August 2007

OEM Prism Series Photoelectric Sensors

Contents

Overview 1
Model Selection, Sensors 2
Model Selection, Compatible Connector Cables 2
Wiring Diagrams 3
Model Selection, Accessories 4
Specifications 5
Dimensions 5

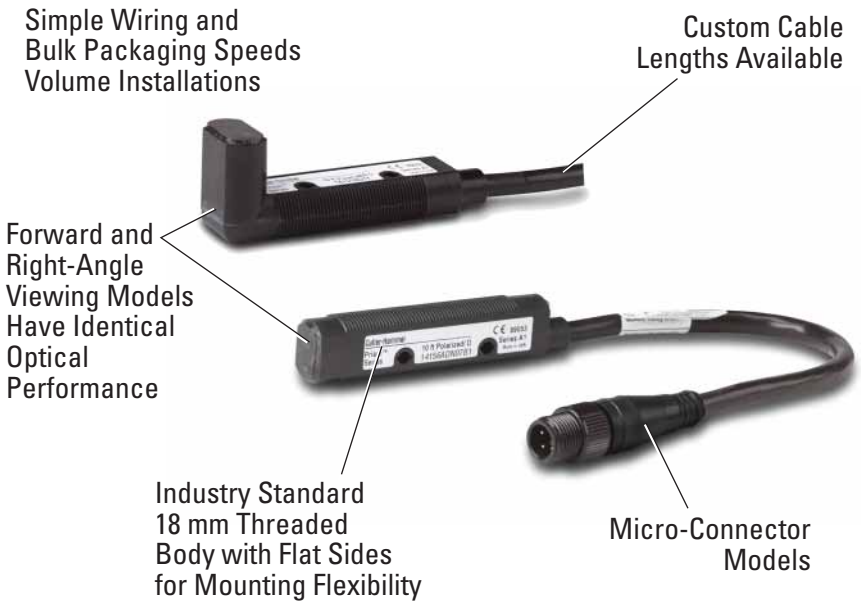
The Cutler-Hammer® OEM Prism Series from Eaton's electrical business is very similar to our standard cost-effective Prism Series and has been optimized for high volume OEM use. In place of the isolated output found in the standard models, the OEM Prism features dual or single discrete outputs for simple wiring. In addition, OEM Prism sensors are shipped bulk packaged for easier handling by both the receiver and the installer. Forward and right-angle viewing models feature identical gain and optical characteristics for the best fit on your machine. A gain control allows quick adjustment for peak optical performance in a variety of applications. Both diffuse reflective and polarized reflex models are available.

All models are 10 – 30V DC only to meet the evolving needs of your customers. Polarized reflex units eliminate reliability problems when sensing shiny objects. Visible red sensing beams allow you to see exactly where the sensors are aimed for easier setup. Models are available preconfigured in either Light or Dark Operate modes.

The unique threaded body with flat sides allows quick mounting in a 3/4 inch hole or against any flat surface. Internal components are rigidly sealed in a solid encapsulated package for excellent performance in high-vibration and high-shock applications.

Unless otherwise noted, the products contained in this document are not designed or intended for use in human safety applications.

High Performance 18 mm Tubular Sensors Packaged for High Volume Users

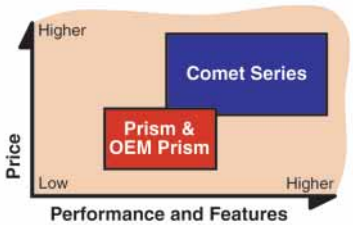


Product Features

- Small size for use in a wide variety of applications and locations
- Sensors are shipped bulk-packed for the convenience of high volume users
- High sensing power for longer ranges and resistance to dust and dirt
- Adjustable gain control to ensure peak optical performance
- High noise immunity, which greatly reduces problems associated with electrical noise
- NPN and PNP outputs provided in a single sensor for simple wiring
- Short circuit protection
- Quick 1.2 mS response time
- Output status LED is highly visible from a wide 300° angle
- Cable models allow for lowest cost wiring
- Micro-connector models provide for quick installation or replacement
- Custom cable length options

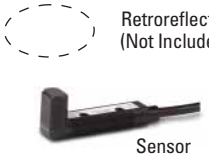
Product Comparison

Eaton's cost-effective Prism Series, OEM Prism and premium Comet Series all share the same 18 mm flat-sided housing. This results in the largest interchangeable sensor family available, allowing you to select from well over 250 different models to solve the widest variety of sensing applications.



For Customer Service in the U.S. call **1-800-356-1243**, in Canada call **1-800-268-3578**.
For Application Assistance in the U.S. and Canada call **1-800-426-9184**.

Model Selection — Sensors

	Operating Voltage	Sensing Range	Optimum Range	Field of View	Output Type	Connection Type	Catalog Number	
							Light Operate	Dark Operate
3-Wire and 4-Wire Sensors								
Polarized Reflex Forward Viewing ① For a complete system, order Sensor and Retroreflector (See **PG.05E.17.T.E**)	10 – 30V DC	10 feet (3m)②	0.1 to 8 feet (0.03 – 2.4m)	3 inch (76 mm) diameter at 12 feet (3.6m)	NPN and PNP	6-foot Cable	**14156AL17B1**	**14156AD17B1**
						4-pin Micro DC Connector	**14156AL07B1** ⊛	**14156AD07B1** ⊛
Polarized Reflex Right-Angle Viewing ①  For a complete system, order Sensor and Retroreflector (See **PG.05E.17.T.E**)	10 – 30V DC	10 feet (3m)②	0.1 to 8 feet (0.03 – 2.4m)	3 inch (76 mm) diameter at 12 feet (3.6m)	NPN and PNP	6-foot Cable	**14156RL17B1**	**14156RD17B1**
						4-pin Micro DC Connector	**14156RL07B1** ⊛	**14156RD07B1** ⊛
Diffuse Reflective Right-Angle Viewing ①	10 – 30V DC	8 inches (200 mm)③	0.1 to 5 inches (3 – 127 mm)	2 inch (51 mm) diameter at 5 inches (127 mm)	NPN and PNP	6-foot Cable	**13156RL17B1**	**13156RD17B1**
						4-pin Micro DC Connector	**13156RL07B1** ⊛	**13156RD07B1** ⊛
		24 inches (609 mm)③	0.1 to 15 inches (3 – 381 mm)	6 inch (152 mm) diameter at 15 inches (381 mm)	NPN and PNP	6-foot Cable	**13157RL17B1**	**13157RD17B1**
						4-pin Micro DC Connector	**13157RL07B1** ⊛	**13157RD07B1** ⊛

① Contact factory for approval status.
② Ranges based on a 3" diameter retroreflector.
③ Sensor will detect a 90% reflectance white card at this range.

⊛ See listing of compatible connector cables below.

Model Selection — Compatible Connector Cables ④

	Voltage Style	Number of Pins	Gauge	Length	Catalog Number			Pin Configuration/Wire Colors (Face View Female Shown)
					PVC Jacket	PUR Jacket	IRR PUR Jacket	
Standard Cables — Micro Style								
Micro Style Straight Female	DC	4-pin 4-wire	22 AWG	6.0 feet (2m)	**CSDS4A4CY2202**	**CSDS4A4RY2202**	**CSDS4A4IO2202**	1-Brown 2-White 3-Blue 4-Black

④ For a full selection of connector cables, see **PG.05.05.T.E**.
Stocked product, typical order quantities guaranteed in stock.

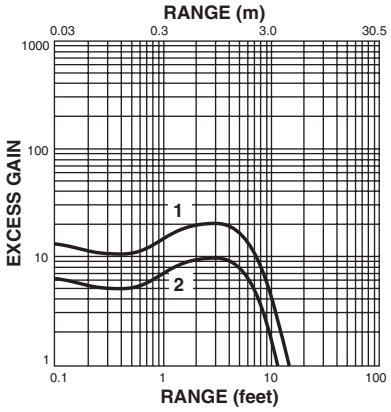
Excess Gain

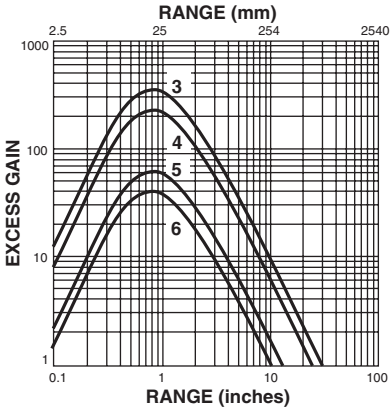
Polarized Reflex
(3-inch diameter retroreflector)

1. 14156 Typical performance
2. 14156 Minimum performance

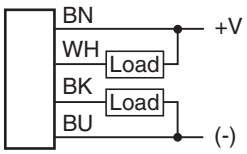
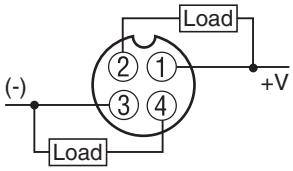
Diffuse Reflective
(90% reflective white card)

3. 13157 Typical performance
4. 13157 Minimum performance
5. 13156 Typical performance
6. 13156 Minimum performance

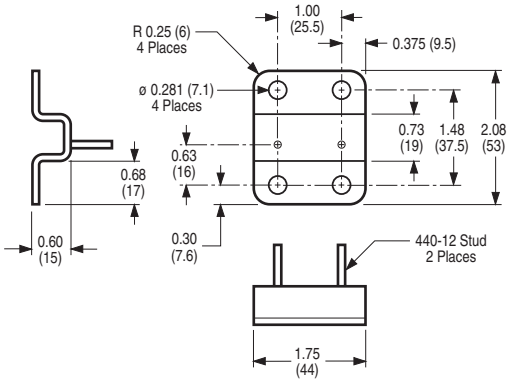
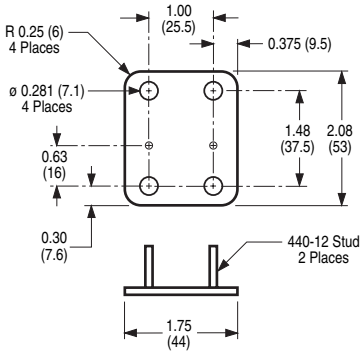
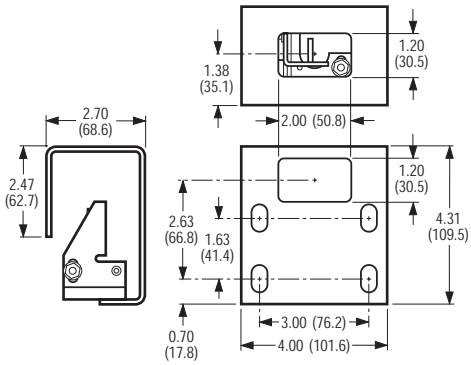
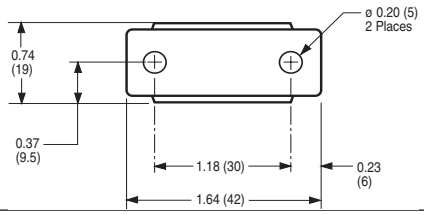




Wiring Diagrams (Pin numbers are for reference, rely on pin location when wiring)

Operating Voltage	Output	Cable Models	Micro-Connector Models (face view male shown)
4-Wire Sensors			
10 – 30V DC	NPN and PNP		

Model Selection — Accessories

	Description	Catalog Number	Approximate Dimensions in Inches (mm)
Retroreflectors	Retroreflectors and retroreflective tape	See **PG.05E.17.T.E**	
Mounting Brackets	A wide variety of mounting brackets for tubular sensors	See **PG.05.03.T.E**	
Flush Mount Bracket	Contoured design is ideal for flush mounting of right-angle OEM Prism Series polarized reflex to mounting surface using 1/4-inch hardware. No alignment adjustment. Sensor mounts on #4 studs. 304 Stainless Steel	**6161AS5296**	
Flush Mount Bracket	Same as above except without contour. Ideal for right-angle diffuse sensors. 304 Stainless Steel	**6161AS5297**	
Adjustable Protective Bracket	Heavy-duty bracket protects the sensor from damage. Works with all OEM Prism Series sensors. Ideal for material handling applications with the OEM Prism Series right-angle polarized reflex sensor. Provides locking vertical and horizontal adjustments for independent adjustment in each axis. Sensor mounts on #4 studs. 10 ga. painted steel	**E58KS5200**	
Comet/Prism Ball Swivel Bracket	Allows 360° rotation and 10° vertical tilt. Hole spacing is identical to our 50 and 55 Series sensors. Ideal for mounting right-angle sensors. Made of Noryl®.	**6181AS5200**	
Accessories	Replacement mounting nuts and other accessories	See **PG.05.04.T.E**	
Connector Cables	A variety of cables, connector blocks and accessories	See **PG.05.05.T.E**	

Stocked product, typical order quantities guaranteed in stock.

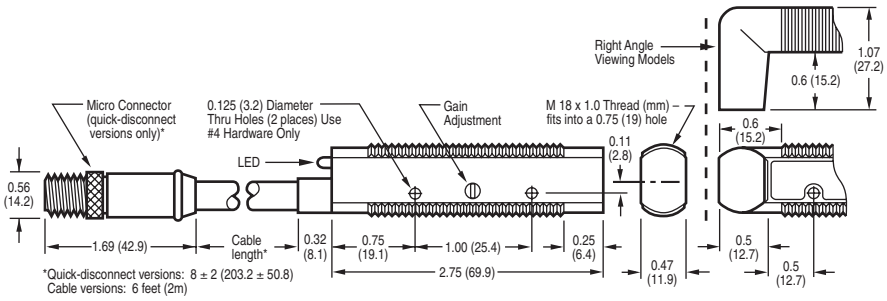
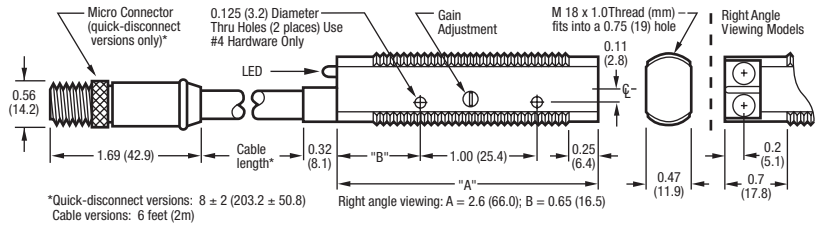
Specifications

	DC Only Models
Input Voltage	10 to 30V DC
Power Dissipation	1W maximum
Output Type	NPN and PNP
Current Switching Capacity	100 mA maximum
OFF-State Leakage	10 µA maximum
ON-State Voltage Drop	NPN: 2.0V at 100 mA; PNP: 2.5V at 100 mA
Short Circuit Protection	Sensor will turn off immediately when short or overload is detected (indicator LED flashes). Sensor will reset when short is removed.
Response Time	1.2 mS
Light/Dark Operation	Specified by Catalog Number
Temperature Range	Operating: -13° to +131°F (-25° to +55°C); Storage: -13° to +158°F (-25° to +70°C)
Sunlight Immunity	1,000 foot-candles
Material of Construction	Lens: polycarbonate; Cable jacket: PVC; Body: structural polyurethane foam (do not expose to concentrated acids, alcohols or ketones)
Cable Versions	2m length; 4 conductor cable
Connector Versions	Micro-Connector, 4-pin male, DC key, on nominal 8" pigtail
Vibration and Shock	Vibration: 30g over 10 Hz to 2 kHz; Shock: 50g for 10 mS 1/2 sine wave pulse
Indicator LED	Lights steady when output is ON; OFF when output is OFF: OFF when output is in short circuit mode
Enclosure Ratings	NEMA 1, 2, 3, 4, 4X, 6, 12 and 13 ①

① **NOTE:** Photoelectric sensors conform to NEMA tests as indicated above, however, some severe washdown applications can exceed these NEMA test specifications. If questions about a particular application arise, contact Eaton's Cutler-Hammer Sensor Applications Department at 1-800-426-9184.

Approximate Dimensions in Inches (mm) Except Where Noted

Polarized Reflex Models



Diffuse Reflective Models