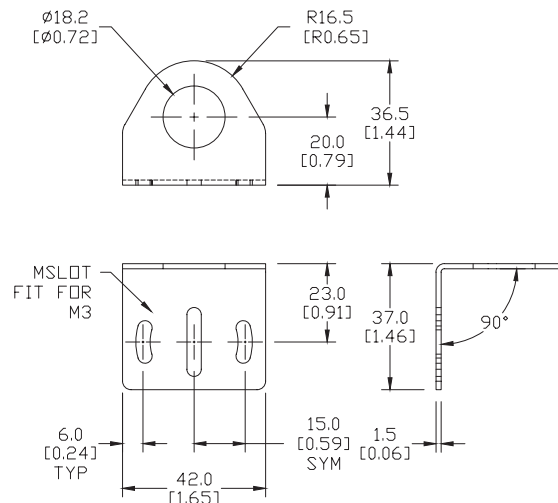
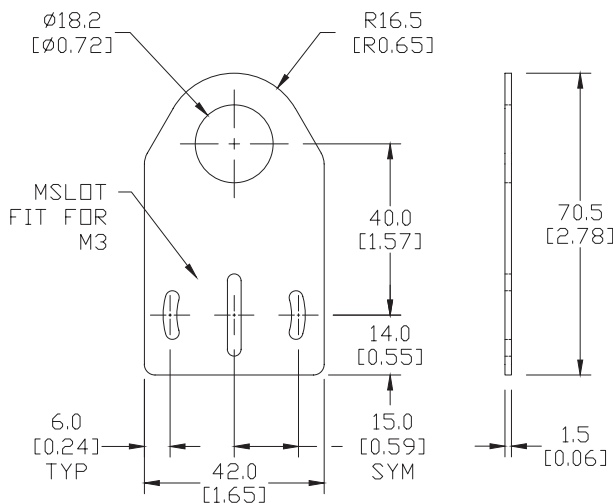
ST18C right-angle bracket

Angular mounting bracket for M18 (18mm) sensors. Has two mounting holes (use 4mm screws) and allows the rotation of an optical axis for axial sensors.



Brackets		
Part Number	Price	Description
ST18A	\$1.25	Metal axial bracket for 18mm sensors, 1/pk
ST18A7W	\$6.00	316L stainless steel axial bracket for 18mm sensors, 1/pk

Brackets		
Part Number	Price	Description
ST18C	\$1.25	Metal right angle bracket for 18mm sensors, 1/pk
ST18C7W	\$6.00	316L stainless steel right angle bracket for 18mm sensors, 1/pk



Accessories: Mounting Brackets

ST02 plastic swivel bracket M18 (18mm)



Brackets		
Part Number	Price	Description
ST02	\$8.25	Plastic mounting bracket for use with M18 photoelectric switches. Has a ball-joint and set screws to adjust sensor orientation. Allows orientation in all directions for retroreflective and through-beam sensors. (Will not work with C18 series).

Dimensions

inches [mm]

