



A

PA-2

NC9

Rod Lock

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Schrader Bellows PA-2 Series Heavy Duty Air Cylinder

When the job calls for reliable, heavy-duty performance, specify PA-2 Series. A 100,000 psi yield strength chrome-plated, case-hardened piston rod. A 125,000 psi yield strength rod-end stud with rolled threads. 100,000 psi yield strength tie rods. With construction like this, the Schrader Bellows PA-2 Series is rated for air service to 250 psi. This is one heavy-duty air cylinder that's really heavy duty.

They're truly premium quality cylinders, factory prelubricated standard with a non-lube option for millions of maintenance-free cycles. And to make sure every cylinder is premium quality, we subject each and every one – not just batch samples – to tough inspection and performance tests. See inside for the inside story on all the features that make PA-2 Series the high performance, long lasting choice for all your heavy-duty air applications.

Note: Rod diameters over 2½" will use a threaded nose gland.

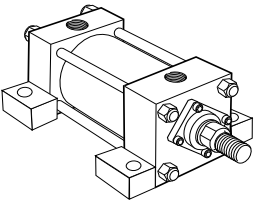
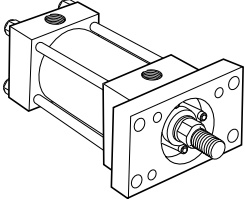
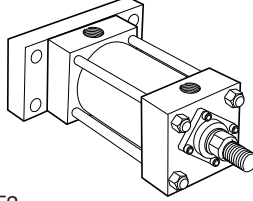
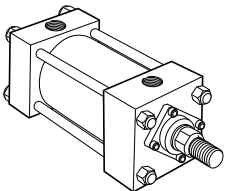
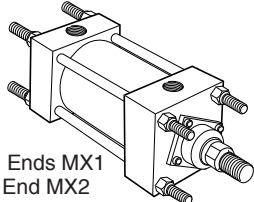
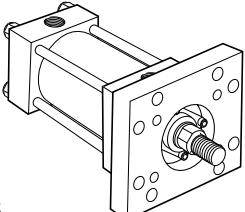
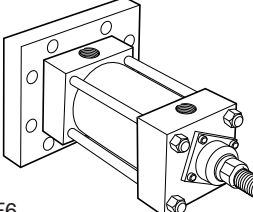
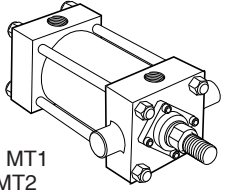
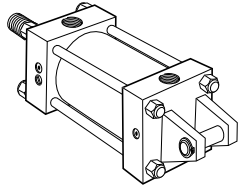
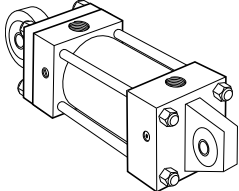
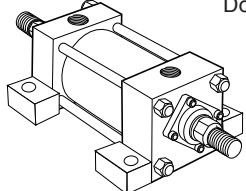


Standard Specifications

- Heavy Duty Service – ANSI/(NFPA) T3.6.7R2-1996 Specifications and Mounting Dimension Standards
- Standard Construction – Square Head – Tie Rod Design
- Nominal Pressure – Up to 250 PSI Air Service
- Standard Fluid – Filtered Air
- Standard Temperature – -10°F. to +165°F.*
- Bore Sizes – 1" through 14"
- Piston Rod Diameter – 1/2" through 5 1/2"
- Mounting Styles – 14 standard styles at various application ratings
- Strokes – Available in any practical stroke length
- Cushions – Optional at either end or both ends of stroke. "Float Check" at cap end.
- Rod Ends – Three Standard Choices – Specials to Order

* See Section C, "Operating Fluids and Temperature Range" for higher temperature service.

In line with our policy of continuing product improvement, specifications in this catalog are subject to change.

Mounting Styles and Ordering Notes																																																																																																																																																																																																								
Available in all bore and rod combinations.		Available in all bore and rod combinations through 6" bore. 8"-14" bores supplied as Head Square (ME3) and Cap Square (ME4) mounts.																																																																																																																																																																																																						
<p>Side Lug</p>  <p>MS2</p>		<p>Head Rectangular Flange</p>  <p>MF1</p>	<p>Cap Rectangular Flange</p>  <p>MF2</p>																																																																																																																																																																																																					
<p>Side Tap</p>  <p>MS4</p>	<p>Tie Rods Extended Both Ends</p>  <p>Both Ends MX1 Cap End MX2 Head End MX3</p>	<p>Head Square Flange</p>  <p>MF5</p>	<p>Cap Square Flange</p>  <p>MF6</p>																																																																																																																																																																																																					
<p>Trunnion Mounts</p>  <p>Head MT1 Cap MT2 Intermediate Fixed MT4</p>	<p>Cap Fixed Clevis</p>  <p>MP1 Pivot Pin Included</p>	<p>Rod Bearing Cartridges</p> <table border="1"> <thead> <tr> <th>Bore</th> <th>Rod Dia.</th> <th>MX1 MS4 MF2 MT4</th> <th>MX3 MS2 MT2 MPU3</th> <th>MX2 MF6 MT1 MP1</th> <th>MF1 MF5</th> <th>ME3 ME4</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1/2, 5/8</td> <td></td> <td>T</td> <td></td> <td>T</td> <td>N/A</td> </tr> <tr> <td>1 1/2</td> <td>5/8</td> <td></td> <td>R</td> <td></td> <td>T</td> <td>N/A</td> </tr> <tr> <td></td> <td>1</td> <td></td> <td>T</td> <td></td> <td>T</td> <td>N/A</td> </tr> <tr> <td>2</td> <td>5/8</td> <td></td> <td>R</td> <td></td> <td>R</td> <td>N/A</td> </tr> <tr> <td></td> <td>1</td> <td></td> <td>R</td> <td></td> <td>T</td> <td>N/A</td> </tr> <tr> <td></td> <td>1 3/8</td> <td></td> <td>T</td> <td></td> <td>T</td> <td>N/A</td> </tr> <tr> <td>2 1/2</td> <td>5/8</td> <td></td> <td>R</td> <td></td> <td>R</td> <td>N/A</td> </tr> <tr> <td></td> <td>1</td> <td></td> <td>R</td> <td></td> <td>R</td> <td>N/A</td> </tr> <tr> <td></td> <td>1 3/8</td> <td></td> <td>T</td> <td></td> <td>T</td> <td>N/A</td> </tr> <tr> <td></td> <td>1 3/4</td> <td></td> <td>T</td> <td></td> <td>T</td> <td>N/A</td> </tr> <tr> <td>3 1/4</td> <td>1</td> <td></td> <td>R</td> <td></td> <td>R</td> <td>N/A</td> </tr> <tr> <td></td> <td>1 3/8</td> <td></td> <td>R</td> <td></td> <td>R</td> <td>N/A</td> </tr> <tr> <td></td> <td>1 3/4, 2</td> <td></td> <td>R</td> <td></td> <td>T</td> <td>N/A</td> </tr> <tr> <td>4</td> <td>1, 1 3/8</td> <td></td> <td>R</td> <td></td> <td>R</td> <td>N/A</td> </tr> <tr> <td></td> <td>1 3/4, 2</td> <td></td> <td>R</td> <td></td> <td>R</td> <td>N/A</td> </tr> <tr> <td></td> <td>2 1/2</td> <td></td> <td>R</td> <td></td> <td>T</td> <td>N/A</td> </tr> <tr> <td>5</td> <td>1 - 2</td> <td></td> <td>R</td> <td></td> <td>R</td> <td>N/A</td> </tr> <tr> <td></td> <td>2 1/2</td> <td></td> <td>R</td> <td></td> <td>T</td> <td>N/A</td> </tr> <tr> <td></td> <td>3, 3 1/2</td> <td></td> <td>T</td> <td></td> <td>T</td> <td>N/A</td> </tr> <tr> <td>6</td> <td>1 3/8 - 2 1/2</td> <td></td> <td>R</td> <td></td> <td>R</td> <td>N/A</td> </tr> <tr> <td></td> <td>3 - 4</td> <td></td> <td>T</td> <td></td> <td>T</td> <td>N/A</td> </tr> <tr> <td>7*</td> <td>1 3/8, 1 3/4, 2</td> <td></td> <td>R</td> <td></td> <td>N/A</td> <td>R</td> </tr> <tr> <td>8*</td> <td>1 3/8 - 4 1/2</td> <td></td> <td>R</td> <td></td> <td>N/A</td> <td>R</td> </tr> <tr> <td></td> <td>5, 5 1/2</td> <td></td> <td>R</td> <td></td> <td>N/A</td> <td>R</td> </tr> <tr> <td>10*</td> <td>1 3/4 - 5 1/2</td> <td></td> <td>R</td> <td></td> <td>N/A</td> <td>R</td> </tr> <tr> <td>12*</td> <td>2 - 5 1/2</td> <td></td> <td>R</td> <td></td> <td>N/A</td> <td>R</td> </tr> <tr> <td>14*</td> <td>2 1/2 - 5 1/2</td> <td></td> <td>R</td> <td></td> <td>N/A</td> <td>R</td> </tr> </tbody> </table> <p>R = Removable Cartridge T = Tie Rod Retained Cartridge</p> <p>*MF5, MF6, MF1, MF2 not available in these bore sizes.</p>			Bore	Rod Dia.	MX1 MS4 MF2 MT4	MX3 MS2 MT2 MPU3	MX2 MF6 MT1 MP1	MF1 MF5	ME3 ME4	1	1/2, 5/8		T		T	N/A	1 1/2	5/8		R		T	N/A		1		T		T	N/A	2	5/8		R		R	N/A		1		R		T	N/A		1 3/8		T		T	N/A	2 1/2	5/8		R		R	N/A		1		R		R	N/A		1 3/8		T		T	N/A		1 3/4		T		T	N/A	3 1/4	1		R		R	N/A		1 3/8		R		R	N/A		1 3/4, 2		R		T	N/A	4	1, 1 3/8		R		R	N/A		1 3/4, 2		R		R	N/A		2 1/2		R		T	N/A	5	1 - 2		R		R	N/A		2 1/2		R		T	N/A		3, 3 1/2		T		T	N/A	6	1 3/8 - 2 1/2		R		R	N/A		3 - 4		T		T	N/A	7*	1 3/8, 1 3/4, 2		R		N/A	R	8*	1 3/8 - 4 1/2		R		N/A	R		5, 5 1/2		R		N/A	R	10*	1 3/4 - 5 1/2		R		N/A	R	12*	2 - 5 1/2		R		N/A	R	14*	2 1/2 - 5 1/2		R		N/A	R
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<p>Cap Fixed Eye with Spherical Bearing</p>  <p>MPU3</p>		<p>Double End Construction</p>  <p>Available in all bore and rod combinations in the following mounting styles: MDS2, MDS4, MDX1, MDX3, MDT1, MDT4, and MDF1 (1"-6"). MDF5 (1"-6") and MDE3 (8"-14").</p>																																																																																																																																																																																																						

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Rod Lock

The inside story on why PA-2 Series is your best choice in heavy duty air cylinders.

Piston Rod – Medium carbon steel, induction case-hardened, hard chrome-plated and polished to 10 RMS finish. Piston rods are made from 90,000 to 100,000 psi minimum yield material in 5/8" through 4" diameters. The piston thread equals the catalog style #2 rod end thread for each rod diameter to assure proper piston-to-rod thread strength. Two wrench flats are provided for rod end attachment.

Rod Seal – The piston rod seal offers maximum sealing performance and efficiency with minimum friction. The highly resilient lips are pressure actuated and wear compensating, giving complete reliability through millions of cycles.

Steel Head – Bored and grooved to provide concentricity for mating parts.

Ports – NPTF ports are standard.

End Seals – Pressure-actuated cylinder body-to-head and cap "O" rings.

Secondary Seal – A Double-Service Wiperseal® Patent #2907596 acts as a secondary pressure seal on the extend stroke and cleans the rod on the return stroke.

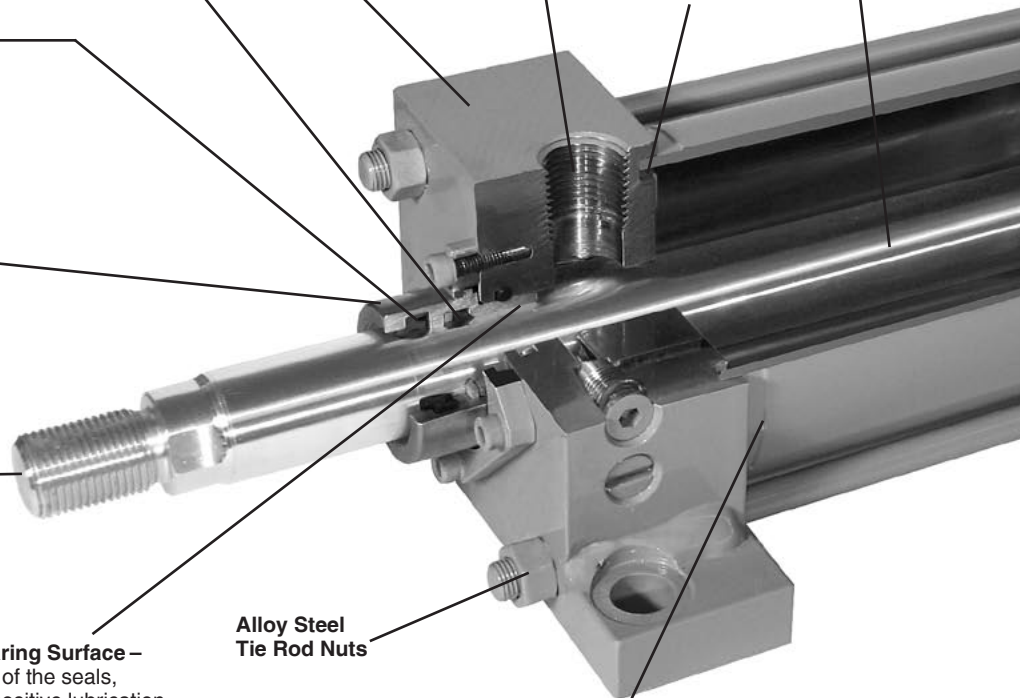
Bolt-On Rod Cartridge – assures true concentricity and allows removal without tie rod disassembly.

Piston Rod Stud – Furnished on 2" diameter rods and smaller when standard style #2 rod end threads are required. Piston rod studs are also available in 2 times the catalog "A" dimension length. Studs have rolled threads and are made from high strength steel. Anaerobic adhesive is used to permanently lock the stud to the piston rod.

Long Bearing Surface – is inboard of the seals, assuring positive lubrication from within the cylinder. An "O" ring is used as a seal between cartridge and head.

Alloy Steel Tie Rod Nuts

Align-A-Groove – (Patent #3043639) – A 3/16" wide surface machined at each end of the cylinder body. This makes precise mounting quick and easy.



Adjustable floating cushions

Cushions are optional, and can be supplied at head end, cap end, or both ends without change in envelope or mounting dimensions. Cushions are adjustable.

The PA-2 Series cylinder design incorporates the longest cushion sleeve and cushion spear that can be provided in the standard envelope without decreasing the rod bearing and piston bearing lengths.

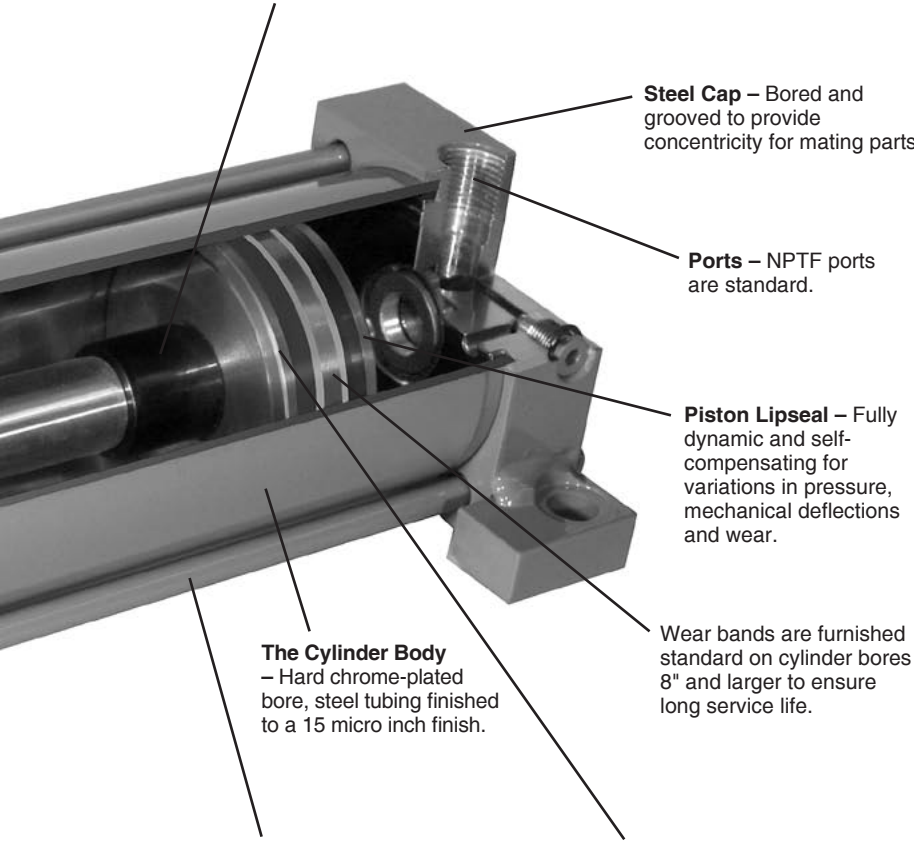
adjacent to the needle valve except on certain bores of mounting style MS2 where it is mounted opposite the needle valve. The needle valve may be identified by the fact that it is slotted.

- (1) When a cushion is specified at the head end:
 - a. A self-centering sleeve is furnished on the piston rod assembly.
 - b. A needle valve is provided that is flush with the side of the head when wide open. It may be identified by the fact that it is socket-keyed. Needle valves are located on side number 2, in all mounting styles except MT1, MT2 and MT4. These styles have needle valves located on side number 3.
 - c. A springless check valve is provided that is also flush with the side of the head and is mounted

- d. The check and needle valves are interchangeable in the head.

- (2) When a cushion is specified at the cap end:
 - a. A cushion spear is provided on the piston rod assembly.
 - b. A "float check" self-centering bushing is provided which incorporates a large flow check valve for fast "out-stroke" action.
 - c. A socket-keyed needle valve is provided that is flush with the side of the cap when wide open. It is located on side number 2 in all mounting styles except MT1, MT2 and MT4. These styles have needle valves located on side number 3.

Adjustable Floating Cushions – Cushions are optional and can be supplied at head end, cap end, or both ends without change in envelope or mounting dimensions.



Steel Cap – Bored and grooved to provide concentricity for mating parts.

Ports – NPTF ports are standard.

Piston Lipseal – Fully dynamic and self-compensating for variations in pressure, mechanical deflections and wear.

The Cylinder Body – Hard chrome-plated bore, steel tubing finished to a 15 micro inch finish.

Wear bands are furnished standard on cylinder bores 8" and larger to ensure long service life.

High Strength Tie Rods – Made from 100,000 psi minimum yield steel with rolled threads for added strength.

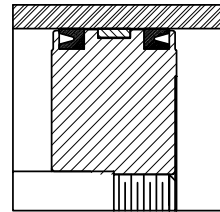
One-Piece Nodular Iron Piston – The wide piston surface contacting cylinder bore reduces bearing loads. Anaerobic adhesive is used to permanently lock and seal the piston to the rod.

Prelubricated Wearing Surfaces

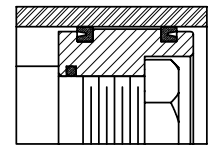
Schrader Bellows PA-2 Series Air Cylinders are factory prelubricated. Lube-A-Cyl applied to seals, piston, cylinder bore, piston rod and gland surfaces provides lubrication for normal operation.

Lube-A-Cyl has been field and laboratory tested, and is recommended by Schrader Bellows for air cylinders where lubricant should remain in the cylinder and not be expelled into the atmosphere.

Note: Threaded rod glands are supplied on cylinders with rod diameters over 2 1/2".



Piston with Wear Band
Standard 8"-14" Bore



Nut Retained Piston
Optional at extra charge

Cushion Length

Cylinder Bore (Inches)	Rod Diameter* (Inches)	Cushion Length (Inches)	
		Head*	Cap
1 1/2	5/8	7/8	13/16
	1	7/8	13/16
2	5/8	7/8	13/16
	1 3/8	7/8	13/16
2 1/2	5/8	7/8	13/16
	1 3/4	7/8	13/16
3 1/4	1	1 1/8	1
	2	13/16	1
4	1	1 1/8	1
	2 1/2	13/16	1
5	1	1 1/8	1
	3 1/2	13/16	1

Cylinder Bore (Inches)	Rod Diameter* (Inches)	Cushion Length (Inches)	
		Head*	Cap
6	1 3/8	1 3/8	1 1/4
	4	1 1/16	1 1/4
7	1 3/8	1 1/16	1 1/4
	2	1 1/16	1 1/4
8	1 3/8	1 1/16	1 1/4
	5 1/2	15/16	1 1/4
10	1 3/4	1 5/16	1 3/4
	5 1/2	1 3/16	1 3/4
12	2	1 5/16	1 3/4
	5 1/2	1 3/16	1 3/4
14	2 1/2	1 3/4	2
	5 1/2	1 11/16	2

*Head end cushions for rod diameters not listed have cushion lengths with the limits shown.

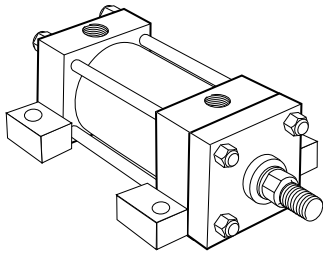
For cushion selection and sizing, see Section C of this catalog for additional information.

Side Lug Mount

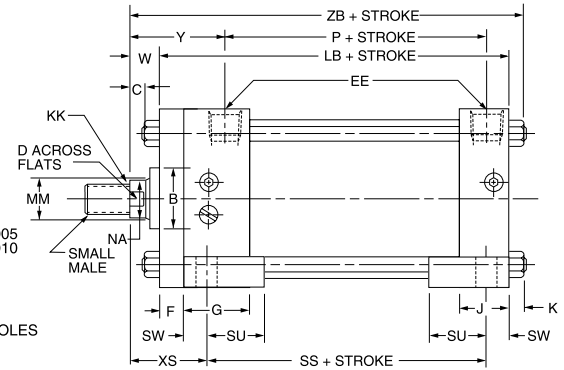
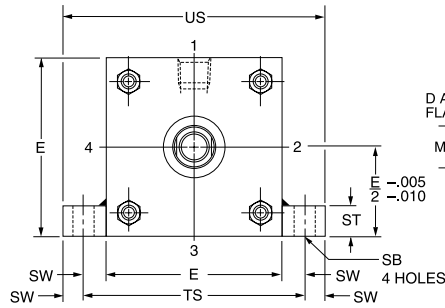
Style MS2

1" - 1 1/2" - 2" - 2 1/2" - 5" and 6" Bore

With Maximum Oversize Rods



Tie Rod Retained Cartridge

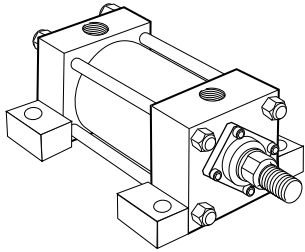


Before determining dimensions: See chart on page 5 for cylinder rod combinations that have removable cartridges.

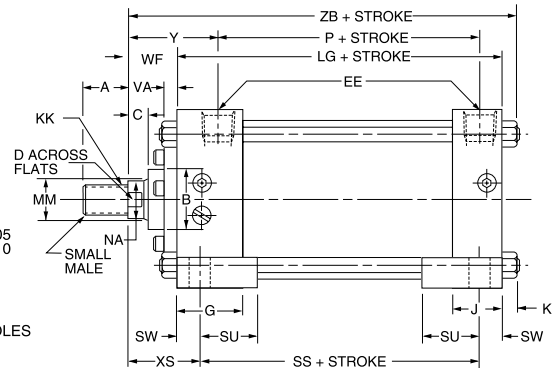
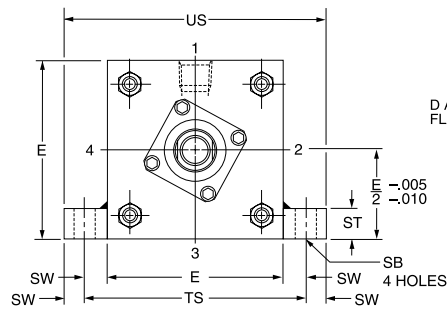
Side Lug Mount

Style MS2

1 1/2" - 6" Bore



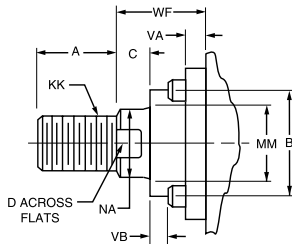
Removable Cartridge



Rod End Dimensions — see table 2

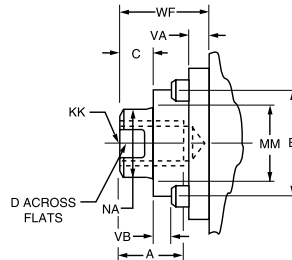
Thread Style 2

Small Male



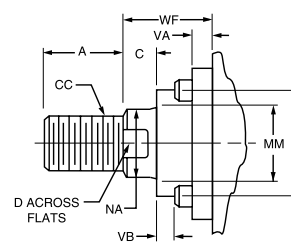
Thread Style 3

Short Female



Thread Style 4

Intermediate Male



"Special" Thread Style 0

Special thread, extension, rod eye, blank, etc., are also available.

To order, specify "Style 0" and give desired dimensions for KK, A, W or WF. If otherwise special, furnish dimensioned sketch.

A high strength rod end stud is supplied on thread style 2 through 2" diameter rods. Larger sizes or special rod ends are cut threads. Style 2 rod ends are recommended where the workpiece is secured against the rod shoulder. When the workpiece is not shouldered,

style 2 rod ends are recommended through 2" piston rod diameters and style 4 rod ends are recommended on larger diameters. Use style 3 for applications where female rod end threads are required. If rod end is not specified, style 2 will be supplied.

Table 1—Envelope and Mounting Dimensions

Bore	E	EE NPTF	F	G	J	K	SB*	ST	SU	SW	TS	US	Add Stroke			
													LB	LG	P	SS
1*	1 1/2	1/4	3/8	1 1/2	1	3/16	9/32	5/16	3/4	5/16	2 1/8	2 3/4	3 7/8	3 1/2	2 1/8	2 7/8
1 1/2	2	3/8†	3/8	1 1/2	1	1/4	7/16	1/2	15/16	3/8	2 3/4	3 1/2	4	3 5/8	2 1/4	2 7/8
2	2 1/2	3/8†	3/8	1 1/2	1	5/16	7/16	1/2	15/16	3/8	3 1/4	4	4	3 5/8	2 1/4	2 7/8
2 1/2	3	3/8†	3/8	1 1/2	1	5/16	7/16	1/2	15/16	3/8	3 3/4	4 1/2	4 1/8	3 3/4	2 3/8	3
3 1/4	3 3/4	1/2	—	1 3/4	1 1/4	3/8	9/16	3/4	1 1/4	1/2	4 3/4	5 3/4	4 7/8	4 1/4	2 5/8	3 1/4
4	4 1/2	1/2	—	1 3/4	1 1/4	3/8	9/16	3/4	1 1/4	1/2	5 1/2	6 1/2	4 7/8	4 1/4	2 5/8	3 1/4
5	5 1/2	1/2	5/8	1 3/4	1 1/4	7/16	13/16	1	1 9/16	1 1/16	6 7/8	8 1/4	5 1/8	4 1/2	2 7/8	3 1/8
6	6 1/2	3/4	3/4	2	1 1/2	7/16	13/16	1	1 9/16	1 1/16	7 7/8	9 1/4	5 3/4	5	3 1/8	3 5/8

* Cushions not available on 1" bore.

† On 1 1/2", 2" and 2 1/2" bore sizes, the head-end (only) pipe thread is not full depth on cylinders with maximum oversize rods. Minimum of three full threads available.

■ 1" bore head is 1 3/4" x 1 1/2". See page 12, Section A.

• Upper surface spot-faced for socket head screws.

Table 2—Rod Dimensions and Envelope Dimensions Affected by Rod Size

Bore	Rod Dia. MM	Thread		Rod Extensions and Envelope Dimensions Affected By Rod Size													
		Style 4 CC	Style 2 & 3 KK	A	+.000 -.002 B	C	D	NA	V	VA	VB	W	WF	XS	Y	Add Stroke ZB	
1*	1/2	7/16-20	5/16-24	5/8	.999	3/8	3/8	7/16	1/4	—	—	5/8	—	1 5/16	1 15/16	4 1 1/16	
	5/8	1/2-20	7/16-20	3/4	1.124	3/8	1/2	9/16	1/4	—	—	5/8	—	1 5/16	1 15/16	4 1 1/16	
1 1/2	5/8	1/2-20	7/16-20	3/4	1.124	3/8	1/2	9/16	—	1/4	3/16	—	1	1 3/8	1 15/16	4 7/8	
	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	15/16	1/2	—	—	1	—	1 3/4	2 5/16	5 1/4	
2	5/8	1/2-20	7/16-20	3/4	1.124	3/8	1/2	9/16	—	1/4	3/16	—	1	1 3/8	1 15/16	4 15/16	
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	5/8	—	—	1 1/4	—	2	2 9/16	5 9/16	
2 1/2	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	15/16	—	1/4	3/8	—	1 3/8	1 3/4	2 5/16	5 5/16	
	5/8	1/2-20	7/16-20	3/4	1.124	3/8	1/2	9/16	—	1/4	3/16	—	1	1 3/8	1 15/16	5 1/16	
3 1/4	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	5/8	—	—	1 1/4	—	2	2 9/16	5 1 1/16	
	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	15/16	—	1/4	3/8	—	1 3/8	1 7/8	2 7/16	6	
4	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 1 1/16	1 15/16	—	1/4	9/16	—	2	2 1/2	3 1/16	6 5/8	
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	—	1/4	1/2	—	1 5/8	2 1/8	2 1 1/16	6 1/4	
5	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 1 1/16	—	1/4	9/16	—	1 7/8	2 3/8	2 15/16	6 1/2	
	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	15/16	—	1/4	3/8	—	1 3/8	1 7/8	2 7/16	6	
6	2 1/2	2 1/4-12	1 7/8-12	3	3.124	1	2 1/16	2 3/8	—	1/4	1 1/16	—	2 1/4	2 3/4	3 5/16	6 7/8	
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	—	1/4	1/2	—	1 5/8	2 1/8	2 1 1/16	6 1/4	
7	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 1 1/16	—	1/4	9/16	—	1 7/8	2 3/8	2 15/16	6 1/2	
	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 1 1/16	1 15/16	—	1/4	9/16	—	2	2 1/2	3 1/16	6 5/8	
8	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	15/16	—	1/4	3/8	—	1 3/8	2 1/16	2 7/16	6 5/16	
	3 1/2	3 1/4-12	2 1/2-12	3 1/2	4.249	1	3	3 3/8	5/8	—	—	1 5/8	—	2 15/16	3 5/16	7 3/16	
9	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	—	1/4	1/2	—	1 5/8	2 5/16	2 1 1/16	6 9/16	
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 1 1/16	—	1/4	9/16	—	1 7/8	2 3/16	2 15/16	6 13/16	
10	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 1 1/16	1 15/16	—	1/4	9/16	—	2	2 1 1/16	3 1/16	6 15/16	
	2 1/2	2 1/4-12	1 7/8-12	3	3.124	1	2 1/16	2 3/8	—	1/4	1 1/16	—	2 1/4	2 15/16	3 5/16	7 3/16	
11	3	2 3/4-12	2 1/4-12	3 1/2	3.749	1	2 5/8	2 7/8	5/8	—	—	1 5/8	—	2 15/16	3 5/16	7 3/16	
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	—	1/4	7/16	—	1 5/8	2 5/16	2 13/16	7 1/16	
12	4	3 3/4-12	3-12	4	4.749	1	3 3/8	3 7/8	1/2	—	—	1 1/2	—	2 15/16	3 7/16	7 1 1/16	
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 1 1/16	—	1/4	9/16	—	1 7/8	2 9/16	3 1/16	7 5/16	
13	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 1 1/16	1 15/16	—	1/4	9/16	—	2	2 1 1/16	3 3/16	7 7/16	
	2 1/2	2 1/4-12	1 7/8-12	3	3.124	1	2 1/16	2 3/8	—	1/4	1 1/16	—	2 1/4	2 15/16	3 7/16	7 1 1/16	
14	3	2 3/4-12	2 1/4-12	3 1/2	3.749	1	2 5/8	2 7/8	1/2	—	—	1 1/2	—	2 15/16	3 7/16	7 1 1/16	
	3 1/2	3 1/4-12	2 1/2-12	3 1/2	4.249	1	3	3 3/8	1/2	—	—	1 1/2	—	2 15/16	3 7/16	7 1 1/16	

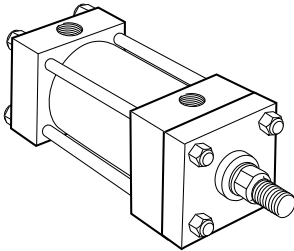
Side Tap Mount

Style MS4

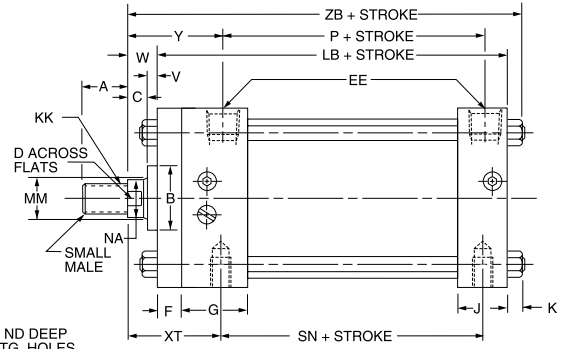
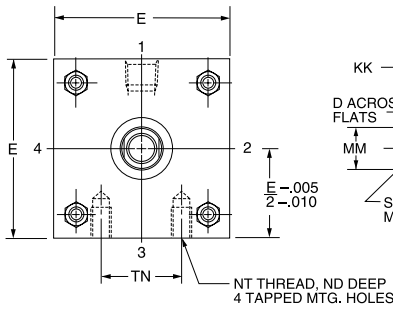
1" - 1 1/2" - 2" - 2 1/2" - 5"

and 6" Bore

With Maximum Oversize Rods



Tie Rod Retained Cartridge

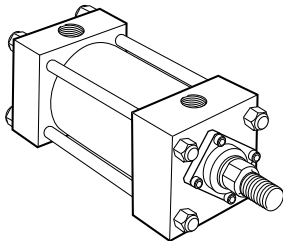


Before determining dimensions: See chart on page 5 for cylinder rod combinations that have removable cartridges.

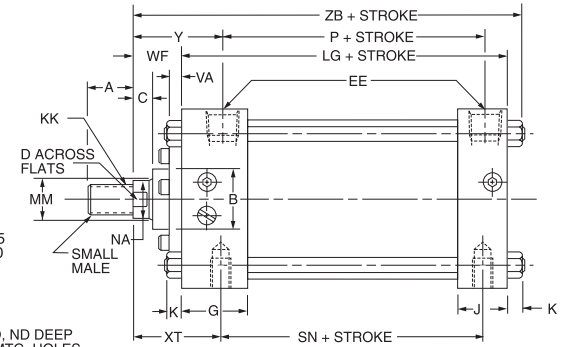
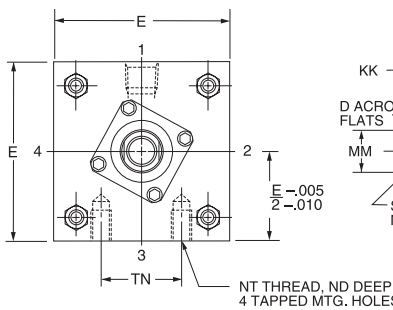
Side Tap Mount

Style MS4

1 1/2" - 6" Bore



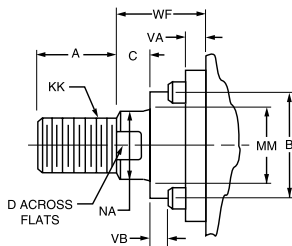
Removable Cartridge



Rod End Dimensions — see table 2

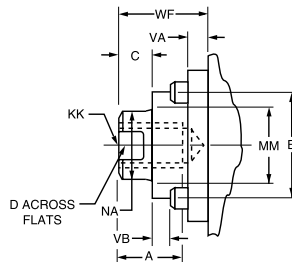
Thread Style 2

Small Male



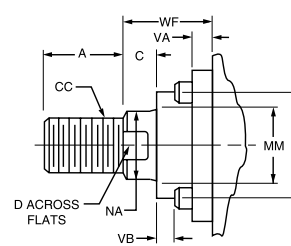
Thread Style 3

Short Female



Thread Style 4

Intermediate Male



“Special” Thread Style 0

Special thread, extension, rod eye, blank, etc., are also available.

To order, specify “Style 0” and give desired dimensions for KK, A, W or WF. If otherwise special, furnish dimensioned sketch.

A high strength rod end stud is supplied on thread style 2 through 2" diameter rods. Larger sizes or special rod ends are cut threads. Style 2 rod ends are recommended where the workpiece is secured against the rod shoulder. When the workpiece is not shouldered,

style 2 rod ends are recommended through 2" piston rod diameters and style 4 rod ends are recommended on larger diameters. Use style 3 for applications where female rod end threads are required. If rod end is not specified, style 2 will be supplied.

Table 1—Envelope and Mounting Dimensions

Bore	E	EE NPTF	F	G	J	K	NT	TN	Add Stroke			
									LB	LG	P	SN
1*	■	1/4	3/8	1 1/2	1	3/16	10-24	9/16	3 7/8	—	2 1/8	2 1/8
1 1/2	2	3/8†	3/8	1 1/2	1	1/4	1/4-20	5/8	4	3 5/8	2 1/4	2 1/4
2	2 1/2	3/8†	3/8	1 1/2	1	5/16	5/16-18	7/8	4	3 5/8	2 1/4	2 1/4
2 1/2	3	3/8†	3/8	1 1/2	1	5/16	3/8-16	1 1/4	4 1/8	3 3/4	2 3/8	2 3/8
3 1/4	3 3/4	1/2	5/8	1 3/4	1 1/4	3/8	1/2-13	1 1/2	4 7/8	4 1/4	2 5/8	2 5/8
4	4 1/2	1/2	5/8	1 3/4	1 1/4	3/8	1/2-13	2 1/16	4 7/8	4 1/4	2 5/8	2 5/8
5	5 1/2	1/2	5/8	1 3/4	1 1/4	7/16	5/8-11	2 11/16	5 1/8	4 1/2	2 7/8	2 7/8
6	6 1/2	3/4	3/4	2	1 1/2	7/16	3/4-10	3 1/4	5 3/4	5	3 1/8	3 1/8

* Cushions not available on 1" bore.

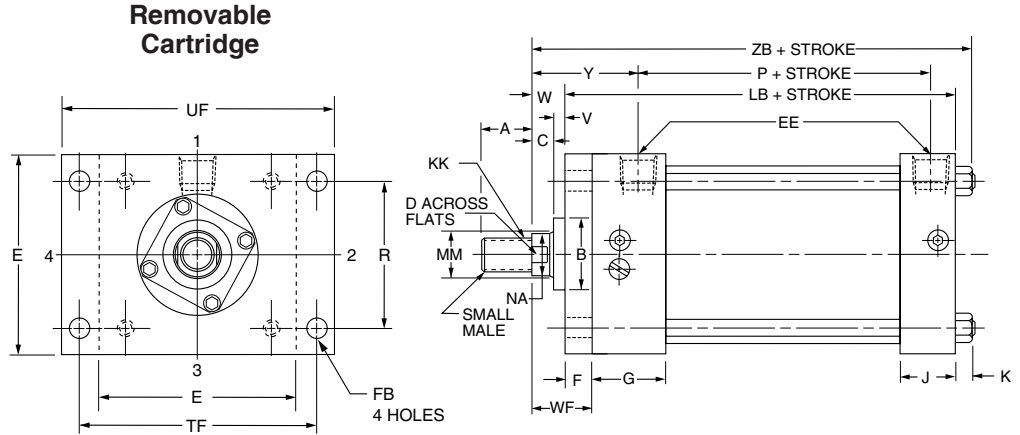
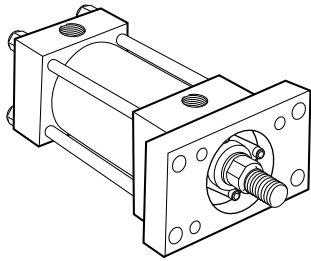
† On 1 1/2", 2" and 2 1/2" bore sizes, the head-end (only) pipe thread is not full depth on cylinders with maximum oversize rods. Minimum of three full threads available.

■ 1" bore head is 1 3/4" x 1 1/2". See page 12, Section A.

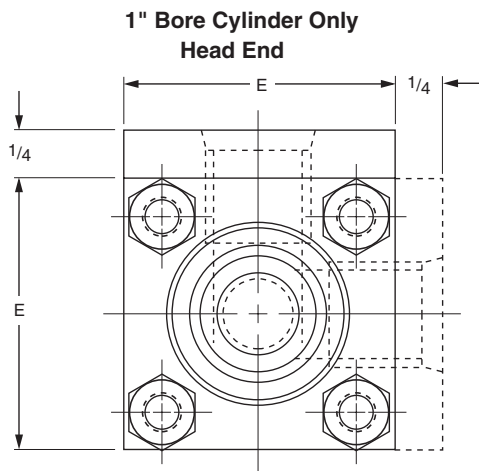
Table 2—Rod Dimensions and Envelope Dimensions Affected by Rod Size

Bore	Rod Dia. MM	Thread		Rod Extensions and Envelope Dimensions Affected By Rod Size													Add Stroke ZB
		Style 4 CC	Style 2 & 3 KK	A	+0.000 -0.002 B	C	D	NA	V	VA	VB	W	WF	XT	Y	ND	
1*	1/2	7/16-20	5/16-24	5/8	.999	3/8	3/8	7/16	1/4	—	—	5/8	—	1 15/16	1 15/16	1/4	4 11/16
	5/8	1/2-20	7/16-20	3/4	1.124	3/8	1/2	9/16	1/4	—	—	5/8	—	1 15/16	1 15/16	1/4	4 11/16
1 1/2	5/8	1/2-20	7/16-20	3/4	1.124	3/8	1/2	9/16	—	1/4	3/16	—	1	1 15/16	1 15/16	3/8	4 7/8
	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	15/16	1/2	—	—	1	—	2 5/16	2 5/16	3/8	5 1/4
2	5/8	1/2-20	7/16-20	3/4	1.124	3/8	1/2	9/16	—	1/4	3/16	—	1	1 15/16	1 13/16	11/32	4 15/16
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	5/8	—	—	1 1/4	—	2 9/16	2 9/16	11/32	5 9/16
	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	15/16	—	1/4	3/8	—	1 3/8	2 5/16	2 5/16	11/32	5 5/16
2 1/2	5/8	1/2-20	7/16-20	3/4	1.124	3/8	1/2	9/16	—	1/4	3/16	—	1	1 15/16	1 15/16	7/16	5 1/16
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	3/4	—	—	1 1/2	—	2 13/16	2 13/16	7/16	5 15/16
	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	15/16	—	1/4	3/8	—	1 3/8	2 5/16	2 5/16	7/16	5 7/16
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	5/8	—	—	1 1/4	—	2 9/16	2 9/16	7/16	5 11/16
3 1/4	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	15/16	—	1/4	3/8	—	1 3/8	2 7/16	2 7/16	1/2	6
	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 11/16	1 5/16	—	1/4	9/16	—	2	3 1/16	3 1/16	1/2	6 5/8
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	—	1/4	1/2	—	1 5/8	2 11/16	2 11/16	1/2	6 1/4
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	—	1/4	9/16	—	1 7/8	2 15/16	2 15/16	1/2	6 1/2
4	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	15/16	—	1/4	3/8	—	1 3/8	2 7/16	2 7/16	5/8	6
	2 1/2	2 1/4-12	1 7/8-12	3	3.124	1	2 1/16	2 3/8	—	1/4	11/16	—	2 1/4	3 9/16	3 5/16	5/8	6 7/8
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	—	1/4	1/2	—	1 5/8	2 11/16	2 11/16	5/8	6 1/4
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	—	1/4	9/16	—	1 7/8	2 15/16	2 15/16	5/8	6 1/2
	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 11/16	1 5/16	—	1/4	9/16	—	2	3 1/16	3 1/16	5/8	6 5/8
5	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	15/16	—	1/4	3/8	—	1 3/8	2 7/16	2 7/16	3/4	6 5/16
	3 1/2	3 1/4-12	2 1/2-12	3 1/2	4.249	1	3	3 3/8	5/8	—	—	1 5/8	—	3 5/16	3 5/16	3/4	7 3/16
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	—	1/4	1/2	—	1 5/8	2 11/16	2 11/16	3/4	6 9/16
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	—	1/4	9/16	—	1 7/8	2 15/16	2 15/16	3/4	6 13/16
	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 11/16	1 5/16	—	1/4	9/16	—	2	3 1/16	3 1/16	3/4	6 15/16
	2 1/2	2 1/4-12	1 7/8-12	3	3.124	1	2 1/16	2 3/8	—	1/4	11/16	—	2 1/4	3 5/16	3 5/16	3/4	7 3/16
6	3	2 3/4-12	2 1/4-12	3 1/2	3.749	1	2 5/8	2 7/8	5/8	—	—	1 5/8	—	3 5/16	3 5/16	3/4	7 3/16
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	—	1/4	7/16	—	1 5/8	2 13/16	2 13/16	7/8	7 1/16
	4	3 3/4-12	3-12	4	4.749	1	3 3/8	3 7/8	1/2	—	—	1 1/2	—	3 7/16	3 7/16	7/8	7 11/16
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	—	1/4	9/16	—	1 7/8	3 1/16	3 1/16	7/8	7 5/16
	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 11/16	1 5/16	—	1/4	9/16	—	2	3 3/16	3 3/16	7/8	7 7/16
	2 1/2	2 1/4-12	1 7/8-12	3	3.124	1	2 1/16	2 3/8	—	1/4	11/16	—	2 1/4	3 7/16	3 7/16	7/8	7 11/16
	3	2 3/4-12	2 1/4-12	3 1/2	3.749	1	2 5/8	2 7/8	1/2	—	—	1 1/2	—	3 7/16	3 7/16	7/8	7 11/16
3 1/2	3 1/4-12	2 1/2-12	3 1/2	4.249	1	3	3 3/8	1/2	—	—	1 1/2	—	3 7/16	3 7/16	7/8	7 11/16	

Head Rectangular Flange Mount
Style MF1
1" - 6" Bore

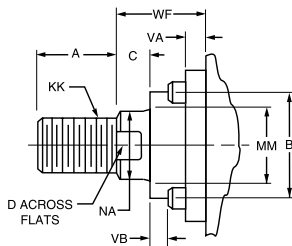


1" Bore Cylinder Only

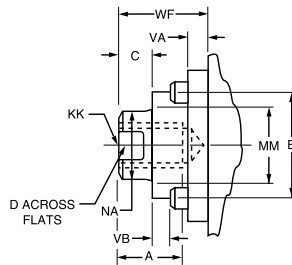


Rod End Dimensions — see table 2

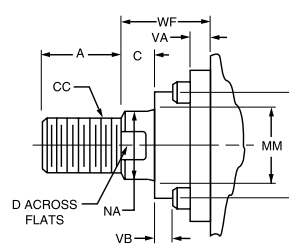
Thread Style 2
Small Male



Thread Style 3
Short Female



Thread Style 4
Intermediate Male



**“Special”
Thread Style 0**

Special thread, extension, rod eye, blank, etc., are also available.

To order, specify “Style 0” and give desired dimensions for KK, A, W or WF. If otherwise special, furnish dimensioned sketch.

A high strength rod end stud is supplied on thread style 2 through 2" diameter rods. Larger sizes or special rod ends are cut threads. Style 2 rod ends are recommended where the workpiece is secured against the rod shoulder. When the workpiece is not shouldered,

style 2 rod ends are recommended through 2" piston rod diameters and style 4 rod ends are recommended on larger diameters. Use style 3 for applications where female rod end threads are required. If rod end is not specified, style 2 will be supplied.

Table 1—Envelope and Mounting Dimensions

Bore	E	EE NPTF	F	FB	G	J	K	R	TF	UF	Add Stroke	
											LB	P
1*	■	1/4	3/8	1/4	1 1/2	1	3/16	1.08	2	2 1/2	3 7/8	2 1/8
1 1/2	2	3/8†	3/8	5/16	1 1/2	1	1/4	1.43	2 3/4	3 3/8	4	2 1/4
2	2 1/2	3/8†	3/8	3/8	1 1/2	1	5/16	1.84	3 3/8	4 1/8	4	2 1/4
2 1/2	3	3/8†	3/8	7/16	1 1/2	1	5/16	2.19	3 7/8	4 5/8	4 7/8	2 3/8
3 1/4	3 3/4	1/2	5/8	3/8	1 3/4	1 1/4	3/8	2.76	4 11/16	5 1/2	4 7/8	2 5/8
4	4 1/2	1/2	5/8	7/16	1 3/4	1 1/4	3/8	3.32	5 7/16	6 1/4	4 7/8	2 5/8
5	5 1/2	1/2	5/8	9/16	1 3/4	1 1/4	7/16	4.10	6 5/8	7 5/8	5 1/8	2 7/8
6	6 1/2	3/4	3/4	9/16	2	1 1/2	7/16	4.88	7 5/8	8 5/8	5 3/4	3 1/8

* Cushions not available on 1" bore.

† On 1 1/2", 2" and 2 1/2" bore sizes, the head-end (only) pipe thread is not full depth on cylinders with maximum oversize rods. Minimum of three full threads available.

■ 1" bore head is 1 3/4" x 1 1/2". See page 12, Section A.

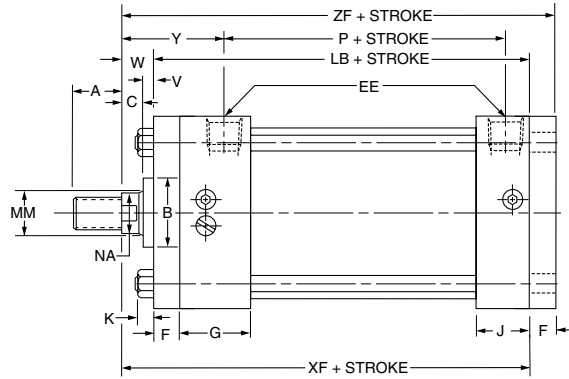
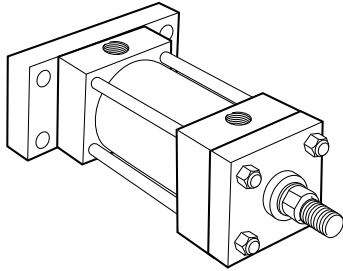
Table 2—Rod Dimensions and Envelope Dimensions Affected by Rod Size

Bore	Rod Dia. MM	Thread		Rod Extensions and Envelope Dimensions Affected By Rod Size										Add Stroke ZB
		Style 4 CC	Style 2 & 3 KK	A	+0.002 -0.002 B	C	D	NA	V	W	WF	Y		
1*	1/2	7/16-20	5/16-24	5/8	.999	3/8	3/8	7/16	1/4	5/8	1	1 15/16	4 11/16	
	5/8	1/2-20	7/16-20	3/4	1.124	3/8	1/2	9/16	1/4	5/8	1	1 15/16	4 11/16	
1 1/2	5/8	1/2-20	7/16-20	3/4	1.124	3/8	1/2	9/16	1/4	5/8	1	1 15/16	4 7/8	
	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	1 5/16	1/2	1	1 3/8	2 5/16	5 1/4	
2	5/8	1/2-20	7/16-20	3/4	1.124	3/8	1/2	9/16	1/4	5/8	1	1 15/16	4 15/16	
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	5/8	1 1/4	1 5/8	2 9/16	5 9/16	
	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	1 5/16	1/2	1	1 3/8	2 5/16	5 5/16	
2 1/2	5/8	1/2-20	7/16-20	3/4	1.124	3/8	1/2	9/16	1/4	5/8	1	1 15/16	5 1/16	
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	3/4	1 1/2	1 7/8	2 13/16	5 15/16	
	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	1 5/16	1/2	1	1 3/8	2 5/16	5 7/16	
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	5/8	1 1/4	1 5/8	2 9/16	5 11/16	
3 1/4	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	1 5/16	1/4	3/4	1 3/8	2 7/16	6	
	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 11/16	1 15/16	1/2	1 3/8	2	3 1/16	6 5/8	
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	3/8	1	1 5/8	2 11/16	6 1/4	
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	1/2	1 1/4	1 7/8	2 15/16	6 1/2	
4	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	1 5/16	1/4	3/4	1 3/8	2 7/16	6	
	2 1/2	2 1/4-12	1 7/8-12	3	3.124	1	2 1/16	2 3/8	5/8	1 5/8	2 1/4	3 5/16	6 7/8	
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	3/8	1	1 5/8	2 11/16	6 1/4	
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	1/2	1 1/4	1 7/8	2 15/16	6 1/2	
	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 11/16	1 15/16	1/2	1 3/8	2	3 1/16	6 5/8	
5	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	1 5/16	1/4	3/4	1 3/8	2 7/16	6 5/16	
	3 1/2	3 1/4-12	2 1/2-12	3 1/2	4.249	1	3	3 3/8	5/8	1 5/8	2 1/4	3 5/16	7 3/16	
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	3/8	1	1 5/8	2 11/16	6 9/16	
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	1/2	1 1/4	1 7/8	2 15/16	6 13/16	
	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 11/16	1 15/16	1/2	1 3/8	2	3 1/16	6 15/16	
	2 1/2	2 1/4-12	1 7/8-12	3	3.124	1	2 1/16	2 3/8	5/8	1 5/8	2 1/4	3 5/16	7 3/16	
	3	2 3/4-12	2 1/4-12	3 1/2	3.749	1	2 5/8	2 7/8	5/8	1 5/8	2 1/4	3 5/16	7 3/16	
6	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	1/4	7/8	1 5/8	2 13/16	7 1/16	
	4	3 3/4-12	3-12	4	4.749	1	3 3/8	3 7/8	1/2	1 1/2	2 1/4	3 7/16	7 11/16	
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	3/8	1 1/8	1 7/8	3 1/16	7 5/16	
	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 11/16	1 15/16	3/8	1 1/4	2	3 3/16	7 7/16	
	2 1/2	2 1/4-12	1 7/8-12	3	3.124	1	2 1/16	2 3/8	1/2	1 1/2	2 1/4	3 7/16	7 11/16	
	3	2 3/4-12	2 1/4-12	3 1/2	3.749	1	2 5/8	2 7/8	1/2	1 1/2	2 1/4	3 7/16	7 11/16	
	3 1/2	3 1/4-12	2 1/2-12	3 1/2	4.249	1	3	3 3/8	1/2	1 1/2	2 1/4	3 7/16	7 11/16	

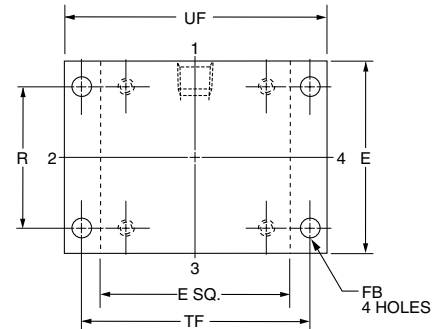
Cap Rectangular Flange Mount

Style MF2

1" - 1 1/2" - 2" - 2 1/2" - 5" and 6" Bore
With Maximum Oversize Rods



Tie Rod Retained Cartridge

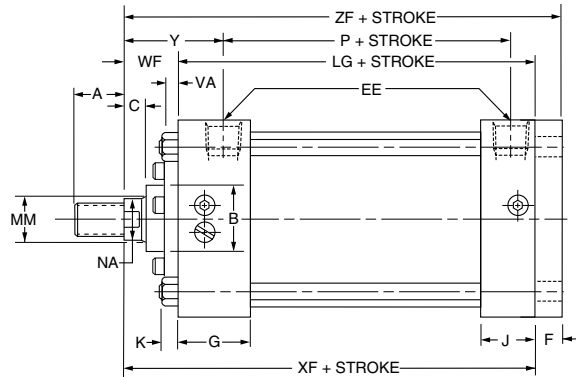
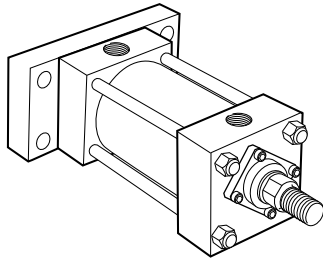


Before determining dimensions: See chart on page 5 for cylinder rod combinations that have removable cartridges.

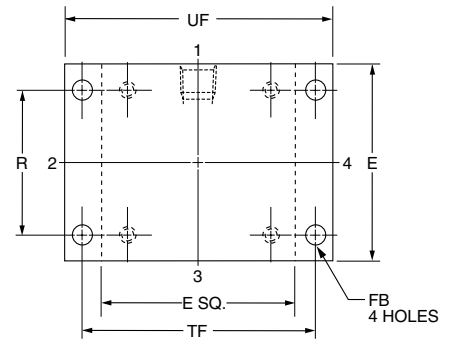
Cap Rectangular Flange Mount

Style MF2

1 1/2" - 6" Bore



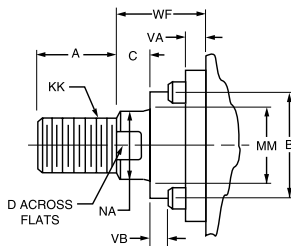
Removable Cartridge



Rod End Dimensions — see table 2

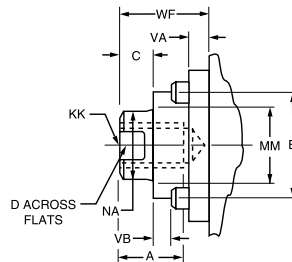
Thread Style 2

Small Male



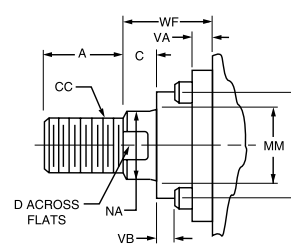
Thread Style 3

Short Female



Thread Style 4

Intermediate Male



“Special” Thread Style 0

Special thread, extension, rod eye, blank, etc., are also available.

To order, specify “Style 0” and give desired dimensions for KK, A, W or WF. If otherwise special, furnish dimensioned sketch.

A high strength rod end stud is supplied on thread style 2 through 2" diameter rods. Larger sizes or special rod ends are cut threads. Style 2 rod ends are recommended where the workpiece is secured against the rod shoulder. When the workpiece is not shouldered,

style 2 rod ends are recommended through 2" piston rod diameters and style 4 rod ends are recommended on larger diameters. Use style 3 for applications where female rod end threads are required. If rod end is not specified, style 2 will be supplied.

Table 1—Envelope and Mounting Dimensions

Bore	E	EE NPTF	F	FB	G	J	K	R	TF	UF	Add Stroke		
											LB	LG	P
1*	■	1/4	3/8	1/4	1 1/2	1	3/16	1.08	2	2 1/2	3 7/8	—	2 1/8
1 1/2	2	3/8†	3/8	5/16	1 1/2	1	1/4	1.43	2 3/4	3 3/8	4	3 5/8	2 1/4
2	2 1/2	3/8†	3/8	3/8	1 1/2	1	5/16	1.84	3 3/8	4 1/8	4	3 5/8	2 1/4
2 1/2	3	3/8†	3/8	3/8	1 1/2	1	5/16	2.19	3 7/8	4 5/8	4 1/8	3 3/4	2 3/8
3 1/4	3 3/4	1/2	5/8	7/16	1 3/4	1 1/4	3/8	2.76	4 11/16	5 1/2	—	4 1/4	2 5/8
4	4 1/2	1/2	5/8	7/16	1 3/4	1 1/4	3/8	3.32	5 7/16	6 1/4	—	4 1/4	2 5/8
5	5 1/2	1/2	5/8	9/16	1 3/4	1 1/4	7/16	4.10	6 5/8	7 5/8	5 1/8	4 1/2	2 7/8
6	6 1/2	3/4	3/4	9/16	2	1 1/2	7/16	4.88	7 5/8	8 5/8	5 3/4	5	3 1/8

* Cushion not available on 1" bore.

† On 1 1/2", 2" and 2 1/2" bore sizes, the head-end (only) pipe thread is not full depth on cylinders with maximum oversize rods. Minimum of three full threads available.

■ 1" bore head is 1 3/4" x 1 1/2". See page 12, Section A.

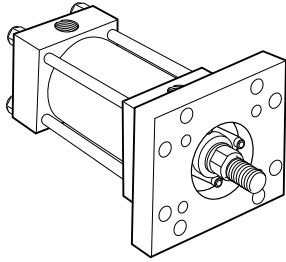
Table 2—Rod Dimensions and Envelope Dimensions Affected by Rod Size

Bore	Rod Dia. MM	Thread		Rod Extensions and Envelope Dimensions Affected By Rod Size													Add Stroke	
		Style 4 CC	Style 2 & 3 KK	A	+0.000 -0.002 B	C	D	NA	V	VA	VB	W	WF	Y	XF	ZF		
		1	1/2	7/16-20	5/16-24	5/8	.999	3/8	3/8	7/16	1/4	—	—	5/8	—	1 15/16	4 1/2	4 7/8
1 1/2	5/8	1/2-20	7/16-20	3/4	1.124	3/8	1/2	9/16	1/4	—	—	5/8	—	1 15/16	4 1/2	4 7/8		
	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	1 5/16	1/2	—	—	1	—	2 5/16	5	5 3/8		
2	5/8	1/2-20	7/16-20	3/4	1.124	3/8	1/2	9/16	—	1/4	3/16	—	1	1 15/16	4 5/8	5		
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	5/8	—	—	1 1/4	—	2 9/16	5 1/4	5 5/8		
2 1/2	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	1 5/16	—	1/4	3/8	—	1 3/8	2 5/16	5	5 3/8		
	5/8	1/2-20	7/16-20	3/4	1.124	3/8	1/2	9/16	—	1/4	3/16	—	1	1 15/16	4 3/4	5 1/8		
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	3/4	—	—	1 1/2	—	2 13/16	5 5/8	6		
3 1/4	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	1 5/16	—	1/4	3/8	—	1 3/8	2 5/16	5 1/8	5 1/2		
	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 11/16	1 5/16	—	1/4	9/16	—	2	3 1/16	6 1/4	6 7/8		
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	5/8	—	—	1 1/4	—	2 9/16	5 3/8	5 3/4		
4	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	—	1/4	9/16	—	1 7/8	2 15/16	6 1/8	6 3/4		
	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	1 5/16	—	1/4	3/8	—	1 3/8	2 7/16	5 5/8	6 1/4		
	2 1/2	2 1/4-12	1 7/8-12	3	3.124	1	2 1/16	2 3/8	—	1/4	1 1/16	—	2 1/4	3 5/16	6 1/2	7 1/8		
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	—	1/4	1/2	—	1 5/8	2 11/16	5 7/8	6 1/2		
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	—	1/4	9/16	—	1 7/8	2 15/16	6 1/8	6 3/4		
5	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 11/16	1 5/16	—	1/4	9/16	—	2	3 1/16	6 1/4	6 7/8		
	2 1/2	2 1/4-12	1 7/8-12	3	3.124	1	2 1/16	2 3/8	—	1/4	1 1/16	—	2 1/4	3 5/16	6 3/4	7 3/8		
	3	2 3/4-12	2 1/4-12	3 1/2	3.749	1	2 5/8	2 7/8	5/8	—	—	1 5/8	—	3 5/16	6 3/4	7 3/8		
	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	1 5/16	—	1/4	3/8	—	1 3/8	2 7/16	5 7/8	6 1/2		
	3 1/2	3 1/4-12	2 1/2-12	3 1/2	4.249	1	3	3 3/8	5/8	—	—	1 5/8	—	3 5/16	6 3/4	7 3/8		
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	—	1/4	1/2	—	1 5/8	2 11/16	6 1/8	6 3/4		
6	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 11/16	1 5/16	—	1/4	9/16	—	2	3 1/16	6 1/2	7 1/8		
	2 1/2	2 1/4-12	1 7/8-12	3	3.124	1	2 1/16	2 3/8	—	1/4	1 1/16	—	2 1/4	3 5/16	6 3/4	7 3/8		
	3	2 3/4-12	2 1/4-12	3 1/2	3.749	1	2 5/8	2 7/8	5/8	—	—	1 5/8	—	3 5/16	6 3/4	7 3/8		
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	—	1/4	7/16	—	1 5/8	2 13/16	6 5/8	7 3/8		
	4	3 3/4-12	3-12	4	4.749	1	3 3/8	3 7/8	1/2	—	—	1 1/2	—	3 7/16	7 1/4	8		
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	—	1/4	9/16	—	1 7/8	3 1/16	6 7/8	7 5/8		
6	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 11/16	1 5/16	—	1/4	9/16	—	2	3 1/16	7	7 3/4		
	2 1/2	2 1/4-12	1 7/8-12	3	3.124	1	2 1/16	2 3/8	—	1/4	1 1/16	—	2 1/4	3 7/16	7 1/4	8		
	3	2 3/4-12	2 1/4-12	3 1/2	3.749	1	2 5/8	2 7/8	1/2	—	—	1 1/2	—	3 7/16	7 1/4	8		
	3 1/2	3 1/4-12	2 1/2-12	3 1/2	4.249	1	3	3 3/8	1/2	—	—	1 1/2	—	3 7/16	7 1/4	8		

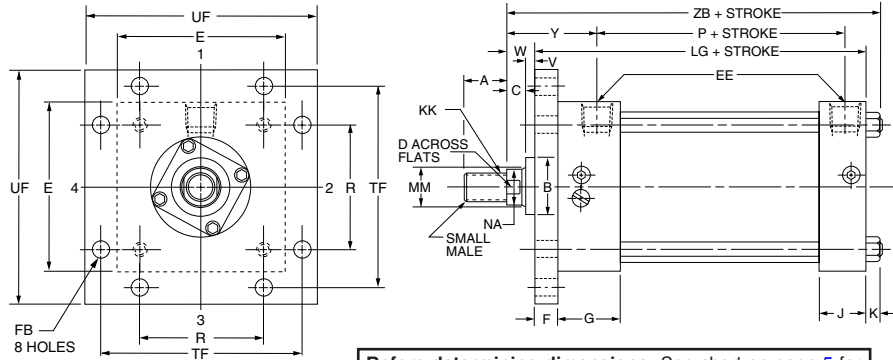
Mounting Information – 1" to 6" Bore

Head Square Flange Mount

Style MF5
1" - 6" Bore



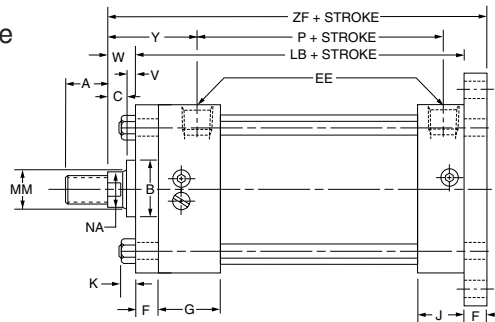
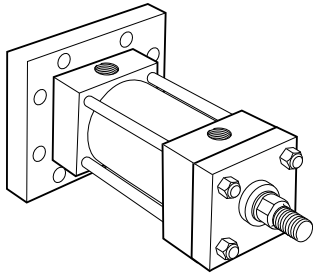
Removable Cartridge



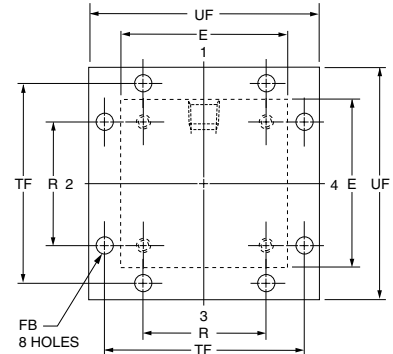
Before determining dimensions: See chart on page 5 for cylinder rod combinations that have removable cartridges.

Cap Square Flange Mount

Style MF6
1" - 1 1/2" - 2" - 2 1/2" - 5" and 6" Bore
With Maximum Oversize Rods

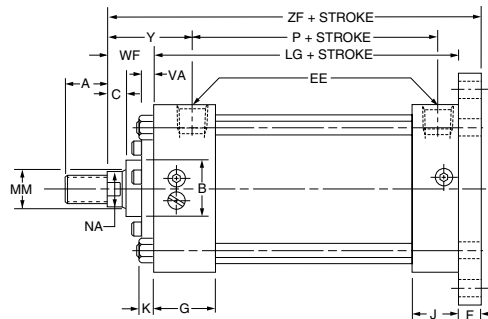
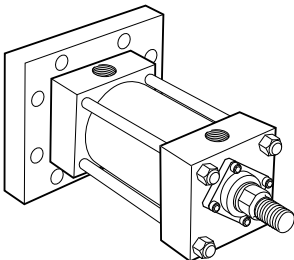


Tie Rod Retained Cartridge

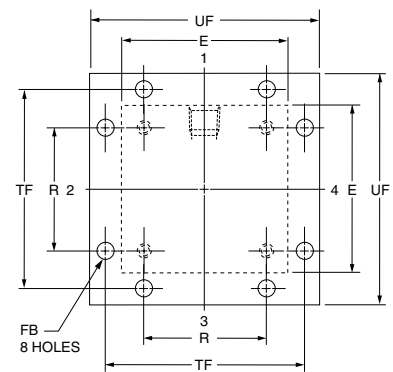


Cap Square Flange Mount

Style MF6
1 1/2" - 6" Bore



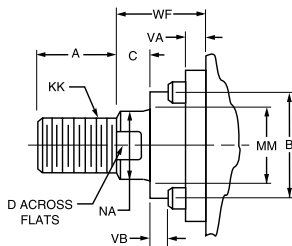
Removable Cartridge



Rod End Dimensions — see table 2

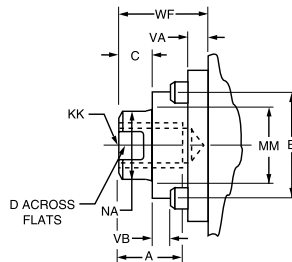
Thread Style 2

Small Male



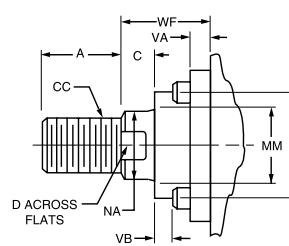
Thread Style 3

Short Female



Thread Style 4

Intermediate Male



“Special” Thread Style 0

Special thread, extension, rod eye, blank, etc., are also available.

To order, specify “Style 0” and give desired dimensions for KK, A, W or WF. If otherwise special, furnish dimensioned sketch.

A high strength rod end stud is supplied on thread style 2 through 2" diameter rods. Larger sizes or special rod ends are cut threads. Style 2 rod ends are recommended where the workpiece is secured against the rod shoulder. When the workpiece is not shouldered,

style 2 rod ends are recommended through 2" piston rod diameters and style 4 rod ends are recommended on larger diameters. Use style 3 for applications where female rod end threads are required. If rod end is not specified, style 2 will be supplied.

Table 1—Envelope and Mounting Dimensions

Bore	E	EE NPTF	F	FB	G	J	K	R	TF	UF	Add Stroke		
											LB	LG	P
1*	■	1/4	3/8	1/4	1 1/2	1	3/16	1.08	2	2 1/2	3 7/8	—	2 1/8
1 1/2	2	3/8†	3/8	5/16	1 1/2	1	1/4	1.43	2 3/4	3 3/8	4	3 5/8	2 1/4
2	2 1/2	3/8†	3/8	3/8	1 1/2	1	5/16	1.84	3 3/8	4 1/8	4	3 5/8	2 1/4
2 1/2	3	3/8†	3/8	3/8	1 1/2	1	5/16	2.19	3 7/8	4 5/8	4 1/8	3 3/4	2 3/8
3 1/4	3 3/4	1/2	5/8	7/16	1 3/4	1 1/4	3/8	2.76	4 11/16	5 1/2	4 7/8	4 1/4	2 5/8
4	4 1/2	1/2	5/8	7/16	1 3/4	1 1/4	3/8	3.32	5 7/16	6 1/4	4 7/8	4 1/4	2 5/8
5	5 1/2	1/2	5/8	9/16	1 3/4	1 1/4	7/16	4.10	6 5/8	7 5/8	5 1/8	4 1/2	2 7/8
6	6 1/2	3/4	3/4	9/16	2	1 1/2	7/16	4.88	7 5/8	8 5/8	5 3/4	5	3 1/8

* Cushion not available on 1" bore.

† On 1 1/2", 2" and 2 1/2" bore sizes, the head-end (only) pipe thread is not full depth on cylinders with maximum oversize rods. Minimum of three full threads available.

■ 1" bore head is 1 3/4" x 1 1/2". See page 12, Section A.

Table 2—Rod End Dimensions and Envelope Dimensions Affected By Rod Size

Bore	Rod Dia. MM	Thread		Rod Extensions and Envelope Dimensions Affected By Rod Size											Add Stroke	
		Style 4 CC	Style 2 & 3 KK	A	+0.000 -0.002 B	C	D	NA	V	VA	VB	W	WF	Y	ZB	ZF
1	1/2	7/16-20	5/16-24	5/8	.999	3/8	3/8	7/16	1/4	—	—	5/8	—	1 15/16	4 11/16	4 7/8
	5/8	1/2-20	7/16-20	3/4	1.124	3/8	1/2	9/16	1/4	—	—	5/8	—	1 15/16	4 11/16	4 7/8
1 1/2	5/8	1/2-20	7/16-20	3/4	1.124	3/8	1/2	9/16	1/4**	1/4	3/16	1/4	1	1 15/16	4 7/8	5
	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	1 5/16	1/2	—	—	1	—	2 5/16	5 1/4	5 3/8
2	5/8	1/2-20	7/16-20	3/4	1.124	3/8	1/2	9/16	1/4**	1/4	3/16	5/8	1	1 15/16	4 15/16	5
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	5/8	—	—	1 1/4	—	2 9/16	5 9/16	5 5/8
	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	1 5/16	1 1/2**	1/4	3/8	1	1 3/8	2 5/16	5 5/16	5 3/8
2 1/2	5/8	1/2-20	7/16-20	3/4	1.124	3/8	1/2	9/16	1/4**	1/4	3/16	5/8	1	1 15/16	5 1/16	5 1/8
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	3/4	—	—	1 1/2	—	2 13/16	5 15/16	6
	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	1 5/16	1 1/2**	1/4	3/8	1	1 3/8	2 5/16	5 7/16	5 1/2
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	5/8	—	—	1 1/4	—	2 9/16	5 11/16	5 3/4
3 1/4	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	1 5/16	1/4**	1/4	3/8	3/4	1 3/8	2 7/16	6	6 1/4
	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 11/16	1 5/16	1 1/2**	1/4	9/16	1 3/8	2	3 1/16	6 5/8	6 7/8
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	3/8**	1/4	1/2	1	1 5/8	2 11/16	6 1/4	6 1/2
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	1 1/2**	1/4	9/16	1 1/4	1 7/8	2 15/16	6 1/2	6 3/4
4	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	1 5/16	1/4**	1/4	3/8	3/4	1 3/8	2 7/16	6	6 1/4
	2 1/2	2 1/4-12	1 7/8-12	3	3.124	1	2 1/16	2 3/8	5/8**	1/4	1 1/16	1 5/8	2 1/4	3 5/16	6 7/8	7 1/8
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	3/8**	1/4	1/2	1	1 5/8	2 11/16	6 1/4	6 1/2
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	1 1/2**	1/4	9/16	1 1/4	1 7/8	2 15/16	6 1/2	6 3/4
	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 11/16	1 15/16	1 1/2**	1/4	9/16	1 3/8	2	3 1/16	6 5/8	6 7/8
5	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	1 5/16	1/4**	1/4	3/8	3/4	1 3/8	2 7/16	6 5/16	6 1/2
	3 1/2	3 1/4-12	2 1/2-12	3 1/2	4.249	1	3	3 3/8	5/8	—	—	1 5/8	—	3 5/16	7 3/16	7 3/8
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	3/8**	1/4	1/2	1	1 5/8	2 11/16	6 9/16	6 3/4
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	1 1/2**	1/4	9/16	1 1/4	1 7/8	2 15/16	6 13/16	7
	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 11/16	1 5/16	1 1/2**	1/4	9/16	1 3/8	2	3 1/16	6 15/16	7 1/8
	2 1/2	2 1/4-12	1 7/8-12	3	3.124	1	2 1/16	2 3/8	5/8**	1/4	1 1/16	1 5/8	2 1/4	3 5/16	7 3/16	7 3/8
	3	2 3/4-12	2 1/4-12	3 1/2	3.749	1	2 5/8	2 7/8	5/8	—	—	1 5/8	—	3 5/16	7 3/16	7 3/8
6	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	1/4	1/4	7/16	7/8	1 5/8	2 13/16	7 1/16	7 3/8
	4	3 3/4-12	3-12	4	4.749	1	3 3/8	3 7/8	3/8	—	—	1 1/2	—	3 7/16	7 11/16	8
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	3/8**	1/4	9/16	1 1/8	1 7/8	3 1/16	7 5/16	7 5/8
	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 11/16	1 5/16	1 1/2**	1/4	9/16	1 1/4	2	3 3/16	7 7/16	7 3/4
	2 1/2	2 1/4-12	1 7/8-12	3	3.124	1	2 1/16	2 3/8	1 1/2**	1/4	1 1/16	1 1/2	2 1/4	3 7/16	7 11/16	8
	3	2 3/4-12	2 1/4-12	3 1/2	3.749	1	2 5/8	2 7/8	1 1/2	—	—	1 1/2	—	3 7/16	7 11/16	8
3 1/2	3 1/4-12	2 1/2-12	3 1/2	4.249	1	3	3 3/8	1 1/2	—	—	1 1/2	—	3 7/16	7 11/16	8	

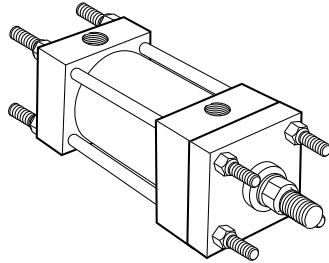
** For all MF5 mounts and MF6 mounts with maximum oversized rods.

Tie Rods Extended Mount

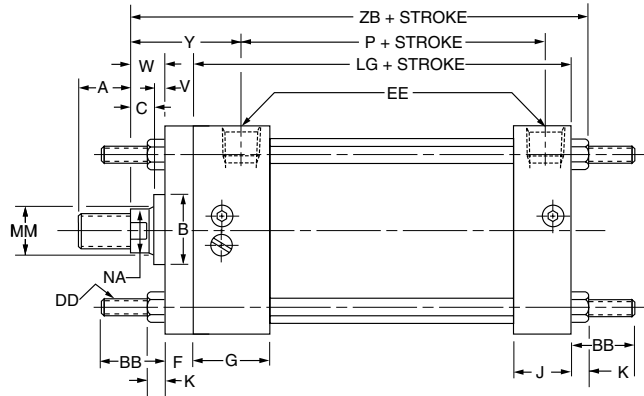
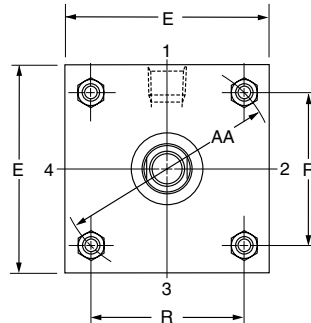
Style MX1

1" - 1 1/2" - 2" - 2 1/2" - 5" and 6" Bore

With Maximum Oversize Rods



Tie Rod Retained Cartridge



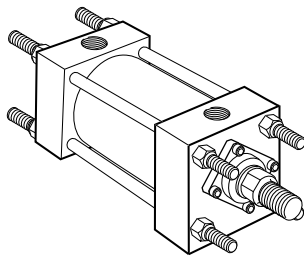
Tie Rods can be extended: Both Ends — Model MX1; Cap End — Model MX2; Head End — Model MX3.

Before determining dimensions: See chart on page 5 for cylinder rod combinations that have removable cartridges.

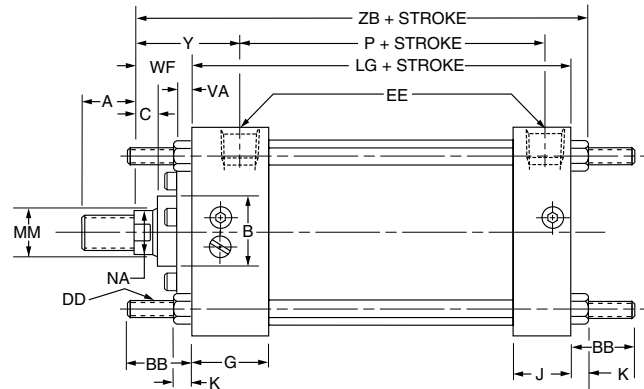
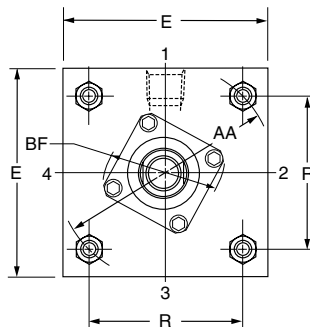
Tie Rods Extended Mount

Style MX1

1 1/2" - 6" Bore



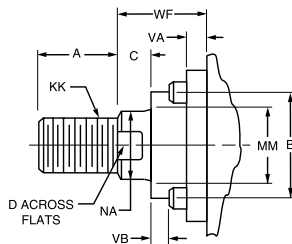
Removable Cartridge



Rod End Dimensions — see table 2

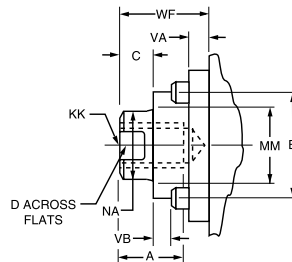
Thread Style 2

Small Male



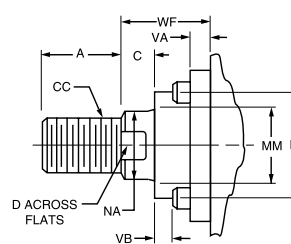
Thread Style 3

Short Female



Thread Style 4

Intermediate Male



“Special” Thread Style 0

Special thread, extension, rod eye, blank, etc., are also available.

To order, specify “Style 0” and give desired dimensions for KK, A, W or WF. If otherwise special, furnish dimensioned sketch.

A high strength rod end stud is supplied on thread style 2 through 2" diameter rods. Larger sizes or special rod ends are cut threads. Style 2 rod ends are recommended where the workpiece is secured against the rod shoulder. When the workpiece is not shouldered,

style 2 rod ends are recommended through 2" piston rod diameters and style 4 rod ends are recommended on larger diameters. Use style 3 for applications where female rod end threads are required. If rod end is not specified, style 2 will be supplied.

Table 1—Envelope and Mounting Dimensions

Bore	AA	BB	DD	E	EE NPTF	F	G	J	K	R	Add Stroke	
											LG	P
1*	1.53	3/4	10-24	■	1/4	3/8	1 1/2	1	3/16	1.08	3 1/2	2 1/8
1 1/2	2.02	1	1/4-28	2	3/8†	3/8	1 1/2	1	1/4	1.43	3 5/8	2 1/4
2	2.6	1 1/8	5/16-24	2 1/2	3/8†	3/8	1 1/2	1	5/16	1.84	3 5/8	2 1/4
2 1/2	3.1	1 1/8	5/16-24	3	3/8†	3/8	1 1/2	1	5/16	2.19	3 3/4	2 3/8
3 1/4	3.9	1 3/8	3/8-24	3 3/4	1/2	—	1 3/4	1 1/4	3/8	2.76	4 1/4	2 5/8
4	4.7	1 3/8	3/8-24	4 1/2	1/2	—	1 3/4	1 1/4	3/8	3.32	4 1/4	2 5/8
5	5.8	1 13/16	1/2-20	5 1/2	1/2	5/8	1 3/4	1 1/4	7/16	4.10	4 1/2	2 7/8
6	6.9	1 13/16	1/2-20	6 1/2	3/4	3/4	2	1 1/2	7/16	4.88	5	3 1/8

* Cushion not available on 1" bore.

† On 1 1/2", 2" and 2 1/2" bore sizes, the head-end (only) pipe thread is not full depth on cylinders with maximum oversize rods. Minimum of three full threads available.

■ 1" bore head is 1 3/4" x 1 1/2". See page 12, Section A.

Table 2—Rod End Dimensions and Envelope Dimensions Affected By Rod Size

Bore	Rod Dia. MM	Thread		Rod Extensions and Envelope Dimensions Affected By Rod Size													Add Stroke ZB
		Style 4 CC	Style 2 & 3 KK	A	+0.000 -0.002 B	BF	C	D	NA	V	VA	VB	W	WF	Y		
1	1/2	7/16-20	5/16-24	5/8	.999	—	3/8	3/8	7/16	1/4	—	—	5/8	—	1 15/16	4 11/16	
	5/8	1/2-20	7/16-20	3/4	1.124	—	3/8	1/2	9/16	1/4	—	—	5/8	—	1 15/16	4 11/16	
1 1/2	5/8	1/2-20	7/16-20	3/4	1.124	1.968	3/8	1/2	9/16	—	1/4	3/16	—	1	1 15/16	4 7/8	
	1	7/8-14	3/4-16	1 1/8	1.499	—	1/2	7/8	1 5/16	1/2	—	—	1	—	2 5/16	5 1/4	
2	5/8	1/2-20	7/16-20	3/4	1.124	1.968	3/8	1/2	9/16	—	1/4	3/16	—	1	1 15/16	4 15/16	
	1	7/8-14	3/4-16	1 1/8	1.499	2.468	1/2	7/8	1 5/16	—	1/4	3/8	—	1 3/8	2 5/16	5 5/16	
2 1/2	5/8	1/2-20	7/16-20	3/4	1.124	1.968	3/8	1/2	9/16	—	1/4	3/16	—	1	1 15/16	5 1/16	
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	—	3/4	1 1/2	1 11/16	3/4	—	—	1 1/2	—	2 13/16	5 5/16	
	1	7/8-14	3/4-16	1 1/8	1.499	2.468	1/2	7/8	1 5/16	—	1/4	3/8	—	1 3/8	2 5/16	5 7/16	
3 1/4	1 3/8	1 1/4-12	1-14	1 5/8	1.999	—	5/8	1 1/8	1 5/16	5/8	—	—	1 1/4	—	2 9/16	5 11/16	
	1	7/8-14	3/4-16	1 1/8	1.499	2.468	1/2	7/8	1 5/16	—	1/4	3/8	—	1 3/8	2 7/16	6	
	2	1 3/4-12	1 1/2-12	2 1/4	2.624	3.735	7/8	1 11/16	1 15/16	—	1/4	9/16	—	2	3 1/16	6 5/8	
4	1 3/8	1 1/4-12	1-14	1 5/8	1.999	2.968	5/8	1 1/8	1 5/16	—	1/4	1/2	—	1 5/8	2 11/16	6 1/4	
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3.735	3/4	1 1/2	1 11/16	—	1/4	9/16	—	1 7/8	2 15/16	6 1/2	
	2	1 3/4-12	1 1/2-12	2 1/4	2.624	3.735	7/8	1 11/16	1 15/16	—	1/4	9/16	—	2	3 1/16	6 5/8	
	1	7/8-14	3/4-16	1 1/8	1.499	2.468	1/2	7/8	1 5/16	—	1/4	3/8	—	1 3/8	2 7/16	6	
5	2 1/2	2 1/4-12	1 7/8-12	3	3.124	4.312	1	2 1/16	2 3/8	—	1/4	1 1/16	—	2 1/4	3 5/16	6 7/8	
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	2.968	5/8	1 1/8	1 5/16	—	1/4	1/2	—	1 5/8	2 11/16	6 1/4	
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3.735	3/4	1 1/2	1 11/16	—	1/4	9/16	—	1 7/8	2 15/16	6 1/2	
	2	1 3/4-12	1 1/2-12	2 1/4	2.624	3.735	7/8	1 11/16	1 15/16	—	1/4	9/16	—	2	3 1/16	6 5/8	
	2 1/2	2 1/4-12	1 7/8-12	3	3.124	5.000	1	2 1/16	2 3/8	—	1/4	1 1/16	—	2 1/4	3 5/16	7 3/16	
6	3	2 3/4-12	2 1/4-12	3 1/2	3.749	—	1	2 5/8	2 7/8	5/8	—	—	1 5/8	—	3 5/16	7 3/16	
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	2.968	5/8	1 1/8	1 5/16	—	1/4	7/16	—	1 5/8	2 13/16	7 1/16	
	4	3 3/4-12	3-12	4	4.749	—	1	3 3/8	3 7/8	1/2	—	—	1 1/2	—	3 7/16	7 11/16	
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3.625	3/4	1 1/2	1 11/16	—	1/4	9/16	—	1 7/8	3 1/16	7 5/16	
	2	1 3/4-12	1 1/2-12	2 1/4	2.624	3.735	7/8	1 11/16	1 15/16	—	1/4	9/16	—	2	3 3/16	7 7/16	
	2 1/2	2 1/4-12	1 7/8-12	3	3.124	4.312	1	2 1/16	2 3/8	—	1/4	1 1/16	—	2 1/4	3 7/16	7 11/16	
6	3	2 3/4-12	2 1/4-12	3 1/2	3.749	—	1	2 5/8	2 7/8	1/2	—	—	1 1/2	—	3 7/16	7 11/16	
	3 1/2	3 1/4-12	2 1/2-12	3 1/2	4.249	—	1	3	3 3/8	1/2	—	—	1 1/2	—	3 7/16	7 11/16	

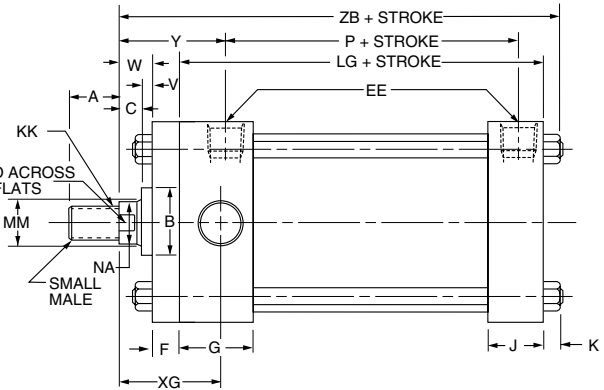
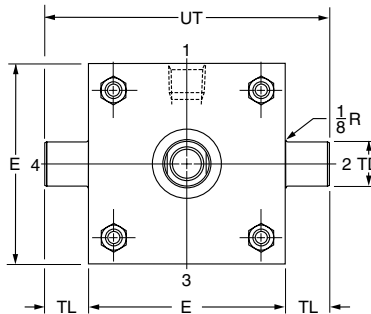
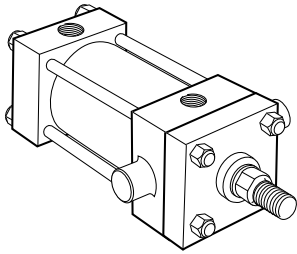
Head Trunnion Mount

Style MT1

1" - 1 1/2" - 2" - 2 1/2" - 5" and 6" Bore

With Maximum Oversize Rods

Tie Rod Retained Cartridge



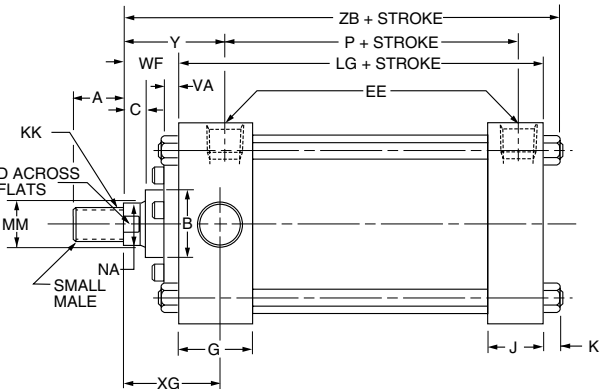
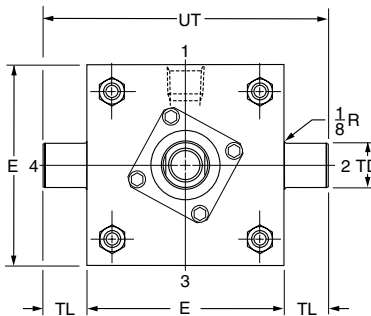
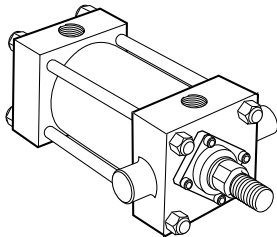
Before determining dimensions: See chart on page 5 for cylinder rod combinations that have removable cartridges.

Head Trunnion Mount

Style MT1

1 1/2" - 6" Bore

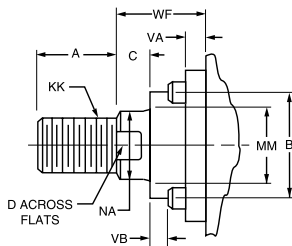
Removable Cartridge



Rod End Dimensions — see table 2

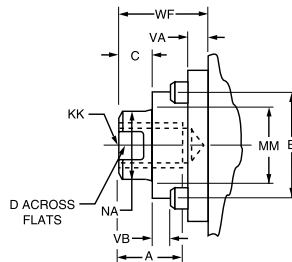
Thread Style 2

Small Male



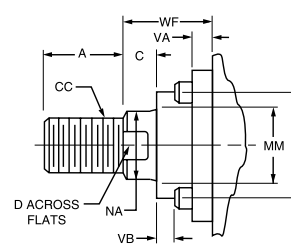
Thread Style 3

Short Female



Thread Style 4

Intermediate Male



“Special” Thread Style 0

Special thread, extension, rod eye, blank, etc., are also available.

To order, specify “Style 0” and give desired dimensions for KK, A, W or WF. If otherwise special, furnish dimensioned sketch.

A high strength rod end stud is supplied on thread style 2 through 2" diameter rods. Larger sizes or special rod ends are cut threads. Style 2 rod ends are recommended where the workpiece is secured against the rod shoulder. When the workpiece is not shouldered,

style 2 rod ends are recommended through 2" piston rod diameters and style 4 rod ends are recommended on larger diameters. Use style 3 for applications where female rod end threads are required. If rod end is not specified, style 2 will be supplied.

Mounting Information – 1" to 6" Bore

Table 1—Envelope and Mounting Dimensions

Bore	E	EE NPTF	F	G	J	K	+.000 TD -.001	TL	UT	Add Stroke	
										LG	P
1*	■	1/4	3/8	1 1/2	1	3/16	.750	3/4	3	3 1/2	2 1/8
1 1/2	2	3/8†	3/8	1 1/2	1	1/4	1.000	1	4	3 5/8	2 1/4
2	2 1/2	3/8†	3/8	1 1/2	1	5/16	1.000	1	4 1/2	3 5/8	2 1/4
2 1/2	3	3/8†	3/8	1 1/2	1	5/16	1.000	1	5	3 3/4	2 3/8
3 1/4	3 3/4	1/2	—	1 3/4	1 1/4	3/8	1.000	1	5 3/4	4 1/4	2 5/8
4	4 1/2	1/2	—	1 3/4	1 1/4	3/8	1.000	1	6 1/2	4 1/4	2 5/8
5	5 1/2	1/2	5/8	1 3/4	1 1/4	7/16	1.000	1	7 1/2	4 1/2	2 7/8
6	6 1/2	3/4	3/4	2	1 1/2	7/16	1.375	1 3/8	9 1/4	5	3 1/8

* Cushion not available on 1" bore.

† On 1 1/2", 2" and 2 1/2" bore sizes, the head-end (only) pipe thread is not full depth on cylinders with maximum oversize rods. Minimum of three full threads available.

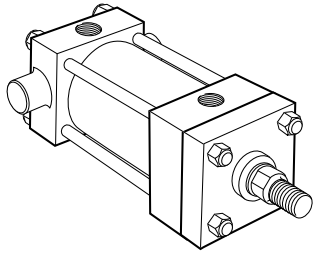
■ 1" bore head is 1 3/4" x 1 1/2". See page 12, Section A.

Table 2—Rod End Dimensions and Envelope Dimensions Affected By Rod Size

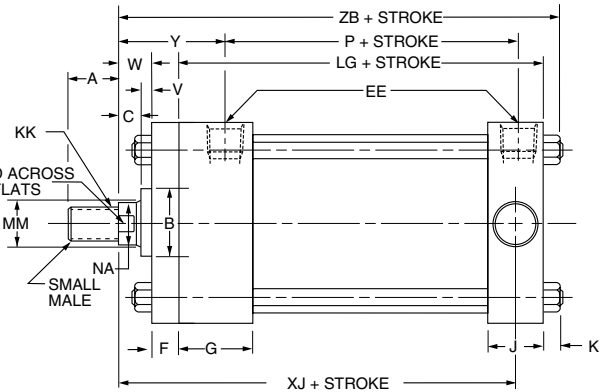
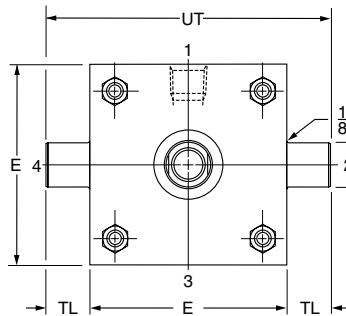
Bore	Rod Dia. MM	Thread		Rod Extensions and Envelope Dimensions Affected By Rod Size													Add Stroke ZB
		Style 4 CC	Style 2 & 3 KK	A	+.000 B -.002	C	D	NA	V	VA	VB	W	WF	XG	Y		
1	1/2	7/16-20	5/16-24	5/8	.999	3/8	3/8	7/16	1/4	—	—	5/8	—	1 3/4	1 15/16	4 11/16	
	5/8	1/2-20	7/16-20	3/4	1.124	3/8	1/2	9/16	1/4	—	—	5/8	—	1 3/4	1 15/16	4 11/16	
1 1/2	5/8	1/2-20	7/16-20	3/4	1.124	3/8	1/2	9/16	—	1/4	3/16	—	1	1 3/4	1 15/16	4 7/8	
	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	1 5/16	1/2	—	—	1	—	2 1/8	2 5/16	5 1/4	
2	5/8	1/2-20	7/16-20	3/4	1.124	3/8	1/2	9/16	—	1/4	3/16	—	1	1 3/4	1 15/16	4 15/16	
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	5/8	—	—	1 1/4	—	2 3/8	2 9/16	5 9/16	
2 1/2	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	1 5/16	—	1/4	3/8	—	1 3/8	2 1/8	2 5/16	5 5/16	
	5/8	1/2-20	7/16-20	3/4	1.124	3/8	1/2	9/16	—	1/4	3/16	—	1	1 3/4	1 15/16	5 1/16	
3 1/4	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	3/4	—	—	1 1/2	—	2 5/8	2 13/16	5 15/16	
	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	1 5/16	—	1/4	3/8	—	1 3/8	2 1/8	2 5/16	5 7/16	
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	5/8	—	—	1 1/4	—	2 3/8	2 9/16	5 11/16	
	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 11/16	1 15/16	—	1/4	9/16	—	2	2 7/8	3 1/16	6	
4	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	—	1/4	1/2	—	1 5/8	2 1/2	2 11/16	6 1/4	
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	—	1/4	9/16	—	1 7/8	2 3/4	2 15/16	6 1/2	
	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	1 5/16	—	1/4	3/8	—	1 3/8	2 1/4	2 7/16	6	
	2 1/2	2 1/4-12	1 7/8-12	3	3.124	1	2 1/16	2 3/8	—	1/4	1 1/16	—	2 1/4	3 1/8	3 5/16	6 7/8	
5	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	—	1/4	1/2	—	1 5/8	2 1/2	2 11/16	6 1/4	
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	—	1/4	9/16	—	1 7/8	2 3/4	2 15/16	6 13/16	
	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 11/16	1 15/16	—	1/4	9/16	—	2	2 7/8	3 1/16	6 15/16	
	2 1/2	2 1/4-12	1 7/8-12	3	3.124	1	2 1/16	2 3/8	—	1/4	1 1/16	—	2 1/4	3 1/8	3 5/16	7 3/16	
	3	2 3/4-12	2 1/4-12	3 1/2	3.749	1	2 5/8	2 7/8	5/8	—	—	1 5/8	—	3 1/8	3 5/16	7 3/16	
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	—	1/4	7/16	—	1 5/8	2 5/8	2 13/16	7 1/16	
6	4	3 3/4-12	3-12	4	4.749	1	3 3/8	3 7/8	1/2	—	—	1 1/2	—	3 1/4	3 7/16	7 11/16	
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	—	1/4	9/16	—	1 7/8	2 7/8	3 1/16	7 5/16	
	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 11/16	1 15/16	—	1/4	9/16	—	2	3	3 3/16	7 7/16	
	2 1/2	2 1/4-12	1 7/8-12	3	3.124	1	2 1/16	2 3/8	—	1/4	1 1/16	—	2 1/4	3 1/4	3 7/16	7 11/16	
	3	2 3/4-12	2 1/4-12	3 1/2	3.749	1	2 5/8	2 7/8	1/2	—	—	1 1/2	—	3 1/4	3 7/16	7 11/16	
	3 1/2	3 1/4-12	2 1/2-12	3 1/2	4.249	1	3	3 3/8	1/2	—	—	1 1/2	—	3 1/4	3 7/16	7 11/16	

Cap Trunnion Mount
Style MT2

1" - 1 1/2" - 2" - 2 1/2" - 5" and 6" Bore
With Maximum Oversize Rods



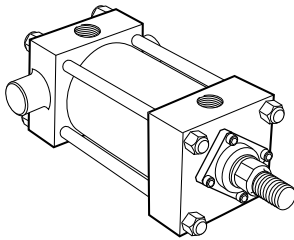
Tie Rod Retained Cartridge



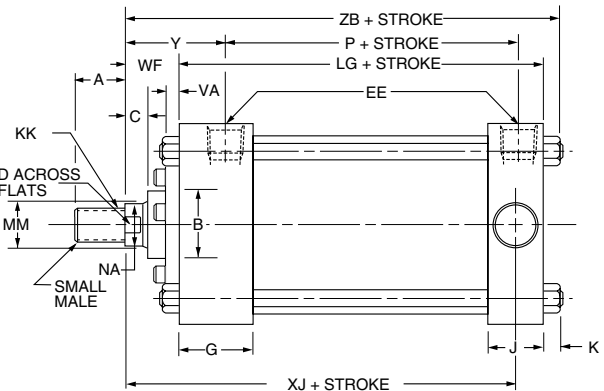
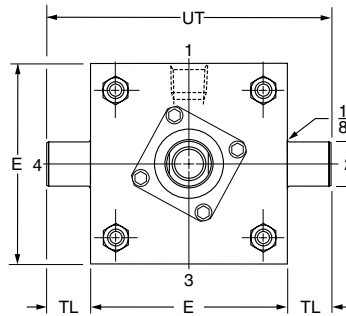
Before determining dimensions: See chart on page 5 for cylinder rod combinations that have removable cartridges.

Cap Trunnion Mount
Style MT2

1 1/2" - 6" Bore

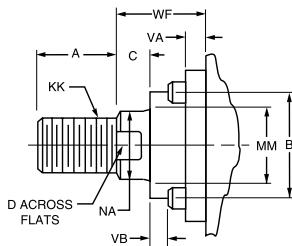


Removable Cartridge

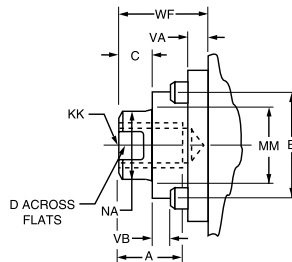


Rod End Dimensions — see table 2

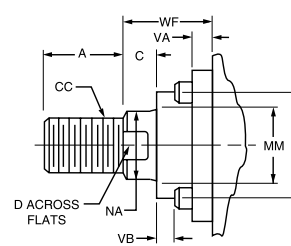
Thread Style 2
Small Male



Thread Style 3
Short Female



Thread Style 4
Intermediate Male



“Special” Thread Style 0

Special thread, extension, rod eye, blank, etc., are also available.

To order, specify “Style 0” and give desired dimensions for KK, A, W or WF. If otherwise special, furnish dimensioned sketch.

A high strength rod end stud is supplied on thread style 2 through 2" diameter rods. Larger sizes or special rod ends are cut threads. Style 2 rod ends are recommended where the workpiece is secured against the rod shoulder. When the workpiece is not shouldered,

style 2 rod ends are recommended through 2" piston rod diameters and style 4 rod ends are recommended on larger diameters. Use style 3 for applications where female rod end threads are required. If rod end is not specified, style 2 will be supplied.

Table 1—Envelope and Mounting Dimensions

Bore	E	EE NPTF	F	G	J	K	+.000 TD -.001	TL	UT	Add Stroke	
										LG	P
1*	■	1/4	3/8	1 1/2	1	3/16	.750	3/4	3	3 1/2	2 1/8
1 1/2	2	3/8†	3/8	1 1/2	1	1/4	1.000	1	4	3 5/8	2 1/4
2	2 1/2	3/8†	3/8	1 1/2	1	5/16	1.000	1	4 1/2	3 5/8	2 1/4
2 1/2	3	3/8†	3/8	1 1/2	1	5/16	1.000	1	5	3 3/4	2 3/8
3 1/4	3 3/4	1/2	—	1 3/4	1 1/4	3/8	1.000	1	5 3/4	4 1/4	2 5/8
4	4 1/2	1/2	—	1 3/4	1 1/4	3/8	1.000	1	6 1/2	4 1/4	2 5/8
5	5 1/2	1/2	5/8	1 3/4	1 1/4	7/16	1.000	1	7 1/2	4 1/2	2 7/8
6	6 1/2	3/4	3/4	2	1 1/2	7/16	1.375	1 3/8	9 1/4	5	3 1/8

* Cushion not available on 1" bore.

† On 1 1/2", 2" and 2 1/2" bore sizes, the head-end (only) pipe thread is not full depth on cylinders with maximum oversize rods. Minimum of three full threads available.

■ 1" bore head is 1 3/4" x 1 1/2". See page 12, Section A.

Table 2—Rod End Dimensions and Envelope Dimensions Affected By Rod Size

Bore	Rod Dia. MM	Thread		Rod Extensions and Envelope Dimensions Affected By Rod Size											Add Stroke	
		Style 4 CC	Style 2 & 3 KK	A	+.000 -0.002 B	C	D	NA	V	VA	VB	W	WF	Y	XJ	ZB
1	1/2	7/16-20	5/16-24	5/8	.999	3/8	3/8	7/16	1/4	—	—	5/8	—	1 15/16	4	4 11/16
	5/8	1/2-20	7/16-20	3/4	1.124	3/8	1/2	9/16	1/4	—	—	5/8	—	1 15/16	4	4 11/16
1 1/2	5/8	1/2-20	7/16-20	3/4	1.124	3/8	1/2	9/16	—	1/4	3/16	—	1	1 15/16	4 1/8	4 7/8
	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	1 5/16	1/2	—	—	1	—	2 5/16	4 1/2	5 1/4
2	5/8	1/2-20	7/16-20	3/4	1.124	3/8	1/2	9/16	—	1/4	3/16	—	1	1 15/16	4 1/8	4 5/16
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	5/8	—	—	1 1/4	—	2 9/16	4 3/4	5 9/16
2 1/2	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	1 5/16	—	1/4	3/8	—	1 3/8	2 5/16	4 1/2	5 5/16
	5/8	1/2-20	7/16-20	3/4	1.124	3/8	1/2	9/16	—	1/4	3/16	—	1	1 15/16	4 1/4	5 1/16
2 1/2	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	3/4	—	—	1 1/2	—	2 13/16	5 1/8	5 15/16
	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	1 5/16	—	1/4	3/8	—	1 3/8	2 5/16	4 5/8	5 7/16
3 1/4	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	5/8	—	—	1 1/4	1 5/8	2 9/16	4 7/8	5 11/16
	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	1 5/16	—	1/4	3/8	—	1 3/8	2 7/16	5	6
3 1/4	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 11/16	1 15/16	—	1/4	9/16	—	2	3 1/16	5 5/8	6 5/8
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	—	1/4	1/2	—	1 5/8	2 11/16	5 1/4	6 1/4
4	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	—	1/4	9/16	—	1 7/8	2 15/16	5 1/2	6 1/2
	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	1 5/16	—	1/4	3/8	—	1 3/8	2 7/16	5	6
4	2 1/2	2 1/4-12	1 7/8-12	3	3.124	1	2 1/16	2 3/8	—	1/4	1 1/16	—	2 1/4	3 5/16	5 7/8	6 7/8
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	—	1/4	1/2	—	1 5/8	2 11/16	5 1/4	6 1/4
5	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	—	1/4	9/16	—	1 7/8	2 15/16	5 3/4	6 13/16
	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	1 5/16	—	1/4	3/8	—	1 3/8	2 7/16	5 1/4	6 5/16
5	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 11/16	1 15/16	—	1/4	9/16	—	2	3 1/16	5 7/8	6 15/16
	3 1/2	3 1/4-12	2 1/2-12	3 1/2	4.249	1	3	3 3/8	5/8	—	—	1 5/8	—	3 5/16	6 1/8	7 3/16
6	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	—	1/4	7/16	—	1 5/8	2 13/16	5 7/8	7 1/16
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	—	1/4	9/16	—	1 7/8	3 1/16	6 1/8	7 5/16
6	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 11/16	1 15/16	—	1/4	9/16	—	2	3 3/16	6 1/4	7 1/16
	2 1/2	2 1/4-12	1 7/8-12	3	3.124	1	2 1/16	2 3/8	—	1/4	1 1/16	—	2 1/4	3 7/16	6 1/2	7 11/16
6	3	2 3/4-12	2 1/4-12	3 1/2	3.749	1	2 5/8	2 7/8	5/8	—	—	1 5/8	—	3 5/16	6 1/8	7 3/16
	3 1/2	3 1/4-12	2 1/2-12	3 1/2	4.249	1	3	3 3/8	1/2	—	—	1 1/2	—	3 7/16	6 1/2	7 11/16

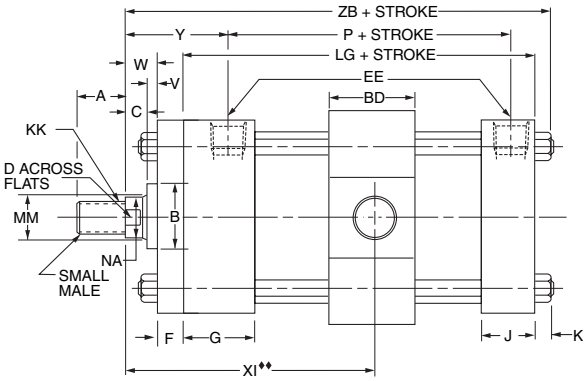
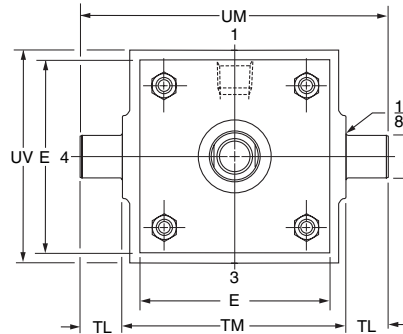
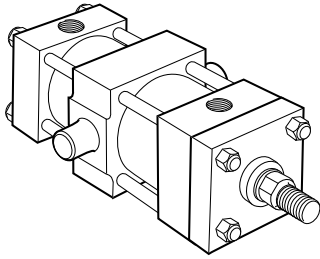
Intermediate Fixed Trunnion Mount

Style MT4

1 1/2" - 2" - 2 1/2" - 5" and 6" Bore

With Maximum Oversize Rods

Tie Rod Retained Cartridge



♦♦Dimension XI to be specified by customer.

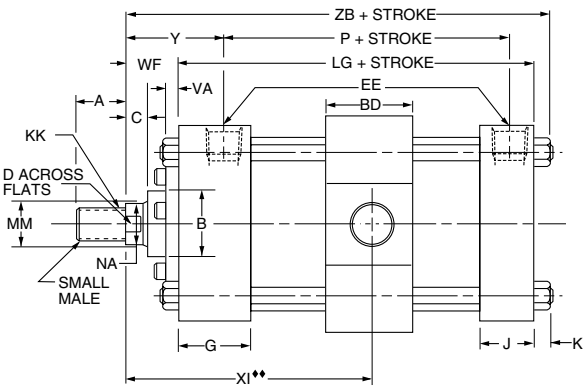
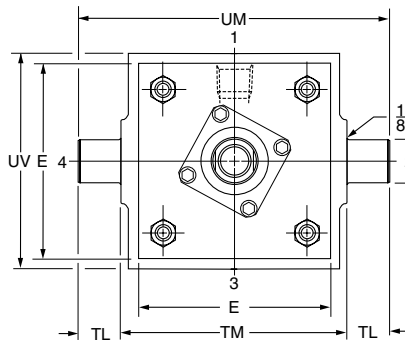
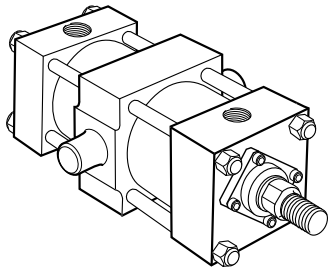
Before determining dimensions: See chart on page 5 for cylinder rod combinations that have removable cartridges.

Intermediate Fixed Trunnion Mount

Style MT4

1 1/2" - 6" Bore

Removable Cartridge

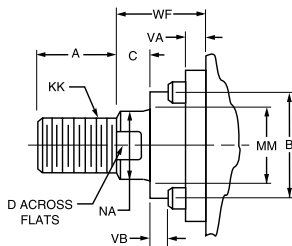


♦♦Dimension XI to be specified by customer.

Rod End Dimensions — see table 2

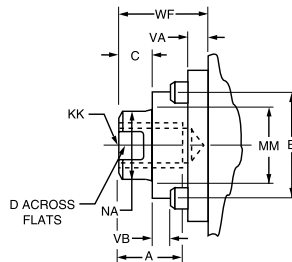
Thread Style 2

Small Male



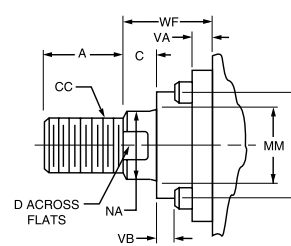
Thread Style 3

Short Female



Thread Style 4

Intermediate Male



"Special" Thread Style 0

Special thread, extension, rod eye, blank, etc., are also available.

To order, specify "Style 0" and give desired dimensions for KK, A, W or WF. If otherwise special, furnish dimensioned sketch.

A high strength rod end stud is supplied on thread style 2 through 2" diameter rods. Larger sizes or special rod ends are cut threads. Style 2 rod ends are recommended where the workpiece is secured against the rod shoulder. When the workpiece is not shouldered,

style 2 rod ends are recommended through 2" piston rod diameters and style 4 rod ends are recommended on larger diameters. Use style 3 for applications where female rod end threads are required. If rod end is not specified, style 2 will be supplied.

Mounting Information – 1½" to 6" Bore

Table 1—Envelope and Mounting Dimensions

Bore	BD	E	EE NPTF	F	G	J	K	+0.000 TD -0.001	TL	TM	UM	UV	Minimum Stroke	Add Stroke	
														LG	P
1½	1¼	2	¾†	¾	1½	1	¼	1.000	1	2½	4½	2½	¼	3⅝	2¼
2	1½	2½	¾†	¾	1½	1	⅝	1.000	1	3	5	3	½	3⅝	2¼
2½	1½	3	¾†	¾	1½	1	⅝	1.000	1	3½	5½	3½	⅜	3¾	2⅜
3¼	2	3¾	½	⅝	1¾	1¼	⅜	1.000	1	4½	6½	4¼	⅞	4¼	2⅝
4	2	4½	½	—	1¾	1¼	⅜	1.000	1	5¼	7¼	5	⅞	4¼	2⅝
5	2	5½	½	—	1¾	1¼	⅞	1.000	1	6¼	8¼	6	⅝	4½	2⅞
6	2½	6½	¾	¾	2	1½	⅞	1.375	1⅜	7⅝	10⅜	7	1⅞	5	3⅞

† On 1½", 2" and 2½" bore sizes, the head-end (only) pipe thread is not full depth on cylinders with maximum oversize rods. Minimum of three full threads available.

Table 2—Rod End Dimensions and Envelope Dimensions Affected By Rod Size

Bore	Rod Dia. MM	Thread		Rod End Dimensions and Envelope Dimensions Affected By Rod Size													Add Stroke ZB
		Style 4 CC	Style 2 & 3 KK	A	+0.000 -0.002 B	C	D	NA	V	VA	VB	W	WF	Min.♦♦ XI	Y		
1½	⅝	½-20	⅞-20	¾	1.124	⅜	½	⅑	—	¼	⅜	—	1	3⅜	1⅓	4⅞	
	1	⅞-14	¾-16	1⅞	1.499	½	⅞	⅒	½	—	—	1	—	3⅜	2⅓	5¼	
2	⅝	½-20	⅞-20	¾	1.124	⅜	½	⅑	—	¼	⅜	—	1	3⅜	1⅓	4⅞	
	1⅜	1¼-12	1-14	1⅝	1.999	⅝	1⅞	⅒	⅝	—	—	1¼	—	3⅜	2⅓	5⅞	
2½	1	⅞-14	¾-16	1⅞	1.499	½	⅞	⅒	—	¼	⅜	—	1⅜	3⅜	2⅓	5⅞	
	⅝	½-20	⅞-20	¾	1.124	⅜	½	⅑	—	¼	⅜	—	1	3⅜	1⅓	4⅞	
	1¾	1½-12	1¼-12	2	2.374	¾	1½	⅒	¾	—	—	1½	—	4⅜	2⅓	5⅞	
3¼	1	⅞-14	¾-16	1⅞	1.499	½	⅞	⅒	—	¼	⅜	—	1⅜	4⅜	2⅓	6	
	2	1¾-12	1½-12	2¼	2.624	⅞	1⅞	⅒	—	¼	⅜	—	2	4⅜	3⅓	6⅝	
	1⅜	1¼-12	1-14	1⅝	1.999	⅝	1⅞	⅒	—	¼	½	—	1⅝	4⅞	2⅓	6¼	
	1¾	1½-12	1¼-12	2	2.374	¾	1½	⅒	—	¼	⅜	—	1⅞	4⅜	2⅓	6½	
4	1	⅞-14	¾-16	1⅞	1.499	½	⅞	⅒	—	¼	⅜	—	1⅜	4⅜	2⅓	6	
	2½	2¼-12	1⅞-12	3	3.124	1	2⅓	⅒	—	¼	⅞	—	2¼	5⅓	3⅓	6⅞	
	1⅜	1¼-12	1-14	1⅝	1.999	⅝	1⅞	⅒	—	¼	½	—	1⅝	4⅞	2⅓	6¼	
	1¾	1½-12	1¼-12	2	2.374	¾	1½	⅒	—	¼	⅜	—	1⅞	4⅜	2⅓	6½	
	2	1¾-12	1½-12	2¼	2.624	⅞	1⅞	⅒	—	¼	⅜	—	2	4⅜	3⅓	6⅝	
5	1	⅞-14	¾-16	1⅞	1.499	½	⅞	⅒	—	¼	⅜	—	1⅜	4⅜	2⅓	6⅞	
	3½	3¼-12	2½-12	3½	4.249	1	3	⅒	⅝	—	—	1⅝	—	5⅓	3⅓	7⅓	
	1⅜	1¼-12	1-14	1⅝	1.999	⅝	1⅞	⅒	—	¼	½	—	1⅝	4⅞	2⅓	6⅞	
	1¾	1½-12	1¼-12	2	2.374	¾	1½	⅒	—	¼	⅜	—	1⅞	4⅜	2⅓	6⅞	
	2	1¾-12	1½-12	2¼	2.624	⅞	1⅞	⅒	—	¼	⅜	—	2	4⅜	3⅓	6⅝	
	2½	2¼-12	1⅞-12	3	3.124	1	2⅓	⅒	—	¼	⅞	—	2¼	5⅓	3⅓	7⅓	
6	3	2¾-12	2¼-12	3½	3.749	1	2⅝	⅒	⅝	—	—	1⅝	—	5⅓	3⅓	7⅓	
	1⅜	1¼-12	1-14	1⅝	1.999	⅝	1⅞	⅒	—	¼	⅞	—	1⅝	4⅞	2⅓	6⅞	
	4	3¾-12	3-12	4	4.749	1	3⅞	⅒	½	—	—	1½	—	5⅓	3⅓	7⅓	
	1¾	1½-12	1¼-12	2	2.374	¾	1½	⅒	—	¼	⅜	—	1⅞	4⅜	2⅓	6⅞	
	2	1¾-12	1½-12	2¼	2.624	⅞	1⅞	⅒	—	¼	⅜	—	2	4⅜	3⅓	6⅝	
	2½	2¼-12	1⅞-12	3	3.124	1	2⅓	⅒	—	¼	⅞	—	2¼	5⅓	3⅓	7⅓	
	3	2¾-12	2¼-12	3½	3.749	1	2⅝	⅒	½	—	—	1½	—	5⅓	3⅓	7⅓	
3½	3¼-12	2½-12	3½	4.249	1	3	⅒	½	—	—	1½	—	5⅓	3⅓	7⅓		

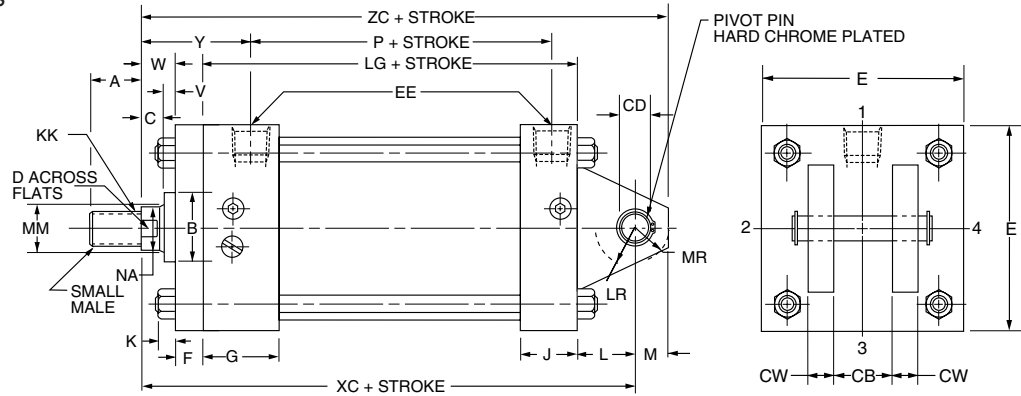
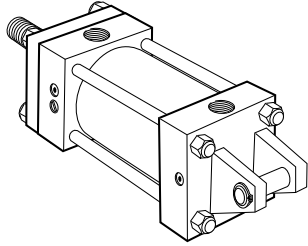
♦♦ Dimension XI to be specified by customer.

Cap Fixed Clevis Mount

Style MP1

1" - 1 1/2" - 2" - 2 1/2" - 5" and 6" Bore

With Maximum Oversize Rods



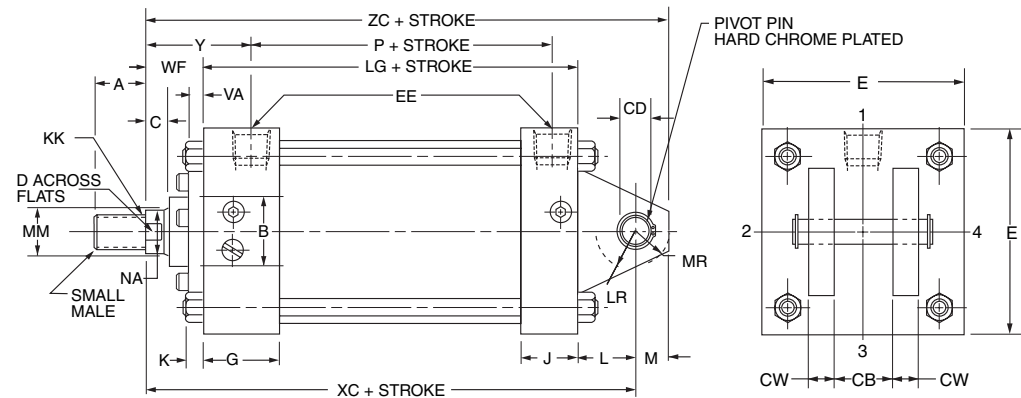
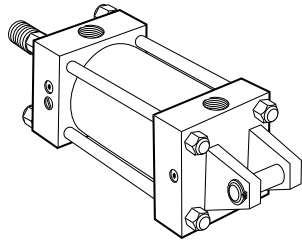
The 1", 4", 5" and 6" bore sizes have the tie rod nuts at both ends as shown. Tie rods thread into cap on all other bore sizes.

Before determining dimensions: See chart on page 5 for cylinder rod combinations that have removable cartridges.

Cap Fixed Clevis Mount

Style MP1

1 1/2" - 6" Bore

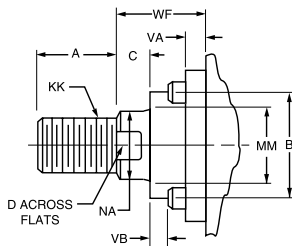


The 1", 4", 5" and 6" bore sizes have the tie rod nuts at both ends as shown. Tie rods thread into cap on all other bore sizes.

Rod End Dimensions — see table 2

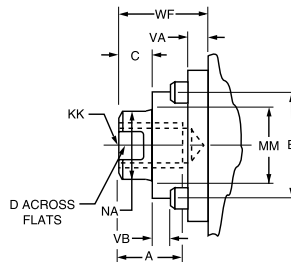
Thread Style 2

Small Male



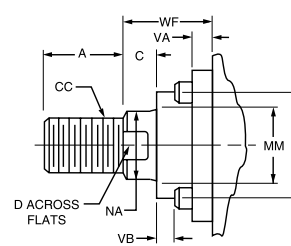
Thread Style 3

Short Female



Thread Style 4

Intermediate Male



"Special" Thread Style 0

Special thread, extension, rod eye, blank, etc., are also available.

To order, specify "Style 0" and give desired dimensions for KK, A, W or WF. If otherwise special, furnish dimensioned sketch.

A high strength rod end stud is supplied on thread style 2 through 2" diameter rods. Larger sizes or special rod ends are cut threads. Style 2 rod ends are recommended where the workpiece is secured against the rod shoulder. When the workpiece is not shouldered,

style 2 rod ends are recommended through 2" piston rod diameters and style 4 rod ends are recommended on larger diameters. Use style 3 for applications where female rod end threads are required. If rod end is not specified, style 2 will be supplied.

Mounting Information – 1" to 6" Bore

Table 1—Envelope and Mounting Dimensions

Bore	CB	+.000 CD• -.002	CW	E	EE NPTF	F	G	J	K	L	LR	M	MR	Add Stroke	
														LG	P
1*	**	.441**	**	■	1/4	3/8	1 1/2	1	3/16	1/2**	1/2**	7/16**	1/2**	3 1/2**	2 1/8
1 1/2	3/4	.501	1/2	2	3/8†	3/8	1 1/2	1	1/4	3/4	3/4	1/2	5/8	3 5/8	2 1/4
2	3/4	.501	1/2	2 1/2	3/8†	3/8	1 1/2	1	5/16	3/4	3/4	1/2	5/8	3 5/8	2 1/4
2 1/2	3/4	.501	1/2	3	3/8†	3/8	1 1/2	1	5/16	3/4	3/4	1/2	5/8	3 3/4	2 3/8
3 1/4	1 1/4	.751	5/8	3 3/4	1/2	—	1 3/4	1 1/4	3/8	1 1/4	1	3/4	15/16	4 1/4	2 5/8
4	1 1/4	.751	5/8	4 1/2	1/2	—	1 3/4	1 1/4	3/8	1 1/4	1	3/4	15/16	4 1/4	2 5/8
5	1 1/4	.751	5/8	5 1/2	1/2	5/8	1 3/4	1 1/4	7/16	1 1/4	1	3/4	15/16	4 1/2	2 7/8
6	1 1/2	1.001	3/4	6 1/2	3/4	3/4	2	1 1/2	7/16	1 1/2	1 1/4	1	1 3/16	5	3 1/8

† On 1 1/2", 2" and 2 1/2" bore sizes, the head-end (only) pipe thread is not full depth on cylinders with maximum oversize rods. Minimum of three full threads available.

■ 1" bore head is 1 3/4" x 1 1/2". See page 12, Section A.

* Cushions not available on 1" bore.

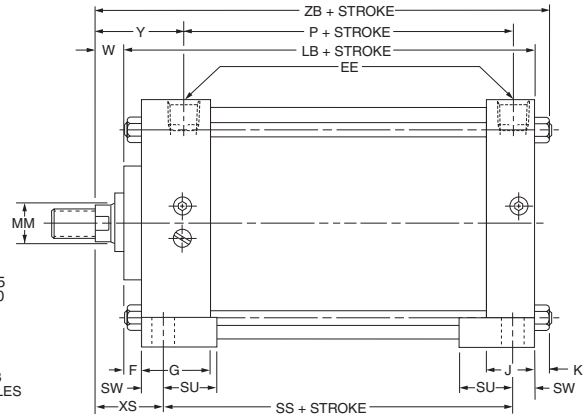
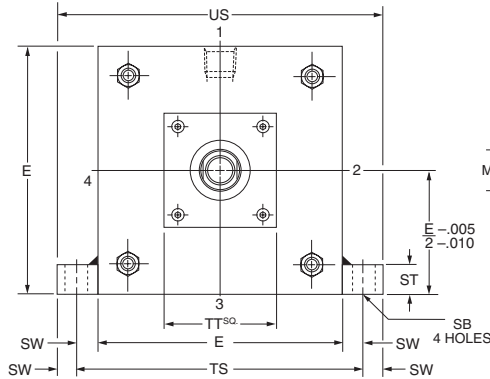
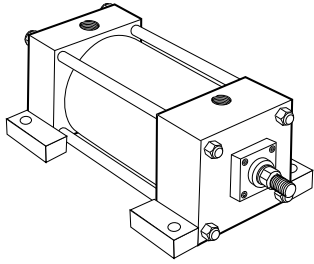
** In 1" bore size model only, a single eye mounting, 7/16" thick, is used. Dimension CD (.441") is hole diameter — pin not supplied.

• Dimension CD is pin diameter except in 1" bore.

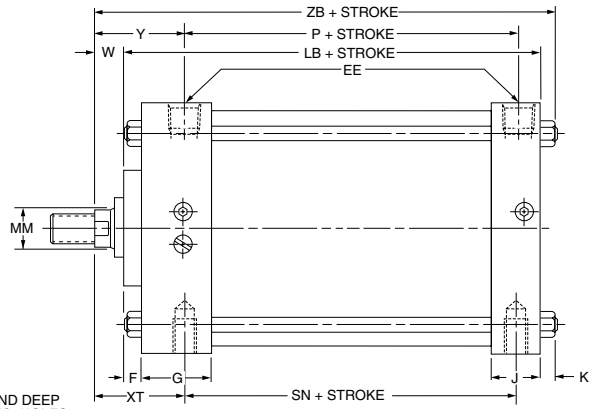
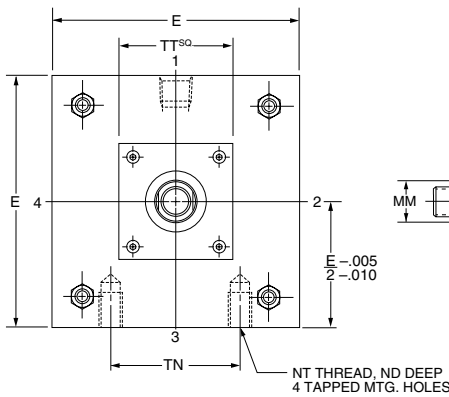
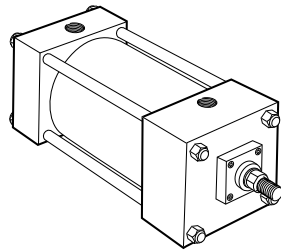
Table 2—Rod End Dimensions and Envelope Dimensions Affected By Rod Size

Bore	Rod Dia. MM	Thread		Rod End Dimensions and Envelope Dimensions Affected By Rod Size												Add Stroke	
		Style 4 CC	Style 2 & 3 KK	A	+.000 -.002 B	C	D	NA	V	VA	VB	W	WF	Y	XC	ZC	
1	1/2	7/16-20	5/16-20	5/8	.999	3/8	3/8	7/16	1/4	—	—	5/8	—	1 5/16	5	5 7/16	
	5/8	1/2-20	7/16-20	3/4	1.124	3/8	1/2	9/16	1/4	—	—	5/8	—	1 5/16	5	5 7/16	
1 1/2	5/8	1/2-20	7/16-20	3/4	1.124	3/8	1/2	9/16	—	1/4	3/16	—	1	1 5/16	5 3/8	5 7/8	
	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	15/16	1/2	—	—	1	—	2 5/16	5 3/4	6 1/4	
2	5/8	1/2-20	7/16-20	3/4	1.124	3/8	1/2	9/16	—	1/4	3/16	—	1	1 5/16	5 3/8	5 7/8	
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	5/8	—	—	1 1/4	—	2 3/16	6	6 1/2	
2 1/2	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	15/16	—	1/4	3/8	—	1 3/8	2 5/16	5 3/4	6 1/4	
	5/8	1/2-20	7/16-20	3/4	1.124	3/8	1/2	9/16	—	1/4	3/16	—	1	1 5/16	5 1/2	6	
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	3/4	—	—	1 1/2	—	2 13/16	6 3/8	6 7/8	
	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	15/16	—	1/4	3/8	—	1 3/8	2 5/16	5 7/8	6 3/8	
3 1/4	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	5/8	—	—	1 1/4	1 5/8	2 9/16	6 1/8	6 5/8	
	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	15/16	—	1/4	3/8	—	1 3/8	2 7/16	6 7/8	7 5/8	
	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 11/16	1 5/16	—	1/4	9/16	—	2	3 1/16	7 1/2	8 1/4	
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	—	1/4	1/2	—	1 5/8	2 11/16	7 1/8	7 7/8	
4	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	—	1/4	9/16	—	1 7/8	2 5/16	7 3/8	8 1/8	
	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	15/16	—	1/4	3/8	—	1 3/8	2 7/16	6 7/8	7 5/8	
	2 1/2	2 1/4-12	1 7/8-12	3	3.124	1	2 1/16	2 3/8	—	1/4	1 1/16	—	2 1/4	3 5/16	7 3/4	8 1/2	
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	—	1/4	1/2	—	1 5/8	2 11/16	7 1/8	7 7/8	
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	—	1/4	9/16	—	1 7/8	2 5/16	7 3/8	8 1/8	
5	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 11/16	1 5/16	—	1/4	9/16	—	2	3 1/16	7 1/2	8 1/4	
	1	7/8-14	3/4-16	1 1/8	1.499	1/2	7/8	15/16	—	1/4	3/8	—	1 3/8	2 7/16	7 1/8	7 7/8	
	3 1/2	3 1/4-12	2 1/2-12	3 1/2	4.249	1	3	3 3/8	5/8	—	—	1 5/8	—	3 5/16	8	8 3/4	
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	—	1/4	1/2	—	1 5/8	2 11/16	7 3/8	8 1/8	
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	—	1/4	9/16	—	1 7/8	2 5/16	7 5/8	8 3/8	
	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 11/16	1 5/16	—	1/4	9/16	—	2	3 1/16	7 3/4	8 1/2	
	2 1/2	2 1/4-12	1 7/8-12	3	3.124	1	2 1/16	2 3/8	—	1/4	1 1/16	—	2 1/4	3 5/16	8	8 3/4	
6	3	2 3/4-12	2 1/4-12	3 1/2	3.749	1	2 5/8	2 7/8	5/8	—	—	1 5/8	—	3 5/16	8	8 3/4	
	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	—	1/4	7/16	—	1 5/8	2 13/16	8 1/8	9 1/8	
	4	3 3/4-12	3-12	4	4.749	1	3 3/8	3 7/8	1/2	—	—	1 1/2	—	3 7/16	8 3/4	9 3/4	
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	—	1/4	9/16	—	1 7/8	3 1/16	8 3/8	9 3/8	
	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 11/16	1 5/16	—	1/4	9/16	—	2	3 3/16	8 1/2	9 1/2	
	2 1/2	2 1/4-12	1 7/8-12	3	3.124	1	2 1/16	2 3/8	—	1/4	1 1/16	—	2 1/4	3 7/16	8 3/4	9 3/4	
	3	2 3/4-12	2 1/4-12	3 1/2	3.749	1	2 5/8	2 7/8	5/8	—	—	1 1/2	—	3 7/16	8 3/4	9 3/4	
3 1/2	3 1/4-12	2 1/2-12	3 1/2	4.249	1	3	3 3/8	1/2	—	—	1 1/2	—	3 7/16	8 3/4	9 3/4		

Side Lug Mount
Style MS2
7" - 14" Bore

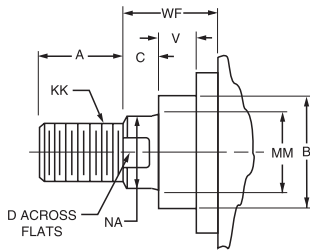


Side Tap Mount
Style MS4
7" - 14" Bore



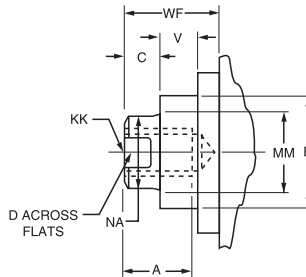
Rod End Dimensions — see table 2

Thread Style 2
Small Male



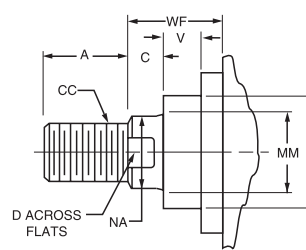
A high strength rod end stud is supplied on thread style 2 through 2" diameter rods. Larger sizes or special rod ends are cut threads. Style 2 rod ends are recommended where the workpiece is secured against the rod shoulder. When the workpiece is not shouldered,

Thread Style 3
Short Female



style 2 rod ends are recommended through 2" piston rod diameters and style 4 rod ends are recommended on larger diameters. Use style 3 for applications where female rod end threads are required. If rod end is not specified, style 2 will be supplied.

Thread Style 4
Intermediate Male



"Special" Thread Style 0

Special thread, extension, rod eye, blank, etc., are also available.

To order, specify "Style 0" and give desired dimensions for KK, A, W or WF. If otherwise special, furnish dimensioned sketch.

Mounting Information – 7" to 14" Bore

Table 1—Envelope and Mounting Dimensions

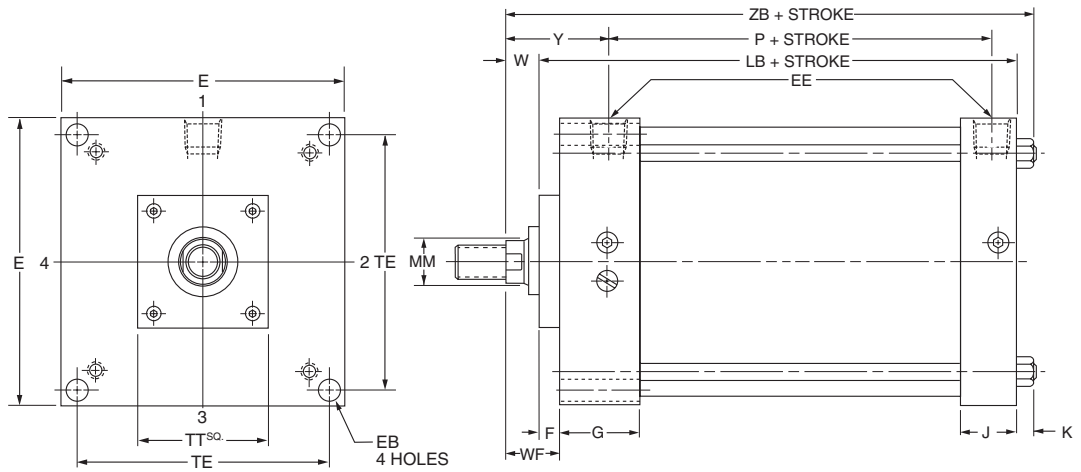
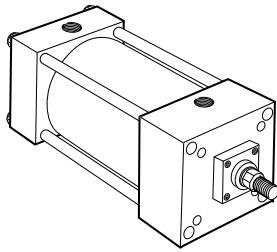
Bore	E	EE NPTF	F	G	J	K	ND	NT	SB*	ST	SU	SW	TN	TS	US	Add Stroke			
																LB	P	SN	SS
7	7½	¾	¾	2	1½	9/16	1⅛	¾-10	13/16	1	19/16	11/16	3½	87/8	10¼	57/8	3¼	3¼	3¾
8	8½	¾	¾	2	1½	9/16	1⅛	¾-10	13/16	1	19/16	11/16	4½	97/8	11¼	57/8	3¼	3¼	3¾
10	105/8	1	¾	2¼	2	11/16	1½	1-8	11/16	1¼	2	7/8	5½	123/8	14⅛	7⅞	4⅞	4⅞	45/8
12	12¾	1	¾	2¼	2	11/16	1½	1-8	11/16	1¼	2	7/8	7¼	14½	16¼	75/8	45/8	45/8	5⅞
14	14¾	1¼	¾	2¾	2¼	¾	17/8	1¼-7	15/16	1½	2½	1⅞	83/8	17	19¼	87/8	5½	5½	57/8

*Upper surface spotfaced for socket head cap screw.

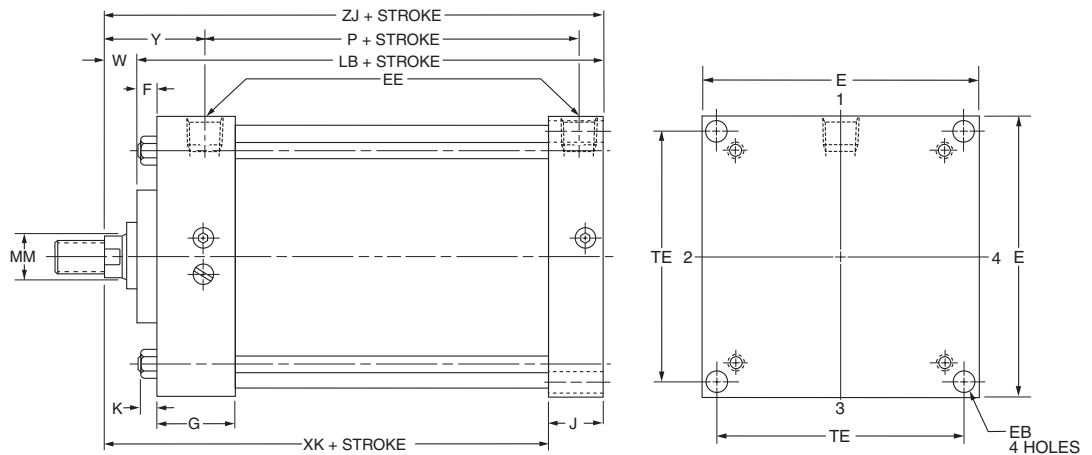
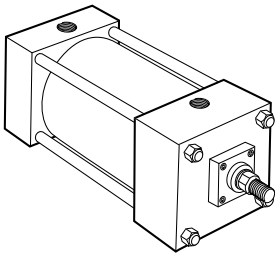
Table 2—Rod End Dimensions and Envelope Dimensions Affected By Rod Size

Bore	Rod Dia. MM	Thread		Rod End Dimensions and Envelope Dimensions Affected By Rod Size												Add Stroke ZB	
		Style 4 CC	Style 2 & 3 KK	A	+0.000 -0.002 B	C	D	NA	TT	V	W	XS	XT	Y			
7	13/8	1¼-12	1-14	15/8	1.999	5/8	1⅛	15/16	4	¼	7/8	25/16	213/16	213/16			75/16
	¾	1½-12	1¼-12	2	2.374	¾	1½	111/16	4	3/8	1⅞	29/16	31/16	31/16			79/16
	2	1¾-12	1½-12	2¼	2.624	7/8	111/16	115/16	4	3/8	1¼	211/16	33/16	33/16			711/16
8	13/8	1¼-12	1-14	15/8	1.999	5/8	1⅛	15/16	4	¼	7/8	25/16	213/16	213/16			75/16
	5½	5¼-12	4-12	5½	6.249	1	45/8	53/8	7	½	1½	215/16	37/16	37/16			715/16
	1¾	1½-12	1¼-12	2	2.374	¾	1½	111/16	4	3/8	1⅞	29/16	31/16	31/16			79/16
	2	1¾-12	1½-12	2¼	2.624	7/8	111/16	115/16	4	3/8	1¼	211/16	33/16	33/16			711/16
	2½	2¼-12	17/8-12	3	3.124	1	21/16	23/8	4	½	1½	215/16	37/16	37/16			715/16
	3	2¾-12	2¼-12	3½	3.749	1	25/8	27/8	5½	½	1½	215/16	37/16	37/16			715/16
	3½	3¼-12	2½-12	3½	4.249	1	3	33/8	5½	½	1½	215/16	37/16	37/16			715/16
	4	3¾-12	3-12	4	4.749	1	33/8	37/8	5½	½	1½	215/16	37/16	37/16			715/16
	4½	4¼-12	3¼-12	4½	5.249	1	37/8	43/8	7	½	1½	215/16	37/16	37/16			715/16
10	1¾	1½-12	1¼-12	2	2.374	¾	1½	111/16	4	3/8	1⅞	29/16	31/16	31/16			815/16
	2	1¾-12	1½-12	2¼	2.624	7/8	111/16	115/16	4	3/8	1¼	211/16	33/16	33/16			91/16
	2½	2¼-12	17/8-12	3	3.124	1	21/16	23/8	4	½	1½	215/16	37/16	37/16			95/16
	3	2¾-12	2¼-12	3½	3.749	1	25/8	27/8	5½	½	1½	215/16	37/16	37/16			95/16
	3½	3¼-12	2½-12	3½	4.249	1	3	33/8	5½	½	1½	215/16	37/16	37/16			95/16
	4	3¾-12	3-12	4	4.749	1	33/8	37/8	5½	½	1½	215/16	37/16	37/16			95/16
	4½	4¼-12	3¼-12	4½	5.249	1	37/8	43/8	7	½	1½	215/16	37/16	37/16			95/16
	5	4¾-12	3½-12	5	5.749	1	4¼	47/8	7	½	1½	215/16	37/16	37/16			95/16
12	2	1¾-12	1½-12	2¼	2.624	7/8	111/16	115/16	4	3/8	1¼	211/16	33/16	33/16			99/16
	2½	2¼-12	17/8-12	3	3.124	1	21/16	23/8	4	½	1½	215/16	37/16	37/16			913/16
	3	2¾-12	2¼-12	3½	3.749	1	25/8	27/8	5½	½	1½	215/16	37/16	37/16			913/16
	3½	3¼-12	2½-12	3½	4.249	1	3	33/8	5½	½	1½	215/16	37/16	37/16			913/16
	4	3¾-12	3-12	4	4.749	1	33/8	37/8	5½	½	1½	215/16	37/16	37/16			913/16
	4½	4¼-12	3¼-12	4½	5.249	1	37/8	43/8	7	½	1½	215/16	37/16	37/16			913/16
	5	4¾-12	3½-12	5	5.749	1	4¼	47/8	7	½	1½	215/16	37/16	37/16			913/16
14	2½	2¼-12	17/8-12	3	3.124	1	21/16	23/8	4	½	1½	215/16	37/16	37/16			111/8
	3	2¾-12	2¼-12	3½	3.749	1	25/8	27/8	5½	½	1½	215/16	37/16	37/16			111/8
	3½	3¼-12	2½-12	3½	4.249	1	3	33/8	5½	½	1½	215/16	37/16	37/16			111/8
	4	3¾-12	3-12	4	4.749	1	33/8	37/8	5½	½	1½	215/16	37/16	37/16			111/8
	4½	4¼-12	3¼-12	4½	5.249	1	37/8	43/8	7	½	1½	215/16	37/16	37/16			111/8
	5	4¾-12	3½-12	5	5.749	1	4¼	47/8	7	½	1½	215/16	37/16	37/16			111/8

Head Square Mount
Style ME3
7" - 14" Bore

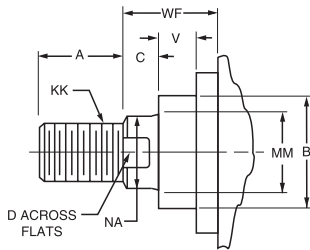


Cap Square Mount
Style ME4
7" - 14" Bore



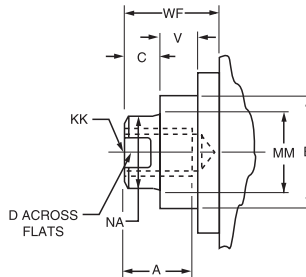
Rod End Dimensions — see table 2

Thread Style 2
Small Male



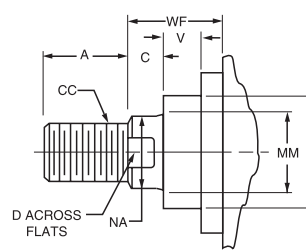
A high strength rod end stud is supplied on thread style 2 through 2" diameter rods. Larger sizes or special rod ends are cut threads. Style 2 rod ends are recommended where the workpiece is secured against the rod shoulder. When the workpiece is not shouldered,

Thread Style 3
Short Female



style 2 rod ends are recommended through 2" piston rod diameters and style 4 rod ends are recommended on larger diameters. Use style 3 for applications where female rod end threads are required. If rod end is not specified, style 2 will be supplied.

Thread Style 4
Intermediate Male



"Special" Thread Style 0

Special thread, extension, rod eye, blank, etc., are also available.

To order, specify "Style 0" and give desired dimensions for KK, A, W or WF. If otherwise special, furnish dimensioned sketch.

Mounting Information – 7" to 14" Bore

Table 1—Envelope and Mounting Dimensions

Bore	E	EB	EE NPTF	F	G	J	K	TE	Add Stroke	
									LB	P
7	7 1/2	9 1/16	3/4	3/4	2	1 1/2	9 1/16	6.75	5 7/8	3 1/4
8	8 1/2	11 1/16	3/4	3/4	2	1 1/2	9 1/16	7.57	5 7/8	3 1/4
10	10 5/8	13 1/16	1	3/4	2 1/4	2	11 1/16	9.40	7 1/8	4 1/8
12	12 3/4	15 1/16	1	3/4	2 1/4	2	11 1/16	11.10	7 5/8	4 5/8
14	14 3/4	17 1/16	1 1/4	3/4	2 3/4	2 1/4	3/4	12.87	8 7/8	5 1/2

Table 2—Rod End Dimensions and Envelope Dimensions Affected By Rod Size

Bore	Rod Dia. MM	Thread		Rod End Dimensions and Envelope Dimensions Affected By Rod Size													
		Style 4 CC	Style 2 & 3 KK	A	+0.002 -0.002 B	C	D	NA	TT	V	W	WF	Y	Add Stroke			
														XK	ZB	ZJ	
7	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	4	1/4	7/8	1 5/8	2 13/16	5 1/4	7 5/16	6 3/4	
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	4	3/8	1 1/8	1 7/8	3 1/16	5 1/2	7 9/16	7	
	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 11/16	1 15/16	4	3/8	1 1/4	2	3 3/16	5 7/8	7 11/16	7 1/8	
8	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	4	1/4	7/8	1 5/8	2 13/16	5 1/4	7 5/16	6 3/4	
	5 1/2	5 1/4-12	4-12	5 1/2	6.249	1	4 5/8	5 3/8	7	1/2	1 1/2	2 1/4	3 7/16	5 7/8	7 15/16	7 3/8	
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	4	3/8	1 1/8	1 7/8	3 1/16	5 1/2	7 9/16	7	
	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 11/16	1 15/16	4	3/8	1 1/4	2	3 3/16	5 5/8	7 11/16	7 1/8	
	2 1/2	2 1/4-12	1 7/8-12	3	3.124	1	2 1/16	2 3/8	4	1/2	1 1/2	2 1/4	3 7/16	5 7/8	7 5/16	7 3/8	
	3	2 3/4-12	2 1/4-12	3 1/2	3.749	1	2 5/8	2 7/8	5 1/2	1/2	1 1/2	2 1/4	3 7/16	5 7/8	7 5/16	7 3/8	
	3 1/2	3 1/4-12	2 1/2-12	3 1/2	4.249	1	3	3 3/8	5 1/2	1/2	1 1/2	2 1/4	3 7/16	5 7/8	7 5/16	7 3/8	
	4	3 3/4-12	3-12	4	4.749	1	3 3/8	3 7/8	5 1/2	1/2	1 1/2	2 1/4	3 7/16	5 7/8	7 5/16	7 3/8	
	4 1/2	4 1/4-12	3 1/4-12	4 1/2	5.249	1	3 7/8	4 3/8	7	1/2	1 1/2	2 1/4	3 7/16	5 7/8	7 5/16	7 3/8	
5	4 3/4-12	3 1/2-12	5	5.749	1	4 1/4	4 7/8	7	1/2	1 1/2	2 1/4	3 7/16	5 7/8	7 5/16	7 3/8		
10	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	4	3/8	1 1/8	1 7/8	3 1/8	6 1/4	8 5/16	8 1/4	
	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 11/16	1 15/16	4	3/8	1 1/4	2	3 1/4	6 3/8	9 1/16	8 3/8	
	2 1/2	2 1/4-12	1 7/8-12	3	3.124	1	2 1/16	2 3/8	4	1/2	1 1/2	2 1/4	3 1/2	6 5/8	9 5/16	8 5/8	
	3	2 3/4-12	2 1/4-12	3 1/2	3.749	1	2 5/8	2 7/8	5 1/2	1/2	1 1/2	2 1/4	3 1/2	6 5/8	9 5/16	8 5/8	
	3 1/2	3 1/4-12	2 1/2-12	3 1/2	4.249	1	3	3 3/8	5 1/2	1/2	1 1/2	2 1/4	3 1/2	6 5/8	9 5/16	8 5/8	
	4	3 3/4-12	3-12	4	4.749	1	3 3/8	3 7/8	5 1/2	1/2	1 1/2	2 1/4	3 1/2	6 5/8	9 5/16	8 5/8	
	4 1/2	4 1/4-12	3 1/4-12	4 1/2	5.249	1	3 7/8	4 3/8	7	1/2	1 1/2	2 1/4	3 1/2	6 5/8	9 5/16	8 5/8	
	5	4 3/4-12	3 1/2-12	5	5.749	1	4 1/4	4 7/8	7	1/2	1 1/2	2 1/4	3 1/2	6 5/8	9 5/16	8 5/8	
5 1/2	5 1/4-12	4-12	5 1/2	6.249	1	4 5/8	5 3/8	7	1/2	1 1/2	2 1/4	3 1/2	6 5/8	9 5/16	8 5/8		
12	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 11/16	1 15/16	4	3/8	1 1/4	2	3 1/4	6 7/8	9 9/16	8 7/8	
	2 1/2	2 1/4-12	1 7/8-12	3	3.124	1	2 1/16	2 3/8	4	1/2	1 1/2	2 1/4	3 1/2	7 1/8	9 13/16	9 1/8	
	3	2 3/4-12	2 1/4-12	3 1/2	3.749	1	2 5/8	2 7/8	5 1/2	1/2	1 1/2	2 1/4	3 1/2	7 1/8	9 13/16	9 1/8	
	3 1/2	3 1/4-12	2 1/2-12	3 1/2	4.249	1	3	3 3/8	5 1/2	1/2	1 1/2	2 1/4	3 1/2	7 1/8	9 13/16	9 1/8	
	4	3 3/4-12	3-12	4	4.749	1	3 3/8	3 7/8	5 1/2	1/2	1 1/2	2 1/4	3 1/2	7 1/8	9 13/16	9 1/8	
	4 1/2	4 1/4-12	3 1/4-12	4 1/2	5.249	1	3 7/8	4 3/8	7	1/2	1 1/2	2 1/4	3 1/2	7 1/8	9 13/16	9 1/8	
	5	4 3/4-12	3 1/2-12	5	5.749	1	4 1/4	4 7/8	7	1/2	1 1/2	2 1/4	3 1/2	7 1/8	9 13/16	9 1/8	
5 1/2	5 1/4-12	4-12	5 1/2	6.249	1	4 5/8	5 3/8	7	1/2	1 1/2	2 1/4	3 1/2	7 1/8	9 13/16	9 1/8		
14	2 1/2	2 1/4-12	1 7/8-12	3	3.124	1	2 1/16	2 3/8	4	1/2	1 1/2	2 1/4	3 3/16	8 1/8	11 1/8	10 3/8	
	3	2 3/4-12	2 1/4-12	3 1/2	3.749	1	2 5/8	2 7/8	5 1/2	1/2	1 1/2	2 1/4	3 3/16	8 1/8	11 1/8	10 3/8	
	3 1/2	3 1/4-12	2 1/2-12	3 1/2	4.249	1	3	3 3/8	5 1/2	1/2	1 1/2	2 1/4	3 3/16	8 1/8	11 1/8	10 3/8	
	4	3 3/4-12	3-12	4	4.749	1	3 3/8	3 7/8	5 1/2	1/2	1 1/2	2 1/4	3 3/16	8 1/8	11 1/8	10 3/8	
	4 1/2	4 1/4-12	3 1/4-12	4 1/2	5.249	1	3 7/8	4 3/8	7	1/2	1 1/2	2 1/4	3 3/16	8 1/8	11 1/8	10 3/8	
	5	4 3/4-12	3 1/2-12	5	5.749	1	4 1/4	4 7/8	7	1/2	1 1/2	2 1/4	3 3/16	8 1/8	11 1/8	10 3/8	
5 1/2	5 1/4-12	4-12	5 1/2	6.249	1	4 5/8	5 3/8	7	1/2	1 1/2	2 1/4	3 3/16	8 1/8	11 1/8	10 3/8		

A

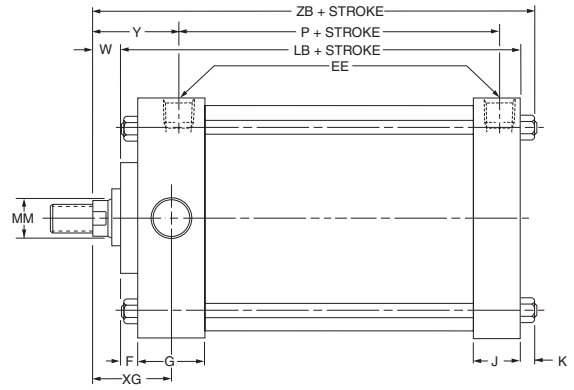
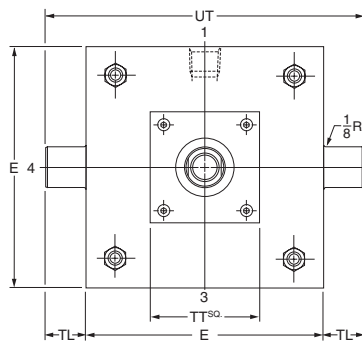
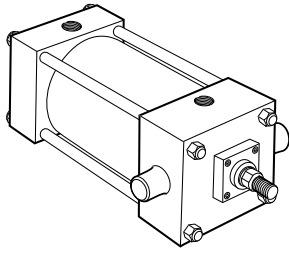
PA-2

NC9

Rod Lock

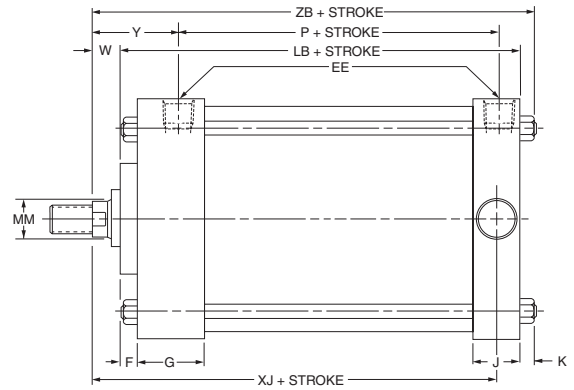
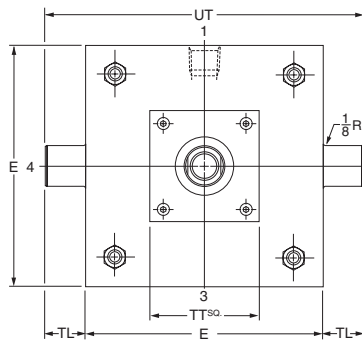
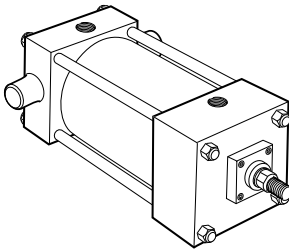
Head Trunnion Mount

Style MT1
7" - 14" Bore



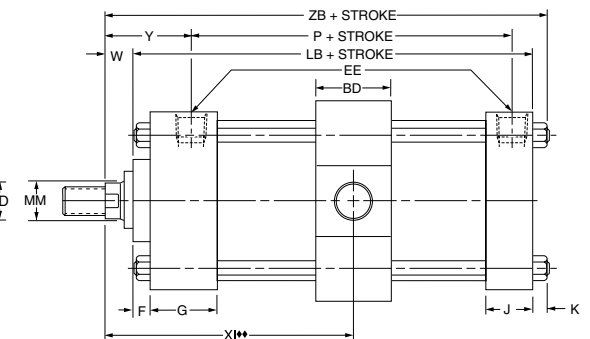
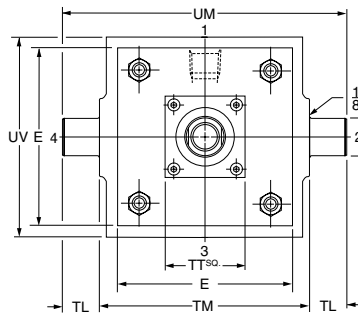
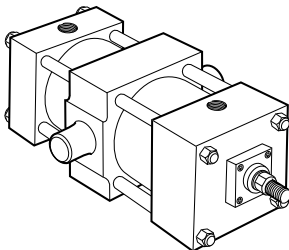
Cap Trunnion Mount

Style MT2
7" - 14" Bore



Intermediate Fixed Trunnion Mount

Model MT4
8" - 14" Bore

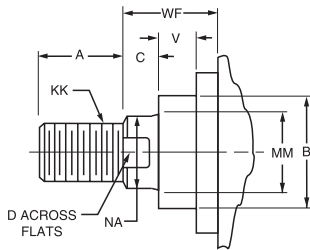


◆◆Dimension XI to be specified by customer.

Rod End Dimensions — see table 2

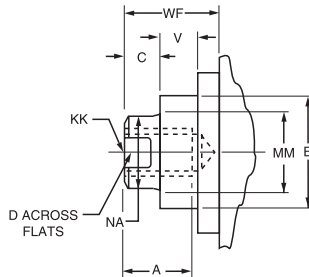
Thread Style 2

Small Male



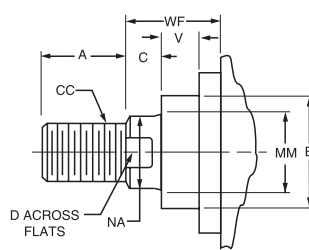
Thread Style 3

Short Female



Thread Style 4

Intermediate Male



“Special” Thread Style 0

Special thread, extension, rod eye, blank, etc., are also available.

To order, specify “Style 0” and give desired dimensions for KK, A, W or WF. If otherwise special, furnish dimensioned sketch.

A high strength rod end stud is supplied on thread style 2 through 2" diameter rods. Larger sizes or special rod ends are cut threads. Style 2 rod ends are recommended where the workpiece is secured against the rod shoulder. When the workpiece is not shouldered,

style 2 rod ends are recommended through 2" piston rod diameters and style 4 rod ends are recommended on larger diameters. Use style 3 for applications where female rod end threads are required. If rod end is not specified, style 2 will be supplied.

Table 1—Envelope and Mounting Dimensions

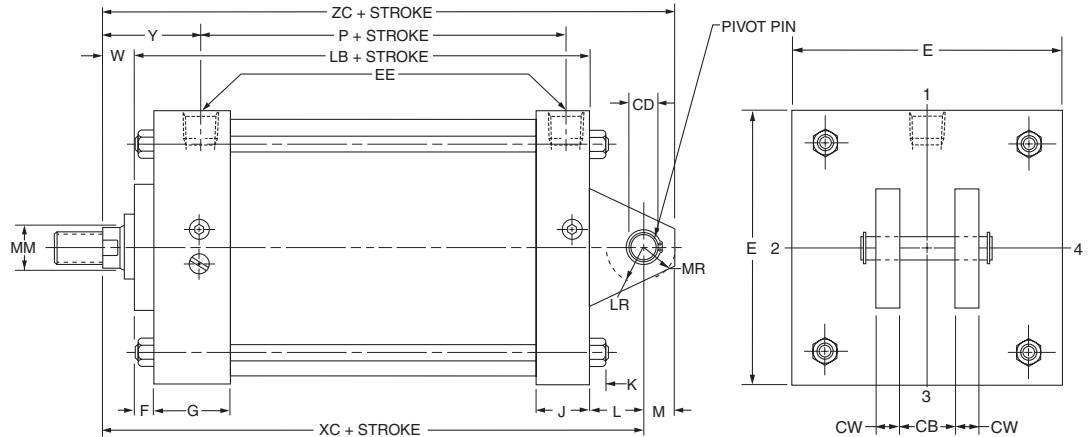
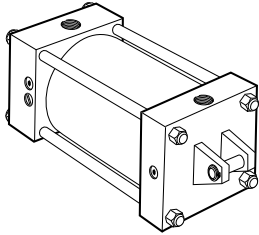
Bore	BD	E	EE NPTF	F	G	J	K	+.000 TD -.001	TL	TM	UT	UM	UV	Add Stroke	
														LB	P
7	—	7 1/2	3/4	3/4	2	1 1/2	9/16	1.375	1 3/8	—	10 1/4	—	—	5 7/8	3 1/4
8	2 1/2	8 1/2	3/4	3/4	2	1 1/2	9/16	1.375	1 3/8	9 3/4	11 1/4	12 1/2	9 1/2	5 7/8	3 1/4
10	3	10 5/8	1	3/4	2 1/4	2	1 1/16	1.750	1 3/4	12	14 1/8	15 1/2	11 3/4	7 1/8	4 1/8
12	3	12 3/4	1	3/4	2 1/4	2	1 1/16	1.750	1 3/4	14	16 1/4	17 1/2	13 3/4	7 5/8	4 5/8
14	3 1/2	14 3/4	1 1/4	3/4	2 3/4	2 1/4	3/4	2.000	2	16 1/4	18 3/4	20 1/4	16	8 7/8	5 1/2

Table 2—Rod End Dimensions and Envelope Dimensions Affected By Rod Size

Bore	Rod Dia. MM	Thread		Rod End Dimensions and Envelope Dimensions Affected By Rod Size												Add Stroke	
		Style 4 CC	Style 2 & 3 KK	A	+.000 -.002 B	C	D	NA	TT	V	W	XG	XI* (Min.)	Y	XJ	ZB	
7	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	4	1/4	7/8	2 5/8	—	2 13/16	6	7 5/16	
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	4	3/8	1 1/8	2 7/8	—	3 1/16	6 1/4	7 9/16	
	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 11/16	1 15/16	4	3/8	1 1/4	3	—	3 3/16	6 3/8	7 11/16	
8	1 3/8	1 1/4-12	1-14	1 5/8	1.999	5/8	1 1/8	1 5/16	4	1/4	7/8	2 5/8	4 15/16	2 13/16	6	7 5/16	
	5 1/2	5 1/4-12	4-12	5 1/2	6.249	1	4 5/8	5 3/8	7	1/2	1 1/2	3 1/4	5 9/16	3 7/16	6 5/8	7 15/16	
	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	4	3/8	1 1/8	2 7/8	5 3/16	3 1/16	6 1/4	7 9/16	
	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 11/16	1 15/16	4	3/8	1 1/4	3	5 5/16	3 3/16	6 3/8	7 11/16	
	2 1/2	2 1/4-12	1 7/8-12	3	3.124	1	2 1/16	2 3/8	4	1/2	1 1/2	3 1/4	5 9/16	3 7/16	6 5/8	7 15/16	
	3	2 3/4-12	2 1/4-12	3 1/2	3.749	1	2 5/8	2 7/8	5 1/2	1/2	1 1/2	3 1/4	5 3/16	3 7/16	6 5/8	7 15/16	
	3 1/2	3 1/4-12	2 1/2-12	3 1/2	4.249	1	3	3 3/8	5 1/2	1/2	1 1/2	3 1/4	5 9/16	3 7/16	6 5/8	7 15/16	
	4	3 3/4-12	3-12	4	4.749	1	3 3/8	3 7/8	5 1/2	1/2	1 1/2	3 1/4	5 9/16	3 7/16	6 5/8	7 15/16	
	4 1/2	4 1/4-12	3 1/4-12	4 1/2	5.249	1	3 7/8	4 3/8	7	1/2	1 1/2	3 1/4	5 9/16	3 7/16	6 5/8	7 15/16	
5	4 3/4-12	3 1/2-12	5	5.749	1	4 1/4	4 7/8	7	1/2	1 1/2	3 1/4	5 9/16	3 7/16	6 5/8	7 15/16		
10	1 3/4	1 1/2-12	1 1/4-12	2	2.374	3/4	1 1/2	1 11/16	4	3/8	1 1/8	3	5 11/16	3 1/8	7 1/4	8 5/16	
	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 11/16	1 15/16	4	3/8	1 1/4	3 1/8	5 13/16	3 1/4	7 3/8	9 1/16	
	2 1/2	2 1/4-12	1 7/8-12	3	3.124	1	2 1/16	2 3/8	4	1/2	1 1/2	3 3/8	6 1/16	3 1/2	7 5/8	9 5/16	
	3	2 3/4-12	2 1/4-12	3 1/2	3.749	1	2 5/8	2 7/8	5 1/2	1/2	1 1/2	3 3/8	6 1/16	3 1/2	7 5/8	9 5/16	
	3 1/2	3 1/4-12	2 1/2-12	3 1/2	4.249	1	3	3 3/8	5 1/2	1/2	1 1/2	3 3/8	6 1/16	3 1/2	7 5/8	9 5/16	
	4	3 3/4-12	3-12	4	4.749	1	3 3/8	3 7/8	5 1/2	1/2	1 1/2	3 3/8	6 1/16	3 1/2	7 5/8	9 5/16	
	4 1/2	4 1/4-12	3 1/4-12	4 1/2	5.249	1	3 7/8	4 3/8	7	1/2	1 1/2	3 3/8	6 1/16	3 1/2	7 5/8	9 5/16	
	5	4 3/4-12	3 1/2-12	5	5.749	1	4 1/4	4 7/8	7	1/2	1 1/2	3 3/8	6 1/16	3 1/2	7 5/8	9 5/16	
	5 1/2	5 1/4-12	4-12	5 1/2	6.249	1	4 5/8	5 3/8	7	1/2	1 1/2	3 3/8	6 1/16	3 1/2	7 5/8	9 5/16	
12	2	1 3/4-12	1 1/2-12	2 1/4	2.624	7/8	1 11/16	1 15/16	4	3/8	1 1/4	3 1/8	5 13/16	3 1/4	7 7/8	9 9/16	
	2 1/2	2 1/4-12	1 7/8-12	3	3.124	1	2 1/16	2 3/8	4	1/2	1 1/2	3 3/8	6 1/16	3 1/2	8 1/8	9 13/16	
	3	2 3/4-12	2 1/4-12	3 1/2	3.749	1	2 5/8	2 7/8	5 1/2	1/2	1 1/2	3 3/8	6 1/16	3 1/2	8 1/8	9 13/16	
	3 1/2	3 1/4-12	2 1/2-12	3 1/2	4.249	1	3	3 3/8	5 1/2	1/2	1 1/2	3 3/8	6 1/16	3 1/2	8 1/8	9 13/16	
	4	3 3/4-12	3-12	4	4.749	1	3 3/8	3 7/8	5 1/2	1/2	1 1/2	3 3/8	6 1/16	3 1/2	8 1/8	9 13/16	
	4 1/2	4 1/4-12	3 1/4-12	4 1/2	5.249	1	3 7/8	4 3/8	7	1/2	1 1/2	3 3/8	6 1/16	3 1/2	8 1/8	9 13/16	
	5	4 3/4-12	3 1/2-12	5	5.749	1	4 1/4	4 7/8	7	1/2	1 1/2	3 3/8	6 1/16	3 1/2	8 1/8	9 13/16	
5 1/2	5 1/4-12	4-12	5 1/2	6.249	1	4 5/8	5 3/8	7	1/2	1 1/2	3 3/8	6 1/16	3 1/2	8 1/8	9 13/16		
14	2 1/2	2 1/4-12	1 7/8-12	3	3.124	1	2 1/16	2 3/8	4	1/2	1 1/2	3 5/8	6 13/16	3 13/16	9 1/4	11 1/8	
	3	2 3/4-12	2 1/4-12	3 1/2	3.749	1	2 5/8	2 7/8	5 1/2	1/2	1 1/2	3 5/8	6 13/16	3 13/16	9 1/4	11 1/8	
	3 1/2	3 1/4-12	2 1/2-12	3 1/2	4.249	1	3	3 3/8	5 1/2	1/2	1 1/2	3 5/8	6 13/16	3 13/16	9 1/4	11 1/8	
	4	3 3/4-12	3-12	4	4.749	1	3 3/8	3 7/8	5 1/2	1/2	1 1/2	3 5/8	6 13/16	3 13/16	9 1/4	11 1/8	
	4 1/2	4 1/4-12	3 1/4-12	4 1/2	5.249	1	3 7/8	4 3/8	7	1/2	1 1/2	3 5/8	6 13/16	3 13/16	9 1/4	11 1/8	
	5	4 3/4-12	3 1/2-12	5	5.749	1	4 1/4	4 7/8	7	1/2	1 1/2	3 5/8	6 13/16	3 13/16	9 1/4	11 1/8	
5 1/2	5 1/4-12	4-12	5 1/2	6.249	1	4 5/8	5 3/8	7	1/2	1 1/2	3 5/8	6 13/16	3 13/16	9 1/4	11 1/8		

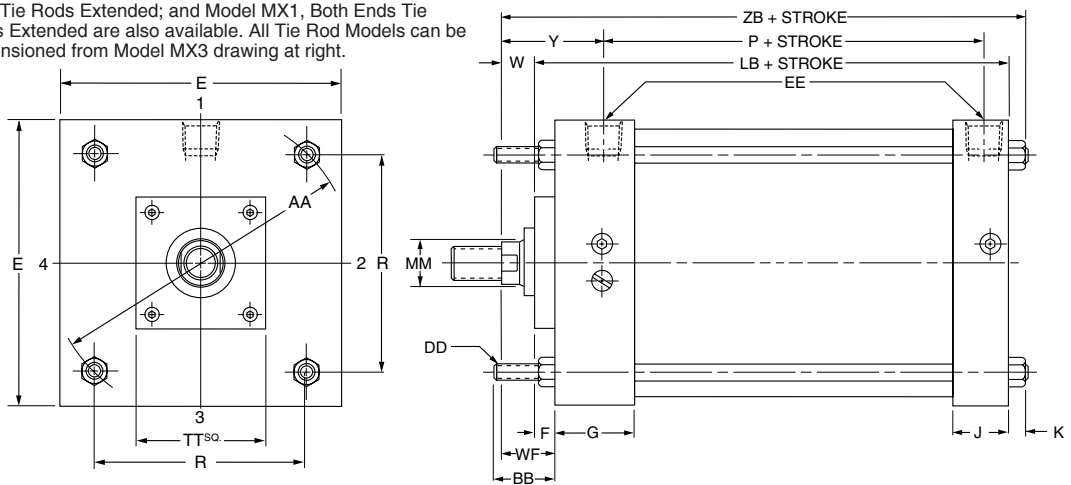
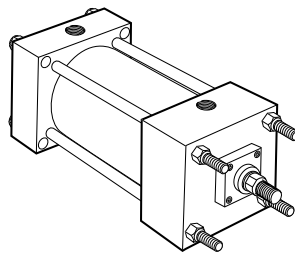
* Dimension XI to be specified by customer.

Cap Fixed Clevis Mount
Style MP1
7" - 14" Bore



Tie Rod Extended Mount
Style MX3
7" - 14" Bore

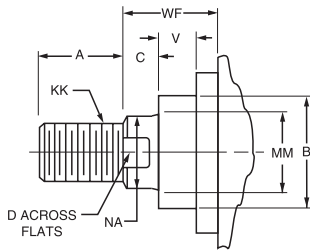
Model MX3 Head Tie Rods Extended, Illustrated. Model MX2 Cap Tie Rods Extended; and Model MX1, Both Ends Tie Rods Extended are also available. All Tie Rod Models can be dimensioned from Model MX3 drawing at right.



Models MX3 and MX1 not offered in 8" bore, rod diameters 4 1/2", 5" and 5 1/2".

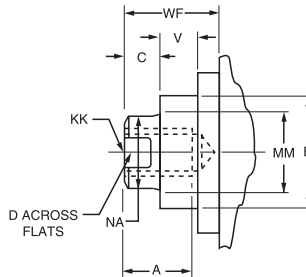
Rod End Dimensions — see table 2

Thread Style 2
Small Male



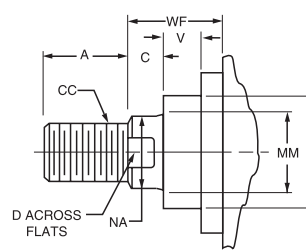
A high strength rod end stud is supplied on thread style 2 through 2" diameter rods. Larger sizes or special rod ends are cut threads. Style 2 rod ends are recommended where the workpiece is secured against the rod shoulder. When the workpiece is not shouldered,

Thread Style 3
Short Female



style 2 rod ends are recommended through 2" piston rod diameters and style 4 rod ends are recommended on larger diameters. Use style 3 for applications where female rod end threads are required. If rod end is not specified, style 2 will be supplied.

Thread Style 4
Intermediate Male



"Special" Thread Style 0

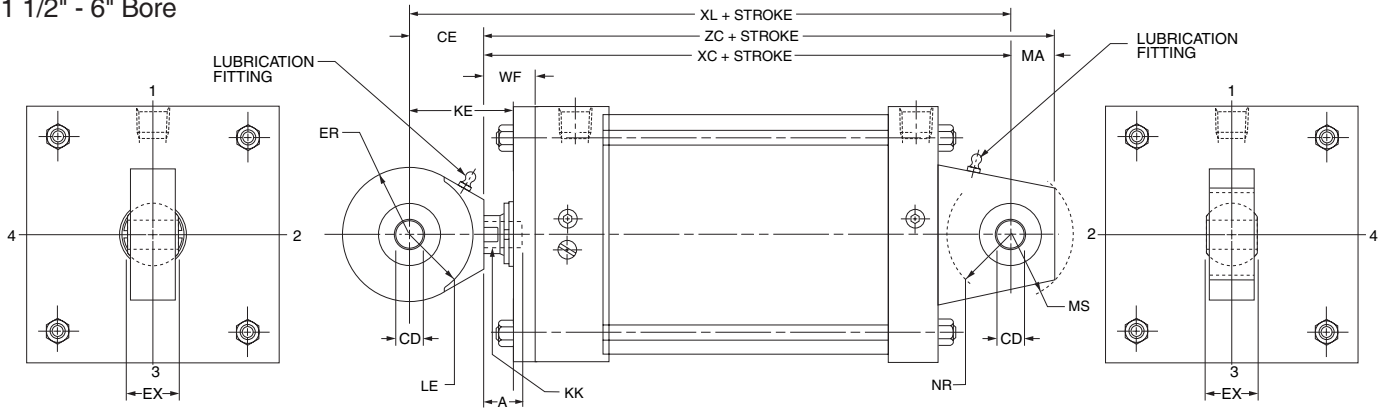
Special thread, extension, rod eye, blank, etc., are also available.

To order, specify "Style 0" and give desired dimensions for KK, A, W or WF. If otherwise special, furnish dimensioned sketch.

Spherical Bearing Mount

Style MPU3

1 1/2" - 6" Bore



Bore	Rod Dia. MM	Thread		A	WF	Add Stroke			KE	CD*	CE	ER	EX	LE	MA	MS	NR	Max. Oper. PSI PA-2
		Style 3 KK	Style 7 KK			XC	XL	ZC										
1½	5/8	7/16-20	—	¾	1	5¾	6¼	6⅝	1½	-.0005	7/8	13/16	7/16	¾	¾	15/16	5/8	250
	1	**	7/16-20	¾	1⅜	5¾	6⅝	6½	1⅞	.5000								
2	5/8	7/16-20	—	¾	1	5¾	6¼	6⅝	1½	-.0005	7/8	13/16	7/16	¾	¾	15/16	5/8	250
	1	**	7/16-20	¾	1⅜	5¾	6⅝	6½	1⅞	.5000								
2½	5/8	7/16-20	—	¾	1	5½	6¾	6¼	1½	-.0005	7/8	13/16	7/16	¾	¾	15/16	5/8	250
	1¾	**	7/16-20	¾	1⅞	6¾	7¼	7⅝	2⅜	-.0005								
	1	**	7/16-20	¾	1⅜	5⅞	6¾	6⅝	1⅞	.5000								
3¼	1	¾-16	—	1⅛	1⅜	6⅞	8⅛	7⅞	2	-.0005	1¼	1⅛	2¹/³²	1⅛	1	1⅜	1	250
	2	**	¾-16	1⅛	2	7½	8¾	8½	2⅝	-.0005								
	1¾	**	¾-16	1⅛	1⅝	7⅛	8¾	8⅛	2¼	.7500								
4	1¾	**	¾-16	1⅛	1⅞	7¾	8⅝	8⅝	2½	-.0005	1¼	1⅛	2¹/³²	1⅛	1	1⅜	1	250
	1¾	**	¾-16	1⅛	1⅞	7¾	8⅝	8⅝	2½	-.0005								
	2	**	¾-16	1⅛	2	7½	8¾	8½	2⅝	.7500								
	2½	**	¾-16	1⅛	2¼	7¾	8¾	8½	2⅝	-.0005								
5	1	¾-16	—	1⅛	1⅜	7⅛	8¾	8⅛	2	-.0005	1¼	1⅛	2¹/³²	1⅛	1	1⅜	1	250
	3½	**	¾-16	1⅛	2¼	8	9¼	9	2⅞	-.0005								
	1¾	**	¾-16	1⅛	1⅝	7¾	8⅝	8⅝	2¼	.7500								
	1¾	**	¾-16	1⅛	1⅞	7¾	8⅝	8⅝	2½	-.0005								
	2	**	¾-16	1⅛	2	7¾	9	8¾	2⅝	.7500								
	2½	**	¾-16	1⅛	2¼	8	9¼	9	2⅞	-.0005								
6	3	**	¾-16	1⅛	2¼	8	9¼	9	2⅞	-.0005	1⅞	1¼	7/8	1⅞	1¼	1¹/¹⁶	1¼	250
	1¾	**	1-14	1⅝	2¼	8¾	10⅝	10	3⅝	-.0005								
	1¾	**	1-14	1⅝	1⅞	8¾	10¼	9⅝	3	1.0000								
	2	**	1-14	1⅝	2	8½	10⅝	9¾	3⅝	-.0005								
	2½	**	1-14	1⅝	2¼	8¾	10⅝	10	3⅝	1.0000								
	3	**	1-14	1⅝	2¼	8¾	10⅝	10	3⅝	-.0005								

Maximum operating pressure at 4:1 design factor is based on tensile strength of material. Pressure ratings are based on standard commercial bearing ratings.

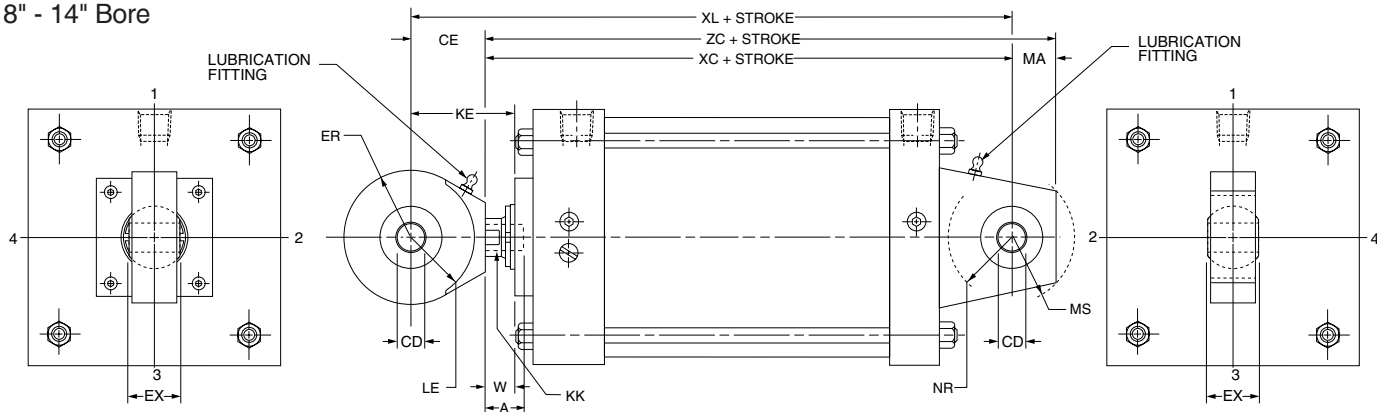
Note: For additional dimensions see [page 26](#).

* Dimension CD is hole diameter.

** Corresponding rod eye pin diameter may not match pin diameter of cap.

Smallest diameter rod size per bore size is standard.

Spherical Bearing Mount
Style MPU3
8" - 14" Bore



Bore	Rod Dia. MM	Thread		A	W	Add Stroke			KE	CD*	CE	ER	EX	LE	MA	MS	NR	Max. Oper. PSI PA-2
		Style 3 KK	Style 7 KK			XC	XL	ZC										
8	1 3/8	1-14	-	1 5/8	7/8	8 1/4	10 1/8	9 1/2	2 3/4	-0.0005 1.0000	1 7/8	1 1/4	7/8	1 7/16	1 1/4	1 11/16	1 1/4	250
	5 1/2	**	1-14	1 5/8	1 1/2	8 7/8	10 3/4	10 1/8	3 3/8									
	1 3/4	**	1-14	1 5/8	1 1/8	8 1/2	10 3/8	9 3/4	3									
	2	**	1-14	1 5/8	1 1/4	8 5/8	10 1/2	9 7/8	3 1/8									
	2 1/2	**	1-14	1 5/8	1 1/2	8 7/8	10 3/4	10 1/8	3 3/8									
	3	**	1-14	1 5/8	1 1/2	8 7/8	10 3/4	10 1/8	3 3/8									
	3 1/2	**	1-14	1 5/8	1 1/2	8 7/8	10 3/4	10 1/8	3 3/8									
	4	**	1-14	1 5/8	1 1/2	8 7/8	10 3/4	10 1/8	3 3/8									
10	1 3/4	1 1/4-12	-	2	1 1/8	10 3/8	12 1/2	12 1/4	3 1/4	-0.0005 1.3750	2 1/8	1 11/16	1 3/16	1 7/8	2 7/16	1 5/8	250	
	2	**	1 1/4-12	2	1 1/4	10 1/2	12 5/8	12 3/8	3 3/8									
	2 1/2	**	1 1/4-12	2	1 1/2	10 3/4	12 7/8	12 5/8	3 5/8									
	3	**	1 1/4-12	2	1 1/2	10 3/4	12 7/8	12 5/8	3 5/8									
	3 1/2	**	1 1/4-12	2	1 1/2	10 3/4	12 7/8	12 5/8	3 5/8									
	4	**	1 1/4-12	2	1 1/2	10 3/4	12 7/8	12 5/8	3 5/8									
	4 1/2	**	1 1/4-12	2	1 1/2	10 3/4	12 7/8	12 5/8	3 5/8									
12	2	1 1/2-12	-	2 1/4	1 1/4	11 1/8	13 5/8	13 5/8	3 3/4	-0.0005 1.7500	2 1/2	2 1/16	1 17/32	2 1/8	2 1/2	2 7/8	2 1/16	250
	2 1/2	**	1 1/2-12	2 1/4	1 1/2	11 3/8	13 7/8	13 7/8	4									
	3	**	1 1/2-12	2 1/4	1 1/2	11 3/8	13 7/8	13 7/8	4									
	3 1/2	**	1 1/2-12	2 1/4	1 1/2	11 3/8	13 7/8	13 7/8	4									
	4	**	1 1/2-12	2 1/4	1 1/2	11 3/8	13 7/8	13 7/8	4									
	4 1/2	**	1 1/2-12	2 1/4	1 1/2	11 3/8	13 7/8	13 7/8	4									
	5	**	1 1/2-12	2 1/4	1 1/2	11 3/8	13 7/8	13 7/8	4									
14	2 1/2	1 7/8-12	-	3	1 1/2	12 7/8	15 5/8	15 3/8	4 1/4	-0.0005 2.0000	2 3/4	2 1/2	1 3/4	2 1/2	2 1/2	3 5/16	2 3/8	250
	3	**	1 7/8-12	3	1 1/2	12 7/8	15 5/8	15 3/8	4 1/4									
	3 1/2	**	1 7/8-12	3	1 1/2	12 7/8	15 5/8	15 3/8	4 1/4									
	4	**	1 7/8-12	3	1 1/2	12 7/8	15 5/8	15 3/8	4 1/4									
	4 1/2	**	1 7/8-12	3	1 1/2	12 7/8	15 5/8	15 3/8	4 1/4									
	5	**	1 7/8-12	3	1 1/2	12 7/8	15 5/8	15 3/8	4 1/4									

Maximum operating pressure at 4:1 design factor is based on tensile strength of material. Pressure ratings are based on standard commercial bearing ratings.

Note: For additional dimensions see page 34.

* Dimension CD is hole diameter.

** Corresponding rod eye pin diameter may not match pin diameter of cap.

Smallest diameter rod size per bore size is standard.

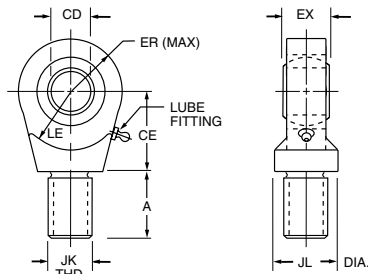
Cylinder Accessories

Spherical Bearing Mount – Style MPU3

Schrader Bellows offers a complete range of Cylinder Accessories to assure you of the greatest versatility in present or future cylinder applications. Accessories offered for the respective cylinder include the Rod Eye,

Pivot Pin and Clevis Bracket. To select the proper part number for any desired accessory refer to the charts below.

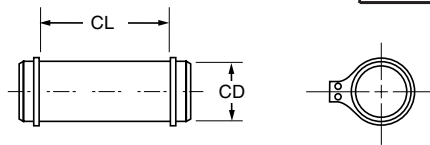
Spherical Rod Eye



Order to fit Piston Rod Thread Size.

Bore Sizes	Series PA-2	1 1/2, 2 & 2 1/2	3 1/4, 4 & 5	6 & 8	10	12	14
Rod Eye	Part No.	1322900000	1322910000	1322920000	1322930000	1322940000	1322950000
	CD	.5000-.0005	.7500-.0005	1.0000-.0005	1.3750-.0005	1.7500-.0005	2.0000-.0005
	A	1 1/16	1	1 1/2	2	2 1/8	2 7/8
	CE	7/8	1 1/4	1 7/8	2 1/8	2 1/2	2 3/4
	EX	7/16	2 1/32	7/8	1 3/16	1 17/32	1 3/4
	ER	1 3/16	1 1/8	1 1/4	1 11/16	2 1/16	2 1/2
	LE	3/4	1 1/16	1 7/16	1 7/8	2 1/8	2 1/2
	JK	7/16-20	3/4-16	1-14	1 1/4-12	1 1/2-12	1 7/8-12
	JL	7/8	1 5/16	1 1/2	2	2 1/4	2 3/4
	LOAD CAPACITY LBS.	2644	9441	16860	28562	43005	70193

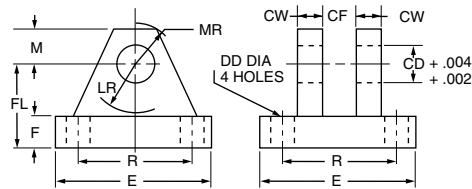
Pivot Pin



Pivot Pins are furnished with (2) Retainer Rings.

Bore Sizes	Series PA-2	1 1/2, 2 & 2 1/2	3 1/4, 4 & 5	6 & 8	10	12	14
Pivot Pin	Part No.	0839620000	0839630000	0839640000	0839650000	0839660000	0839670000
	CD	.4997-.0004	.7497-.0005	.9997-.0005	1.3746-.0006	1.7496-.0006	1.9996-.0007
	CL	1 9/16	2 1/32	2 1/2	3 5/16	4 7/32	4 15/16
	LOAD CAPACITY LBS.	8600	19300	34300	65000	105200	137400

Clevis Bracket



Order to fit Mounting Plate or Rod Eye.

Bore Sizes	Series PA-2	1 1/2, 2 & 2 1/2	3 1/4, 4 & 5	6 & 8	10	12	14
Clevis Bracket	Part No.	0839470000	0839480000	0839490000	0839500000	0839510000	0839520000
	CD	1/2	3/4	1	1 3/8	1 3/4	2
	CF	7/16	2 1/32	7/8	1 3/16	1 17/32	1 3/4
	CW	1/2	5/8	3/4	1	1 1/4	1 1/2
	DD	1 3/32	1 7/32	1 7/32	2 1/32	2 9/32	2 9/32
	E	3	3 3/4	5 1/2	6 1/2	8 1/2	10 5/8
	F	1/2	5/8	3/4	7/8	1 1/4	1 1/2
	FL	1 1/2	2	2 1/2	3 1/2	4 1/2	5
	LR	1 5/16	1 3/8	1 11/16	2 7/16	2 7/8	3 5/16
	M	1/2	7/8	1	1 3/8	1 3/4	2
	MR	5/8	1	1 3/16	1 5/8	2 1/16	2 3/8
	R	2.05	2.76	4.10	4.95	6.58	7.92
	LOAD CAPACITY LBS.	5770	9450	14300	20322	37800	50375

**Double Rod Models
1" to 14" Bore**

To determine dimensions for a double rod cylinder, first refer to the desired single rod mounting style cylinder shown on preceding pages of this catalog. After selecting necessary dimensions from that drawing, return to this page and supplement the single rod dimensions with those shown on the drawing and dimension table below. Note that double rod cylinders have a head (Dim. G) at both ends and that dimension LD or LF replaces LB or LG. The double rod dimensions differ from, or are in addition to those for single rod cylinders shown on preceding pages and provide the information needed to completely dimension a double rod cylinder. On a double rod cylinder where the two rod ends are different, be sure to clearly state which rod end is to be assembled at which end.

Port position 1 is standard. If other than standard, specify position 2, 3, or 4 when viewed from one end only.

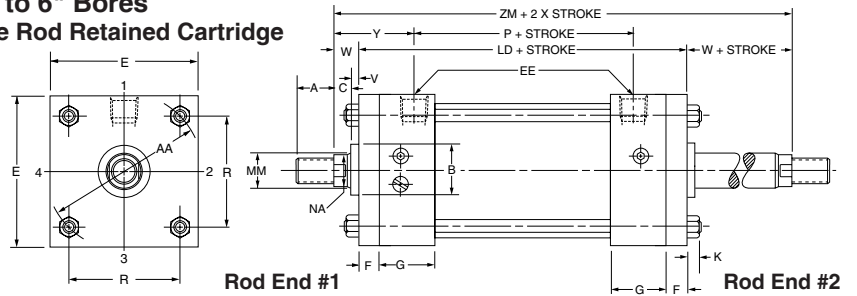
If only one end of these Double Rod Cylinders is to be cushioned, be sure to specify clearly which end this will be.

Specify XI dimension from rod end #1.

How to Use Double Rod Cylinder Dimension Drawings

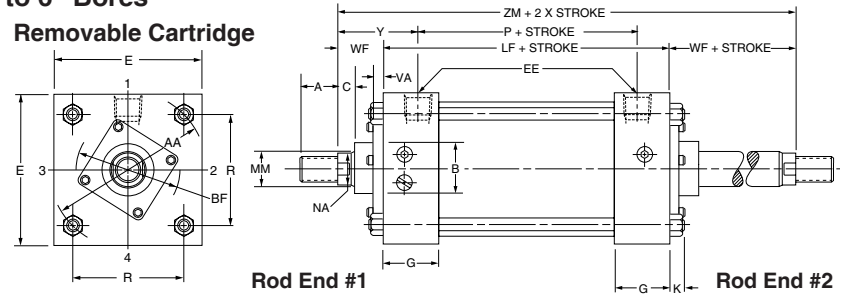
1" to 6" Bores

Tie Rod Retained Cartridge

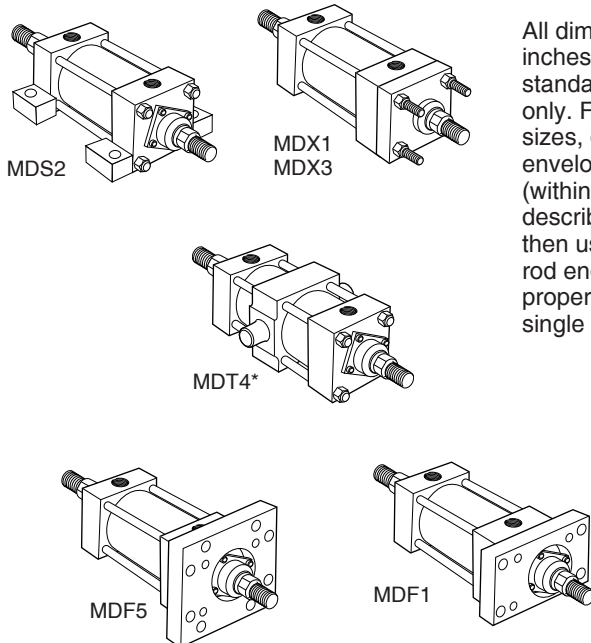
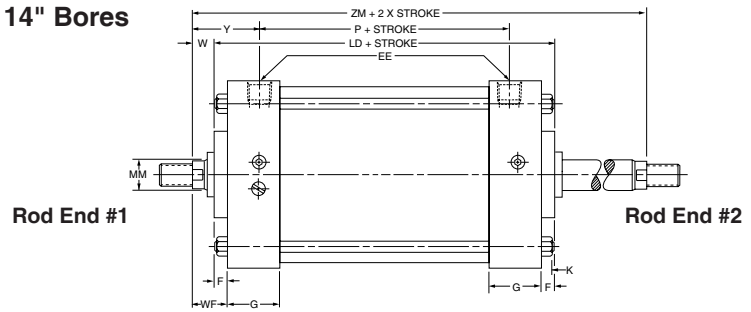


1" to 6" Bores

Removable Cartridge



7" to 14" Bores



All dimensions are in inches and apply to standard rod sizes only. For alternate rod sizes, determine all envelope dimensions (within LD dim.) as described above and then use appropriate rod end dimensions for proper rod size from single rod cylinder.

Bore	Rod Dia. MM	Add Stroke			Add 2X Stroke
		LD	LF	SS	ZM
1	1/2	4 3/4	—	3 3/8	6
1 1/2	5/8	4 7/8	4 1/8	3 3/8	6 1/8
2	5/8	4 7/8	4 1/8	3 3/8	6 1/8
2 1/2	5/8	5	4 1/4	3 1/2	6 1/4
3 1/4	1	6	4 3/4	3 3/4	7 1/2
4	1	6	4 3/4	3 3/4	7 1/2
5	1	6 1/4	5	3 5/8	7 3/4
6	1 3/8	7	5 1/2	4 1/8	8 3/4
7	1 3/8	7 1/8	5 5/8	4 1/4	8 7/8
8	1 3/8	7 1/8	5 5/8	4 1/4	8 7/8
10	1 3/4	8 1/8	6 5/8	4 7/8	10 3/8
12	2	8 5/8	7 1/8	5 3/8	11 1/8
14	2 1/2	10 1/8	8 5/8	6 3/8	13 1/8
Replaces:		LB	LG	SS	—
On single rod mounting styles:		All Mtg. Styles		MS2	All Mtgs.

*Mounting style MDT4 not available in 1" and 7" bore sizes.

Cylinder Accessories

Schrader Bellows offers a complete range of cylinder accessories to assure you of the greatest versatility in present and future cylinder applications.

Rod End Accessories

Accessories offered for the rod end of the cylinder include Rod Clevis, Eye Bracket, Knuckle, Clevis Bracket, and Pivot Pin. To select the proper part number for any desired accessory, refer to the table below or on the opposite page and look in the row to the right of the rod thread in the first column. For economical accessory selection, it is recommended that rod end style 2 be specified on your cylinder order.

Accessory Load Capacity

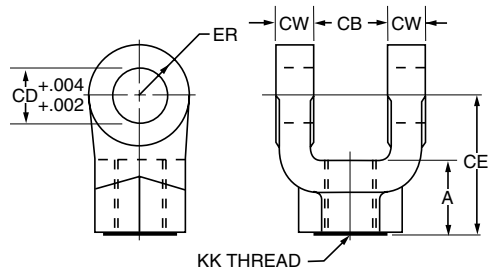
The various accessories have been load rated for your convenience. The load Capacity in lbs. Is the recommended maximum load for that accessory based on a 4:1 design factor in tension. (Pivot Pin is rated in shear.) Before specifying, compare the actual load or the tension (pull) force at maximum operating pressure of the cylinder with the load capacity of the accessory you plan to use. If load or pull force of cylinder exceeds load capacity of accessory, consult factory.

Thread Size	Rod Clevis		Mounting Plate or Eye Bracket		Pivot Pin	
	Part Number	Load Capacity (Lbs.)	Part Number	Load Capacity (Lbs.)	Part Number	Shear Capacity (Lbs.)
5/16-24	0512210000†	2600	0740770000	1700	–	–
7/16-20	0509400000	4250	0691950000	4100	0683680000	8600
1/2-20	0509410000	4900	0691950000	4100	0683680000	8600
3/4-16	0509420000	11200	0691960000	10500	0683690000	19300
3/4-16	1332840000	11200	0691960000	10500	0683690000	19300
7/8-14	0509430000	18800	*0853610000	20400	0683700000	34300
1-14	0509440000	19500	*0853610000	20400	0683700000	34300
1-14	1332850000	19500	*0853610000	20400	0683700000	34300
1 1/4-12	0509450000	33500	0691980000	21200	0683710000	65000
1 1/4-12	1332860000	33500	0691980000	21200	0683710000	65000
1 1/2-12	0509460000	45600	*0853620000	49480	0683720000	105200
1 3/4-12	0509470000	65600	*0853630000	70000	0683730000	137400
1 7/8-12	0509480000	65600	*0853630000	70000	0683730000	137400
2 1/4-12	0509490000	98200	*0853640000	94200	0683740000	214700
2 1/2-12	0509500000	98200	*0853650000	121900	0683750000	309200
2 3/4-12	0509510000	98200	*0853650000	121900	0683750000	309200
3 1/4-12	0509520000	156700	0735380000	57400	0735450000	420900
3 1/2-12	0509530000	193200	0735390000	75000	0735470000	565800
4-12	0509540000	221200	0735390000	75000	0735470000	565800

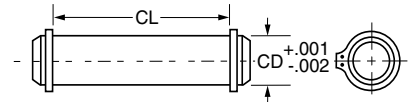
† Includes pivot pin.

* Cylinder accessory dimensions conform to NFPA recommended standard NFPA/T3.6.8 R1-1984, NFPA recommended standard fluid power systems – cylinder – dimensions for accessories for cataloged square head industrial cylinders.

Rod Clevis Dimensions



Pivot Pin Dimensions



Part Number	A	CB	CD	CE	CW	ER	KK
0512210000†	13/16	11/32	5/16	2 1/4	13/64	19/64	5/16-24
0509400000	3/4	3/4	1/2	1 1/2	1/2	1/2	7/16-20
0509410000	3/4	3/4	1/2	1 1/2	1/2	1/2	1/2-20
0509420000	1 1/8	1 1/4	3/4	2 1/8	5/8	3/4	3/4-16
1332840000	1 1/8	1 1/4	3/4	2 3/8	5/8	3/4	3/4-16
0509430000	1 5/8	1 1/2	1	2 15/16	3/4	1	7/8-14
0509440000	1 5/8	1 1/2	1	2 15/16	3/4	1	1-14
1332850000	1 5/8	1 1/2	1	3 1/8	3/4	1	1-14
0509450000	1 7/8	2	1 3/8	3 3/4	1	1 3/8	1 1/4-12
1332860000	2	2	1 3/8	4 1/8	1	1 3/8	1 1/4-12
0509460000	2 1/4	2 1/2	1 3/4	4 1/2	1 1/4	1 3/4	1 1/2-12
0509470000	3	2 1/2	2	5 1/2	1 1/4	2	1 3/4-12
0509480000	3	2 1/2	2	5 1/2	1 1/4	2	1 7/8-12
0509490000	3 1/2	3	2 1/2	6 1/2	1 1/2	2 1/2	2 1/4-12
0509500000	3 1/2	3	3	6 3/4	1 1/2	2 3/4	2 1/2-12
0509510000	3 1/2	3	3	6 3/4	1 1/2	2 3/4	2 3/4-12
0509520000	3 1/2‡	4	3 1/2	7 3/4	2	3 1/2	3 1/4-12
0509530000	4‡	4 1/2	4	8 13/16	2 1/4	4	3 1/2-12
0509540000	4‡	4 1/2	4	8 13/16	2 1/4	4	4-12

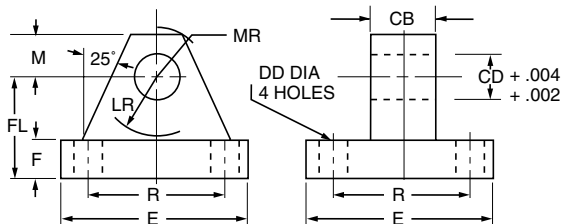
†Includes Pivot Pin

‡Consult appropriate cylinder rod end dimensions for compatibility.

Part Number	CD	CL
0683680000	1/2	1 7/8
0683690000	3/4	2 5/8
0683700000	1	3 1/8
0683710000	1 3/8	4 1/8
0683720000	1 3/4	5 3/16
0683730000	2	5 3/16
0683740000	2 1/2	6 3/16
0683750000	3	6 1/4
0735450000	3 1/2	8 1/4
0735470000*	4	9

- This size supplied with cotter pins.
- 1. Pivot Pins are furnished with Clevis Mounted Cylinders as standard.
- 2. Pivot Pins are furnished with (2) Retainer Rings.
- 3. Pivot Pins must be ordered as a separate item if to be used with Knuckles, Rod Clevises, or Clevis Brackets.

Mounting Plate or Eye Bracket Dimensions



1. When used to mate with the Rod Clevis, select by thread size in table on [opposite page](#).
2. When used to mount the Style MP1 Cylinders, select by bore size below.

Part Number	CB	CD	DD	E	F	FL	LR	M	MR	R	Bore
0740770000	5/16	5/16	17/64	2 1/4	3/8	1	5/8	3/8	1/2	1.75	1"
0691950000	3/4	1/2	13/32	2 1/2	3/8	1 1/8	3/4	1/2	9/16	1.63	1 1/2", 2", 2 1/2"
0691960000	1 1/4	3/4	17/32	3 1/2	5/8	1 7/8	1 1/4	3/4	7/8	2.55	3 1/4", 4", 5"
*0853610000	1 1/2	1	21/32	4 1/2	7/8	2 3/8	1 1/2	1	1 1/4	3.25	6", 7", 8"
0691980000	2	1 3/8	21/32	5	7/8	3	2 1/8	1 3/8	1 5/8	3.82	10"
*0853620000	2 1/2	1 3/4	29/32	6 1/2	1 1/8	3 3/8	2 1/4	1 3/4	2 1/8	4.95	12"
*0853630000	2 1/2	2	1 1/16	7 1/2	1 1/2	4	2 1/2	2	2 7/16	5.73	14"
*0853640000	3	2 1/2	1 3/16	8 1/2	1 3/4	4 3/4	3	2 1/2	3	6.58	-
*0853650000	3	3	1 5/16	9 1/2	2	5 1/4	3 1/4	2 3/4	3 1/4	7.50	-
0735380000	4	3 1/2	1 13/16	12 5/8	1 11/16	5 11/16	4	3 1/2	4 1/8	9.62	-
0735390000	4 1/2	4	2 1/16	14 7/8	1 15/16	6 7/16	4 1/2	4	5 1/4	11.45	-

* Cylinder accessory dimensions conform to NFPA recommended standard NFPA/T3.6.8 R1-1984, NFPA recommended standard fluid power systems - cylinder - dimensions for accessories for cataloged square head industrial cylinders.

Rod End Accessories

Accessories offered for the rod end of the cylinder include Rod Clevis, Eye Bracket, Knuckle, Clevis Bracket, and Pivot Pin. To select the proper part number for any desired accessory, refer to the table below or on the [opposite page](#) and look in the row to the right of the rod thread in the first column. For economical accessory selection, it is recommended that rod end style 2 be specified on your cylinder order.

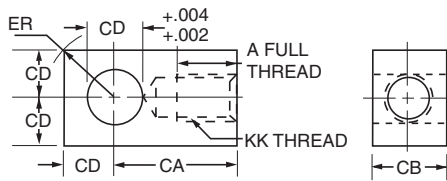
Accessory Load Capacity

The various accessories have been load rated for your convenience. The load Capacity in lbs. is the recommended maximum load for that accessory based on a 4:1 design factor in tension. (Pivot Pin is rated in shear.) Before specifying, compare the actual load or the tension (pull) force at the maximum operating pressure of the cylinder with the load capacity of the accessory you plan to use. If load or pull force of cylinder exceeds load capacity of accessory, consult factory.

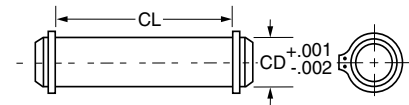
Thread Size	Knuckle		Clevis Bracket		Pivot Pin	
	Part Number	Load Capacity (Lbs.)	Part Number	Load Capacity (Lbs.)	Part Number	Shear Capacity (Lbs.)
5/16-24	0740750000	3300	0740760000	3600	0740780000	6600
7/16-20	0690890000	5000	0692050000	7300	0683680000	8600
1/2-20	0690900000	5700	0692050000	7300	0683680000	8600
3/4-16	0690910000	12100	0692060000	14000	0683690000	19300
3/4-16	0690910000	12100	0692060000	14000	0683690000	19300
7/8-14	0690920000	13000	0692070000	19200	0683700000	34300
1-14	0690930000	21700	0692070000	19200	0683700000	34300
1-14	0690930000	21700	0692070000	19200	0683700000	34300
1 1/4-12	0690940000	33500	0692080000	36900	0683710000	65000
1 1/4-12	0690940000	33500	0692080000	36900	0683710000	65000
1 1/2-12	0690950000	45000	0692090000	34000	0683720000	105200
1 3/4-12	0690960000	53500	0692100000	33000	0692150000	137400
1 7/8-12	0690970000	75000	0692100000	33000	0692150000	137400
2 1/4-12	0690980000	98700	0692110000	34900	0683740000	214700
2 1/2-12	0690990000	110000	0692120000	33800	0683750000	309200
2 3/4-12	0691000000	123300	0692130000	36900	0692160000	309200
3 1/4-12	0735360000	161300	0735420000	83500	0735450000	420900
3 1/2-12	0734370000	217300	0735420000	83500	0735450000	420900
4-12	0734380000	273800	0735430000	102600	0821810000	565800
4 1/2-12	0734390000	308500	0735440000	108400	0735470000•	565800

• This size supplied with cotter pins.

Knuckle Dimensions



Pivot Pin Dimensions

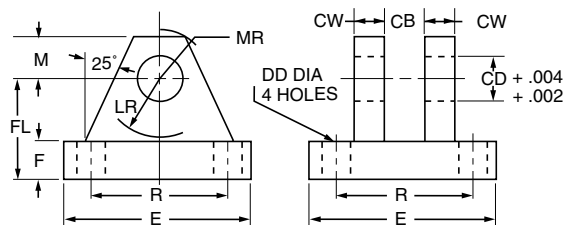


Part Number	A	CA	CB	CD	ER	KK
0740750000	3/4	1 1/2	7/16	7/16	19/32	5/16-24
0690890000	3/4	1 1/2	3/4	1/2	23/32	7/16-20
0690900000	3/4	1 1/2	3/4	1/2	23/32	1/2-20
0690910000	1 1/8	2 1/16	1 1/4	3/4	1 1/16	3/4-16
0690920000	1 1/8	2 3/8	1 1/2	1	1 7/16	7/8-14
0690930000	1 5/8	2 13/16	1 1/2	1	1 7/16	1-14
0690940000	2	3 7/16	2	1 3/8	1 31/32	1 1/4-12
0690950000	2 1/4	4	2 1/2	1 3/4	2 1/2	1 1/2-12
0690960000	2 1/4	4 3/8	2 1/2	2	2 27/32	1 3/4-12
0690970000	3	5	2 1/2	2	2 27/32	1 7/8-12
0690980000	3 1/2	5 13/16	3	2 1/2	3 9/16	2 1/4-12
0690990000	3 1/2	6 1/8	3	3	4 1/4	2 1/2-12
0691000000	3 5/8	6 1/2	3 1/2	3	4 1/4	2 3/4-12
0735360000	4 1/2	7 5/8	4	3 1/2	4 31/32	3 1/4-12
0734370000	5	7 5/8	4	3 1/2	4 31/32	3 1/2-12
0734380000	5 1/2	9 1/8	4 1/2	4	5 11/16	4-12
0734390000	5 1/2	9 1/8	5	4	5 11/16	4 1/2-12

Part Number	CD	CL
0740780000	7/16	1 5/16
0683680000	1/2	1 7/8
0683690000	3/4	2 5/8
0683700000	1	3 1/8
0683710000	1 3/8	4 1/8
0683720000	1 3/4	5 3/16
0692150000	2	5 11/16
0683740000	2 1/2	6 3/16
0683750000	3	6 1/4
0692160000	3	6 3/4
0735450000	3 1/2	8 1/4
0821810000	4	8 5/8
0735470000•	4	9

- This size supplied with cotter pins.
- 1. Pivot Pins are furnished with Clevis Mounted Cylinders as standard.
- 2. Pivot Pins are furnished with (2) Retainer Rings.
- 3. Pivot Pins must be ordered as a separate item if to be used with Knuckles, Rod Clevises, or Clevis Brackets.

Clevis Bracket Dimensions



Part Number	CB	CD	CW	DD	E	F	FL	LR	M	MR	R
0740760000	15/32	7/16	3/8	17/64	2 1/4	3/8	1	5/8	3/8	1/2	1.75
0692050000	3/4	1/2	1/2	13/32	3 1/2	1/2	1 1/2	3/4	1/2	5/8	2.55
0692060000	1 1/4	3/4	5/8	17/32	5	5/8	1 7/8	1 3/16	3/4	29/32	3.82
0692070000	1 1/2	1	3/4	21/32	6 1/2	3/4	2 1/4	1 1/2	1	1 1/4	4.95
0692080000	2	1 3/8	1	21/32	7 1/2	7/8	3	2	1 3/8	1 21/32	5.73
0692090000	2 1/2	1 3/4	1 1/4	29/32	9 1/2	7/8	3 5/8	2 3/4	1 3/4	2 7/32	7.50
0692100000	2 1/2	2	1 1/2	1 1/16	12 3/4	1	4 1/4	3 3/16	2 1/4	2 25/32	9.40
0692110000	3	2 1/2	1 1/2	1 3/16	12 3/4	1	4 1/2	3 1/2	2 1/2	3 1/8	9.40
0692120000	3	3	1 1/2	1 5/16	12 3/4	1	6	4 1/4	3	3 19/32	9.40
0692130000	3 1/2	3	1 1/2	1 5/16	12 3/4	1	6	4 1/4	3	3 19/32	9.40
0735420000	4	3 1/2	2	1 13/16	15 1/2	1 11/16	6 11/16	5	3 1/2	4 1/8	12.00
0735430000	4 1/2	4	2	2 1/16	17 1/2	1 15/16	7 11/16	5 3/4	4	4 7/8	13.75
0735440000	5	4	2	2 1/16	17 1/2	1 15/16	7 11/16	5 3/4	4	4 7/8	13.75

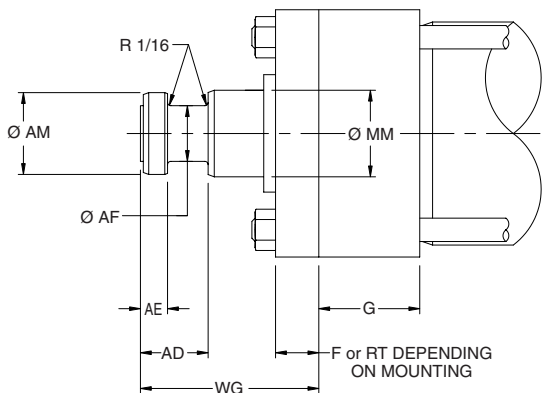
Cylinder accessory dimensions conform to NFPA recommended standard NFPT/T3.6.8 R1-1984, NFPA recommended standard fluid power systems - cylinder - dimensions for accessories for cataloged square head industrial cylinders.

Schrader Bellows “Style 6” Piston Rod End

Rod end flange coupling for Schrader Bellows PA-2 and PN Series Pneumatic Cylinders

- Simplifies alignment
- Reduces assembly time
- Allows full rated pneumatic pressure in push and pull directions
- Available in 5/8" through 5-1/2" piston rod diameters

Style 6 Rod End



Dimensions Style 6 Rod End

MM Rod Dia.	AD	AE	AF	AM	WG
5/8	5/8	1/4	3/8	.57	1 3/4
1	15/16	3/8	11/16	.95	2 3/8
1 3/8	1 1/16	3/8	7/8	1.32	2 3/4
1 3/4	1 5/16	1/2	1 1/8	1.70	3 1/8
2	1 11/16	5/8	1 3/8	1.95	3 3/4
2 1/2	1 15/16	3/4	1 3/4	2.45	4 1/2
3	2 7/16	7/8	2 1/4	2.95	4 7/8
3 1/2	2 11/16	1	2 1/2	3.45	5 5/8
4	2 11/16	1	3	3.95	5 3/4
4 1/2	3 3/16	1 1/2	3 1/2	4.45	6 1/2
5	3 3/16	1 1/2	3 7/8	4.95	6 5/8
5 1/2	3 15/16	1 7/8	4 3/8	5.45	7 1/2

See Cylinder Catalog for F, G and RT per bore and series.

Consult Factory for availability of mounting accessories and Hardware.

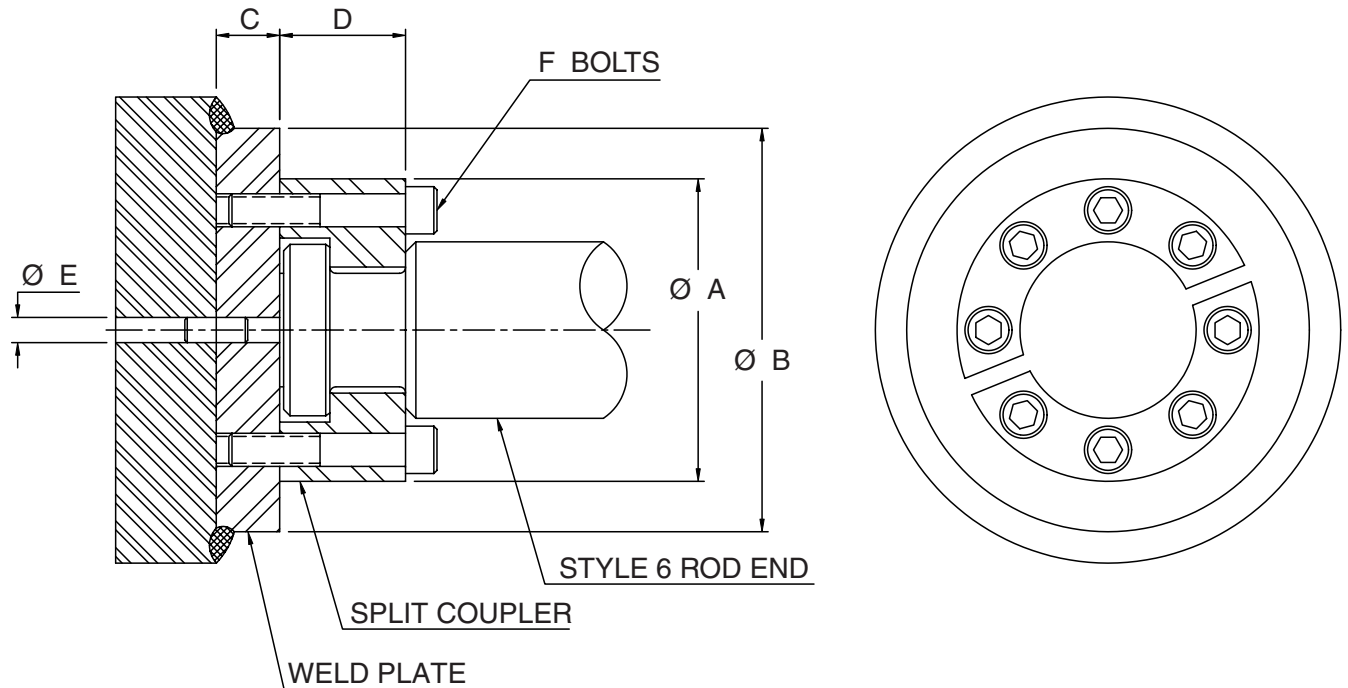
How To Order

Complete Model Number and place a “6” in the Piston Rod End designator position.

Example: PAD113561x12.00

Schrader Bellows “Style 6” Piston Rod End

Split Couplers and Weld Plates



⚠ WARNING: Piston rod separation from the machine member can result in severe personal injury or even death to nearby personnel. The cylinder user must make sure the weld holding the weld plate to the machine is of sufficient quality and size to hold the intended load. The cylinder user must also make sure the bolts holding split coupler to the weld plate are of sufficient strength to hold the intended load and installed in such a way that they will not become loose during the machine’s operation.

Table 1 — Part Numbers and Dimensions

ROD DIA.	A	B	C	D	E	F	BOLT SIZE	BOLT CIRCLE	SPLIT COUPLER PART NO.	WELD PLATE PART NO.
5/8	1.50	2.00	.50	.56	.250	4	#10-24 x .94 LG	1.125	1472340062	1481740062
1	2.00	2.50	.50	.88	.250	6	.250-20 x 1.25 LG	1.500	1472340100	1481740100
1 3/8	2.50	3.00	.63	1.00	.250	6	.312-18 x 1.50 LG	2.000	1472340138	1481740138
1 3/4	3.00	4.00	.63	1.25	.250	8	.312-18 x 1.75 LG	2.375	1472340175	1481740175
2	3.50	4.00	.75	1.63	.375	12	.375-16 x 2.25 LG	2.687	1472340200	1481740200
2 1/2	4.00	4.50	.75	1.88	.375	12	.375-16 x 2.50 LG	3.187	1472340250	1481740250
3	5.00	5.50	1.00	2.38	.375	12	.500-13 x 3.25 LG	4.000	1472340300	1481740300
3 1/2	5.88	7.00	1.00	2.63	.375	12	.625-11 x 3.50 LG	4.687	1472340350	1481740350
4	6.38	7.00	1.00	2.63	.375	12	.625-11 x 3.50 LG	5.187	1472340400	1481740400
4 1/2	6.88	8.00	1.00	3.13	.375	12	.625-11 x 4.00 LG	5.687	1472340450	1481740450
5	7.38	8.00	1.00	3.13	.375	12	.625-11 x 4.00 LG	6.187	1472340500	1481740500
5 1/2	8.25	9.00	1.25	3.88	.375	12	.750-10 x 5.00 LG	6.875	1472340550	1481740550

Note: Bolts are not included with split coupler or weld plate.

How to Order PA-2 Series Cylinders

When ordering PA-2 Series cylinders, please review the following:

Note: Duplicate cylinders can be ordered by giving the SERIAL NUMBER from the nameplate of the original cylinder. Factory records supply a quick positive identification.

Piston Rods: Specify model number code based on bore size and rod diameter. Give thread style number for a standard thread or specify dimensions. See "Style 0 Rod End" below.

Cushions: If cushions are required specify according to the model number on the next page. If the cylinder is to have a double rod and only one cushion is required, be sure to specify clearly which end of the cylinder is to be cushioned.

Special Modifications: Additional information is required on orders for cylinders with special modifications. This is best handled with descriptive notes. For further information, consult factory.

Fluid Medium: PA-2 Series pneumatic cylinders are equipped with seals for use with lubricated air.

Class 1 Seals

Class 1 seals are the seals provided as standard in a cylinder assembly unless otherwise specified. For further information on fluid compatibility or operating limitations of all components, see section C.

For the PA-2 Series cylinders the following make-up Class 1 Seals:

Primary Piston Rod Seal – Nitrile with PTFE back-up washers

Piston Rod Wiper – Nitrile

Piston Seals – Nitrile with polymyte back-up washers

O-Rings – Nitrile

Style 0 Rod End

A style 0 rod end indicates a special rod end configuration. All special piston rod dimensions must have **all three:** KK; A; and W/WF specified with the rod fully retracted. A sketch or drawing should be submitted for rod ends requiring special machining such as snap ring grooves, keyways, tapers, multiple diameters, etc. It is good design practice to have this machining done on a diameter at least 0.065 inches smaller than the piston rod diameter. This allows the piston rod to have a chamfer preventing rod seal damage during assembly

or maintenance. Standard style 6 rod ends with a longer than standard WG dimension should call out a style 0 rod end and the note: **same as 6 except WG=_____**. A drawing should be submitted for special 6 rod ends that have specific tolerances or special radii. Special rod ends that have smaller than standard male threads, larger than standard female threads, or style 6 rod ends with smaller than standard AF or AE dimensions are to be reviewed by Engineering for proper strength at operating pressure.

Service Policy

On cylinders returned to the factory for repairs, it is standard policy for the Cylinder Division to make such part replacements as will put the cylinder in as good as new condition. Should the condition of the returned cylinder be such that expenses for repair would exceed the costs of a new one, you will be notified.

Address all correspondence and make shipments to, Service Department at your nearest regional plant listed in the pages of this catalog.

Certified Dimensions

Schrader Bellows guarantees that all cylinders ordered from this catalog will be built to dimensions shown. All dimensions are certified to be correct, and thus it is not necessary to request certified drawings.

How to Order

PA-2 Series

**How To Order
By Model Number**

PA-2 Pneumatic Cylinders can be specified by model number by using the tables shown at right.

1. Type

Select the Model Number Code which identifies single, double end or non-lube.

2. Bore & Rod Diameter

Select the Model Number Code which identifies the desired bore size and rod diameter combination.

3. Mounting & Cushioning

Select the Model Number Code which identifies the desired mounting style and cushioning option.

4. Rod End Style

Select the Model Number Code which identifies the desired rod end thread style.

5. Seal Type

Complete the Model Number by selecting the type of seals desired.

6. Stroke Length

It is necessary to specify the stroke length desired following the Model Number. For example: PAA101621 with 6" stroke.

Specifying the Desired Trunnion Location

For cylinders with intermediate trunnion mounting, the dimension specified should be the distance from the piston rod reference point to the center-line of the pin.

The Example Would Identify:

A single end pneumatic cylinder, 1-1/2" bore size, 5/8" piston rod diameter, side tapped mount, cushioned both ends, with a small male rod thread, Buna N Seals, a 6" stroke.

Optional Mounting Accessories

Specify separately the part number for desired optional mounting accessories.

Note: For special modifications other than piston rod ends use S in the tenth position of the model number and describe special features required.

Example: PAA101621S 6" Stroke
Cylinder to be Nickel Plated.

1	Model Number		
Type	PA-2 Series Pneumatic		
Single End	PA		
Double End	PB		
Non-Lube Single End	PN		
Non-Lube Double End	PP		

Model Number Example:

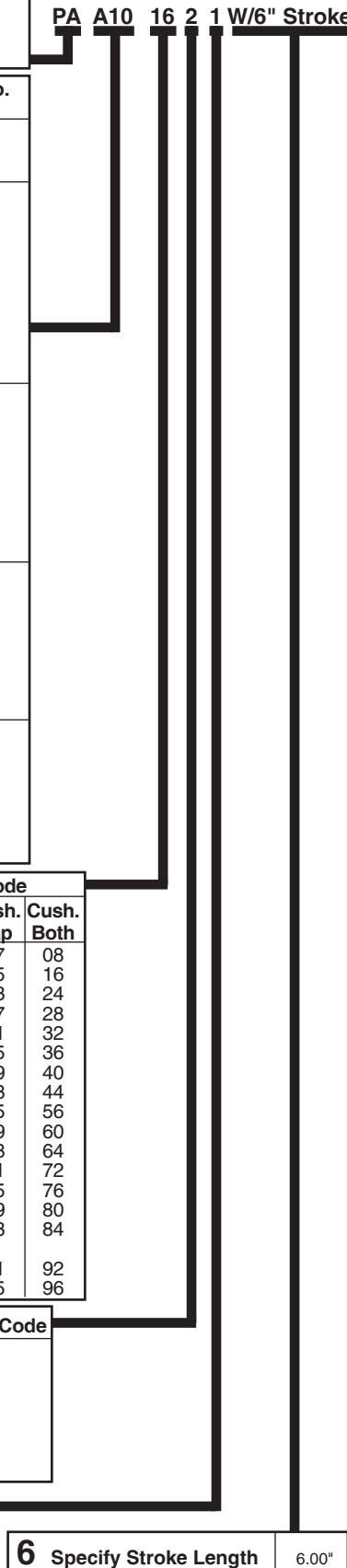
PA A10 16 2 1 W/6" Stroke

2	Bore Size	Rod Dia.	Model No. Code
1"	1/2" 5/8"	S50	H12
		A10	H13
		A11	H14
1 1/2"	5/8" 1"	B10	J12
		B11	J13
		B12	J14
		C10	J15
		C11	J16
		C12	J17
2"	1" 1 1/8"	C13	J18
			J19
			J41
			J42
2 1/2"	1 1/8" 1" 1 1/4"	D11	K13
		D12	K14
		D13	K15
		D14	K16
3 1/4"	1" 1 1/8" 1 1/4" 2"	E11	K17
		E12	K18
		E13	K19
		E14	K41
		E15	K42
4"	1" 1 1/8" 1 1/4" 2" 2 1/2"	F11	L14
		F12	L15
		F13	L16
		F14	L17
		F15	L18
		F16	L19
		F17	L41
5"	1" 1 1/8" 1 1/4" 2" 2 1/2" 3" 3 1/2"	G12	L42
		G13	M15
		G14	M16
		G15	M17
		G16	M18
		G17	M19
		G18	M41
6"	1 3/8" 1 1/4" 2" 2 1/2" 3" 3 1/2" 4"	H12	M42

3	Model Number Code				
	NFPA Style	Non-Cush.	Cush. Head	Cush. Cap	Cush. Both
Mounting Style	MS2	05	06	07	08
Side Lug	MS4	13	14	15	16
Side Tap	MF1	21	22	23	24
Head Rectangular Flange (1-6)	MF2	25	26	27	28
Cap Rectangular Flange (1-6)	MF5	29	30	31	32
Head Square Flange (1-6)	MF6	33	34	35	36
Cap Square Flange (1-6)	ME3	37	38	39	40
Head Square (7-14)	ME4	41	42	43	44
Cap Square (7-14)	MX1	53	54	55	56
Tie Rods Extended Both Ends	MX2	57	58	59	60
Tie Rods Extended Cap End	MX3	61	62	63	64
Tie Rods Extended Head End	MT1	69	70	71	72
Head Trunnion	MT2	73	74	75	76
Cap Trunnion	MT4	77	78	79	80
Intermediate Fixed Trunnion	MP1	81	82	83	84
Cap Fixed Clevis	MPU3	89	90	91	92
Cap Fixed Universal Clevis (1 1/2-14 Spherical Bearing)	MX0	93	94	95	96
NO MOUNT					

4	Rod End Style	Model Number Code
	Small Male	2
	Short Female	3
	Intermediate Male	4
	Flange Coupling	6
	Female Thread for Spherical Rod Eye	7
	Special Specify	0

5	Seal Type	Model Number Code
	Buna N Seals	1
	Fluorocarbon Seals	2



A

PA-2

NC9

Rod Lock

Schrader Bellows Non-Lube Heavy-Duty Air Cylinders

PN Series



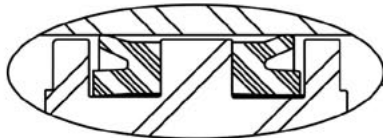
For millions of trouble free cycles

- Nominal pressure — 250 PSI — Air Service
- Standard Bore Sizes — 1" through 14"
- Piston Rod Diameters — 1/2" through 5 1/2"
- 14 Standard Mounting Styles
- NFPA Interchangeable
- Exceeds Automotive Specifications

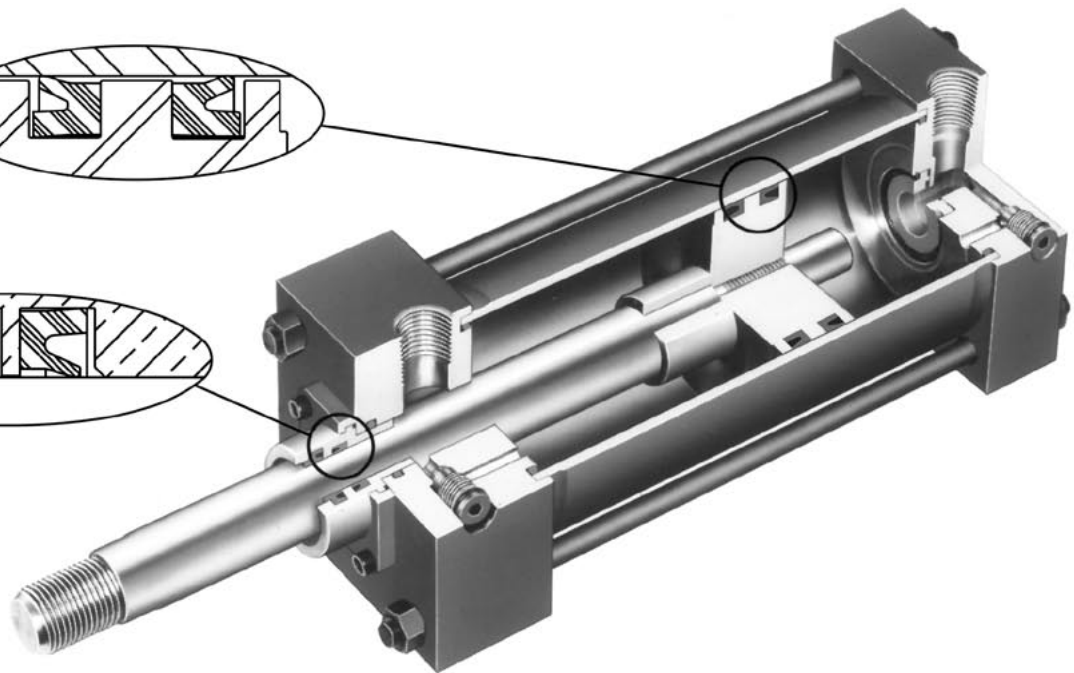
The PN Series Non-Lube Air Cylinder with Proven Performance

Millions of trouble free cycles with... ZERO LEAKAGE.

Piston Lipseals



Gland Lipseal



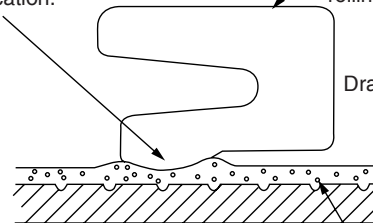
Increased Market Demand and continuous research and testing efforts inspired the development of the PN Series Non-Lubricated Air Cylinder. The PN Series piston rod and cylinder barrel surfaces act as highly efficient lubricant reservoirs, maintaining their own lubricant film. Other manufacturers pack grease into grooves and pockets and call them reservoirs. The fact of the matter is that as those grooves empty out over time; grease is being transported out of the cylinder and into the control system components and the atmosphere. The PN Series concept eliminates that problem by maintaining the lubricant film where it belongs: on the seals, bearing surfaces, piston rod and cylinder bore.

Benefits include...long seal and bearing life and since no oil is added through the use of lubricators – no oil is expelled into the atmosphere with the exhaust air as the cylinder strokes.

Anatomy of PN Series Sealing and Lubricant Retention Systems

Rounded sealing lip glides over lubricant film instead of scraping it off. Reduces friction, increases life and eliminates the need for added lubrication.

Increased heel thickness and outer lip extension improve stability, resist rolling.



Drawing not to scale

High integrity lubricant film with suspended PTFE particles

In the PN Series you get all the cost saving benefits and features of the popular heavy-duty PA-2 Series air cylinder including...

- Bolt-On Rod Gland Assembly for positive no leak sealing
- Piston rod, hard chrome-plated and case-hardened steel
- High strength rolled thread Piston Rod Stud

- Steel tube cylinder body with chrome-plated micro finish bore...

Plus the innovative “Non-Lube” feature which further increases your benefits of lower operating and maintenance costs.

Standard Specifications

- Heavy-Duty Service — ANSI/(NFPA) T3.6.7 R2-1996 Mounting Dimension Standards
- Standard Construction — Square Head — Tie Rod Design
- Standard Temperature — -10°F to +165°F

- Standard Fluid — Filtered Air
- Strokes — Available in any practical stroke length
- Cushions — Optional at either end or both ends of stroke. “Float Check” at cap end.

In line with our policy of continuing product improvement, specifications in this bulletin are subject to change.

Available Bore and Rod Sizes

Bore Sizes Available	1"	1½"	2"	2½"	3¼"	4"	5"	6"	8"	10"	12"	14"
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Rod Sizes Available	½"	5/8"	1"	1⅜"	1¾"	2"	2½"	3"	3½"	4"	4½"	5"	5½"
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How to Order PN Series Non-Lube Air Cylinders

Data Required on all PN Cylinder Orders

When ordering PN Series cylinders, be sure to specify each of the following requirements:

(**Note:** Duplicate cylinders can be ordered by giving the SERIAL NUMBER from the nameplate of the original cylinder. Factory records supply a quick, positive identification.)

a) Bore Size

b) Mounting Style

Specify your choice of mounting style — as shown in this catalog. If double rod is wanted, specify “with double rod.”

c) Series Designation (PN)

d) Length of Stroke

e) Piston Rod Diameter

Specify rod diameter in PN Series cylinders, standard rod diameters will be furnished if not otherwise specified, unless length of stroke makes the application questionable.

f) Piston Rod End Thread Style

Give thread style number or specify dimensions. Thread style number 2 will be supplied if not otherwise specified.

g) Cushions (if required)

Specify “Cushion-head end,” “Cushion-cap end” or “Cushion-both ends” as required. If cylinder is to have a double rod and only one cushion is required, be sure to specify clearly which end of the cylinder is to be cushioned.