C18 Series Photoelectric Sensors

M18 (18mm) metal – DC

- Diffuse, Polarized reflective, Through-beam, and Diffuse with background suppression models
- Long operating distances
- Scratch resistant and easy-to-clean glass lens
- Adjustable sensitivity (diffuse models only)
- Axial cable or 12mm quick-disconnect models
- Complete overload protection
- IP67 rated

NEED CABLES?

C18 Series Photoelectric Sensor Selection Chart

Part Number	Price	Sensing Range	Output State	Optics	Logic	Connection	Wiring	Dimensions	Characteristic Curves
Diffuse									
C18D-0N-1A	$54.00	Up to 600mm [23.62 in]	1 N.O. and 1 N.C.	Axial	NPN	2m [6.5 ft] axial cable	Diagram 3	Figure 1	Chart 5
C18D-0P-1A	$54.00		1 N.O. and 1 N.C.	Axial	PNP	2m [6.5 ft] axial cable	Diagram 4	Figure 1	Chart 5
C18D-0N-1E	$54.00		1 N.O. and 1 N.C.	Axial	NPN	M12 [12mm] connector	Diagram 3	Figure 2	Chart 5
C18D-0P-1E	$54.00		1 N.O. and 1 N.C.	Axial	PNP	M12 [12mm] connector	Diagram 4	Figure 2	Chart 5
C18D-0N-2A	$68.00		1 N.O. and 1 N.C.	Right-angle	NPN	2m [6.5 ft] axial cable	Diagram 3	Figure 3	Chart 6
C18D-0P-2A	$68.00		1 N.O. and 1 N.C.	Right-angle	PNP	2m [6.5 ft] axial cable	Diagram 4	Figure 3	Chart 6
C18D-0N-2E	$68.00		1 N.O. and 1 N.C.	Right-angle	NPN	M12 [12mm] connector	Diagram 3	Figure 4	Chart 6
C18D-0P-2E	$68.00		1 N.O. and 1 N.C.	Right-angle	PNP	M12 [12mm] connector	Diagram 4	Figure 4	Chart 6
Diffuse with background suppression									
C18B-AN-1A	$88.00	10-120mm [0.39 to 4.72 in]	N.O.	Axial	NPN	2m [6.5 ft] axial cable	Diagram 1	Figure 1	Chart 1
C18B-AP-1A	$88.00			Axial	PNP	2m [6.5 ft] axial cable	Diagram 2	Figure 1	Chart 1
C18B-AN-1E	$88.00			Axial	NPN	M12 [12mm] connector	Diagram 1	Figure 2	Chart 1
C18B-AP-1E	$88.00			Axial	PNP	M12 [12mm] connector	Diagram 2	Figure 2	Chart 1
C18B-AN-2A	$137.00		N.O.	Right-angle	NPN	2m [6.5 ft] axial cable	Diagram 1	Figure 3	Chart 2
C18B-AP-2A	$137.00			Right-angle	PNP	2m [6.5 ft] axial cable	Diagram 2	Figure 3	Chart 2
C18B-AN-2E	$137.00			Right-angle	NPN	M12 [12mm] connector	Diagram 1	Figure 4	Chart 2
C18B-AP-2E	$137.00			Right-angle	PNP	M12 [12mm] connector	Diagram 2	Figure 4	Chart 2
Polarized reflective *Purchase reflectors separately.									
C18P-AN-1A	$57.00	Up to 2m [6.6 ft]	N.O.	Axial	NPN	2m [6.5 ft] axial cable	Diagram 1	Figure 1	Chart 3
C18P-AP-1A	$57.00			Axial	PNP	2m [6.5 ft] axial cable	Diagram 2	Figure 1	Chart 3
C18P-AN-1E	$57.00			Axial	NPN	M12 [12mm] connector	Diagram 1	Figure 2	Chart 3
C18P-AP-1E	$57.00			Axial	PNP	M12 [12mm] connector	Diagram 2	Figure 2	Chart 3
C18P-AN-2A	$73.00		N.O.	Right-angle	NPN	2m [6.5 ft] axial cable	Diagram 1	Figure 3	Chart 4
C18P-AP-2A	$73.00			Right-angle	PNP	2m [6.5 ft] axial cable	Diagram 2	Figure 3	Chart 4
C18P-AN-2E	$73.00			Right-angle	NPN	M12 [12mm] connector	Diagram 1	Figure 4	Chart 4
C18P-AP-2E	$73.00			Right-angle	PNP	M12 [12mm] connector	Diagram 2	Figure 4	Chart 4
Through-beam **Purchase one receiver and one emitter for a complete set.									
C18R-0N-1A	$50.00	Up to 6m [19.7 ft]	1 N.O. and 1 N.C.	Axial	NPN	2m [6.5 ft] axial cable	Diagram 3	Figure 1	Chart 7
C18R-0P-1A	$50.00			Axial	PNP	2m [6.5 ft] axial cable	Diagram 4	Figure 1	Chart 7
C18R-0N-1E	$50.00			Axial	NPN	M12 [12mm] connector	Diagram 3	Figure 2	Chart 7
C18R-0P-1E	$50.00			Axial	PNP	M12 [12mm] connector	Diagram 4	Figure 2	Chart 7
C18E-00-1A	$36.00	Receiver dependent	Receiver dependent	Axial	Receiver dependent	2m [6.5 ft] axial cable	Diagram 5	Figure 5	Chart 7
C18E-00-1E	$36.00			Axial		M12 [12mm] connector	Diagram 5	Figure 6	Chart 7
C18R-0N-2A	$65.00	Up to 6m [19.7 ft.]	1 N.O. and 1 N.C.	Right-angle	NPN	2m [6.5 ft] axial cable	Diagram 3	Figure 3	Chart 8
C18R-0P-2A	$65.00			Right-angle	PNP	2m [6.5 ft] axial cable	Diagram 4	Figure 3	Chart 8
C18R-0N-2E	$65.00			Right-angle	NPN	M12 [12mm] connector	Diagram 3	Figure 4	Chart 8
C18R-0P-2E	$54.00			Right-angle	PNP	M12 [12mm] connector	Diagram 4	Figure 4	Chart 8
C18E-00-2A	$50.00	Receiver dependent	Receiver dependent	Right-angle	Receiver dependent	2m [6.5 ft] axial cable	Diagram 5	Figure 7	Chart 8
C18E-00-2E	$50.00			Right-angle		M12 [12mm] connector	Diagram 5	Figure 8	Chart 8

Photoelectric Sensors tSEN-57

C18 Series Photoelectric Sensors

C18 Series Photoelectric Sensors				
Specifications	Diffuse Models	Diffuse Models with Background Suppression	Reflective Models	Through-beam Models
Type	Diffuse	Diffuse with background suppression	Polarized reflection	Through-beam[1]
Sensing Distance	600mm [23.62in][2]	10 to 120mm [0.39 to 4.72 in][3]	2m [6.6 ft]	6m [19.7 ft]
Emission	LED red [660nm]	LED red [660nm]	LED red polarized [660 nm]	LED red [660nm]
Light Spot Diameter	See charts			
Sensitivity	Adjustable one-turn pot.		–	
Output Type	NPN or PNP; 1 L.O. and 1 D.O.	NPN or PNP; L.O. only	NPN or PNP; D.O. only	NPN or PNP; 1 L.O. and 1 D.O.
Operating Voltage	10-36 VDC			
No Load Supply Current	20mA	25mA	15mA	Receiver: 10mA Emitter: 15mA
Operating (Load) Current	≤ 200 mA			
Off-state (Leakage) Current	≤ 10µ A			
Voltage Drop	≤ 2.0 V			
Switching Frequency	1kHz	500Hz	1kHz	1kHz
Ripple	≤ 20%			
Time Delay Before Availability (tv)	60ms	20ms	20ms	20ms
Short-Circuit Protection	Yes (switch auto-resets after overload is removed)			
Operating Temperature Range	-25 to 55°C [-13 to 131°F]			
Protection Degree (DIN 40050)	IEC IP67			
LED Indicators - Switching Status	Yellow (output state, output energized), green (excess light indication). Emitter has no LED			
Housing Material	Chrome-plated brass			
Lens Material	Glass			
Shock/Vibration	See terminology section			
Tightening Torque	50 N•m [36.88 lb-ft]			
Weight	65.22 g [2.3 oz]			
Connectors	2m [6.5 ft] axial cable; M12 [12mm] connector			
Agency Approvals	UL file E328811			

[1] Through-beam sensors must be used in pairs consisting of one receiver and one emitter. [2] With 200x200mm white matte paper. [3] With 100x100mm white matte paper.
To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.
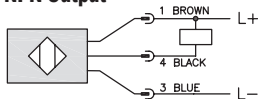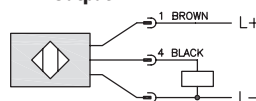
Wiring Diagrams

Diagram 1
NPN Output

1 BROWN L+
4 BLACK
3 BLUE L−

Diagram 2
PNP Output

1 BROWN L+
4 BLACK
3 BLUE L−

Connector
M12 Connector

2 1
3 4
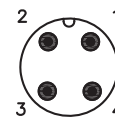
Diagram 3
4-Wire NPN Output

1 BROWN L+
4 BLACK
2 WHITE
3 BLUE L−
4:
2:
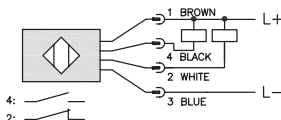
Diagram 4
4-Wire PNP Output

1 BROWN L+
4 BLACK
2 WHITE
3 BLUE L−
4:
2:

Switching Element Function		
	Through-beam and Reflective Models	Diffuse Models
Light-on	N.C.	N.O.
Dark-on	N.O.	N.C.

Diagram 5
Emitter

1 BROWN L+
3 BLUE L−
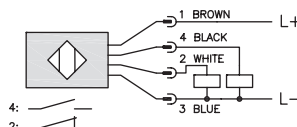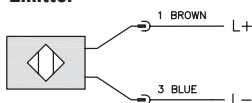
Emitter test input (<4V: OFF / >8V or open: ON) 0.5mA

Warning: These products are not safety sensors and are not suitable for use in personal safety applications.

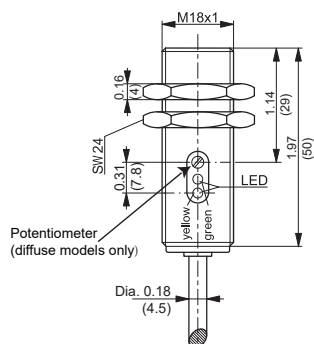# C18 Series Photoelectric Sensors
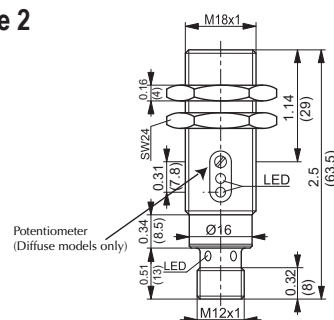
Dimensions

Inches (mm)

Figure 1

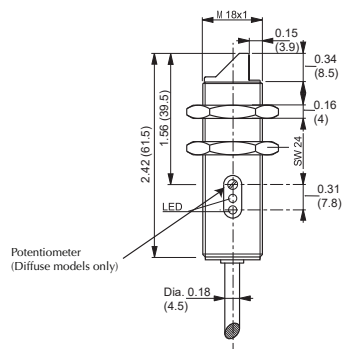M18x1
0.16 (4)
1.14 (29)
1.97 (50)
SW24
0.31 (7.8)
LED
Potentiometer (diffuse models only)
yellow green
Dia. 0.18 (4.5)

Figure 2

M18x1
0.16 (4)
1.14 (29)
2.5 (63.5)
SW24
0.31 (7.8)
LED
0.34 (8.5)
Ø 16
Potentiometer (Diffuse models only)
0.51 (13)
LED
0.32 (8)
M12x1

Figure 3

M18x1
0.15 (3.9)
0.34 (8.5)
0.16 (4)
2.42 (61.5)
1.56 (39.5)
SW24
0.31 (7.8)
LED
Potentiometer (Diffuse models only)
Dia. 0.18 (4.5)

Figure 4

M18x1
0.15 (3.9)
1.56 (39.5)
2.42 (61.5)
SW24
2.95 (75)
LED
Potentiometer (Diffuse models only)
0.32 (8)

Figure 5

1.97 (50)
Ø 0.2 (5)
M18x1
SW24
0.16 (4)

Figure 6

2.5 (63.5)
0.32 (8)
M18x1
Ø 0.7 (16.4)
M12x1
SW24
0.16 (4)
0.34 (8.5)
0.5 (13)

Figure 7

0.15 (3.9)
0.34 (8.5)
0.16 (4)
SW24
M18x1
Ø 0.18 (4.5)
2.42 (61.5)

Figure 8

2.95 (75)
SW24
0.32 (8)
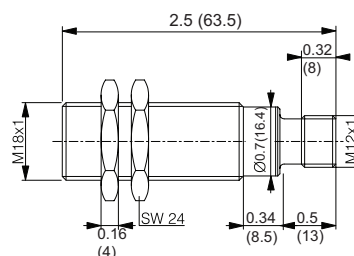Ø 0.67 (16.9)
M12x1
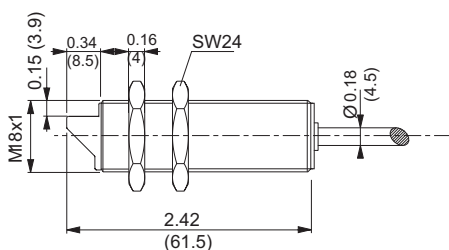0.34 (8.5)
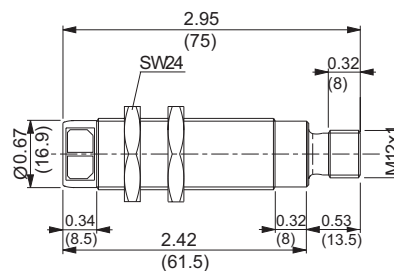0.32 (8)
0.53 (13.5)
2.42 (61.5)

C18 Series Photoelectric Sensors

Characteristic Curves

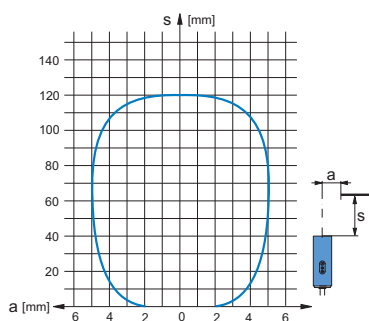### Chart 1 (Diffuse with background suppression C18B-*--1*)

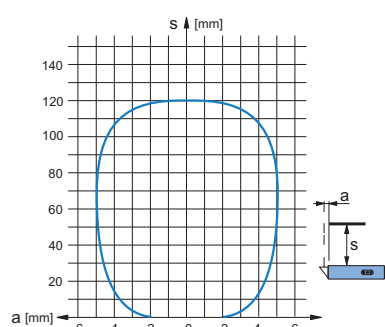### Chart 2 (Diffuse with Background Suppression C18B-*-2*)
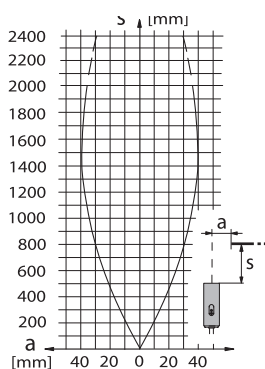

Chart 3 (Polarized reflective C18P-*-1*)

Chart 4 (Polarized reflective C18P-*-2*)
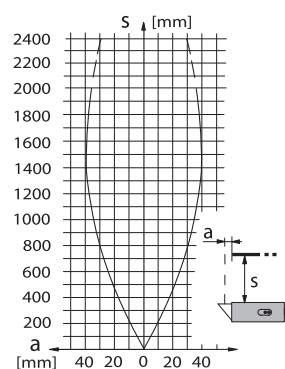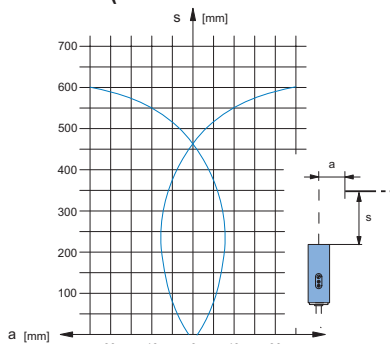

Chart 5 (Diffuse c18D-*-1*
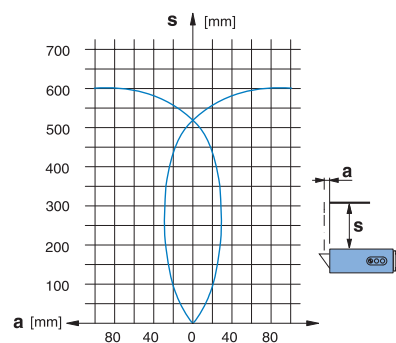

Chart 6 (Diffuse c18D-*-2*)
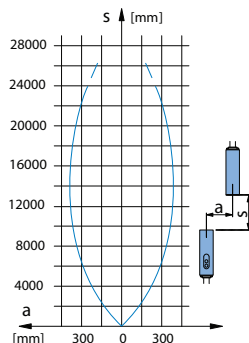

Chart 7 (Through-beam C18R-*-1*)

Chart 8 (Through-beam C18R-*-2*)

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-adapter sensors. Hexagonal nuts not included. For use with 18mm sensors.

Accessories for 18mm Sensors			
Part Number	**Price**	**Description**	**Weight lb [g]**
ST18A	$2.00	Micro Detectors mounting bracket, axial, zinc plated steel. For use with 18mm sensors.	0.06 [27.2]
ST18A7W	$7.25	Micro Detectors mounting bracket, axial, 316L stainless steel. For use with 18mm sensors.	0.06 [27.2]

ST18A

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.

Accessories for 18mm Sensors			
Part Number	**Price**	**Description**	**Weight lb [g]**
ST18C	$2.00	Micro Detectors mounting bracket, right-angle, zinc plated steel. For use with 18mm sensors.	0.06 [27.2]
ST18C7W	$7.25	Micro Detectors mounting bracket, right-angle, 316L stainless steel. For use with 18mm sensors.	0.06 [27.2]

ST18C

Dimensions

mm [inches]
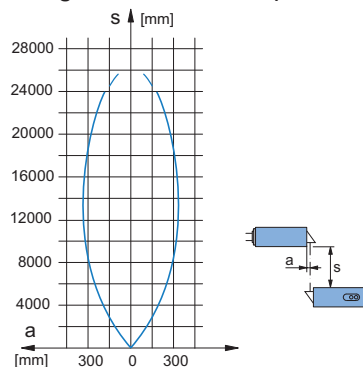
Accessories for 18mm Sensors

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.

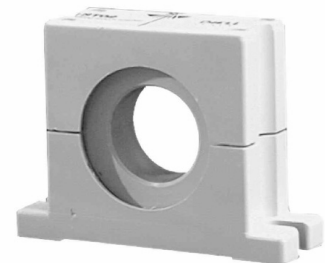| Accessories for 18mm Sensors				
Part Number	*Price*	*Description*	*Drawing Link*	*Weight [lb]*
OPT2036	$38.50	Wenglor mounting bracket, right-angle, fine tune vertical and horizontal adjustment, nickel plated steel. For use with 18mm sensors.	PDF	0.02
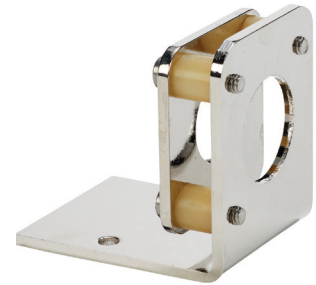
OPT2036

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	$9.50	Micro Detectors mounting bracket, ball swivel, plastic. For use with 18mm sensors.	0.06

ST02

Dimensions

mm [inches]

```
        1.73
       [44.0]
          30°
0.71                    0.16
[18.0]                  [4.0]

        2.17
       [55.0]


        1.61
       [41.0]
                    ø0.71
                    [ø18.0]
1.42
[36.0]

0.22
[5.5]
```
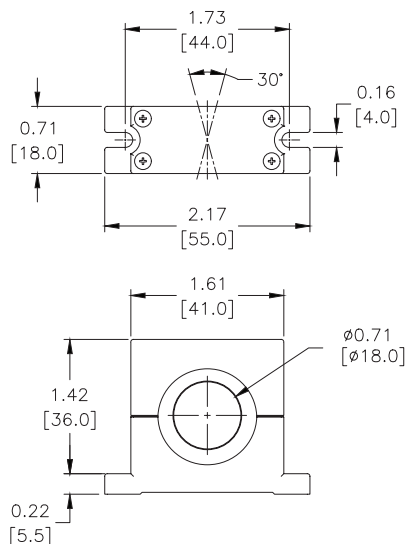
Accessories for 18mm Sensors

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	$10.50	Wenglor mounting bracket, right-angle, fixed insertion stop adjustment, plastic. For use with 18mm sensors.	PDF	0.06 [27.2]
OPT2105	$10.50	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	$11.50	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	$21.00	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]

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).

OPT2116, OPT2117

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	$13.00	Wenglor mounting rod, 12mm diameter, 200mm length, 304 stainless steel.	PDF	0.41 [185.97]
OPT2110	$16.00	Wenglor mounting rod, 12mm diameter, 300mm length, 304 stainless steel.	PDF	0.60 [272.16]
OPT2111	$21.00	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.

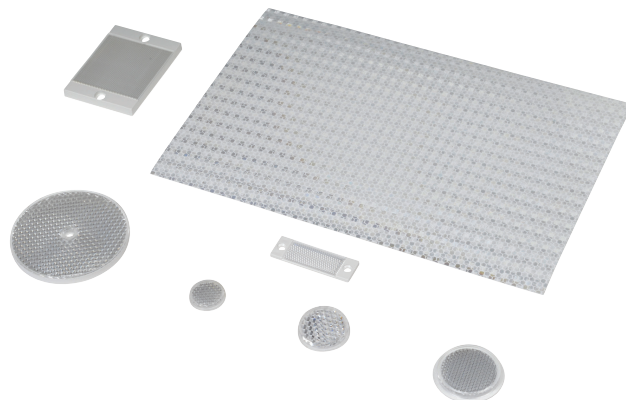| Right-angle Mounting Brackets for 12mm Sensors				
Part Number	Price	Description	Drawing Link	Weight lb [g]
OPT2108	$16.00	Wenglor mounting bracket, right-angle, nickel-plated brass. For use with 12mm mounting rods OPT2109, OPT2110 & OPT2111.	PDF	0.07 [31.8]

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	$38.00	PDF	10	25 [0.98]	IEC IP67	Customer-supplied adhesive or other mounting method required	Reflective face: PMMA Polymethylmethacrylate (acrylic) Base material: ABS (Acrylonitrile-butadiene-styren)
RL102-1	$4.25		1				
RL103	$42.50	PDF	10	34.5 [1.36]			
RL103-1	$4.75		1				
RL104	$42.50	PDF	10	46 [1.81]			
RL104-1	$4.75		1				
RL105G	$38.00	PDF	10	95 x 38 [3.74 x 1.50]		Two 4.3 mm holes	
RL105G-1	$4.25		1				
RL106G	$42.50	PDF	10	182 x 42 [7.17 x 1.65]		Two 6mm holes	
RL106G-1	$4.75		1				
RL110	$19.00	PDF	10	84 [3.31]		One 5mm hole	
RL110-1	$2.00		1				
RL116	$19.00	PDF	10	41 x 60 [3.54 x 2.36]		Two 3mm holes	
RL116-1	$2.00		1				
RL100DA4	$38.50	NA	1	200 x 300 [7.87 x 11.81]		Self-adhesive	Paper (Acrylic tape with micro prism)
RL100DC4	$12.00	NA	1	50 x 300 [1.97 x 11.81]			
RL100DQ1	$8.75	NA	1	100 x 100 [3.94 x 3.94]			
RL111G	$60.00	PDF	10	22.5 x 47 [0.89 x 1.85]		Two 3mm slots	Reflective face: PMMA Polymethylmethacrylate (acrylic) Base material: ABS (Acrylonitrile-butadiene-styren)
RL111G-1	$7.25		1				
RL112G	$44.00	PDF	10	19 x 73 [0.75 x 2.87]			
RL112G-1	$4.75		1				
RL113G	$53.00	PDF	10	51.4 x 60.3 [2.02 x 2.37]		Two 4mm slots	
RL113G-1	$6.00		1				

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	$38.00	$8.25	$35.50	$7.75	$30.00	$6.75
Quantity	5	1	5	1	5	1
Drawing Link	PDF		PDF		PDF	
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.**