

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



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 <i>*Purchase reflectors separately.</i> | | | | | | | | | |
| 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 <i>**Purchase one receiver and one emitter for a complete set.</i> | | | | | | | | | |
| 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 |

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

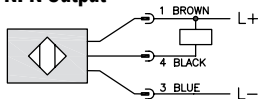
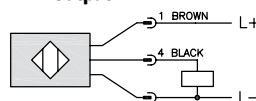


Diagram 2
PNP Output



Connector
M12 Connector

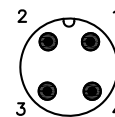


Diagram 3
4-Wire NPN Output

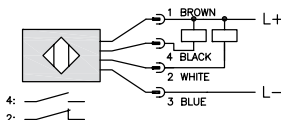


Diagram 4
4-Wire PNP Output

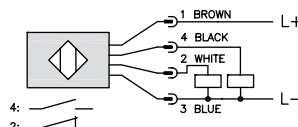
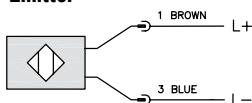


Diagram 5
Emitter



Emitter test input (<4V: OFF / >8V or open: ON) 0.5mA

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

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

C18 Series Photoelectric Sensors

Characteristic Curves

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

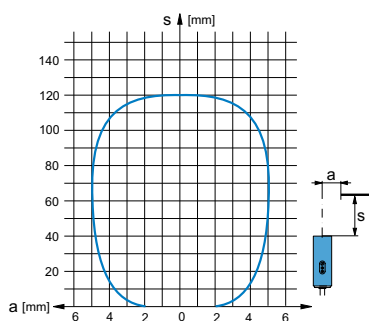


Chart 2 (Diffuse with Background Suppression C18B-*-2*)

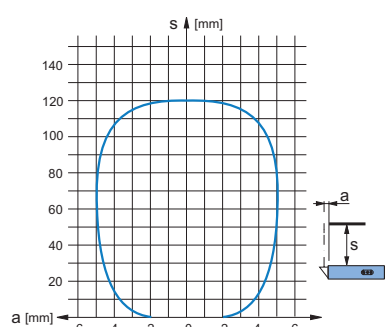


Chart 3 (Polarized reflective C18P-*-1*)

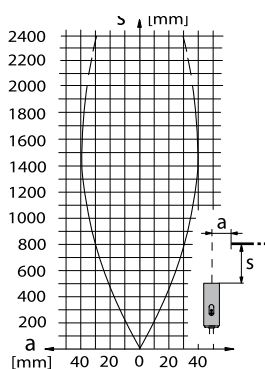


Chart 4 (Polarized reflective C18P-*-2*)

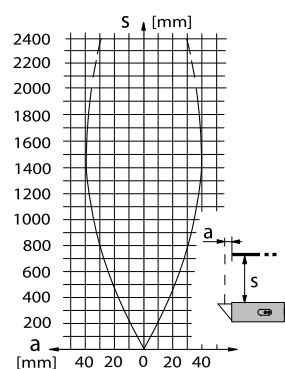


Chart 5 (Diffuse c18D-*-1*)

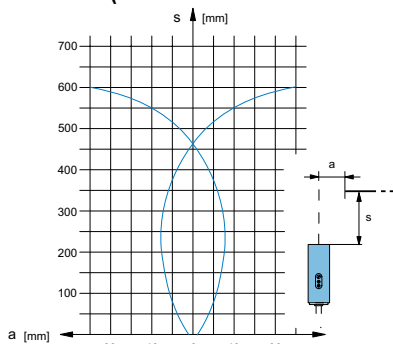


Chart 6 (Diffuse c18D-*-2*)

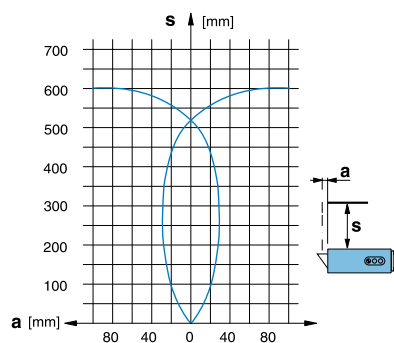


Chart 7 (Through-beam C18R-*-1*)

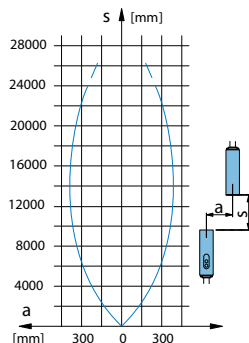
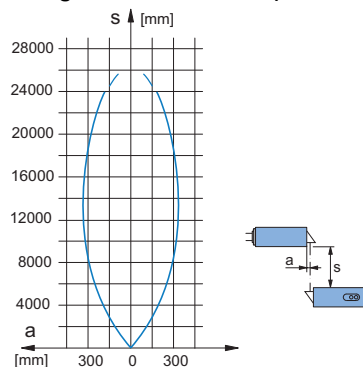


Chart 8 (Through-beam C18R-*-2*)



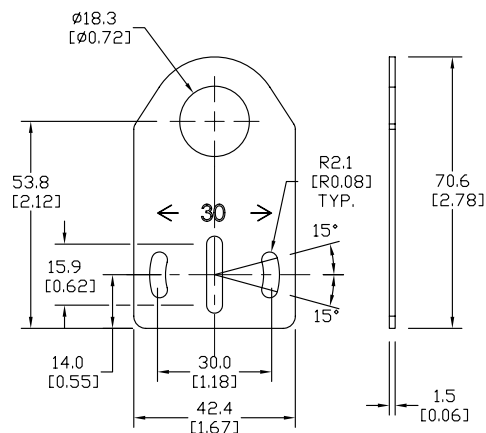
Axial mounting bracket available in zinc plated steel or 316L stainless steel. Has two mounting holes (use 4mm screws) and allows for rotation of an optical axis for right-beam-angle-adaptor sensors. Hexagonal nuts not included. For use with 18mm sensors.

| Accessories for 18mm Sensors | | | |
|------------------------------|--------|---|------------------|
| Part Number | Price | Description | Weight lb [g] |
| <u>ST18A</u> | \$2.25 | Micro Detectors mounting bracket, axial, zinc plated steel. For use with 18mm sensors. | 0.06 [27.2] |
| <u>ST18A7W</u> | \$8.00 | Micro Detectors mounting bracket, axial, 316L stainless steel. For use with 18mm sensors. | 0.06 [27.2] |



ST18A

mm [inches]



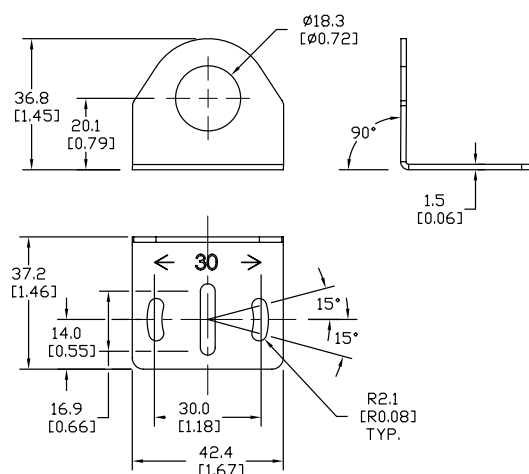
Right-angle mounting bracket for use with 18mm sensors. Has two mounting holes (use 4mm screws) and allows the rotation of an optical axis for axial sensors. Hexagonal nuts not included.

| Accessories for 18mm Sensors | | | |
|------------------------------|--------|---|------------------|
| Part Number | Price | Description | Weight lb [g] |
| <u>ST18C</u> | \$2.25 | Micro Detectors mounting bracket, right-angle, zinc plated steel. For use with 18mm sensors. | 0.06 [27.2] |
| <u>ST18C7W</u> | \$8.00 | Micro Detectors mounting bracket, right-angle, 316L stainless steel. For use with 18mm sensors. | 0.06 [27.2] |



ST18C

mm [inches]

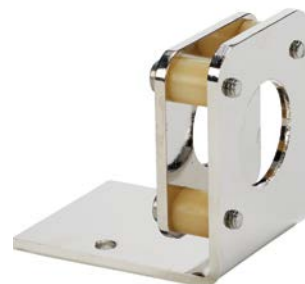


Accessories for 18mm Sensors

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 | \$41.50 | 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).

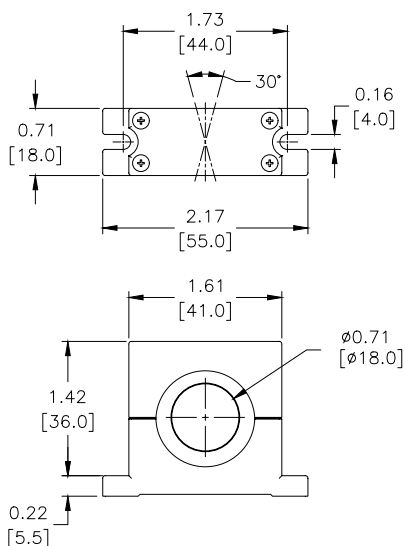
| Accessories for 18mm Sensors | | | |
|------------------------------|---------|--|-------------|
| Part Number | Price | Description | Weight [lb] |
| ST02 | \$10.50 | Micro Detectors mounting bracket, ball swivel, plastic. For use with 18mm sensors. | 0.06 |



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 | \$11.50 | Wenglor mounting bracket, right-angle, fixed insertion stop adjustment, plastic. For use with 18mm sensors. | PDF | 0.06 [27.2] |
| OPT2105 | \$11.50 | 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 | \$12.50 | 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 | \$22.50 | 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 | \$14.00 | Wenglor mounting rod, 12mm diameter, 200mm length, 304 stainless steel. | PDF | 0.41 [185.97] |
| OPT2110 | \$17.50 | Wenglor mounting rod, 12mm diameter, 300mm length, 304 stainless steel. | PDF | 0.60 [272.16] |
| OPT2111 | \$22.50 | 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 | \$17.50 | Wenglor mounting bracket, right-angle, nickel-plated brass. For use with 12mm mounting rods OPT2109, OPT2110 & OPT2111. | PDF | 0.07 [31.8] |



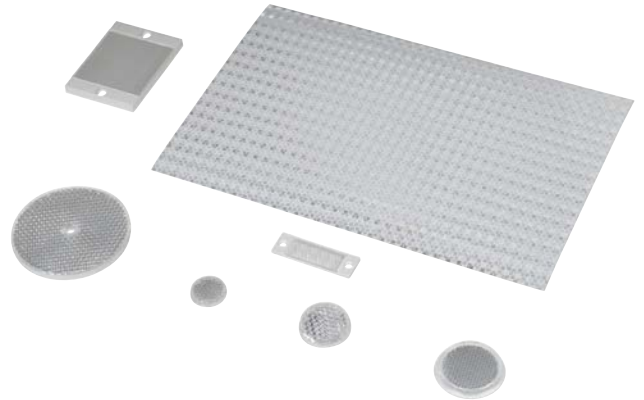
Reflectors

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 $\pm 15^\circ$.



| Reflector Specifications | | | | | | | |
|--------------------------|---------|---------------------|----------|--------------------|----------------------|--|---|
| Part number | Price | Drawing Link | Quantity | Dimensions mm [in] | Degree of Protection | Mounting | Materials |
| RL102 | \$42.00 | 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 | \$4.75 | | 1 | [0.98] | | | |
| RL103 | \$47.00 | PDF | 10 | 34.5 | | | |
| RL103-1 | \$5.25 | | 1 | [1.36] | | | |
| RL104 | \$47.00 | PDF | 10 | 46 | | | |
| RL104-1 | \$5.25 | | 1 | [1.81] | | | |
| RL105G | \$42.00 | PDF | 10 | 95 x 38 | | Two 4.3 mm holes | |
| RL105G-1 | \$4.75 | | 1 | [3.74 x 1.50] | | | |
| RL106G | \$47.00 | PDF | 10 | 182 x 42 | | Two 6mm holes | |
| RL106G-1 | \$5.25 | | 1 | [7.17 x 1.65] | | | |
| RL110 | \$21.00 | PDF | 10 | 84 | | One 5mm hole | |
| RL110-1 | \$2.25 | | 1 | [3.31] | | | |
| RL116 | \$21.00 | PDF | 10 | 41 x 60 | | Two 3mm holes | |
| RL116-1 | \$2.25 | | 1 | [3.54 x 2.36] | | | |
| RL100DA4 | \$42.50 | NA | 1 | 200 x 300 | | Self-adhesive | Paper (Acrylic tape with micro prism) |
| RL100DC4 | \$13.00 | NA | 1 | 50 x 300 | | | |
| RL100DQ1 | \$9.75 | NA | 1 | 100 x 100 | | | |
| RL111G | \$66.00 | PDF | 10 | 22.5 x 47 | | Two 3mm slots | Reflective face: PMMA Polymethylmethacrylate (acrylic) Base material: ABS (Acrylonitrile-butadiene-styren) |
| RL111G-1 | \$8.00 | | 1 | [0.89 x 1.85] | | | |
| RL112G | \$48.50 | PDF | 10 | 19 x 73 | | | |
| RL112G-1 | \$5.25 | | 1 | [0.75 x 2.87] | | | |
| RL113G | \$58.00 | PDF | 10 | 51.4 x 60.3 | | Two 4mm slots | |
| RL113G-1 | \$6.50 | | 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 | <i>RL201</i> | <i>RL201-1</i> | <i>RL203</i> | <i>RL203-1</i> | <i>RL204</i> | <i>RL204-1</i> |
| Price | \$42.00 | \$9.00 | \$39.00 | \$8.50 | \$33.00 | \$7.50 |
| 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.