

SS Series Photoelectric Sensors



M18 (18mm) plastic- DC

- 22 models available
- Diffuse, polarized reflective, and through-beam models
- Plastic housing
- Axial cable or M12 quick-disconnect models
- N.O./N.C. selectable output
- IP67 rated



SS Series Photoelectric Sensor Selection Chart									
Part Number	Price	Sensing Range	Output State*	Logic	Connection	Wiring	Dimensions	Characteristic Curves	
Diffuse									
SS2-0N-4A		100mm (3.9 in.)	N.O./N.C. selectable	NPN	2m (6.5') axial cable	Diagram 1	Figure 1	Chart Set 1	
SS2-0P-4A				PNP	2m (6.5') axial cable	Diagram 2	Figure 1	Chart Set 1	
SS2-0N-4E				NPN	M12 (12mm) connector	Diagram 1	Figure 2	Chart Set 1	
SS2-0P-4E				PNP	M12 (12mm) connector	Diagram 2	Figure 2	Chart Set 1	
SS5-0N-4A		200mm (7.9 in.)	N.O./N.C. selectable	NPN	2m (6.5') axial cable	Diagram 1	Figure 1	Chart Set 2	
SS5-0P-4A				PNP	2m (6.5') axial cable	Diagram 2	Figure 1	Chart Set 2	
SS5-0N-4E				NPN	M12 (12mm) connector	Diagram 1	Figure 2	Chart Set 2	
SS5-0P-4E				PNP	M12 (12mm) connector	Diagram 2	Figure 2	Chart Set 2	
SS6-0N-4A		400mm (15.7 in.)	N.O./N.C. selectable	NPN	2m (6.5') axial cable	Diagram 1	Figure 1	Chart Set 3	
SS6-0P-4A				PNP	2m (6.5') axial cable	Diagram 2	Figure 1	Chart Set 3	
SS6-0N-4E				NPN	M12 (12mm) connector	Diagram 1	Figure 2	Chart Set 3	
SS6-0P-4E				PNP	M12 (12mm) connector	Diagram 2	Figure 2	Chart Set 3	
Polarized Retro-reflective*									
SSP-0N-4A		3m (9.84 ft)	N.O./N.C. selectable	NPN	2m (6.5') axial cable	Diagram 1	Figure 1	Chart Set 4	
SSP-0P-4A				PNP	2m (6.5') axial cable	Diagram 2	Figure 1	Chart Set 4	
SSP-0N-4E				NPN	M12 (12mm) connector	Diagram 1	Figure 2	Chart Set 4	
SSP-0P-4E				PNP	M12 (12mm) connector	Diagram 2	Figure 2	Chart Set 4	
Through-beam**									
SSR-0N-4A	Receiver	8m (26.2 ft)	N.O./N.C. selectable	NPN	2m (6.5') axial cable	Diagram 1	Figure 1	Chart Set 5	
SSR-0P-4A	Receiver			PNP	2m (6.5') axial cable	Diagram 2	Figure 1	Chart Set 5	
SSR-0N-4E	Receiver			NPN	M12 (12mm) connector	Diagram 1	Figure 2	Chart Set 5	
SSR-0P-4E	Receiver			PNP	M12 (12mm) connector	Diagram 2	Figure 2	Chart Set 5	
SSE-00-4A	Emitter		Receiver dependent	Receiver dependent		2m (6.5') axial cable	Diagram 3	Figure 1	Chart Set 5
SSE-00-4E	Emitter					M12 (12mm) connector	Diagram 3	Figure 2	Chart Set 5

*Purchase reflectors separately.

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

Wiring Diagrams

Diagram 1

NPN Output

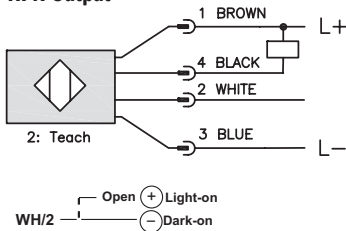


Diagram 2

PNP Output

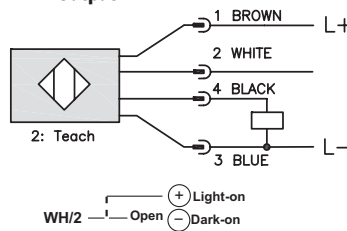
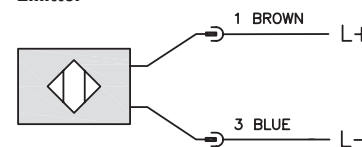
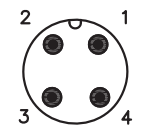


Diagram 3

Emitter



Connector
M12 connector



Switching Element Function

	Through-Beam and Reflective Models	Diffuse Models
Light-on	N.C.	N.O.
Dark-on	N.O.	N.C.

SS Series Photoelectric Sensors

SS Series Photoelectric Sensors Specifications					
Specifications	Diffuse Models			Reflective Models	Through-Beam Models
Type	Diffuse reflection			Polarized reflection ⁴	Through-beam ⁵
Sensing Distance	100mm ¹	200mm ¹	400mm ²	2m ³	8M
Light Spot Diameter	50mm @ 100mm	90mm @ 200mm	240mm @ 400mm	80mm @ 3m	900mm @ 10m
Emission	Infrared (880nm)			Red (660nm)	Infrared (880nm)
Sensitivity	Fixed				
Output Type	NPN or PNP/N.O./N.C. selectable				
Operating Voltage	10-30VDC				
Ripple	≤ 10%				
No-load Supply Current	30mA			15mA (SSE), 20mA (SSR)	
Operating (Load) Current	≤ 100mA				
Off-state (Leakage) Current	≤ 10μA				
Voltage Drop	≤ 1.2volt maximum at 100mA				
Switching Frequency	250Hz			25Hz	
Ripple	N/A				
Time Delay Before Availability (tv)	200ms				
Short-Circuit Protection	Yes (switch autoresets after overload is removed)				
Operating Temperature	-25 to + 70° C (-13 to 158° F)				
Protection Degree (DIN 40050)	IEC IP67				
LED Indicators Switching Status	Yellow (output energized)			Red (output energized)	
Housing Material	Polybutylene Terephthalate (PBT) plastic housing, polycarbonate (PC) cable exit				
Lens Material	Polymethyl metacrylate (PMMA)				
Shock/Vibration	See terminology section				
Tightening Torque	1 Nm (0.74 lb-ft)				
Weight	100g (3.53 oz)			200g (7.05oz)	
Connectors	2m (6.5') axial cable; M12 (12mm) connector				
Agency Approvals	CE				

¹ With 100x100mm white matte paper

² With 200x200mm white matte paper

³ With standard Ø84mm RL110 reflector

⁴ Purchase reflectors separately.

⁵ An emitter (SSE) and receiver (SSR) pair must be ordered for a complete sensor set.

Dimensions

in/mm

Figure 1

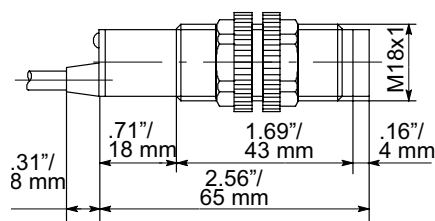
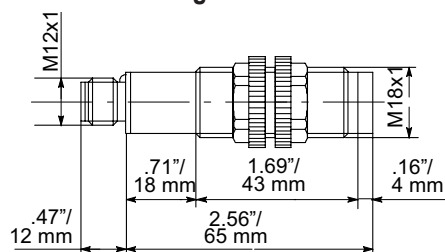


Figure 2



SS Series Photoelectric Sensors

Characteristic curves

Chart Set 1 (Diffuse SS2)

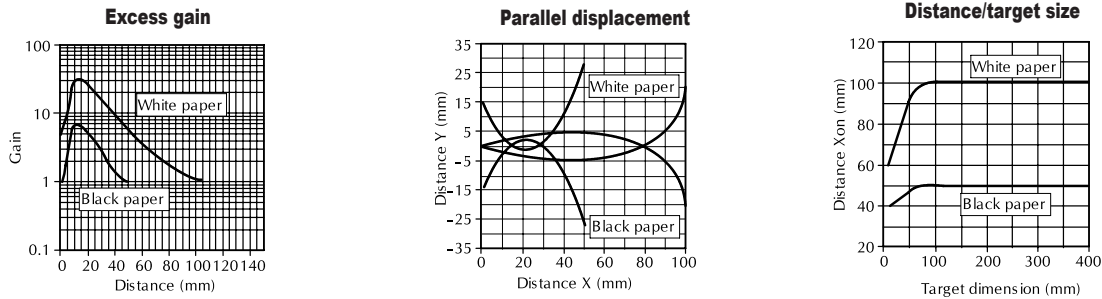


Chart Set 2 (Diffuse SS5)

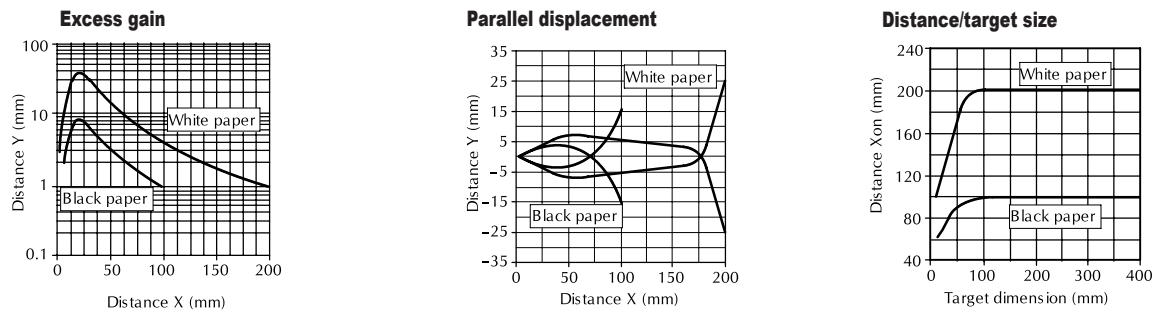


Chart Set 3 (Diffuse SS6)

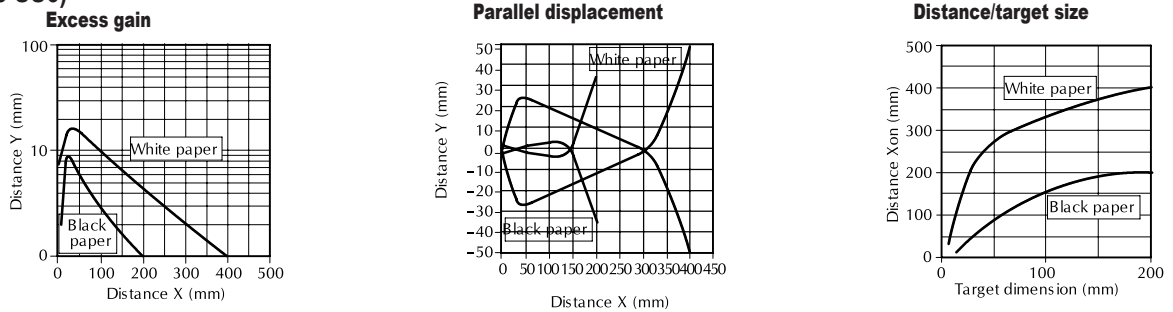


Chart Set 4 (Polarized Reflective)

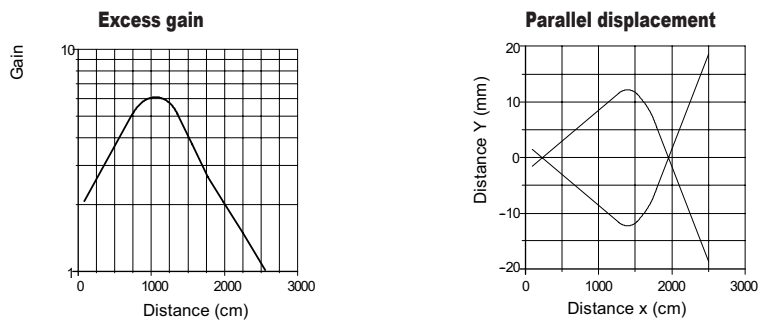
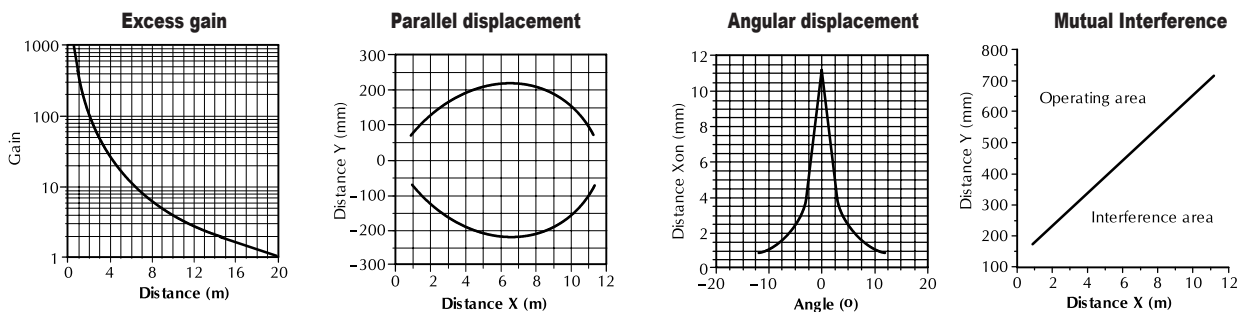


Chart Set 5 (Through-Beam)



Accessories for 18mm Sensors

Axial Mounting Bracket

Axial mounting bracket available in zinc plated steel or 316L stainless steel. Has two mounting holes (use 4mm screws) and allows for rotation of an optical axis for right-beam-angle-adaptor sensors. Hexagonal nuts not included. For use with 18mm sensors.

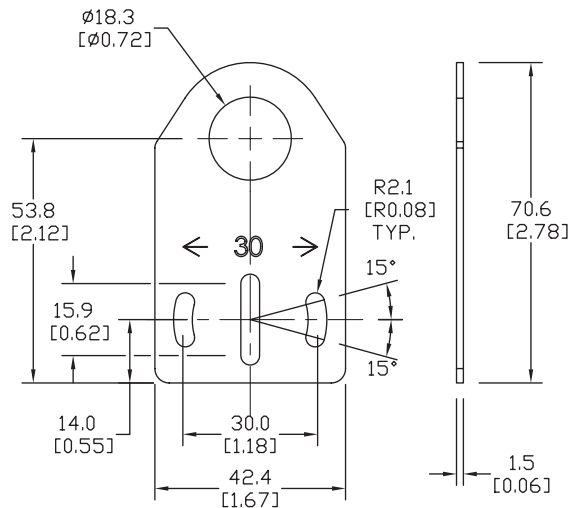


ST18A

Accessories for 18mm Sensors			
Part Number	Price	Description	Weight lb (g)
ST18A		Mounting bracket, axial, zinc plated steel. For use with 18mm sensors.	0.06 (27.2)
ST18A7W		Mounting bracket, axial, 316L stainless steel. For use with 18mm sensors.	0.06 (27.2)

Dimensions

mm [inches]



Right-angle Mounting Bracket

Right-angle mounting bracket for use with 18mm sensors. Has two mounting holes (use 4mm screws) and allows the rotation of an optical axis for axial sensors. Hexagonal nuts not included.

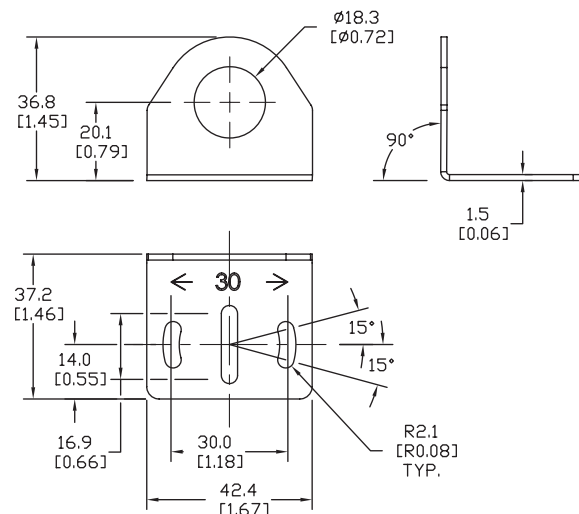


ST18C

Accessories for 18mm Sensors			
Part Number	Price	Description	Weight lb (g)
ST18C		Mounting bracket, right-angle, zinc plated steel. For use with 18mm sensors.	0.06 (27.2)
ST18C7W		Mounting bracket, right-angle, 316L stainless steel. For use with 18mm sensors.	0.06 (27.2)

Dimensions

mm [inches]

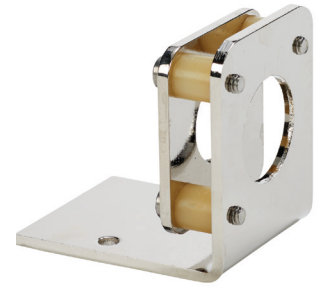


Accessories for 18mm Sensors

Right-angle Fine Tune Mounting Bracket

Mounting bracket, right-angle, fine tune vertical and horizontal adjustment, nickel-plated steel. For use with 18mm sensors. Allows for fine tuning vertical and horizontal placement.

Accessories for 18mm Sensors				
Part Number	Price	Description	Drawing Link	Weight [lb]
OPT2036		Wenglor mounting bracket, right-angle, fine tune vertical and horizontal adjustment, nickel plated steel. For use with 18mm sensors.	PDF	0.02

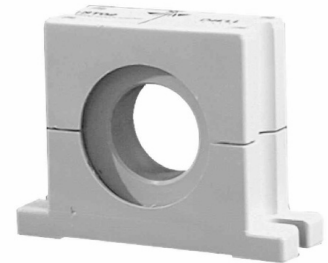


OPT2036

Swivel Mounting Bracket

Mounting bracket, ball swivel, plastic. For use with 18mm sensors. Has a ball-joint and set screws to adjust sensor orientation. Allows angular orientation up to 15 degrees (from center) in all directions for photoelectric sensors (Will not work with C18 series).

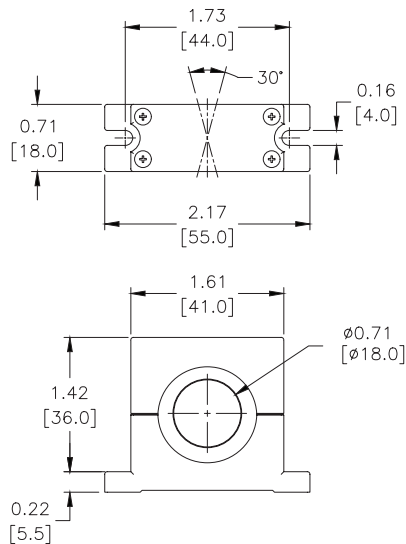
Accessories for 18mm Sensors			
Part Number	Price	Description	Weight [lb]
ST02		Mounting bracket, ball swivel, plastic. For use with 18mm sensors.	0.06



ST02

Dimensions

mm [inches]



Accessories for 18mm Sensors

Right-angle Mounting Brackets

Mounting bracket, right-angle, fixed insertion stop adjustment, plastic. For use with 18mm sensors. Available with or without fixed insertion stop.

Accessories for 18mm Sensors				
Part Number	Price	Description	Drawing Link	Weight lb (g)
OPT2104		Wenglor mounting bracket, right-angle, fixed insertion stop adjustment, plastic. For use with 18mm sensors.	PDF	0.06 (27.2)
OPT2105		Wenglor mounting bracket, right-angle, plastic. For use with 18mm sensors.	PDF	0.06 (27.2)



OPT2104, OPT2105

Right-angle Swivel Mounting Systems

Mounting bracket, right-angle swivel, 360 degree vertical and horizontal adjustment, 12mm rod mount. For use with 18mm sensors. Available in all 304 stainless steel or with an aluminum head and a stainless steel mounting plate.

Accessories for 18mm Sensors						
Part Number	Price	Description	Mounting Head	Mounting Plate	Drawing Link	Weight lb (g)
OPT2116		Wenglor mounting bracket, right-angle swivel, 360 degree vertical and horizontal adjustment, aluminum, 12mm rod mount. For use with 18mm sensors.	Aluminum	304 Stainless steel	PDF	0.15 (68.0)
OPT2117		Wenglor mounting bracket, right-angle swivel, 360 degree vertical and horizontal adjustment, 304 stainless steel, 12mm rod mount. For use with 18mm sensors.	304 Stainless steel	304 Stainless steel	PDF	0.28 (127.0)



OPT2116, OPT2117

Note: 304 Stainless steel mounting rods sold separately: OPT2109 (200mm [7.87 in] length), OPT2110 (300mm [11.81 in] length), and OPT2111 (500mm [19.69 in] length).

Mounting Rods and Brackets

Mounting Rods

304 Stainless steel rods for mounting swivel brackets OPT2112 - OPT2127. Available in three lengths: 200mm, 300mm, and 500mm. 12mm diameter.

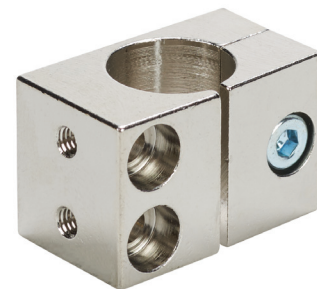
Mounting Rods for OPT2112-2127 Swivel Mounting Brackets				
Part Number	Price	Description	Drawing Link	Weight lb (g)
OPT2109		Wenglor mounting rod, 12mm diameter, 200mm length, 304 stainless steel.	PDF	0.41 (185.97)
OPT2110		Wenglor mounting rod, 12mm diameter, 300mm length, 304 stainless steel.	PDF	0.60 (272.16)
OPT2111		Wenglor mounting rod, 12mm diameter, 500mm length, 304 stainless steel.	PDF	0.98 (444.52)



Right-angle Mounting Bracket

Mounting bracket, right-angle, nickel-plated brass. For use with 12mm mounting rods OPT2109, OPT2110 & OPT2111.

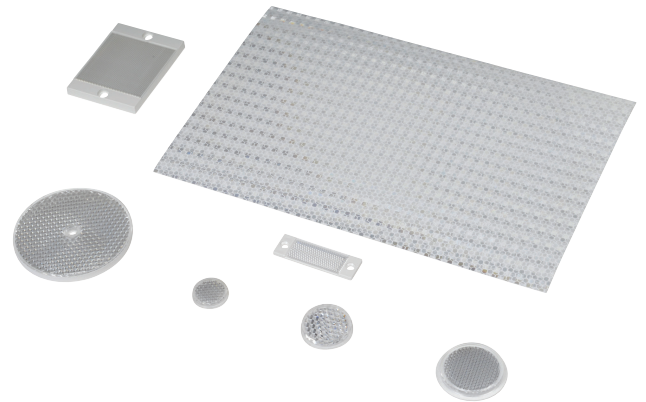
Right-angle Mounting Brackets for 12mm Sensors				
Part Number	Price	Description	Drawing Link	Weight lb (g)
OPT2108		Wenglor mounting bracket, right-angle, nickel plated brass. For use with 12mm mounting rods OPT2109, OPT2110 & OPT2111.	PDF	0.07 (31.8)



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 ±15°.

Reflector Specifications							
Part number	Price	Drawing Link	Quantity	Dimensions mm [in]	Degree of Protection	Mounting	Materials
RL102		PDF	10	25	IEC IP67	Customer-supplied adhesive or other mounting method required	Reflective face: PMMA Polymethylmethacrylate (acrylic) Base material: ABS (Acrylonitrile-butadiene-styren)
RL102-1			1	[0.98]			
RL103		PDF	10	34.5			
RL103-1			1	[1.36]			
RL104		PDF	10	46			
RL104-1			1	[1.81]			
RL105G		PDF	10	95 x 38		Two 4.3 mm holes	
RL105G-1			1	[3.74 x 1.50]			
RL106G		PDF	10	182 x 42		Two 6mm holes	
RL106G-1			1	[7.17 x 1.65]			
RL110		PDF	10	84		One 5mm hole	
RL110-1			1	[3.31]			
RL116		PDF	10	41 x 60		Two 3mm holes	
RL116-1			1	[3.54 x 2.36]			
RL100DA4		NA	1	200 x 300		Self-adhesive	
RL100DC4		NA	1	50 x 300			
RL100DQ1		NA	1	100 x 100			
RL111G		PDF	10	22.5 x 47	Two 3mm slots	Reflective face: PMMA Polymethylmethacrylate (acrylic) Base material: ABS (Acrylonitrile-butadiene-styren)	
RL111G-1			1	[0.89 x 1.85]			
RL112G		PDF	10	19 x 73			
RL112G-1			1	[0.75 x 2.87]			
RL113G		PDF	10	51.4 x 60.3			Two 4mm slots
RL113G-1			1	[2.02 x 2.37]			

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						
Part Number	RL201	RL201-1	RL203	RL203-1	RL204	RL204-1
Price						
Drawing Link	PDF		PDF		PDF	
Quantity	5	1	5	1	5	1
Dimensions	60 x 82 mm 2.36 x 3.23 in		19 x 6mm 0.75 x 2.36 in		20mm x 32mm 0.80 in x 1.26 in	
Degree of Protection ¹	IEC IP67					
Mounting	Two 0.4 mm holes		Two 0.4 mm holes		Two 0.3 mm holes	
Materials	Acrylic/polycarbonate					

¹ Not recommended for applications involving moist air environments or water immersion.

Shutters and Adapters

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	ST0S3	ST0S4	ST0S6	ST0S8
Price						
Ø x shutter (mm)	1	2	3	4	6	8
Distance (m) Object (mm)	N/A	N/A	N/A	1.5 2	3.5 3	6.5 4

Table shows sensing distance and minimal detectable object.

Shutter Accessory for QM Series Sensors				
Part Number	Price	Drawing Link	Description	Weight [lb]
STQMO		PDF	Micro Detectors shutter, plastic. Package of 2. For use with through beam QM series photoelectric sensors. Vertical and horizontal diaphragms (0.5, 1, 2mm) included.	0.1

Shutter (STQMO) Sensing Distances			
Shutter Size	0.5 mm	1mm	2mm
Maximum Sensing Distance	1.5 m	2 m	4.5 m
Minimum Detectable Object Diameter	0.8 mm	1.5 mm	2.5 mm

Note: With shutters on emitter and receiver in same vertical or horizontal orientation.

Right-angle M18 (18 mm) Beam Adapter

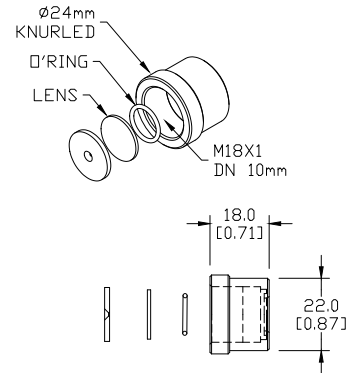
For use with M18 retroreflective and through-beam photoelectric switches (not for use with diffuse reflection sensors). Allows 90° light detection using an internal mirror set at 45° to the optical axis. Sensitivity loss is about 20-30%.

Beam Adapters			
Part Number	Price	Description	Weight [lb]
ST03		Right-angle beam adapter, for use with 18mm sensors (except diffuse reflection models), mirror allows 90 degree light detection.	0.06



ST0S1-ST0S8

Dimensions
mm [inches]



ST03

Dimensions
mm [inches]

