Retroreflectors

Contents

Cutler-Hammer® Retroreflectors from Eaton's electrical business are used with reflex-type sensors. Two types of retroreflective target material are available: corner cube and embedded glass bead.

Corner Cube Retroreflectors

This type provides the highest signal return to the sensor, typically 2000 to 3000 times the reflectivity of white paper. Three adjoining sides are arranged at right angles to each other. When a ray of light strikes one of these sides (A), it is reflected to the second (B), then the third (C), and then back to the source parallel to its original course. Thousands of these cube shapes are molded into a rugged plastic reflector or vinyl tape material. Corner cube retroreflectors are suitable for use with both standard reflex and polarized reflex sensors.


Corner cube
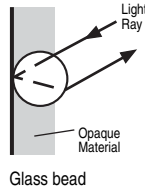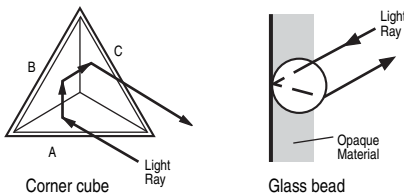
Glass bead

Glass Bead Retroreflectors

Glass bead retroreflectors are available in tape form with an adhesive backing. The bead style surface is typically rated at 200 to 900 times the reflectivity of white paper — much lower than corner cube reflectors. Glass bead retroreflectors are not suitable for use with polarized reflex sensors.

For the most current information on this product, visit our web site: www.EatonElectrical.com

High Quality Retroreflectors and Retroreflective Tape in a Wide Variety of Sizes to Meet Your Needs

Retroreflectors Available in Both Rectangular and Round Form Factors
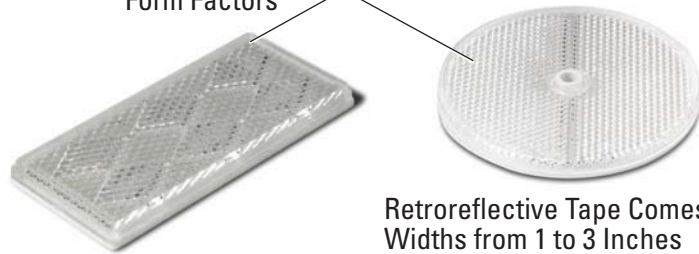
Retroreflective Tape Comes in Widths from 1 to 3 Inches

Retroreflector Size

The size of the retroreflective target has a significant effect on the excess gain and range of a reflex sensor. In general, we recommend you use the largest possible reflector in every reflex sensing application to maximize performance of the sensor and simplify alignment. To provide an even larger reflective area, multiple retroreflectors can be grouped together as shown.

7 Retroreflectors Grouped Together

Using Retroreflectors with Polarized Reflex Sensors

Only corner cube retroreflective material can be used with polarized reflex sensors. When polarized light from the sensor's light source strikes a corner cube retroreflector, it is returned to the sensor in a depolarized state. This allows some of the light to pass through the detector's polarizer, which is positioned at 90° to the source polarizer, to allow the sensor to operate.

Glass bead retroreflectors do not depolarize light and will not work with polarized reflex sensors.

Molded plastic corner cube retroreflectors are always recommended as they provide the highest signal return to the sensor.

Corner cube tape works with polarized reflex sensors but returns less light to the sensor. In all cases, Eaton recommends testing sensor and tape prior to final installation.

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SENSOR ACCESSORIES

Model Selection — Retroreflectors

|	Description	Catalog Number
Corner Cube Retroreflector		
	1.5 x 3.25 inch, adhesive backed, one per package	**6200A-6507**
	3 inch diameter, with mounting hole, two per package	**6200A-6501**
	Bulk packaged version of above (ordered quantity will be bulk packaged)	**6200AS6501**
	3 inch diameter, with mounting hole, one per package	**E51KR84**
	3 inch diameter, metal backed, with mounting hole, one per package	**6200A-6506**
	2.18 inch diameter, with mounting hole, one per package	**6200A-6505**
	2.18 inch diameter, adhesive backed, one per package	**6200A-6502**
	1.25 inch diameter, adhesive backed, one per package	**6200A-6504**
	Bulk packaged version of above (ordered quantity will be sent bulk packaged)	**6200AS6504**
	1.25 inch diameter, no adhesive, one per package	**E51KR32**

Retroreflective Tape

	Corner Cube Style ①	
	2 inch wide, 1 piece, quantity is length in feet	**6201A-XXXX**
	3 inch wide, 1 piece, quantity is length in feet	**6203A-XXXX**
	Glass Bead Style (Not for use with polarized reflex sensors)	
	1 inch wide, 1 piece, quantity is length in feet	**6200A-XXXX**
	2 inch wide, 1 piece, quantity is length in feet	**6202A-XXXX**

① Although corner cube tape works with polarized reflex sensors, we recommend testing sensor and tape prior to installation.

☐ Fast turn product with typical one business day lead-time to shipment.

▨ Stocked product, typical order quantities guaranteed in stock.

Approximate Dimensions in Inches (mm)
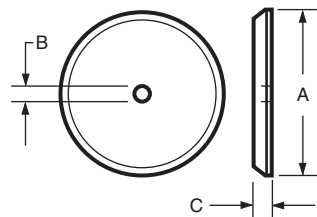
Round Retroreflectors

Catalog Number	Approximate Dimensions in Inches (mm)		
	A — Diameter	**B — Hole Size**	**C — Thickness**
6200A-6501	3.30 (84)	0.20 (5)	0.35 (9)
6200A-6502	2.40 (61)	None	0.30 (7.5)
6200A-6504	1.30 (33)	None	0.25 (6)
6200A-6505	2.40 (61)	0.25 (6)	0.30 (7.5)
6200A-6506	3.30 (84)	0.20 (5)	0.30 (7.5)
E51KR32	1.25 (32)	None	0.35 (9)
E51KR84	3.30 (84)	0.20 (5)	0.35 (9)

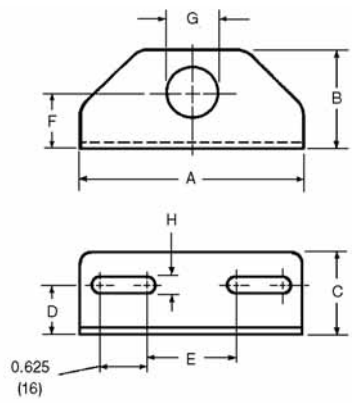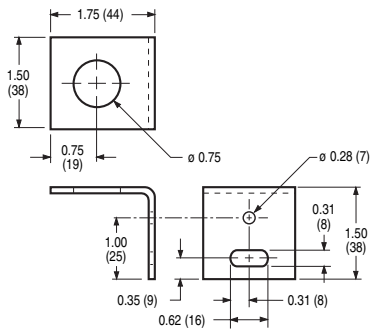## Sensor Mounting Brackets

Contents

**For the most current information
on this product, visit our web site:
www.EatonElectrical.com**

The Cutler-Hammer® Mounting Brackets by Eaton's electrical business found in this section are suited for use with 8 mm to 30 mm diameter tubular sensors only. Cutler-Hammer Mounting Brackets designed to specifically fit other types of sensors are found in the respective "Accessories" sections for those sensor families.

When choosing a bracket, consider:

■ Adjustability — Do you need minimal alignment capability (mounting an inductive proximity sensor), or a high level of alignment precision (mounting a long range photoelectric thru-beam sensor)?

■ Material of Construction — This can be dictated by the sensing environment or the type of sensor you are using.
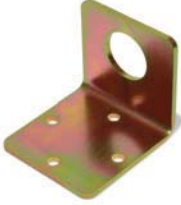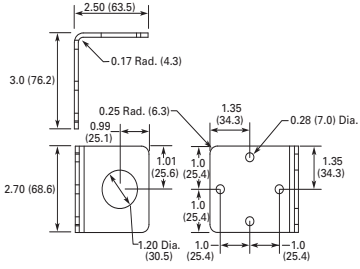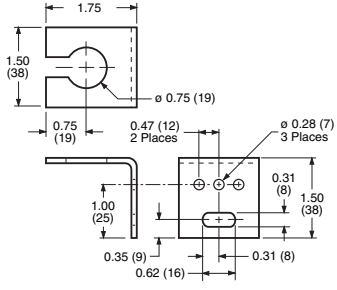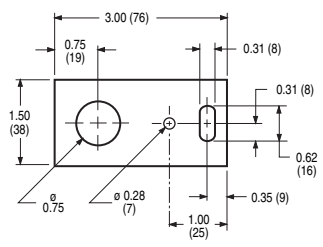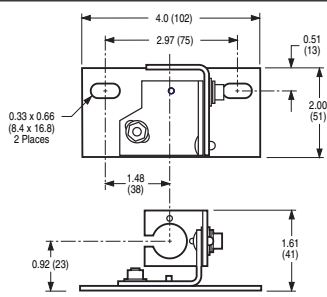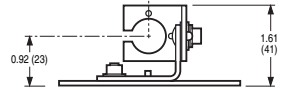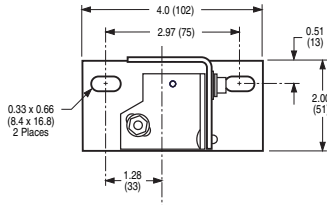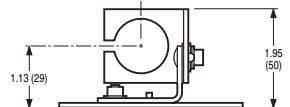
Model Selection — Mounting Brackets for Tubular Sensors

	Description	Size	Catalog Number	Approximate Dimensions in Inches (mm)
L-Shaped Bracket	Adjustability: Allows some adjustment in two axes Sensor Mounting: Sensor mounts with two jam nuts and washers (included with sensor) Material of Construction: Stainless steel Packaging: One per package	8 mm	**E57KM8**	
		12 mm	**E57KM12**	
		18 mm	**E57KM18**	
		30 mm	**E57KM30**	
L-Shaped Bracket	Adjustability: Allows some adjustment in one axis and allows for aiming of the sensor through a short arc Sensor Mounting: Sensor mounts with two jam nuts and washers (included with sensor) Material of Construction: Aluminum with chromate finish Packaging: Two per package	18 mm	**6161A-6501**	
	Same as **6161A-6501** (above), except: Packaging: Bulk packaged (ordered quantity will be sent bulk packed)	18 mm	**6161AS6501**	

Size	A	B	C	D
8 mm	3.00 (76)	1.35 (34)	1.125 (29)	0.65 (17)
12 mm	3.00 (76)	1.35 (34)	1.125 (29)	0.65 (17)
18 mm	3.00 (76)	1.35 (34)	1.125 (29)	0.65 (17)
30 mm	4.25 (108)	2.15 (55)	1.75 (45)	1.00 (25)

Size	E	F	G	H
8 mm	1.20 (31)	0.75 (19)	0.323 (8)	0.218 (6)
12 mm	1.20 (31)	0.75 (19)	0.484 (12)	0.218 (6)
18 mm	1.20 (31)	0.75 (19)	0.718 (18)	0.218 (6)
30 mm	2.00 (51)	1.25 (29)	1.203 (30)	0.281 (7)

▨ Stocked product, typical order quantities guaranteed in stock.

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Model Selection — Mounting Brackets for Tubular Sensors (Continued)

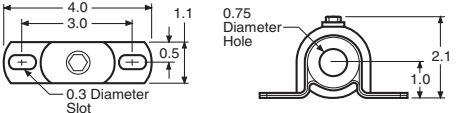|	Description	Size	Catalog Number	Approximate Dimensions in Inches (mm)
L-Shaped Bracket	Allows a minimum range. Suitable for 30 mm sensors. Adjustability: Allows some adjustment in one axis Sensor Mounting: Sensor mounts with two jam nuts (included with sensor) Material of Construction: Zinc dichromate Packaging: One per package	30 mm	**6167A-6501**	
L-Shaped Bracket with Slot	Adjustability: Allows some adjustment in one axis and allows for aiming of the sensor through a short arc Sensor Mounting: Sensor mounts with two jam nuts and washers (included with sensor) Material of Construction: Aluminum with chromate finish Packaging: Bulk packaged (ordered quantity will be sent bulk packed) Note: Allows installation of sensor with jam nuts already in place on Sensor Body (Comet and Prism Sensors only).	18 mm	**6161AS7050**	
Flat Bracket	Adjustability: Allows some adjustment in one axis and allows for aiming of the sensor through a short arc Sensor Mounting: Sensor mounts with two jam nuts and washers (included with sensor) Material of Construction: Aluminum with chromate finish Packaging: Bulk packaged (ordered quantity will be sent bulk packed)	18 mm	**6161AS5295**	
Adjustable Bracket	Adjustability: Locking vertical and horizontal adjustments for independent adjustments in each axis Sensor Mounting: Sensor mounts with two jam nuts and washers (included with sensor) Material of Construction: 304 stainless steel Packaging: One per package Note: Sensor is electrically isolated from mounting surface.	18 mm	**E58KAM18**	
	Same as **E58KAM18**, except not electrically isolated from mounting surface.	18 mm	**E58KAM18U**	
Adjustable Bracket	Adjustability: Locking vertical and horizontal adjustments for independent adjustment in each axis Sensor Mounting: Sensor mounts with two jam nuts (included with sensor) Material of Construction: 304 stainless steel Packaging: One per package Note: Sensor is electrically isolated from mounting surface.	30 mm	**E58KAM30**	
	Same as **E58KAM30**, except not electrically isolated from mounting surface.	30 mm	**E58KAM30U**	

▨ Stocked product, typical order quantities guaranteed in stock.

SENSOR ACCESSORIES

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Model Selection — Mounting Brackets for Tubular Sensors (Continued)

	Description	Size	Catalog Number	Approximate Dimensions in Inches (mm) Except Where Noted
18 mm Ball Swivel Bracket	Adjustability: Allows 360° rotation and 10° vertical tilt Sensor Mounting: Mounts directly to any 18 mm threaded sensor Material of Construction: 5% glass filled Valox® Packaging: One per package	18 mm	**E58KAM18B**	
Metal Ball Swivel Mount	Adjustability: Allows 5.5° rotation with screw lock to fix final position Sensor Mounting: Mounts directly to any 18 mm tubular sensor Material of Construction: Extremely rugged, made from zinc plated steel/Celenex® Packaging: One per package Note: Electrically isolates the sensor to prevent noise pick-up caused by poor grounding.	0.75 inch (18 mm)	**6168A-6501**	Note: Dimensions in Inches
Plastic Ball Swivel Mount	Adjustability: Allows 10° rotation on X and Y axes with a clamping action to hold adjustment Sensor Mounting: Mounts directly to any 8 mm tubular sensor Material of Construction: Noryl (avoid exposing to chlorinated halogenated or aromatic hydrocarbons). Operating temperature: -40° to 160°F. Packaging: One per package	0.375 inch (8 mm)	**6143A-6501**	
Plastic Ball Swivel Mount	Same as **6143A-6501** (above), except: Sensor Mounting: Mounts directly to any 18 mm tubular sensor	0.75 inch (18 mm)	**6142A-6501**	(see table below)

Size	A	B	C	D
8 mm	1.96 (49.8)	1.56 (39.6)	0.20 (5.1)	0.40 (10.2)
18 mm	2.80 (71.1)	2.25 (57.2)	0.275 (7.0)	0.50 (12.7)

Size	E	F	G
8 mm	0.80 (20.3)	1.05 (26.7)	0.375 (9.5)
18 mm	1.00 (25.4)	1.64 (41.7)	0.75 (19.1)

	Description	Size	Catalog Number	
Cushioned Sensor Mounts	Precision machined, spring-loaded sleeves that hold tubular sensors to protect them from accidental impact due to overtravel of the target being sensed. Used for inductive proximity sensors only.	8 mm	**E57KNZ8**	
		12 mm	**E57KNZ12**	
		18 mm	**E57KNZ18**	***NOTE**: Sensing Range Will Be Reduced by Thickness of Cap's Wear Surface: 0.030 inch (0.76 mm) max.
		30 mm	**E57KNZ30**	

Size	A	B	C	D	E
8 mm	M8 x 1	M16 x 1.5	0.87 (22)	0.87 (22)	0.35 (9)
12 mm	M12 x 1	M22 x 1.5	0.87 (22)	1.12 (29)	0.41 (10)
18 mm	M18 x 1	M30 x 1.5	1.17 (30)	1.41 (36)	0.49 (12)
30 mm	M30 x 1.5	M47 x 1.5	1.47 (37)	1.72 (51)	0.57 (15)

▨ Stocked product, typical order quantities guaranteed in stock.

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SENSOR ACCESSORIES

August 2007

Sensor Accessories

Contents

Cutler-Hammer® Accessories from Eaton's electrical business include Portable Power Supplies for testing or demonstrating DC sensors, a variety of Replacement Mounting Nuts, Protective End Caps for tubular proximity sensors, and Conduit Adapters for tubular sensors.

For the most current information on this product, visit our web site: www.EatonElectrical.com

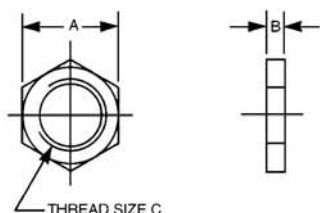## A Variety of Items for Replacement, Testing or Additional Functionality

DC Sensor
Testers / Demonstrators

Replacement
Mounting Nuts

And More...

Model Selection — Sensor Accessories
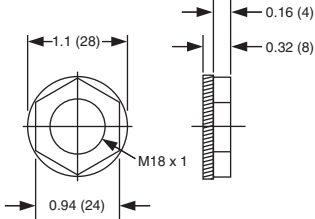
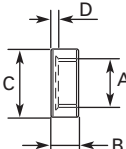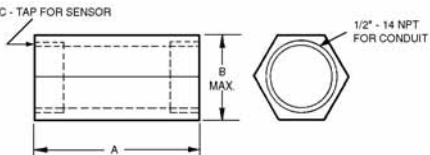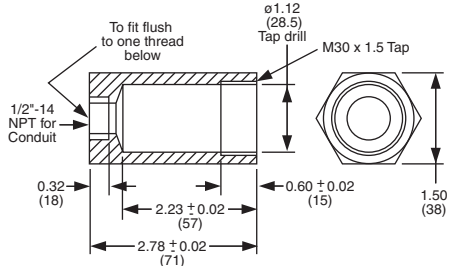|	Description	Sensor Diameter	Catalog Number	Approximate Dimensions in Inches (mm) Except Where Noted
	DC Sensor Tester/Demonstrator For 2-, 3- and 4-wire DC sensors Provides 27V DC power from three 9V batteries (included) Test output connections for both NPN and PNP outputs	—	9902A-6501	W x H x D 2.5 x 4.75 x 2.1 inches (65 x 120 x 55 mm)
	AC Sensor Tester/Demonstrator For AC sensors Provides AC power from wall mount Includes AC adapter	—	9902A-6502	W x H x D 2.5 x 4.5 x 1.5 inches (65 x 114 x 38 mm)
	Replacement Mounting Nuts — Stainless Steel Where Used: Harsh environment for tubular sensors Material of Construction: Stainless Steel Packaging: Two per package	8 mm	E57KNM8	
		12 mm	E57KNS12	
		18 mm	E57KNS18	
		30 mm	E57KNS30	
	Replacement Mounting Nuts — Brass Where Used: General purpose for tubular sensors. These are the standard mounting nuts shipped with the Comet, Prism and OEM Prism Photoelectric Sensors. Material of Construction: Brass Packaging: Two nuts and two wave washers per package	18 mm	E60KNS18	
	Replacement Mounting Nuts — Stainless Steel Where Used: Harsh environment for tubular sensors Material of Construction: Stainless Steel Packaging: Two per package	18 mm	E58KNS18	
		30 mm	E58KNS30	

THREAD SIZE C

Size	Dimensions in Inches (mm) Except Where Noted		
	A	B	C
8 mm	0.5 (13)	0.16 (4)	M8 x 1
12 mm	0.7 (17)	0.16 (4)	M12 x 1
18 mm	0.94 (24)	0.16 (4)	M18 x 1
30 mm	1.4 (36)	0.16 (4)	M30 x 1.5

▢ Stocked product, typical order quantities guaranteed in stock.

SENSOR ACCESSORIES

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For Customer Service in the U.S. call **1-877-ETN CARE (386-2273)**, in Canada call **1-800-268-3578**. For Application Assistance in the U.S. and Canada call **1-800-426-9184**.

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Model Selection — Sensor Accessories (Continued)

	Description	Sensor Diameter	Catalog Number	Approximate Dimensions in Inches (mm) Except Where Noted
	Replacement Mounting Nuts — Plastic Where Used: Harsh environment for tubular and SM Series sensors Material of Construction: Plastic Packaging: Two per package	18 mm	**E57KNC18**	0.16 (4), 0.32 (8), 1.1 (28), M18 x 1, 0.94 (24)
	Protective Caps Where Used: Tubular Proximity Sensors Material of Construction: Delrin Packaging: One per package	12 mm 18 mm 30 mm	**E57KP12** **E57KP18** **E57KP30**	(table below)
	Conduit Adapters Where Used: To attach electrical conduit to rear of tubular sensors Material of Construction: Die cast steel Packaging: One adapter and nut per package	8 mm 12 mm 18 mm 30 mm	**E57KC8** **E57KC12** **E57KC18** **E57KC30**	(table below)
	Conduit Adapters Where Used: To attach E58 Harsh Duty 30 mm sensors to half-inch conduit fittings Material of Construction: Stainless steel Packaging: One per package	30 mm	**E58KC30**	ø1.12 (28.5) Tap drill, M30 x 1.5 Tap, To fit flush to one thread below, 1/2"-14 NPT for Conduit, 0.32 (18), 2.23 ± 0.02 (57), 0.60 ± 0.02 (15), 1.50 (38), 2.78 ± 0.02 (71)

Protective Caps dimensions:

Size in mm	Dimensions in Inches (mm)			
	A (Switch Size)	B	C	D (Thickness)
12	0.47 (12)	0.39 (10)	0.63 (16)	0.04 (1.0)
18	0.71 (18)	0.36 (9.2)	0.83 (21.2)	0.04 (0.9)
30	1.18 (30)	0.59 (15)	1.42 (36)	0.07 (1.7)

Conduit Adapters dimensions:

Size	Dimensions in Inches (mm) Except Where Noted		
	A-Length	B-Hex	C-Tap
8 mm	1.0 (25)	1.0 (25)	M8 x 1
12 mm	1.5 (38)	1.0 (25)	M12 x 1
18 mm	1.5 (38)	1.0 (25)	M18 x 1
30 mm	1.9 (48)	1.5 (38)	M30 x 1.5

C - TAP FOR SENSOR · 1/2" - 14 NPT FOR CONDUIT · B MAX. · A

Stocked product, typical order quantities guaranteed in stock.