



Enhanced 50 Series Clear Object Photoelectric Sensors



1452E-6547



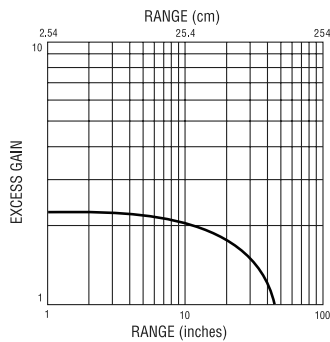
1452E-6517

- 7 models available
- Fiberglass-reinforced plastic housing
- Field of view: 0.68°
- Cable wires or mini/micro connector termination
- NPN/PNP, Solid-State Relay, or SPDT EM Relay outputs
- IP67 rated

Note: Cutler-Hammer parts available for sale to North America locations only.

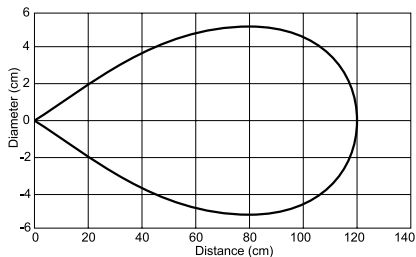
Enhanced 50 Series Clear Object Photoelectric Sensors Selection Chart								
Part Number	Price	Voltage Range	Sensing Range	Optimum Range	Sensing Beam	Output Type	Connection Type	Cable Part Number
1452E-6517	\$129.00	10 - 40 VDC	45 in. (1.2 m)	1 to 24 in. (25 to 610 m m)	Visible Red	NPN/PNP 250 mA	6-foot cable (300V)	Pre-wired 6 ft. (1.8 m)
1452E-6547	\$129.00						4-pin Euro (Micro) DC connector	CSDS4A4CY2202 CSDS4A4CY2205
1452E-6507	\$125.00						4-pin Mini connector	CSMS4A4CY1602 CSMS4A4CY1606
1452E-6513	\$133.00	12 - 240 VDC 24 - 240 VAC	45 in. (1.2 m)	1 to 24 in. (25 to 610 m m)	Visible Red	Solid-state relay 300 mA @ 240 VAC/VDC	6-foot cable (300V)	Pre-wired 6 ft. (1.8 m)
1452E-6543	\$129.00						4-pin Micro AC connector	CSAS4F4CY2202 CSAS4F4CY2205
1452E-6503	\$133.00						4-pin Mini connector	CSMS4A4CY1602 CSMS4A4CY1606
1452E-6504	\$128.00						5-pin Mini connector	CSMS5A5CY1602 CSMS5A5CY1606

Characteristic curve chart



Note: Purchase reflectors separately.

Spot dimension chart



Wiring Diagrams

(Pin numbers are for reference only. Rely on pin location when wiring.)

Operating Voltage	Models	Cable Models	Mini-Connector Models (Face View Male Shown)	Micro and Euro (Micro) Connector Models (Face View Male Shown)
10-40 VDC	Clear Object			
12 - 240 VDC or 24 - 240 VAC	Clear Object Solid-State Relay			
12 - 240 VDC or 24 - 240 VAC	Clear Object SPDT EM Relay			

① Connect load to appropriate output for either sinking or sourcing operation.



Cutler-Hammer

Enhanced 50 Series Photoelectric Sensors Selection Guide

Overview

The Enhanced 50 family of high performance photoelectric sensors offers outstanding features, flexibility and durability at an incredible price. Choose from a wide selection of Thru-beam, Polarized Reflex, Diffuse and even Clear

Object models all designed in a rugged, industry standard, rectangular package. Each model comes with a variety of input options for maximum flexibility across many voltage ratings. Cabling choices include built-in mini-connector, micro-connector, pigtail micro-connector or a 6 ft. integrated cable.

Other convenient features included are Dark-On/Light-On selectability and Gain adjustment, available on all models. Use the Selection Guide below to find the sensor model that best suits your requirements.



Enhanced 50 Photoelectric Sensors Specifications by Model Type

Specifications	Thru-Beam	Diffuse	Polarized Reflex	Clear Object Detector
Voltage Range	10 - 40 VDC 12 - 240 VDC 24 - 240 VAC	10 - 40 VDC 12 - 240 VDC 24 - 240 VAC	10 - 40 VDC 12 - 240 VDC 24 - 240 VAC	10 - 40 VDC 12 - 240 VDC 24 - 240 VAC
Sensing Range	500 ft. (152 m)	10 ft. (3 m)	16 ft. (4.9 m)	45 in. (1.2 m)
Optimum Power	0.1 to 250 ft. (0.03 to 77 m)	1 to 60 in. (25 to 1520 mm)	0.5 to 8 ft. (0.2 to 2.5 m)	1 to 24 in. (25 to 610 mm)
Sensing Beam	Infrared	Infrared	Visible Red	Visible Red
Output Types	NPN/PNP 250 mA, Solid-state relay 300 mA @ 240 VAC/VDC, SPDT EM relay 3 A @ 120 VAC	NPN/PNP 250 mA, Solid-state relay 300 mA @ 240 VAC/VDC, SPDT EM relay 3 A @ 120 VAC	NPN/PNP 250 mA, Solid-state relay 300 mA @ 240 VAC/VDC, SPDT EM relay 3 A @ 120 VAC	NPN/PNP 250 mA, Solid-state relay 300 mA @ 240 VAC/VDC, SPDT EM relay 3 A @ 120 VAC

Enhanced 50 Photoelectric Sensors Specifications by Input Type

Specifications	AC/DC EM Relay Models	AC/DC Solid-State Relay Models	DC Only Models
Input Voltage	12 - 240 VDC 24 - 240 VAC	12 - 240 VDC 24 - 240 VAC	10 - 40 VDC
Light/Dark Operation	Switch selectable		
Operating Temperature	-13° to 131°F (-25° to 55°C)		
Humidity	95% relative humidity, non-condensing		
Case Material	Fiberglass reinforced plastic		
Lens Material	Acrylic		
Vibration	IEC 60947-5-2 part 7.4.2		
Shock	IEC 60947-5-2 part 7.4.1		
Protection	Output short circuit and overcurrent protection, reverse polarity protection		
Enclosure Ratings	IP67		
Agency Approvals	IEC IP67, cCSAus, UL508 (CSA File 224447)	IEC IP67, cCSAus, UL508 (CSA File 224447)	IEC IP67, cCSAus, UL508 (CSA File 224447)
Output Load	3A @ 120 VAC 3A @ 28 VAC 3A @ 240 VAC	300 mA @ 240 VAC/VDC	250 mA
Response Time	15 ms	2 ms	
No Load Current Draw	<30 mA		
Leakage Current (max.)	—	1 mA @ 240 VAC	<10 µA
Indicator LEDs	Thru-Beam Source All Others: Red: Power Green: Output Yellow: Power Red: Alignment		

EATON Enhanced 50 Series Cutler-Hammer Photoelectric Sensors

Application Guide

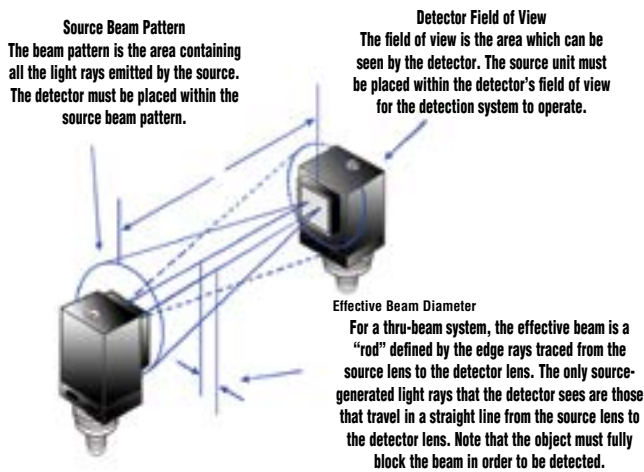
The Enhanced 50 Series Photoelectric Sensors are a great fit for applications such as material handling, packaging, wrapping and sortation.

This family of sensors, with its four basic models (Thru-beam, Polarized Reflex, Diffuse and Clear Object), meets the needs for almost any sensing requirement, including harsh environments with excessive dust or high temperature.

Follow the application guide below to choose the best sensor model for your application.

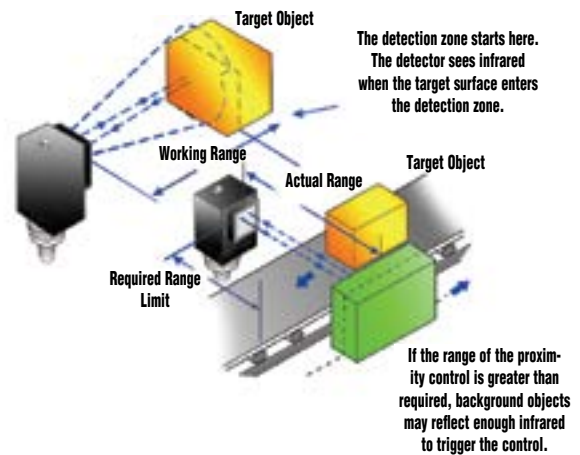
Thru-Beam

- Most accurate
- Longest sensing range
- Most reliable
- Must be installed in two points on system: emitter and receiver
- More costly



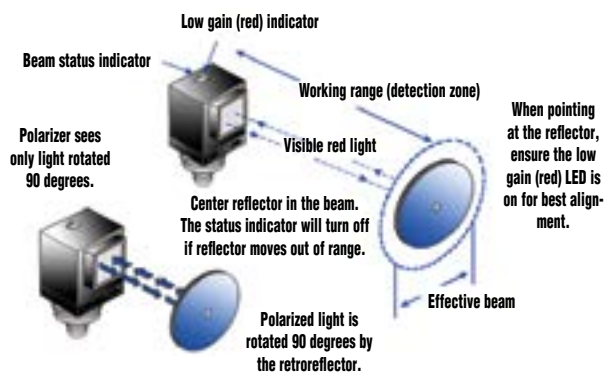
Diffuse

- Lower cost
- Install at one point
- Less accurate than Thru-Beam or Polarized Reflex
- More setup time involved



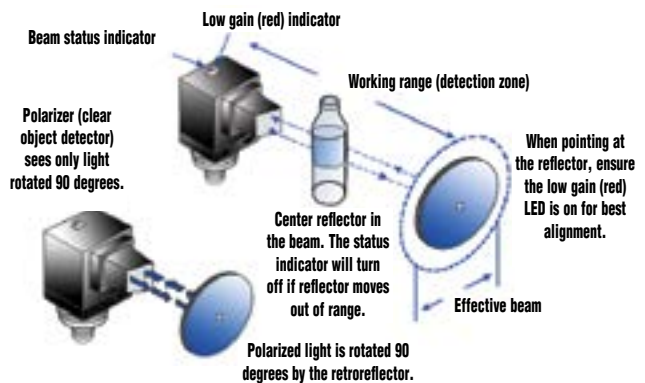
Polarized Reflex

- Lower cost than Thru-Beam
- Longer sensing range than Diffuse
- Very reliable
- Must be installed in two points on system: sensor and reflector



Clear Object Detector

- Most reliable for sensing transparent objects
- Must be installed in two points on system: sensor and reflector.
- Short sensing distance: 45 inches max.





Enhanced 50 Series Photoelectric Sensors Connector Cables

Enhanced 50 Series Cables Selection Chart				
Part Number	Price	Description	Gauge	Pin-Out Diagram
CSDS4A4CY2202	\$19.00	DC Euro (Micro) connector cable for quick-disconnect photoelectric sensors, straight female, DC 4-pin/4-wire, PVC, 6 feet (2 meter) length	22	1-Brown 2-White 3-Blue 4-Black
CSDS4A4CY2205	\$20.00	DC Euro (Micro) connector cable for quick-disconnect photoelectric sensors, straight female, DC 4-pin/4-wire, PVC, 16.4 feet (5 meter) length	22	1-Brown 2-White 3-Blue 4-Black
CSAS4F4CY2202	\$21.50	AC Micro connector cable for quick-disconnect photoelectric sensors, straight female, AC 4-pin/4-wire, PVC, 6 feet (2 meter) length, 1/2" - 20 UNF thread	22	1-Red/Black 2-Red/White 3-Red 4-Green
CSAS4F4CY2205	\$22.50	AC Micro connector cable for quick-disconnect photoelectric sensors, straight female, AC 4-pin/4-wire, PVC, 16.4 feet (5 meter) length, 1/2" - 20 UNF thread	22	1-Red/Black 2-Red/White 3-Red 4-Green
CSAS5A5CY2202	\$27.00	AC Micro connector cable for quick-disconnect photoelectric sensors, straight female, AC 5-pin/5-wire, PVC, 6 feet (2 meter) length, 1/2" - 20 UNF thread	22	1-Brown 2-Blue 3-Gray 4-Black 5-White
CSAS5A5CY2205	\$29.00	AC Micro connector cable for quick-disconnect photoelectric sensors, straight female, AC 5-pin/5-wire, PVC, 16.4 feet (5 meter) length, 1/2" - 20 UNF thread	22	1-Brown 2-Blue 3-Gray 4-Black 5-White
CSMS4A4CY1602	\$29.50	Mini connector cable for quick-disconnect photoelectric sensors, straight female, 4-pin/4-wire, PVC, 6 feet (2 meter) length, 7/8" - 16 UN thread	16	1-Black 2-Blue 3-Brown 4-White
CSMS4A4CY1606	\$48.00	Mini connector cable for quick-disconnect photoelectric sensors, straight female, 4-pin/4-wire, PVC, 19.69 feet (6 meter) length, 7/8" - 16 UN thread	16	1-Black 2-Blue 3-Brown 4-White
CSMS5A5CY1602	\$34.00	Mini connector cable for quick-disconnect photoelectric sensors, straight female, 5-pin/5-wire, PVC, 6 feet (2 meter) length, 7/8" - 16 UN thread	16	1-Black 2-Blue 3-Orange 4-Brown 5-White
CSMS5A5CY1606	\$54.00	Mini connector cable for quick-disconnect photoelectric sensors, straight female, 5-pin/5-wire, PVC, 19.69 feet (6 meter) length, 7/8" - 16 UN thread	16	1-Black 2-Blue 3-Orange 4-Brown 5-White



CSDS4A4CY2205



CSAS4F4CY2205

Note: Cutler-Hammer parts available for sale to North America locations only.

Connector Cables Specifications		
	Micro Style	Mini Style
Jacket Material	PVC	PVC
Contact Material	Gold-plated copper alloy	Gold-plated brass
Coupling Nut Material	Zinc die-cast epoxy-coat	Zinc die cast epoxy-coat
O-ring	Nitrile rubber	None
Cable	PVC insulation and jacket, stranded copper conductors	
Cable Strain Relief	35 pounds minimum	
Voltage Rating	320 V (24 VDC for LED plugs)	600 V
Current Rating	4A	4-pin: 10A 5-pin: 8 A
Contact Resistance	5 mΩ maximum	5 mΩ maximum
Isolation Resistance	1000 MΩ minimum	1000 MΩ minimum
Protection	IP67	NEMA 6P, IP68
Temperature Range	-25° to 90°C	-20° to 105°C
Cable Diameter (3/C = 3 Conductor)	22 AWG PVC: 4/C: 0.21 inch (5.3 mm) 5/C: 0.20 inch (5.1 mm)	16AWG PVC: 4/C: 0.42 inch (10.7 mm) 5/C: 0.50 inch (12.7 mm)
Bend Radius	Minimum recommended bend radius is 12X cable diameter	



CSAS5A5CY2202



CSMS4A4CY1602



CSMS5A5CY1602

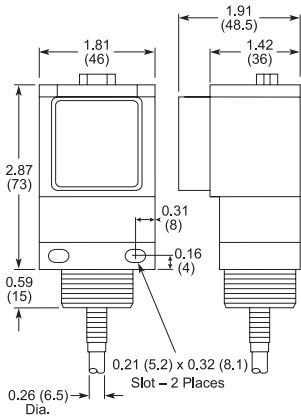


Enhanced 50 Series Photoelectric Sensors Dimensions

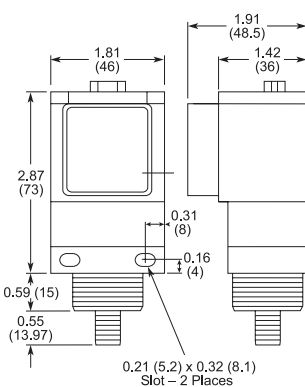
Sensor Dimensions

(inches (mm))

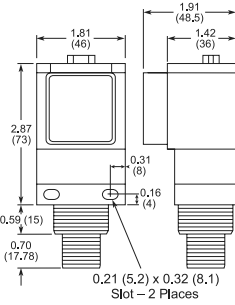
Cable and Pigtail Connector* Version



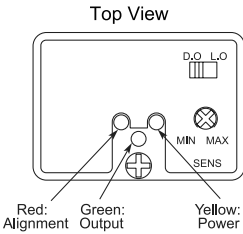
AC/DC Micro or Euro (Micro) Connector Versions



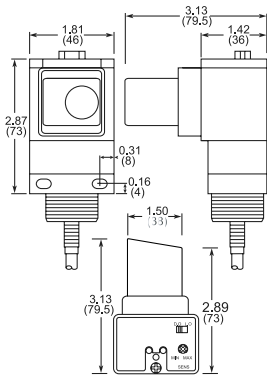
Mini Connector Versions



* Pigtail length: 7.5" nominal



Clear Object Versions (Cable Version Shown)

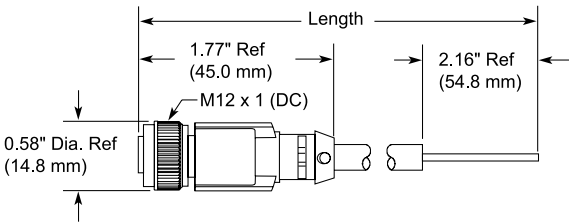


Connector Cables Dimensions

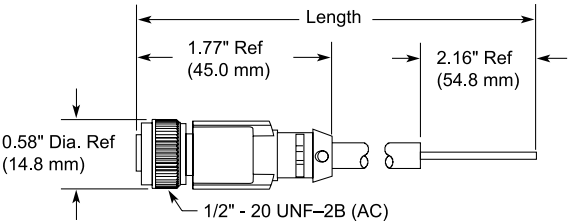
(in/mm)

Micro Style Connector Cables

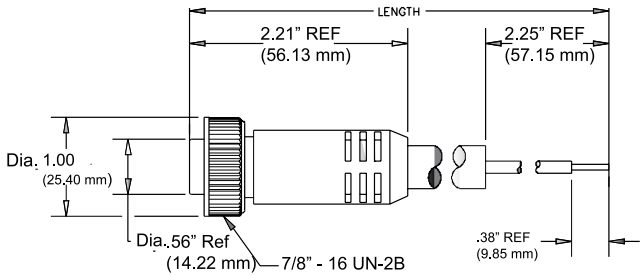
M12 x 1 (DC) connector cable



1/2" - 20 UNF-2B (AC) connector cable



Mini Style Connector Cables



Accessories for 50 Series Photoelectric Sensors

Mounting Brackets

Short, tall or ball-swivel style of mounting brackets are available. All styles allow 360° rotation of the sensor.

Note: Cutler-Hammer parts available for sale to North America locations only.

Accessories for Enhanced 50 Series Sensors			
Part Number	Price	Description	Weight [lb]
6150E-6501	\$5.75	Mounting bracket, right-angle, 1.5 inch vertical adjustment, nickel-plated steel. For use with CH Enhanced 50 Series sensor.	0.20
6150E-6502	\$7.25	Mounting bracket, right-angle, 3.5 inch vertical adjustment, nickel-plated steel. For use with CH Enhanced 50 Series sensor.	0.39
6150E-6503	\$7.25	Mounting bracket, right-angle ball swivel, 60 degree vertical and horizontal adjustment, plastic. For use with CH Enhanced 50 Series sensor. Ball swivel allows for ±30° sensor angle.	0.11



6150E-6501



6150E-6502

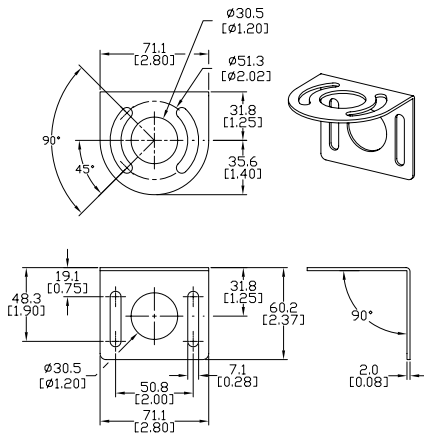


6150E-6503

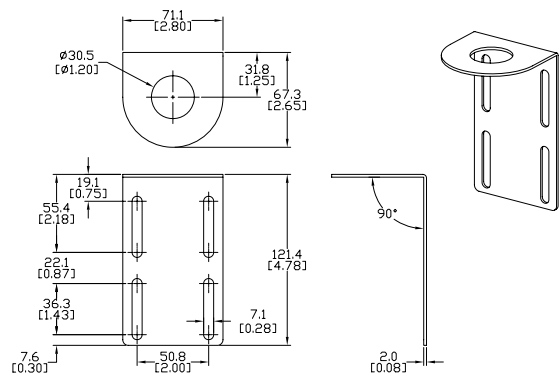
Dimensions

mm [inches]

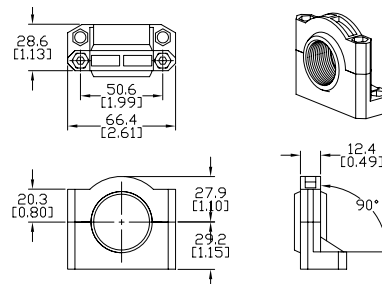
6150E-6501



6150E-6502



6150E-6503



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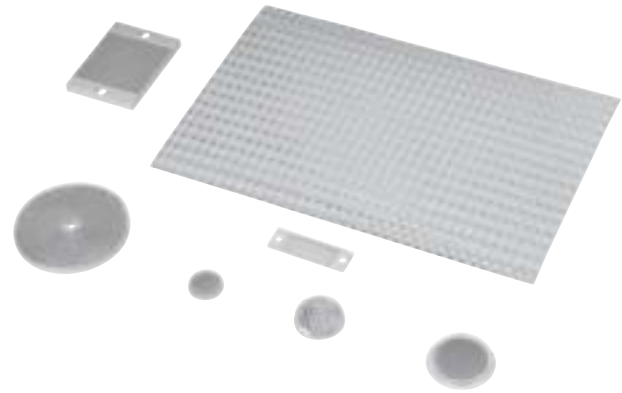
Reflectors

RL Series Reflectors for Polarized Reflective Photoelectric Sensors (All Models)

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

Installation Notes

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



Specifications						
Model	Price	Quantity	Dimensions	Degree of Protection	Mounting	Materials
RL102	\$35.00	10 per pack	25mm [0.98 in]	IEC IP67	Customer-supplied adhesive or other mounting method required	Reflective face: PMMA Polymethylmethacrylate (acrylic) Base material: ABS (Acrylonitrile-butadiene-styren)
RL102-1	\$3.75	1 per pack				
RL103	\$40.00	10 per pack	34.5 mm [1.36 in]			
RL103-1	\$4.25	1 per pack				
RL104	\$40.00	10 per pack	46mm [1.81 in]			
RL104-1	\$4.25	1 per pack				
RL105 *	\$35.00	10 per pack	90 x 40 mm [3.54 x 1.58 in]		Two 4.3 mm holes	
RL105-1 *	\$3.75	1 per pack				
RL105G *	\$35.00	10 per pack	95 x 38 mm [3.74 x 1.50 in]		Two 6mm holes	
RL105G-1 *	\$3.75	1 per pack				
RL106G	\$40.00	10 per pack	182 x 42 mm [7.17 x 1.65 in]		One 5mm hole	
RL106G-1	\$4.25	1 per pack				
RL110	\$18.00	10 per pack	84mm [3.31 in]		Two 3mm holes	
RL110-1	\$2.00	1 per pack				
RL116	\$18.00	10 per pack	41 x 60 mm [3.54 x 2.36 in]	Self-adhesive		
RL116-1	\$2.00	1 per pack				
RL100DA4	\$32.50	1 per pack	200 x 300 mm [7.87 x 11.81 in]	Paper (Acrylic tape with micro prism)		
RL100DC4	\$10.00	1 per pack	50 x 300 mm [1.97 x 11.81 in]			
RL100DQ1	\$7.50	1 per pack	100 x 100 mm [3.94 x 3.94 in]	Two 3mm slots		
RL111G	\$52.00	10 per pack	22.5 x 47 mm [0.89 x 21.85 in]			
RL111G-1	\$6.00	1 per pack				
RL112G	\$40.00	10 per pack	19 x 73 mm [0.75 x 2.87 in]	Two 4mm slots		
RL112G-1	\$4.25	1 per pack				
RL113G	\$46.00	10 per pack	51.4 x 60.3 mm [2.02 x 2.37 in]			
RL113G-1	\$5.00	1 per pack				

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

* Note: RL105 and RL105-1 reflectors are being replaced by the RL105G and RL105G-1 models, and will no longer be available once our current stock is depleted.

The new reflectors function the same but the dimensions are slightly different. Compare the outside dimensions shown in this table and the dimensional drawings on the next page.

Reflectors

RL Series Reflectors for Polarized Reflective Laser Photoelectric Sensors (FALN series)

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

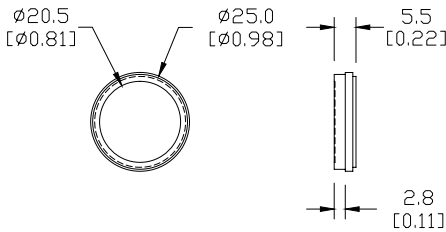
Specifications						
Model	RL201	RL201-1	RL203	RL203-1	RL204	RL204-1
Price	\$32.00	\$7.00	\$30.00	\$6.50	\$26.00	\$5.75
Quantity (per package)	5	1	5	1	5	1
Dimensions	60 x 82 mm 2.36 x 3.23 in		19 x 6mm 0.75 x 2.36 in		20mm x 32mm 0.80 in x 1.26 in	
Degree of Protection ¹	IEC IP67					
Mounting	Two 0.4 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.

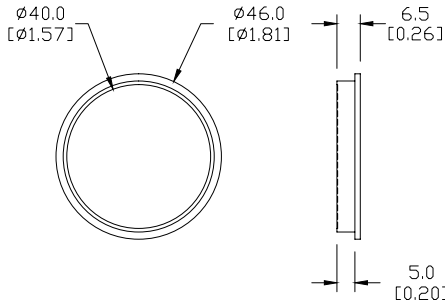
Dimensions

mm [inches]

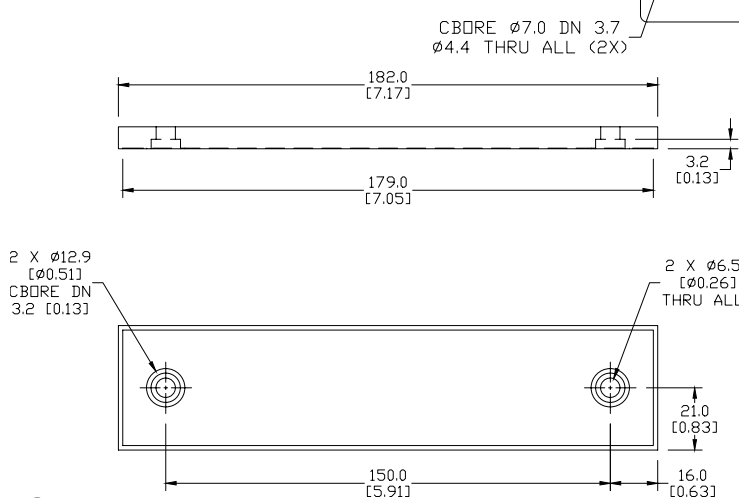
RL102/RL102-1



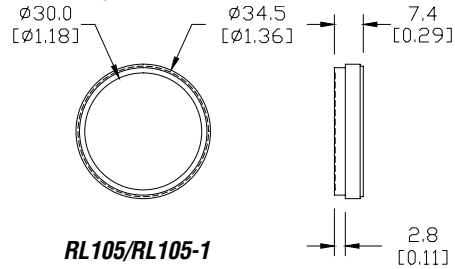
RL104/RL104-1



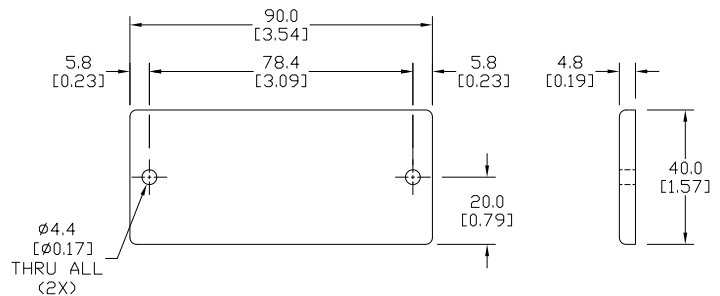
RL106G/RL106G-1



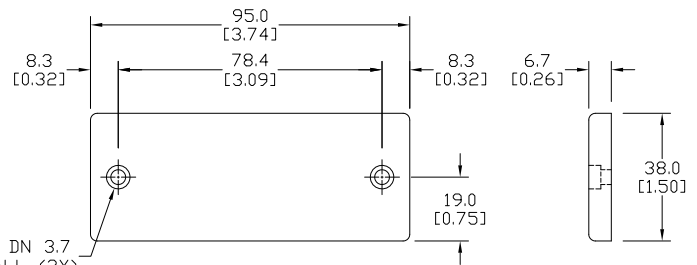
RL103/RL103-1



RL105/RL105-1



RL105G/RL105G-1



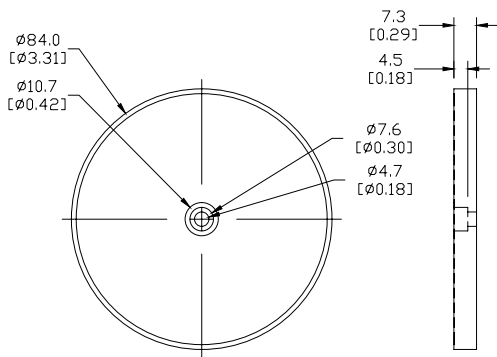
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Reflectors

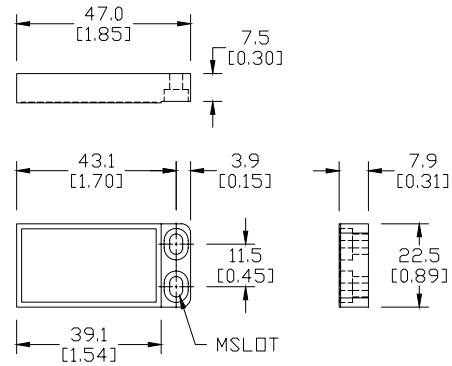
Dimensions

mm [inches]

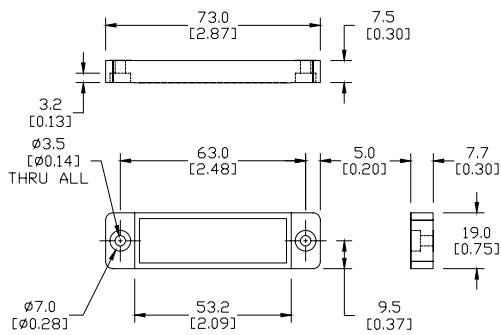
RL110/RL110-1



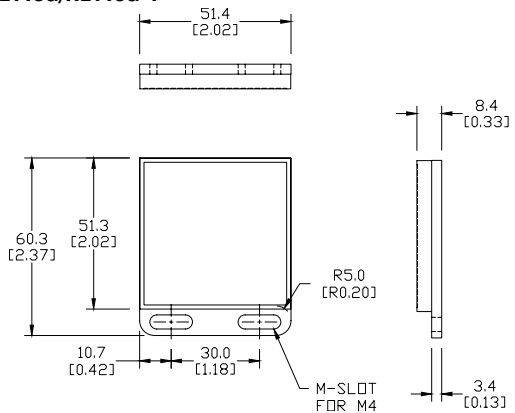
RL111G/RL111G-1



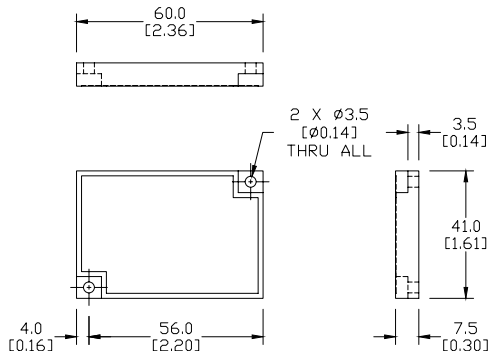
RL112G/RL112G-1



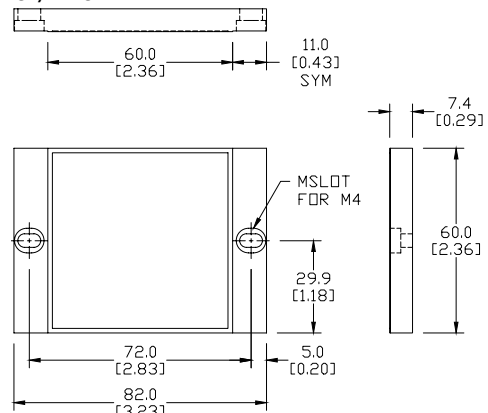
RL113G/RL113G-1



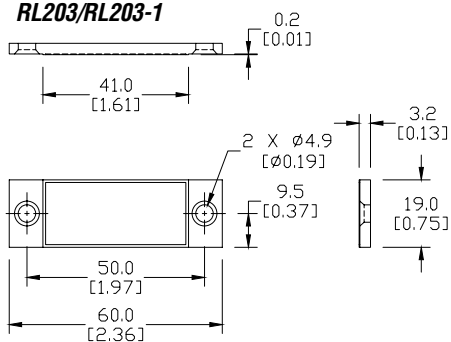
RL116/RL116-1



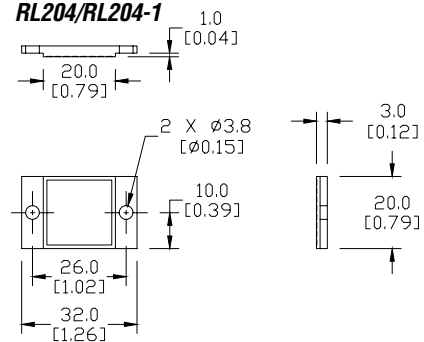
RL201/RL201-1



RL203/RL203-1



RL204/RL204-1



See our website: www.AutomationDirect.com for complete engineering drawings