

# Leuze M18 Plastic Photoelectric Sensors

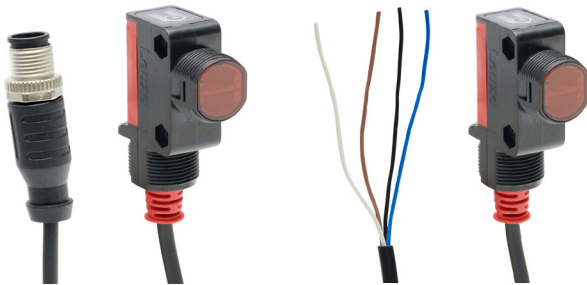
## M18 (18mm) Rectangular Plastic Photoelectric Sensors – 28 Series

### Overview

The Leuze 28 series photoelectric sensors are reliable and powerful for standard detection tasks in material handling, packaging, and other applications. The 28 series offers large ranges, highly visible red LED and Infrared models, and the ultimate in mounting flexibility with front and bottom 18mm threads or rugged through-holes. Strong opto performance and various electrical options make the 28 series photoelectric sensors a solid performer even in rough industrial environments.

### Features

- Diffuse, polarized retroreflective, and through-beam models available
- Operating voltage 10-30VDC
- Complete overload protection
- IP67 rated
- M12 quick-disconnect (purchase cable separately) or pigtail models
- Includes mounting hardware
- 2-year warranty



ET28.3-4P-200-M12

ET28.3-4P



### M18 (18mm) Rectangular Plastic Photoelectric Sensors - 28 Series

| Part Number                       | Price   | Sensing Distance             | Light Type               | Logic | Output Function                     | Connection Type                                              | Wiring Diagram | Drawing Link        |
|-----------------------------------|---------|------------------------------|--------------------------|-------|-------------------------------------|--------------------------------------------------------------|----------------|---------------------|
| Diffuse, teach-in button          |         |                              |                          |       |                                     |                                                              |                |                     |
| <a href="#">ET28.3-4P-200-M12</a> | \$68.00 | 1-650mm<br>[0.03-25.59 in]   | Visible red<br>LED 620nm | PNP   | Complementary<br>Light-on / Dark-on | 4-wire, 4-pin M12 quick-disconnect, 0.2m [0.6 ft] cable, PUR | 2              | <a href="#">PDF</a> |
| <a href="#">ET28.3-4P</a>         | \$62.00 |                              |                          | PNP   |                                     | 4-wire, pigtail 2m [6.5 ft] cable, PUR                       | 2              | <a href="#">PDF</a> |
| <a href="#">ET28.3-2N-200-M12</a> | \$68.00 |                              |                          | NPN   |                                     | 4 wire, 4-pin M12 quick-disconnect, 0.2m [0.6 ft] cable, PUR | 1              | <a href="#">PDF</a> |
| <a href="#">ET28.3-2N</a>         | \$62.00 |                              |                          | NPN   |                                     | 4-wire, pigtail, 2m [6.5 ft] cable, PUR                      | 1              | <a href="#">PDF</a> |
| Polarized Retroreflective *       |         |                              |                          |       |                                     |                                                              |                |                     |
| <a href="#">PRK28-4P-200-M12</a>  | \$68.00 | 0.02-4.5m<br>[0.06-14.76 ft] | Visible red<br>LED 620nm | PNP   | Complementary<br>Light-on / Dark-on | 4-wire, 4-pin M12 quick-disconnect, 0.2m [0.6 ft] cable, PUR | 2              | <a href="#">PDF</a> |
| <a href="#">PRK28-4P</a>          | \$62.00 |                              |                          | PNP   |                                     | 4-wire, pigtail, 2m [6.5 ft] cable, PUR                      | 2              | <a href="#">PDF</a> |
| <a href="#">PRK28-2N-200-M12</a>  | \$68.00 |                              |                          | NPN   |                                     | 4-wire, 4-pin M12 quick-disconnect, 0.2m [0.6 ft] cable, PUR | 1              | <a href="#">PDF</a> |
| <a href="#">PRK28-2N</a>          | \$62.00 |                              |                          | NPN   |                                     | 4-wire, pigtail, 2m [6.5 ft] cable, PUR                      | 1              | <a href="#">PDF</a> |
| * Purchase reflector separately.  |         |                              |                          |       |                                     |                                                              |                |                     |
| Through-beam Emitters             |         |                              |                          |       |                                     |                                                              |                |                     |
| <a href="#">LS28-9D-M12</a>       | \$42.00 | 0-10m<br>[0 to 32.80 ft]     | Visible red<br>LED 620nm | —     | —                                   | 2-wire, 4-pin M12 quick-disconnect                           | 3              | <a href="#">PDF</a> |
| <a href="#">LS28-9D</a>           | \$49.00 |                              |                          | —     | —                                   | 2-wire, pigtail, 2m [6.5 ft] cable, PUR                      | 3              | <a href="#">PDF</a> |
| <a href="#">LS28I</a>             | \$55.00 |                              | Infrared                 | —     | —                                   | 2-wire, pigtail, 2m [6.5 ft] cable, PUR                      | 3              | <a href="#">PDF</a> |
| Through-beam Receivers            |         |                              |                          |       |                                     |                                                              |                |                     |
| <a href="#">LE28-4P-M12</a>       | \$54.00 | 0-10m<br>[0 to 32.80 ft]     | —                        | PNP   | Complementary<br>Light-on / Dark-on | 4-wire, 4-pin M12 quick-disconnect                           | 2              | <a href="#">PDF</a> |
| <a href="#">LE28-4P</a>           | \$62.00 |                              |                          | PNP   |                                     | 4-wire, pigtail, 2m [6.5 ft] cable, PUR                      | 2              | <a href="#">PDF</a> |
| <a href="#">LE28-2N-M12</a>       | \$54.00 |                              |                          | NPN   |                                     | 4-wire, 4-pin M12 quick-disconnect                           | 1              | <a href="#">PDF</a> |
| <a href="#">LE28-2N</a>           | \$62.00 |                              |                          | NPN   |                                     | 4-wire, pigtail, 2m [6.5 ft] cable, PUR                      | 1              | <a href="#">PDF</a> |

Note: Purchase cable separately for the M12 quick-disconnect models.

The 28 Series Photoelectric Sensors are not intended for safety applications.

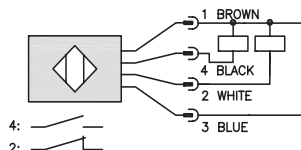
# Leuze M18 Plastic Photoelectric Sensors

## M18 (18mm) Rectangular Plastic Photoelectric Sensors – 28 Series

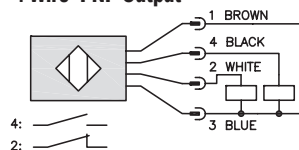
| M18 (18mm) Rectangular Plastic Photoelectric Sensors - 28 Series Specifications |                                                                                                                                     |                                                                                                                  |                                                                   |                                                                                                                  |
|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Sensor type                                                                     | Diffuse, teach-in button                                                                                                            | Polarized Retroreflective                                                                                        | Through-beam Emitters                                             | Through-beam Receivers                                                                                           |
| Operating Voltage                                                               | 10-30 VDC                                                                                                                           |                                                                                                                  |                                                                   |                                                                                                                  |
| Residual Ripple                                                                 | 0 to 15%, From $U_B$                                                                                                                |                                                                                                                  |                                                                   |                                                                                                                  |
| Open-circuit Current                                                            | 0-20mA                                                                                                                              |                                                                                                                  | 0-15mA                                                            |                                                                                                                  |
| Switching Current (maximum)                                                     | 100mA                                                                                                                               |                                                                                                                  | –                                                                 | 100mA                                                                                                            |
| Switching Voltage High                                                          | $\geq(U_B-2.5V)$                                                                                                                    |                                                                                                                  | –                                                                 | $\geq(U_B-2.5V)$                                                                                                 |
| Switching Voltage Low                                                           | $\leq 2.5 V$                                                                                                                        |                                                                                                                  | –                                                                 | $\leq 2.5 V$                                                                                                     |
| Switching Frequency                                                             | 500Hz                                                                                                                               | 500Hz                                                                                                            | –                                                                 | 500Hz                                                                                                            |
| Response Time                                                                   | 1ms                                                                                                                                 |                                                                                                                  | –                                                                 | 1ms                                                                                                              |
| Time Delay Before Availability (tv)                                             | 300ms                                                                                                                               |                                                                                                                  |                                                                   |                                                                                                                  |
| Voltage Reversal Protection                                                     | Yes                                                                                                                                 |                                                                                                                  |                                                                   |                                                                                                                  |
| Short-circuit Protection                                                        | Yes                                                                                                                                 |                                                                                                                  |                                                                   |                                                                                                                  |
| Operating Temperature                                                           | -40 to 60°C [-40 to 140°F]                                                                                                          |                                                                                                                  |                                                                   |                                                                                                                  |
| Storage Temperature                                                             | -40 to 70°C [-40 to 158°F]                                                                                                          |                                                                                                                  |                                                                   |                                                                                                                  |
| Degree of Protection                                                            | IP67                                                                                                                                |                                                                                                                  |                                                                   |                                                                                                                  |
| Protection Class                                                                | III                                                                                                                                 |                                                                                                                  |                                                                   |                                                                                                                  |
| LED Indicators - Switching Status                                               | Green LED: Operation ready<br>Yellow LED: Object detected                                                                           | Green LED: Operation ready<br>Yellow continuous LED: Light path free<br>Yellow flashing LED: No function reserve | Green LED: Operation ready<br>Yellow LED: Transmitted beam active | Green LED: Operation ready<br>Yellow continuous LED: Light path free<br>Yellow flashing LED: No function reserve |
| Housing Material                                                                | ABS plastic (Acrylonitrile butadiene styrene)                                                                                       |                                                                                                                  |                                                                   |                                                                                                                  |
| Lens Material                                                                   | Plastic                                                                                                                             |                                                                                                                  |                                                                   |                                                                                                                  |
| Shock/Vibration                                                                 | See terminology section                                                                                                             |                                                                                                                  |                                                                   |                                                                                                                  |
| Tightening Torque                                                               | 1 N•m [0.74 ft•lb]                                                                                                                  |                                                                                                                  |                                                                   |                                                                                                                  |
| Weight                                                                          | 75g [2.64 oz] Connector models<br>40g [1.41 oz] Cable models                                                                        |                                                                                                                  |                                                                   |                                                                                                                  |
| Connectors                                                                      | 4-pin M12 quick-disconnect, wire cross 0.2 mm <sup>2</sup><br>or<br>4-wire, pigtail, A-coded, wire cross 0.2 mm <sup>2</sup> 24 AWG |                                                                                                                  |                                                                   |                                                                                                                  |
| Agency Approvals                                                                | cULus File: E203683, CE                                                                                                             |                                                                                                                  |                                                                   |                                                                                                                  |

## Wiring Diagrams

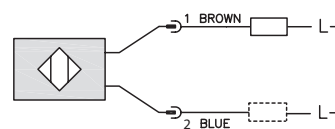
**Diagram 1**  
4-Wire NPN Output



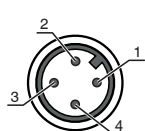
**Diagram 2**  
4-Wire PNP Output



**Diagram 3**  
Emitter



**M12 connector**



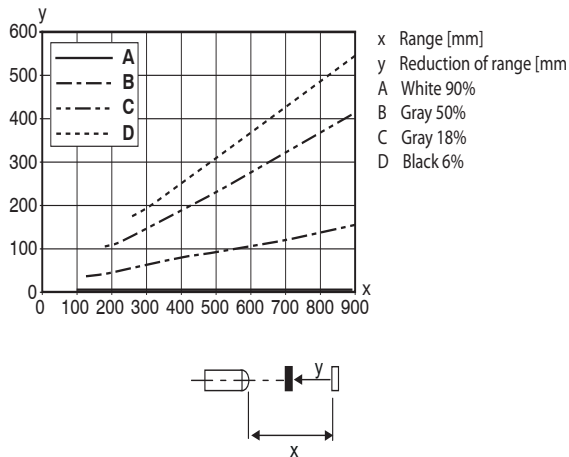
# Leuze M18 Plastic Photoelectric Sensors

## M18 (18mm) Rectangular Plastic Photoelectric Sensors – 28 Series

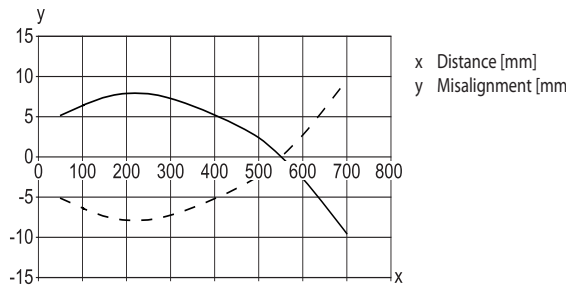
### Characteristic Curves

#### Diffuse Models

Typical black/white behavior

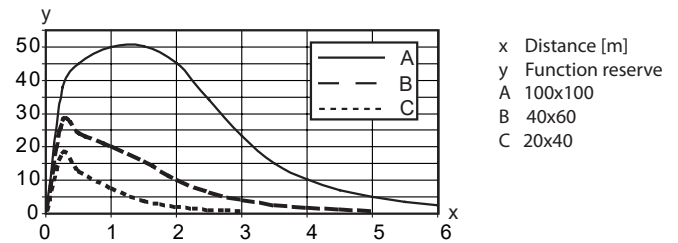
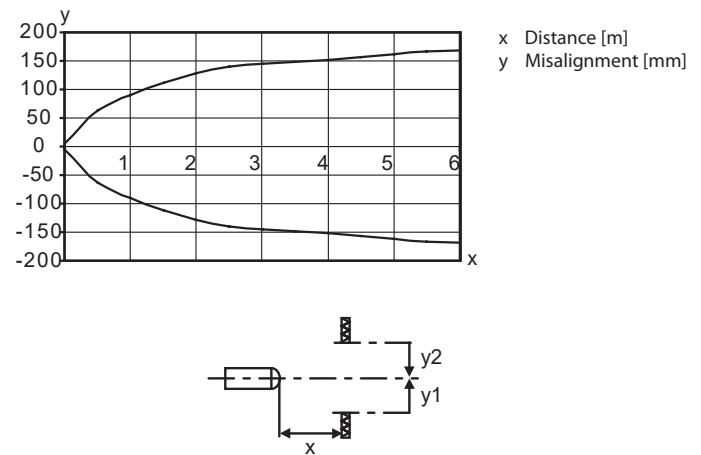


Typical response behavior (white 90%)



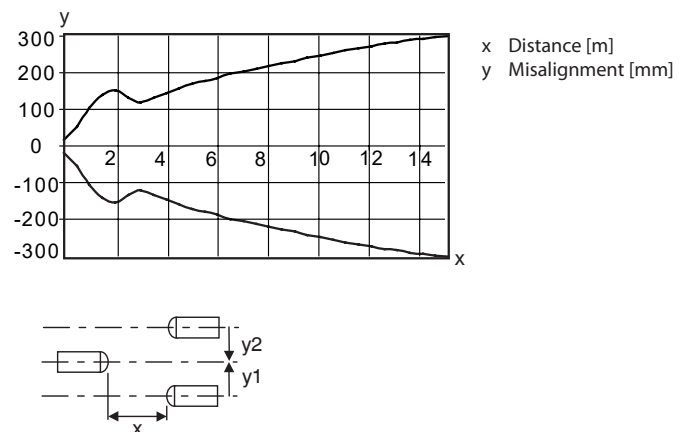
#### Polarized Retroreflective Models

Typical response behavior 100x100



#### Through-beam Models

Typical response behavior



# 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.

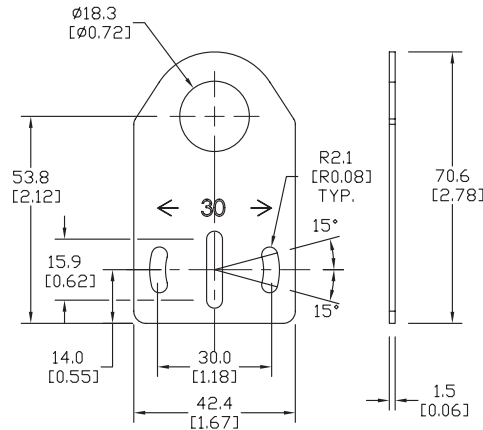
| Accessories for 18mm Sensors   |        |                                                                                           |                  |
|--------------------------------|--------|-------------------------------------------------------------------------------------------|------------------|
| Part Number                    | Price  | Description                                                                               | Weight<br>lb [g] |
| <a href="#"><u>ST18A</u></a>   | \$2.00 | Micro Detectors mounting bracket, axial, zinc plated steel. For use with 18mm sensors.    | 0.06 [27.2]      |
| <a href="#"><u>ST18A7W</u></a> | \$7.25 | Micro Detectors mounting bracket, axial, 316L stainless steel. For use with 18mm sensors. | 0.06 [27.2]      |



**ST18A**

## Dimensions

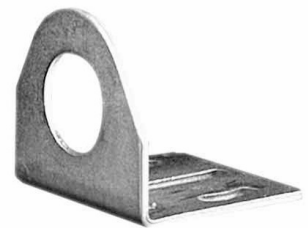
mm [inches]



## 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.

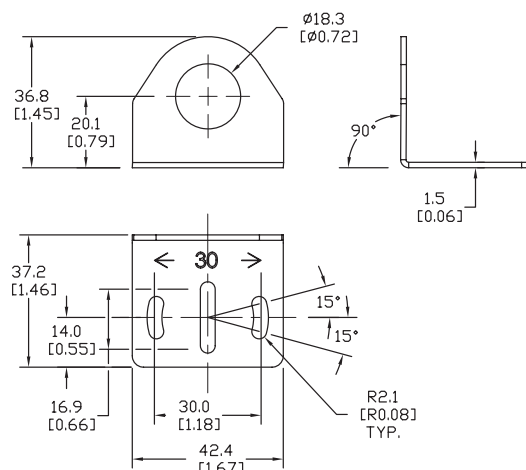
| Accessories for 18mm Sensors   |        |                                                                                                 |                  |
|--------------------------------|--------|-------------------------------------------------------------------------------------------------|------------------|
| Part Number                    | Price  | Description                                                                                     | Weight<br>lb [g] |
| <a href="#"><u>ST18C</u></a>   | \$2.00 | Micro Detectors mounting bracket, right-angle, zinc plated steel. For use with 18mm sensors.    | 0.06 [27.2]      |
| <a href="#"><u>ST18C7W</u></a> | \$7.25 | Micro Detectors mounting bracket, right-angle, 316L stainless steel. For use with 18mm sensors. | 0.06 [27.2]      |



**ST18C**

## Dimensions

mm [inches]



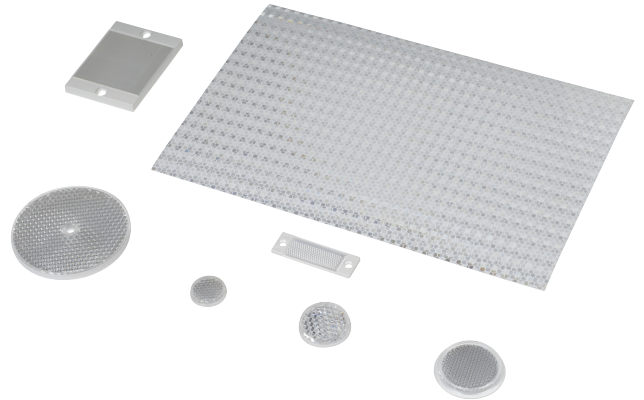
# Reflectors

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

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