

# CX Series Photoelectric Sensors

## Mini-rectangular plastic - DC



- 18 models available
- Long operating distances
- Adjustable sensitivity
- Scratch-resistant and easy to clean glass lens
- Axial cable or M8 quick-disconnect models
- Complete overload protection
- Mounting brackets are not needed
- IP65 rated



**CX Series Mini-Rectangular Photoelectric Sensors Selection Chart**

Part Number	Price	Sensing Range	Output State	Logic	Connection	Wiring	Dimensions	Characteristic Curves	
<b>Diffuse</b>									
<b>CX3-AN-1A</b>	\$48.50	Up to 600 mm (23.62 in)	N.O.	NPN	2 m (6.5') axial cable	Diagram 1	Figure 1	Chart 1	
<b>CX3-AP-1A</b>	\$48.50			PNP	2 m (6.5') axial cable	Diagram 2	Figure 1	Chart 1	
<b>CX3-AN-1F</b>	\$48.50			NPN	M8 (8 mm) connector	Diagram 1	Figure 2	Chart 1	
<b>CX3-AP-1F</b>	\$48.50			PNP	M8 (8 mm) connector	Diagram 2	Figure 2	Chart 1	
<b>Diffuse with background suppression</b>									
<b>CX5-AN-1A</b>	\$65.00	15-150 mm (0.59 to 5.91 in)	N.O.	NPN	2 m (6.5') axial cable	Diagram 1	Figure 1	Chart 2	
<b>CX5-AP-1A</b>	\$65.00			PNP	2 m (6.5') axial cable	Diagram 2	Figure 1	Chart 2	
<b>CX5-AN-1F</b>	\$65.00			NPN	M8 (8 mm) connector	Diagram 1	Figure 2	Chart 2	
<b>CX5-AP-1F</b>	\$65.00			PNP	M8 (8 mm) connector	Diagram 2	Figure 2	Chart 2	
<b>Polarized reflective*</b>									
<b>CXP-AN-1A</b>	\$51.00	Up to 2 m (6.6 ft)	N.O.	NPN	2 m (6.5') axial cable	Diagram 1	Figure 1	Chart 3	
<b>CXP-AP-1A</b>	\$51.00			PNP	2 m (6.5') axial cable	Diagram 2	Figure 1	Chart 3	
<b>CXP-AN-1F</b>	\$51.00			NPN	M8 (8 mm) connector	Diagram 1	Figure 2	Chart 3	
<b>CXP-AP-1F</b>	\$51.00			PNP	M8 (8 mm) connector	Diagram 2	Figure 2	Chart 3	
<b>Through-beam**</b>									
<b>CXR-AN-1A</b>	Receiver	\$48.50	Up to 6 m (19.7 ft)	N.O.	NPN	2 m (6.5') axial cable	Diagram 1	Figure 1	Chart 4
<b>CXR-AP-1A</b>	Receiver	\$48.50			PNP	2 m (6.5') axial cable	Diagram 2	Figure 1	Chart 4
<b>CXR-AN-1F</b>	Receiver	\$48.50			NPN	M8 (8 mm) connector	Diagram 1	Figure 2	Chart 4
<b>CXR-AP-1F</b>	Receiver	\$48.50			PNP	M8 (8 mm) connector	Diagram 2	Figure 2	Chart 4
<b>CXE-ON-1A</b>	Emitter	\$30.50	Receiver dependent	Receiver dependent	2 m (6.5') axial cable	Diagram 3	Figure 1	Chart 4	
<b>CXE-ON-1F</b>	Emitter	\$30.50			M8 (8 mm) connector	Diagram 3	Figure 2	Chart 4	

\*Purchase reflectors separately.

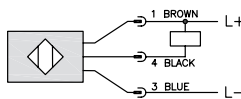
\*\*Purchase one receiver and one emitter for a complete set.

	Switching Element Function	
	Thru-beam and Reflective Models	Diffuse Reflective Models
<b>Light on</b>	N.C.	N.O.
<b>Dark on</b>	N.O.	N.C.

## Wiring Diagrams

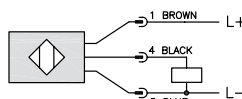
**Diagram 1**

NPN Output



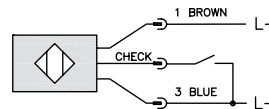
**Diagram 2**

PNP Output



**Diagram 3**

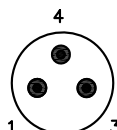
Emitter



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

## Connector

M8 connector



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

# CX Series Photoelectric Sensors

Specifications	Diffuse Models	Diffuse Models with Background Suppression	Reflective Models	Through-beam Models <sup>1</sup>
<b>Type</b>	Diffuse reflection	Diffuse reflection with background suppression	Polarized reflection	Through-beam
<b>Sensing Distance</b>	600mm <sup>2</sup>	15 to 150mm <sup>3</sup>	2m	6m
<b>Light Spot Diameter</b>	See charts			
<b>Emission</b>	IR-LED (880nm)	LED red (660nm)	LED red polarized(660nm)	IR-LED (880nm)
<b>Sensitivity</b>	Adjustable 12-turn pot.			
<b>Output Type</b>	NPN or PNP; N.O. only			
<b>Operating Voltage</b>	10-36VDC			
<b>No Load Supply Current</b>	15mA	25mA	15mA	15mA (R) / 10mA (E)
<b>Operating (Load) Current</b>	≤200mA			
<b>Off-state (Leakage) Current</b>	≤10μA			
<b>Voltage Drop</b>	≤2.0V			
<b>Switching Frequency</b>	1kHz	500Hz	1kHz	1kHz
<b>Ripple</b>	≤20%			
<b>Time Delay Before Availability (tv)</b>	100ms			
<b>Short-Circuit Protection</b>	Yes (switch autoresets after overload is removed)			
<b>Operating Temperature</b>	-25° to +55°C (-13° to 131°F)			
<b>Protection Degree (DIN 40050)</b>	IEC IP65			
<b>LED Indicators - Switching Status</b>	Yellow (output state, output energized), green (excess light indication)			
<b>Housing Material</b>	PBTP (Crastin)			
<b>Lens Material</b>	Glass			
<b>Shock/Vibration</b>	See terminology section			
<b>Tightening Torque</b>	N/A			
<b>Weight (cable/connector)</b>	84g (2.96 oz)/49g (1.73 oz)			232g (8.40oz)/98g (3.46oz)
<b>Connectors</b>	2m (6.5') axial cable; M8 (8 mm) connector			
<b>Agency Approvals</b>	cULus E32881			

<sup>1</sup> Through-beam sensors must be used in pairs consisting of one receiver and one emitter <sup>2</sup>With 200x200mm white matte paper, <sup>3</sup>With 100x100mm white matte paper

## Dimensions

(mm)

Figure 1

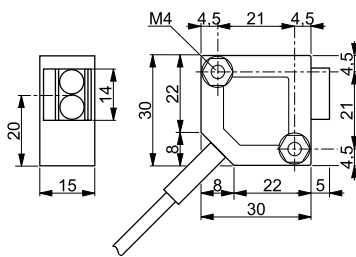
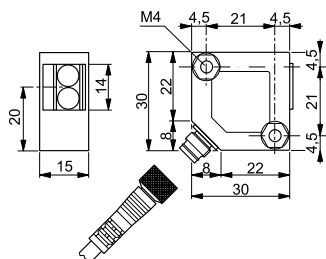


Figure 2



## Characteristic curves

Chart 1 (Diffuse)

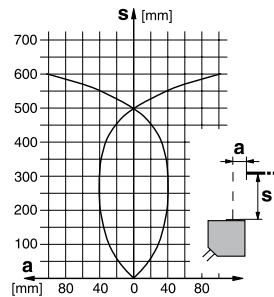


Chart 2 (Diffuse with background suppression)

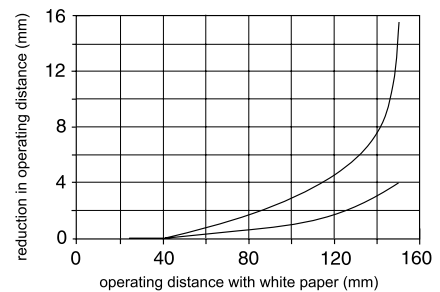


Chart 3 (Polarized reflective)

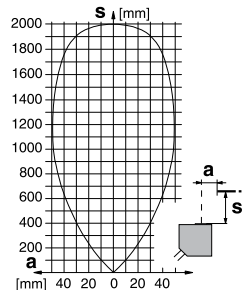
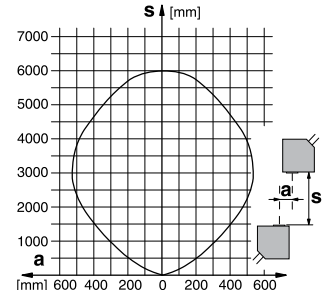


Chart 4 (Through-beam)



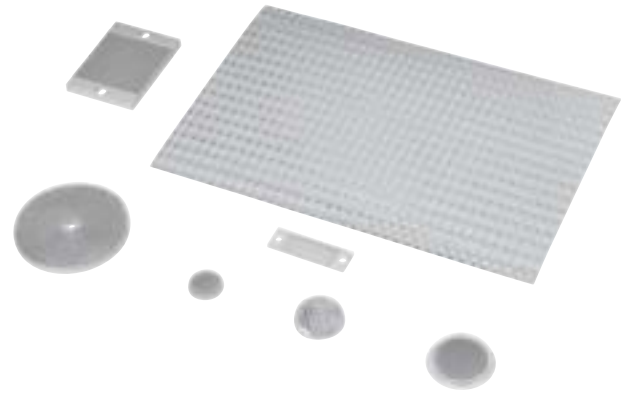
# Reflectors

## 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°.



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]				
RL105G-1 *	\$3.75	1 per pack					
RL106G	\$40.00	10 per pack	182 x 42 mm [7.17 x 1.65 in]		Two 6mm holes		
RL106G-1	\$4.25	1 per pack					
RL110	\$18.00	10 per pack	84mm [3.31 in]		One 5mm hole		
RL110-1	\$2.00	1 per pack					
RL116	\$18.00	10 per pack	41 x 60 mm [3.54 x 2.36 in]		Two 3mm holes		
RL116-1	\$2.00	1 per pack					
RL100DA4	\$32.50	1 per pack	200 x 300 mm [7.87 x 11.81 in]		Self-adhesive		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]				
RL111G	\$52.00	10 per pack	22.5 x 47 mm [0.89 x 21.85 in]		Two 3mm slots		Reflective face: PMMA Polymethylmethacrylate (acrylic)  Base material: ABS (Acrylonitrile-butadiene-styren)
RL111G-1	\$6.00	1 per pack					
RL112G	\$40.00	10 per pack	19 x 73 mm [0.75 x 2.87 in]				
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]	Two 4mm slots			
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

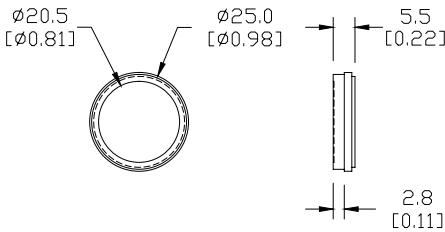
Specifications						
Model	RL201	RL201-1	RL203	RL203-1	RL204	RL204-1
Price	\$32.00	\$7.00	\$30.00	\$6.50	\$26.00	\$5.75
Quantity (per package)	5	1	5	1	5	1
Dimensions	60 x 82 mm 2.36 x 3.23 in		19 x 6mm 0.75 x 2.36 in		20mm x 32mm 0.80 in x 1.26 in	
Degree of Protection <sup>1</sup>	IEC IP67					
Mounting	Two 0.4 mm holes		Two 0.4 mm holes		Two 0.3 mm holes	
Materials	Acrylic/polycarbonate					

<sup>1</sup> Not recommended for applications involving moist air environments or water immersion.

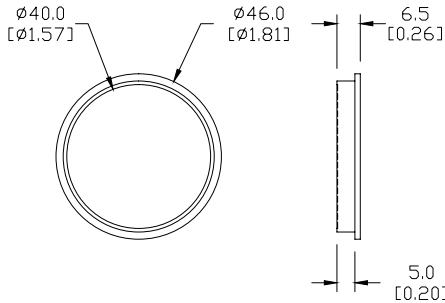
### Dimensions

mm [inches]

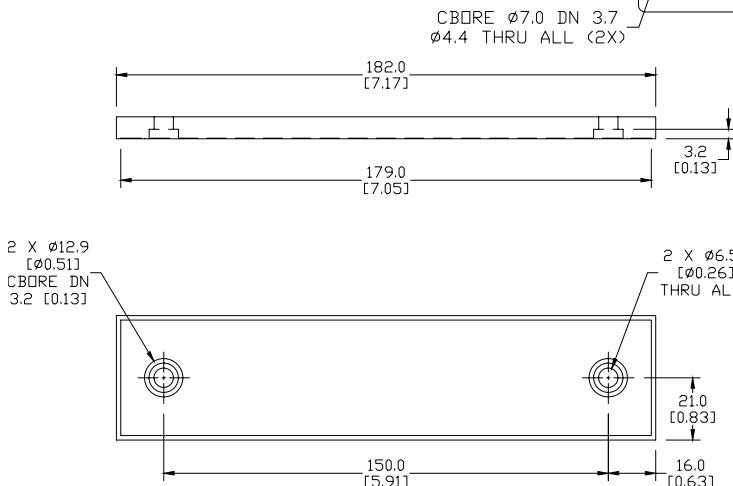
#### RL102/RL102-1



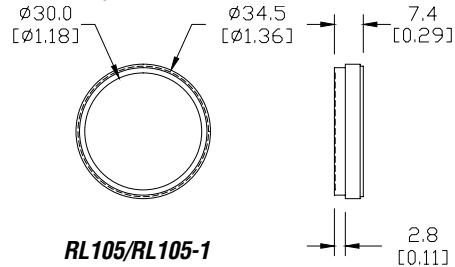
#### RL104/RL104-1



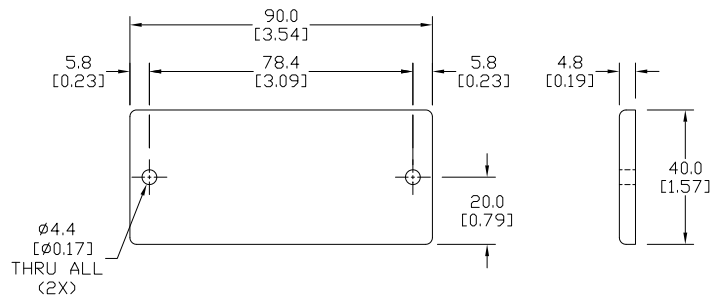
#### RL106G/RL106G-1



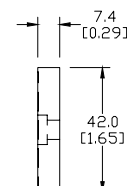
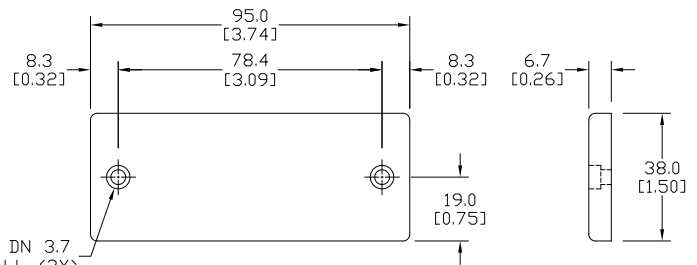
#### RL103/RL103-1



#### RL105/RL105-1



#### RL105G/RL105G-1



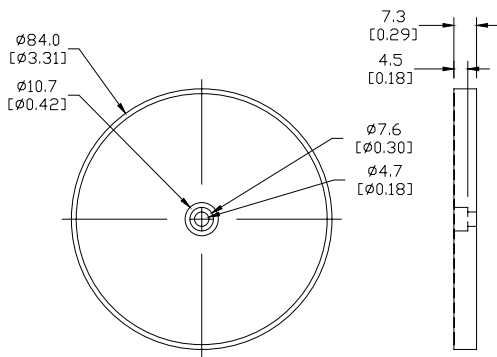
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# Reflectors

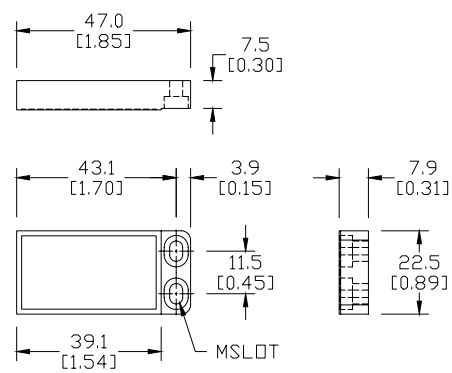
## Dimensions

mm [inches]

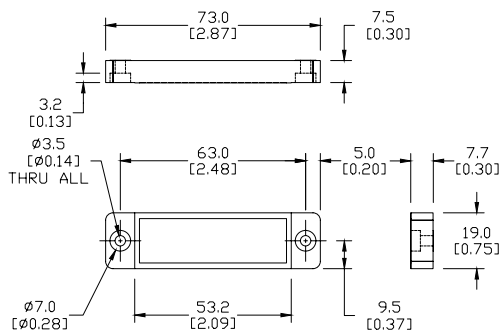
**RL110/RL110-1**



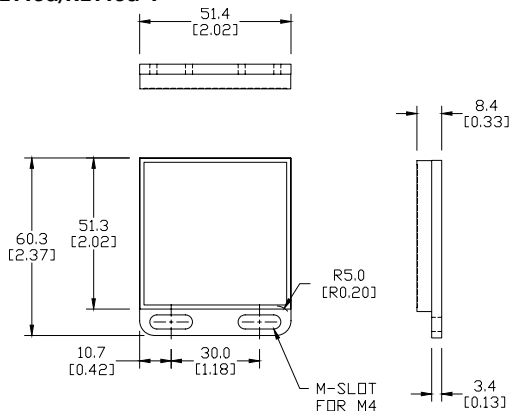
**RL111G/RL111G-1**



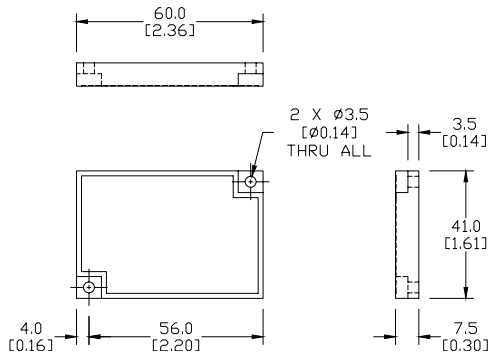
**RL112G/RL112G-1**



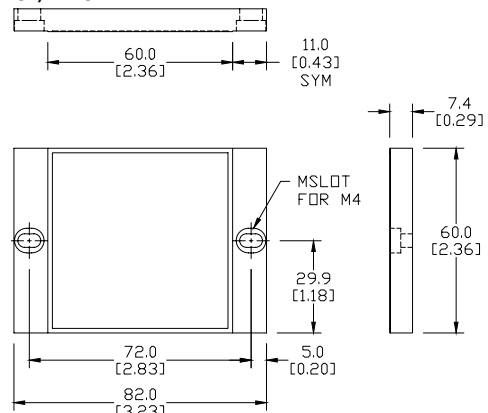
**RL113G/RL113G-1**



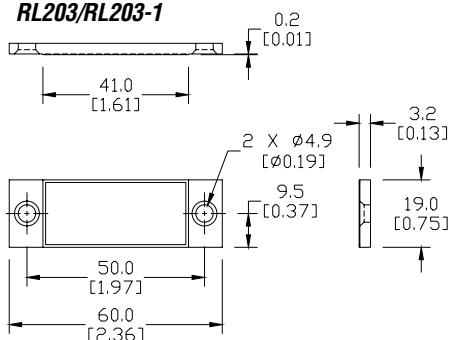
**RL116/RL116-1**



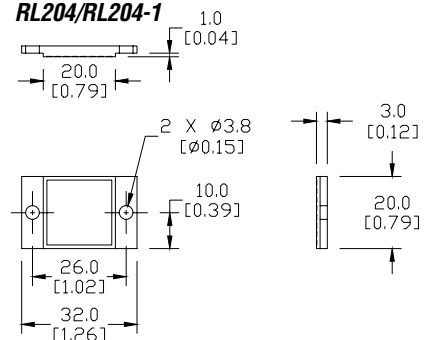
**RL201/RL201-1**



**RL203/RL203-1**



**RL204/RL204-1**



See our website: [www.AutomationDirect.com](http://www.AutomationDirect.com) for complete engineering drawings