

Retroreflectors

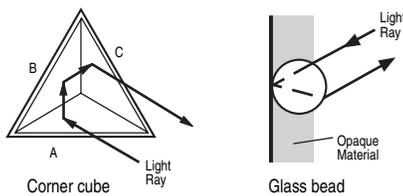
Contents

Overview	8-2
Model Selection	8-3
Dimensions	8-3

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.



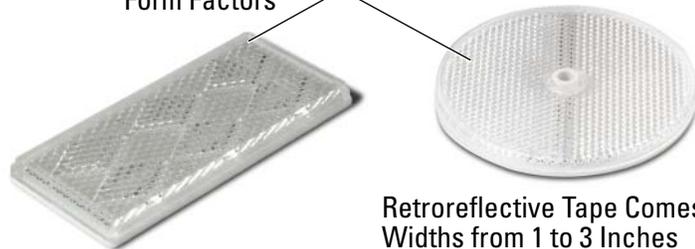
Glass Bead Retroreflectors

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.

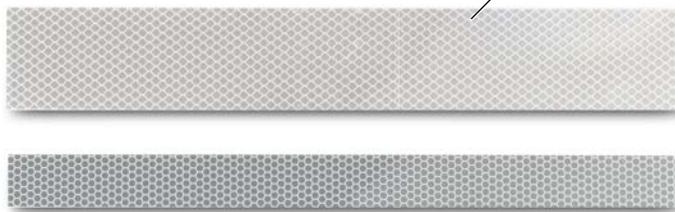
For the most current information on this product, visit our web site: www.EatonElectrical.com

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.

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**.

July 2005

Model Selection — Retroreflectors

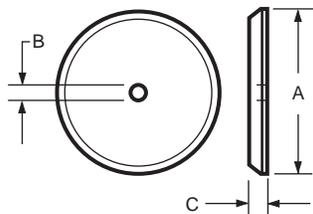
	Description	Catalog Number
Retroreflector		
	1.5 x 3.25 inch, adhesive backed, one per package	6200A-6507
	3 inch diameter, with mounting hole, two per package	6200A-6501
	Bulk packaged version of above (ordered quantity will be bulk packaged)	6200AS6501
	3 inch diameter, with mounting hole, one per 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.

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)

July 2005

Sensor Options for Perfect Prox® — 30 mm Diameter Models Only

(Built-to-order, contact Eaton's Cutler-Hammer Sensor Applications Department at 1-800-426-9184 for delivery lead times)

Food Processing Versions with Threaded Housings

Upgrade to a 316 Stainless Steel threaded body from 303, and change the lens cover to hard-coated polycarbonate from glass. To order, add the Suffix "-FC" to the end of the Catalog Number (Example: E58-30DP150-EL-FC).

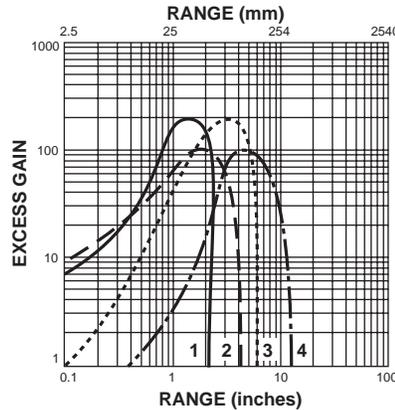
Food Processing Versions with Smooth (Non-threaded) Housings

Upgrade to a 316 Stainless Steel smooth (non-threaded) body from 303, and change the lens cover to hard-coated polycarbonate from glass. To order, add the Suffix "-FSC" to the end of the Catalog Number (Example: E58-30DP150-EL-FSC).

Excess Gain

Perfect Prox

- 1. 18 mm Diameter, 2 Inch (50 mm) range models
- 2. 18 mm Diameter, 4 Inch (100 mm) range models
- 3. 30 mm Diameter, 6 Inch (150 mm) range models
- 4. 30 mm Diameter, 11 Inch (280 mm) range models



Model Selection — Compatible Connector Cables ①

	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								
	AC	3-pin 3-wire	22 AWG	6.0 feet (2m)	CSAS3F3CY2202	CSAS3F3RY2202	—	
		4-pin 4-wire	22 AWG	6.0 feet (2m)	CSAS4F4CY2202	CSAS4F4RY2202	CSAS4F4I02202	
	DC	4-pin 4-wire	22 AWG	6.0 feet (2m)	CSDS4A4CY2202	CSDS4A4RY2202	CSDS4A4I02202	
	Voltage Style	Number of Pins	Gauge	Length	Catalog Number		Pin Configuration/Wire Colors (Face View Female Shown)	
Standard Cables — Mini Style								
 <p>Current Rating @ 600V 3-pin: 13A</p>	—	3-pin	16 AWG	6 feet (2m)	CSMS3F3CY1602			

① For a full selection of connector cables, see Section 10.

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

Model Selection — Accessories

Description	Reference
Retroreflectors and retroreflective tape	See Section 8
Mounting brackets	See Section 8
Mounting nuts and other accessories	See Section 8
Connector cables	See Section 10

Sensor Mounting Brackets

Contents

Overview 8-4
Model Selection 8-4

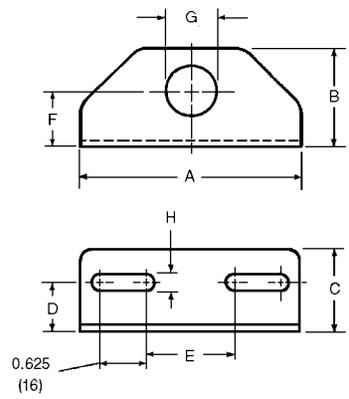
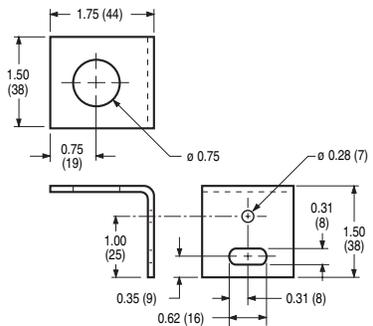
For the most current information on this product, visit our web site: www.EatonElectrical.com

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

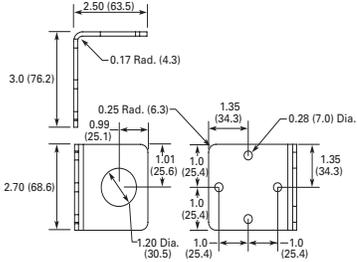
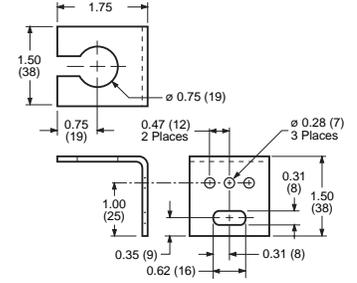
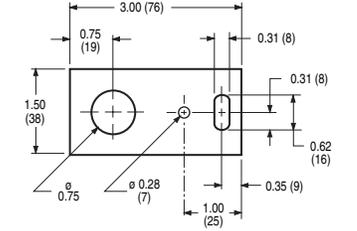
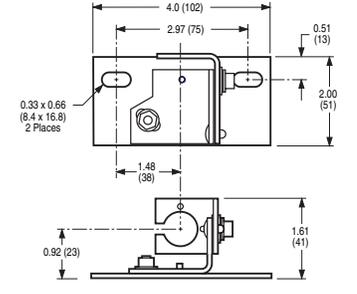
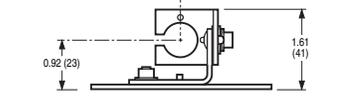
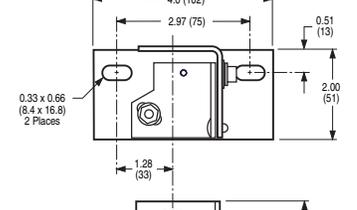
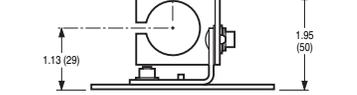
	Description	Size	Catalog Number	Approximate Dimensions in Inches (mm)																																																		
	Adjustability: Allows some adjustment in two axes Sensor Mounting: Sensor mounts with two jam nuts and washers (included with sensor) Material of Construction: Stainless steel Packaging: One per package	8 mm	E57KM8	 <table border="1" data-bbox="990 1081 1437 1249"> <thead> <tr> <th>Size</th> <th>A</th> <th>B</th> <th>C</th> <th>D</th> </tr> </thead> <tbody> <tr> <td>8 mm</td> <td>3.00 (76)</td> <td>1.35 (34)</td> <td>1.125 (29)</td> <td>0.65 (17)</td> </tr> <tr> <td>12 mm</td> <td>3.00 (76)</td> <td>1.35 (34)</td> <td>1.125 (29)</td> <td>0.65 (17)</td> </tr> <tr> <td>18 mm</td> <td>3.00 (76)</td> <td>1.35 (34)</td> <td>1.125 (29)</td> <td>0.65 (17)</td> </tr> <tr> <td>30 mm</td> <td>4.25 (108)</td> <td>2.15 (55)</td> <td>1.75 (45)</td> <td>1.00 (25)</td> </tr> </tbody> </table> <table border="1" data-bbox="990 1249 1437 1417"> <thead> <tr> <th>Size</th> <th>E</th> <th>F</th> <th>G</th> <th>H</th> </tr> </thead> <tbody> <tr> <td>8 mm</td> <td>1.20 (31)</td> <td>0.75 (19)</td> <td>0.323 (8)</td> <td>0.218 (6)</td> </tr> <tr> <td>12 mm</td> <td>1.20 (31)</td> <td>0.75 (19)</td> <td>0.484 (12)</td> <td>0.218 (6)</td> </tr> <tr> <td>18 mm</td> <td>1.20 (31)</td> <td>0.75 (19)</td> <td>0.718 (18)</td> <td>0.218 (6)</td> </tr> <tr> <td>30 mm</td> <td>2.00 (51)</td> <td>1.25 (29)</td> <td>1.203 (30)</td> <td>0.281 (7)</td> </tr> </tbody> </table>	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)
		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)																																																		
12 mm	E57KM12																																																					
18 mm	E57KM18																																																					
30 mm	E57KM30																																																					
	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 Same as 6161A-6501 (above), except: Packaging: Bulk packaged (ordered quantity will be sent bulk packed)	18 mm	6161A-6501																																																			
		18 mm	6161AS6501																																																			

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

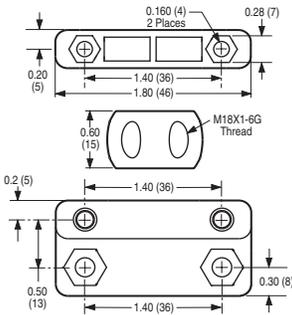
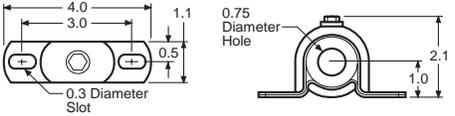
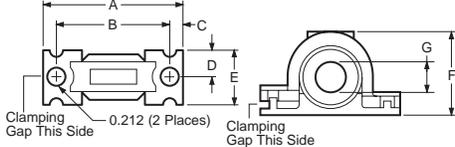
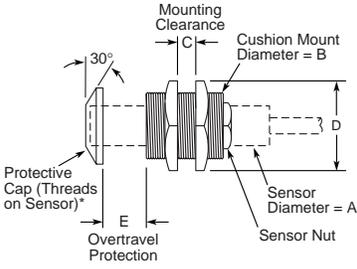
For Customer Service in the U.S. call **1-800-356-1243**,
in Canada call **1-800-268-3578**.
For Application Assistance in the U.S. and Canada
call **1-800-426-9184**.

July 2005

Model Selection — Mounting Brackets for Tubular Sensors (Continued)

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

Model Selection — Mounting Brackets for Tubular Sensors (Continued)

	Description	Size	Catalog Number	Approximate Dimensions in Inches (mm) Except Where Noted																											
	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																												
	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 																											
	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																												
	Same as 6143A-6501 (above), except: Sensor Mounting: Mounts directly to any 18 mm tubular sensor	0.75 inch (18 mm)	6142A-6501	<table border="1"> <thead> <tr> <th>Size</th> <th>A</th> <th>B</th> <th>C</th> <th>D</th> </tr> </thead> <tbody> <tr> <td>8 mm</td> <td>1.96 (49.8)</td> <td>1.56 (39.6)</td> <td>0.20 (5.1)</td> <td>0.40 (10.2)</td> </tr> <tr> <td>18 mm</td> <td>2.80 (71.1)</td> <td>2.25 (57.2)</td> <td>0.275 (7.0)</td> <td>0.50 (12.7)</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Size</th> <th>E</th> <th>F</th> <th>G</th> </tr> </thead> <tbody> <tr> <td>8 mm</td> <td>0.80 (20.3)</td> <td>1.05 (26.7)</td> <td>0.375 (9.5)</td> </tr> <tr> <td>18 mm</td> <td>1.00 (25.4)</td> <td>1.64 (41.7)</td> <td>0.75 (19.1)</td> </tr> </tbody> </table>	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)
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)																												
	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 12 mm 18 mm	E57KNZ8 E57KNZ12 E57KNZ18	 <p>*NOTE: Sensing Range Will Be Reduced by Thickness of Cap's Wear Surface: 0.030 inch (0.76 mm) max.</p> <table border="1"> <thead> <tr> <th>Size</th> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>E</th> </tr> </thead> <tbody> <tr> <td>8 mm</td> <td>M8 x 1</td> <td>M16 x 1.5</td> <td>0.43 (11)</td> <td>0.94 (24)</td> <td>0.39 (10)</td> </tr> <tr> <td>12 mm</td> <td>M12 x 1</td> <td>M22 x 1.5</td> <td>0.43 (11)</td> <td>1.18 (30)</td> <td>0.39 (10)</td> </tr> <tr> <td>18 mm</td> <td>M18 x 1</td> <td>M30 x 1.5</td> <td>0.59 (59)</td> <td>1.73 (44)</td> <td>0.39 (10)</td> </tr> </tbody> </table>	Size	A	B	C	D	E	8 mm	M8 x 1	M16 x 1.5	0.43 (11)	0.94 (24)	0.39 (10)	12 mm	M12 x 1	M22 x 1.5	0.43 (11)	1.18 (30)	0.39 (10)	18 mm	M18 x 1	M30 x 1.5	0.59 (59)	1.73 (44)	0.39 (10)			
Size	A	B	C	D	E																										
8 mm	M8 x 1	M16 x 1.5	0.43 (11)	0.94 (24)	0.39 (10)																										
12 mm	M12 x 1	M22 x 1.5	0.43 (11)	1.18 (30)	0.39 (10)																										
18 mm	M18 x 1	M30 x 1.5	0.59 (59)	1.73 (44)	0.39 (10)																										