



Contents

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The 10" through 20" bore, high pressure dynamic cylinders are designed to meet your needs

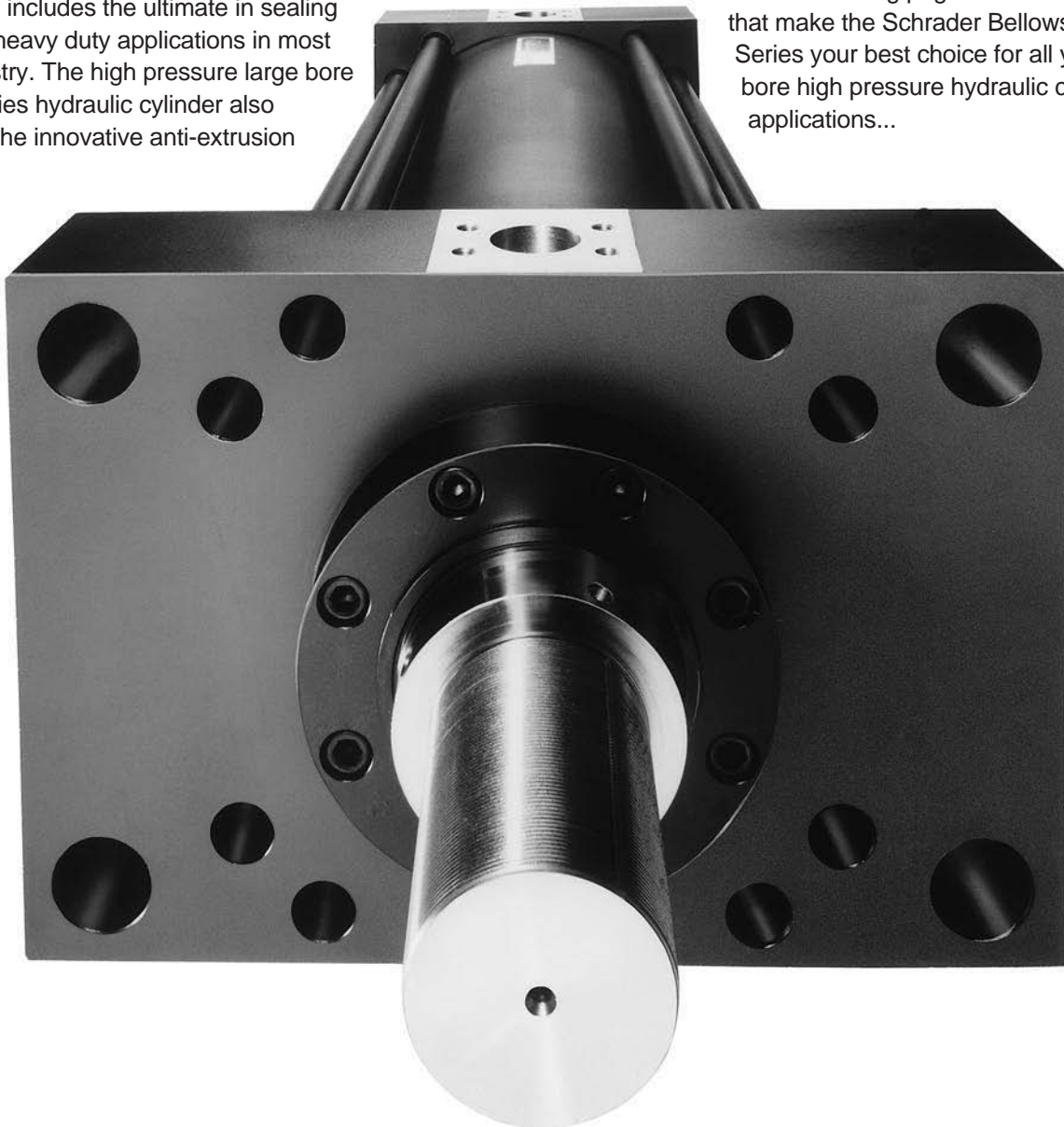
In the PH-3 Series cylinder you get unmatched reliability, performance, and innovative design features to help increase productivity and reduce your operating costs.

Schrader Bellows' externally removable bolt-on gland assembly makes preventive maintenance fast...and easy! You **do not** have to disassemble the cylinder, loosen the tie rod nuts, or remove the long cast iron rod bearing to replace the Polypak™ double bevel lipseal and double service Wiperseal. The ruggedly constructed gland assembly includes the ultimate in sealing for extra heavy duty applications in most any industry. The high pressure large bore PH-3 Series hydraulic cylinder also includes the innovative anti-extrusion

body end seal design...where the heads and caps are specially machined **to prevent** extrusion of the body end seals and insure against leakage — PLUS...Every cylinder is individually tested before it leaves our plant.

For quick delivery, the PH-3 Series is available to you from our regional plant system. Select **genuine** cylinder replacement parts are stocked by local Schrader Bellows distributors from coast-to-coast.

See the following pages for all the features that make the Schrader Bellows PH-3 Series your best choice for all your large bore high pressure hydraulic cylinder applications...



Standard Specifications

- Heavy Duty Service
- Standard Construction – Square Head – Tie Rod Design
- Nominal Pressure – 3000 PSI*
- Standard Fluid – Hydraulic Oil
- Standard Temperature -10°F. to +165°F.**
- Bore Sizes – 10" through 20" (Larger sizes available)
- Piston Rod Diameter – 4 1/2" through 10"

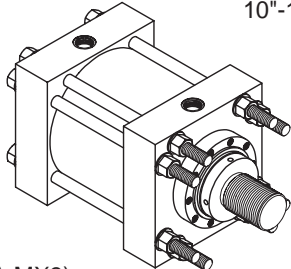
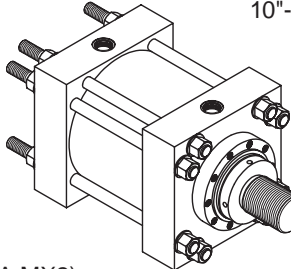
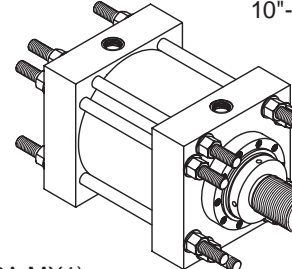
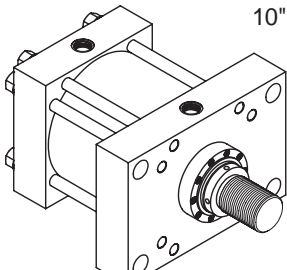
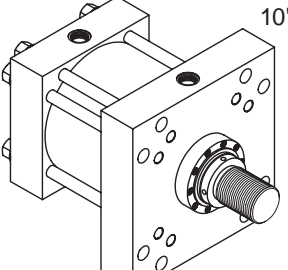
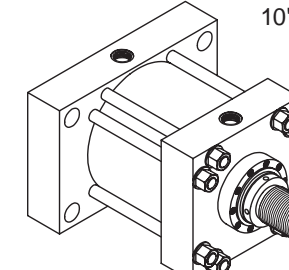
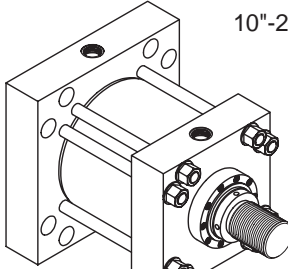
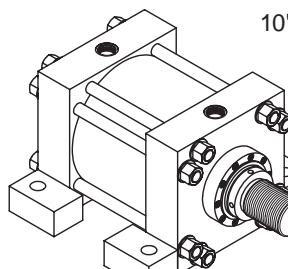
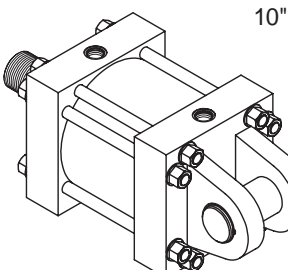
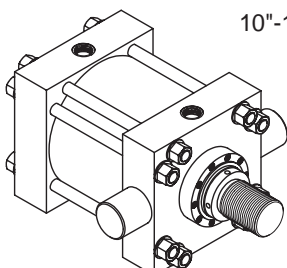
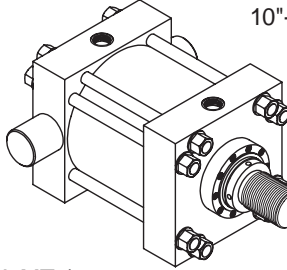
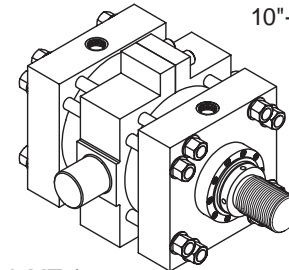
- Mounting Styles – 12 standard styles at various application ratings
- Strokes – Available in any practical stroke length
- Cushions – Optional at either end or both ends of stroke
- Rod Ends – Two Standard Choices – Specials to Order

*If hydraulic operating pressure exceeds 3000 PSI, send application data for engineering evaluation and recommendation. See Engineering Section for actual design factors.

**See Engineering Section for higher temperature service.

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

Available Mounting Styles

<p>Tie Rods Extended Head End 10"-14" Bore</p>  <p>(NFPA MX3)</p>	<p>Tie Rods Extended Cap End 10"-14" Bore</p>  <p>(NFPA MX2)</p>	<p>Tie Rods Extended Both Ends 10"-14" Bore</p>  <p>(NFPA MX1)</p>
<p>Head Rectangular 10"-20" Bore</p>  <p>(NFPA ME5)</p>	<p>Head Square Flange 10"-20" Bore</p>  <p>(NFPA MF5)</p>	<p>Cap Rectangular 10"-20" Bore</p>  <p>(NFPA ME6)</p>
<p>Cap Square 10"-20" Bore</p>  <p>(NFPA MF6)</p>	<p>Side Lug 10"-14" Bore</p>  <p>(NFPA MS2)</p>	<p>Cap Fixed Clevis 10"-20" Bore</p>  <p>(NFPA MP1)</p>
<p>Head Trunnion 10"-14" Bore</p>  <p>(NFPA MT1)</p>	<p>Cap Trunnion 10"-14" Bore</p>  <p>(NFPA MT2)</p>	<p>Intermediate Fixed Trunnion 10"-14" Bore</p>  <p>(NFPA MT4)</p>

B
PL-2
PH-2
PH-3
PHX
SHM
CHE/CHD

These innovative design features make the PH-3 Series your best choice for all your large bore, high pressure hydraulic cylinder applications.

Primary Seal – Polypak™ double-bevel lip design combines ease of installation with rugged construction. The ultimate seal in extra heavy duty applications. Completely self-compensating and self-relieving to withstand pressure variations and conform to mechanical deflection that may occur.

Secondary Seal – Double-Service Wiperseal™ wipes clean any oil film adhering to the rod on the extend stroke and cleans the rod on the return stroke.

Bolt-On Rod Gland Assembly – Externally removable without cylinder disassembly. Long cast-iron bearing surface is inboard of the seals, assuring positive lubrication from within the cylinder. An “O” ring is used as a seal between gland and head.

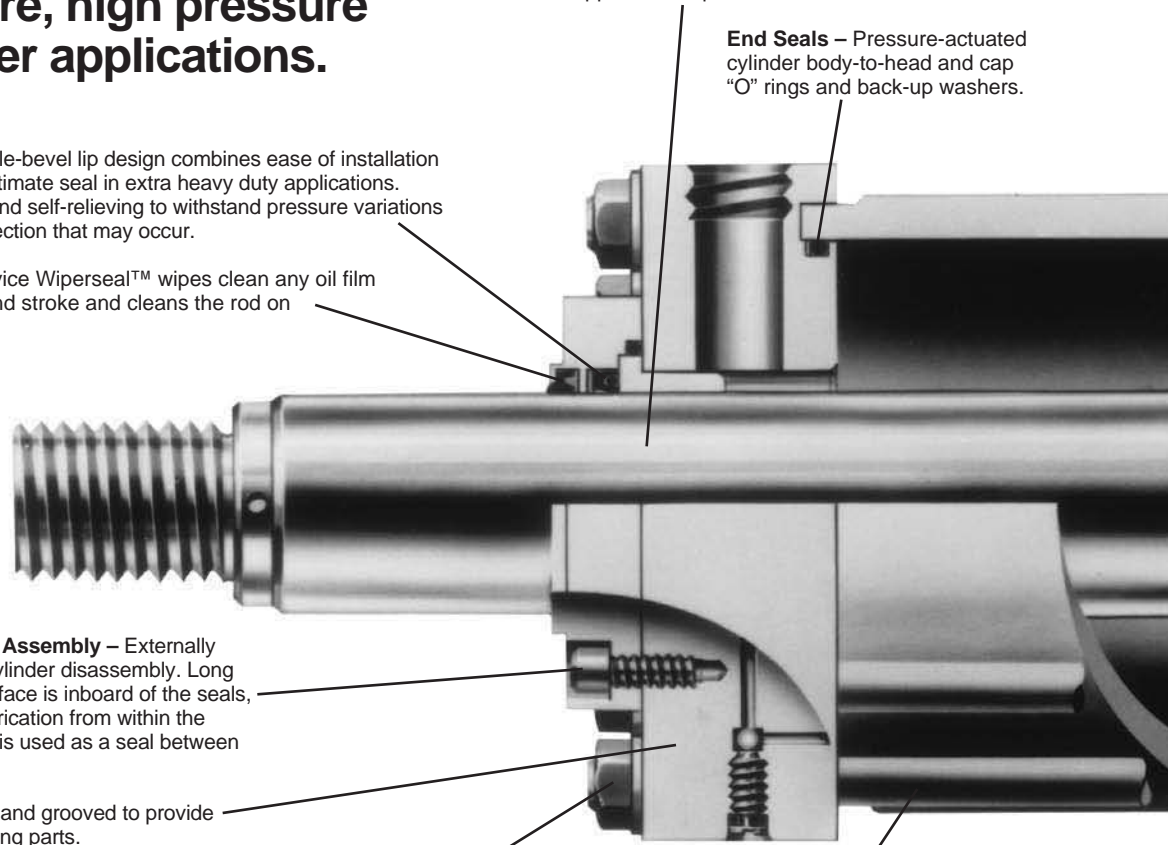
Steel Head – Bored and grooved to provide concentricity for mating parts.

Alloy Steel Tie Rod Nuts – With hardened washer.

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

Piston Rod – Hard chrome-plated and polished for maximum seal and rod bearing life. Two standard thread styles. Rod end is supplied with spanner wrench holes.

End Seals – Pressure-actuated cylinder body-to-head and cap “O” rings and back-up washers.



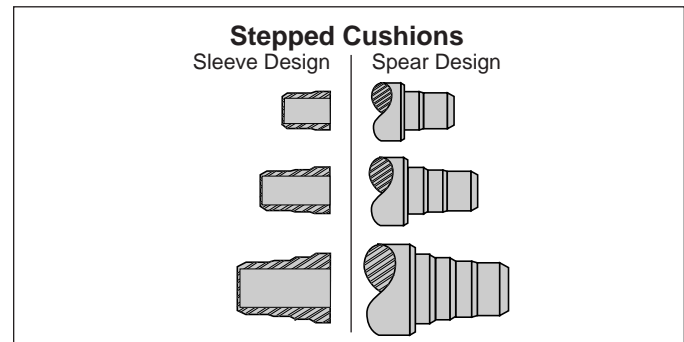
Stepped floating cushions combine the best features of known cushion technology.

Deceleration devices or built-in “cushions” are optional and can be supplied at head end, cap end, or both ends without change in envelope or mounting dimensions. Standard straight or tapered cushions have been used in industrial cylinders over a very broad range of applications. Research has found that both designs have limitations.

As a result, we have taken a new approach in cushioning of industrial hydraulic cylinders and for specific load and velocity conditions have been able to obtain deceleration curves that come very close to the ideal. The success lies in a stepped sleeve or spear concept where the steps are calculated to approximate theoretical orifice areas. In the cushion performance chart, pressure traces show the results of typical orifice flow conditions. Tests of a three-step sleeve or spear show three pressure pulses coinciding with the steps. The deceleration curve shape comes very close to being theoretical, with the exception of the last 1/2" of travel. This is a constant shape in order to have some flexibility in application. The stepped cushion design shows reduced pressure peaks for most load and speed conditions, with comparable reduction of objectionable stopping forces being transmitted to the load and the support structure.

The PH3 Series 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 strengths.

- (1) When a cushion is specified at the head end:
- A stepped sleeve is furnished on the piston rod assembly.
 - A needle valve is provided that is flush with the side of the head even when wide open. It may be identified by the fact that it is socket-keyed. It is located on side number 3, in all mounting styles except the MS2. In this style it is located on side number 2.

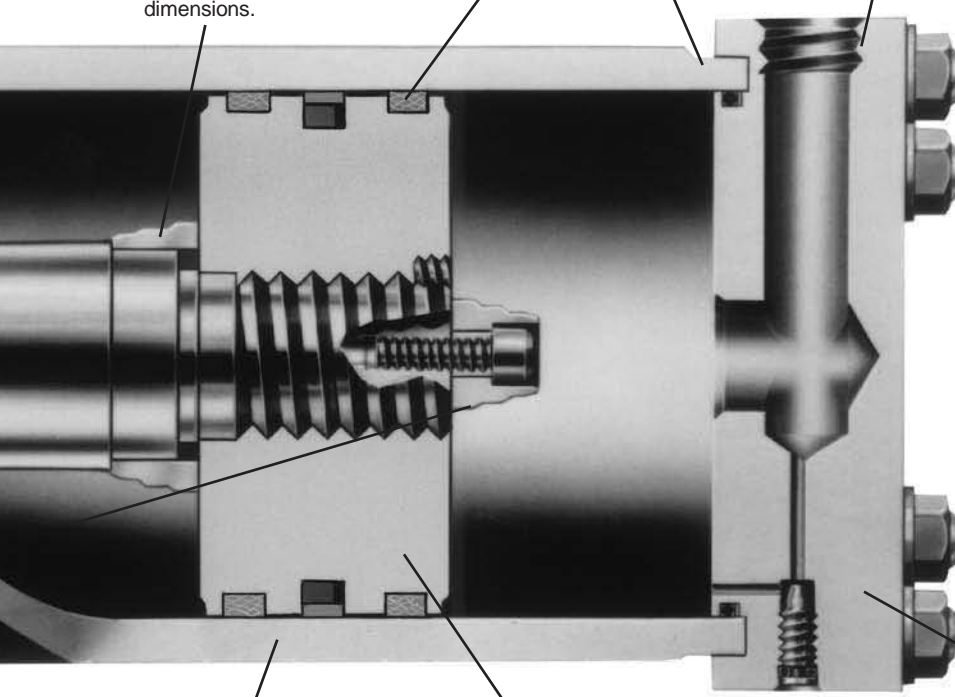


Adjustable Floating Stepped Cushions – For maximum performance. Economical and flexible for even the most demanding applications. Provides superior performance in reducing shock. Cushions are optional and can be supplied at head end, cap end, or both ends without change in envelope or mounting dimensions.

Align-A-Groove™ – A $\frac{3}{16}$ " wide surface machined at each end of the cylinder body. Makes precise mounting quick and easy.

Hi-Load Piston Seals – Are standard.

Ports – SAE O ring straight thread ports are standard.

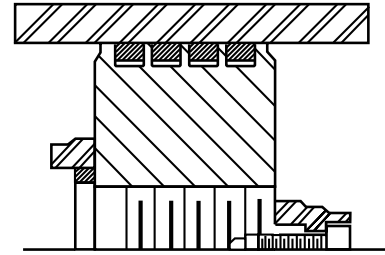


The Cylinder Body – Heavy-wall steel tubing is honed to a 15 RMS micro finish bore providing a wear surface for long lasting piston bearing and seal life.

One-Piece Nodular Iron Piston – The wide piston surface contacting cylinder bore reduces bearing loads. One piece design is piloted to piston rod assuring concentricity. Piston is locked with set screw. Anaerobic adhesive and peening of set screw locks and seals piston to rod.

Optional Piston

Piston Ring Piston – With Step Cut Iron Piston Ring optional

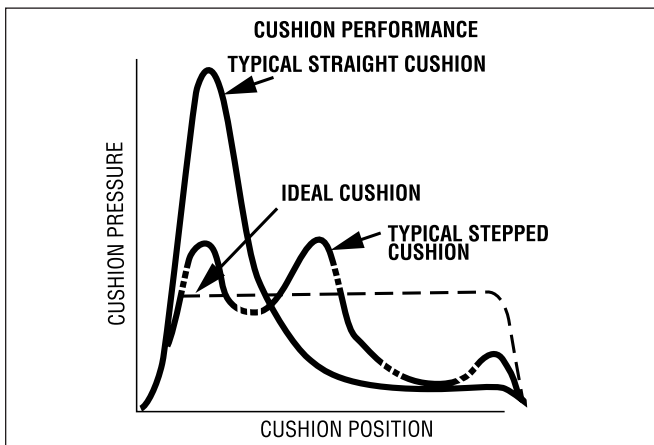


Optional Ports – SAE straight thread ports or NPTF (Dry Seal Pipe Ports) are available at no charge. Optional SAE flange, BSP, BSPT, and Metric ports are available for an extra charge. (See ports, Application Engineering Data page in Section C.)

Seals – Buna-N (Nitrile) seals standard.

Fluorocarbon Seals – Optional at extra charge.

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

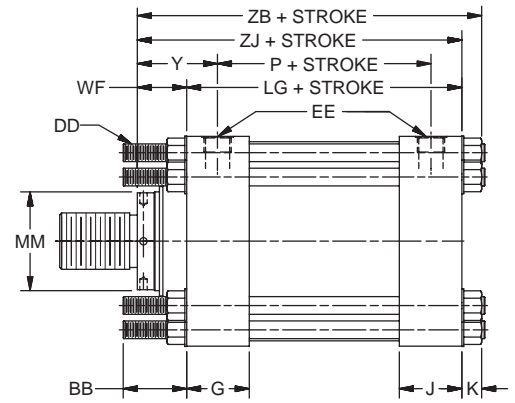
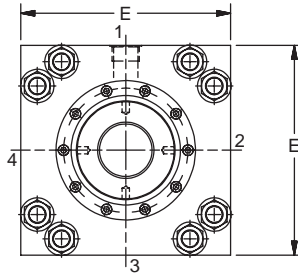
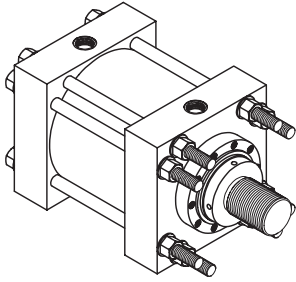


(2) When a cushion is specified at the cap end:

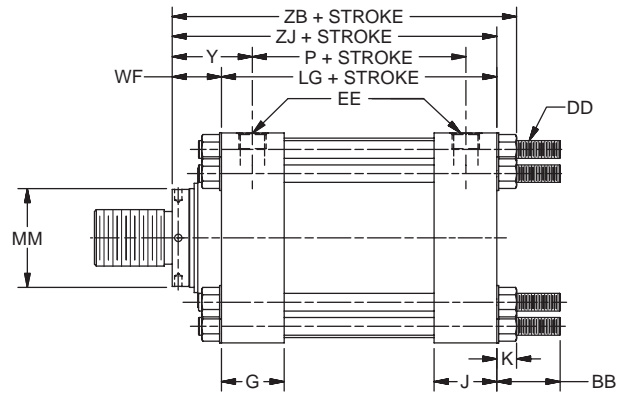
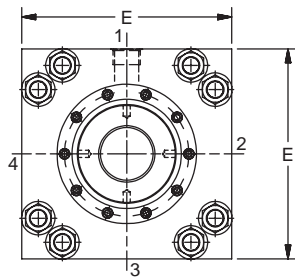
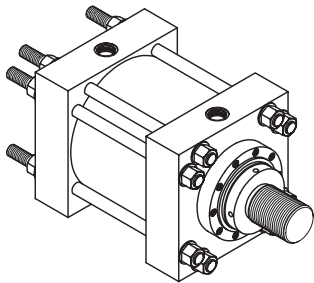
- a. A cushion-stepped spear is provided on the piston rod.
- b. A socket-keyed needle valve is provided that is flush with the side of the cap when wide open. It is located on side number 3 in all mounting styles except the MS2. In this style it is located on side number 2.
- c. A springless check valve is provided that is also flush with the side of the cap and is mounted on the same side as the needle valve except on mounting style MS2, where it is mounted on side number 2, next to the needle valve.
- d. The check and needle valves are interchangeable in the cap.

- c. A springless check valve is provided that is also flush with the side of the head and is mounted on the same side as the needle valve except on mounting style MS2 where it is mounted on side number 2, next to the needle valve. It may be identified by the fact that it is slotted.
- d. The check and needle valves are interchangeable in the head.

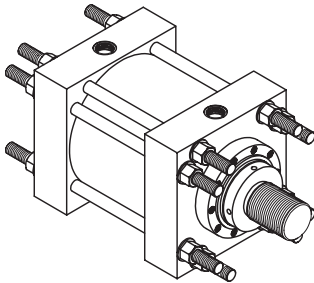
**Tie Rods Extended Head End Mount
(NFFA Style MX3)**



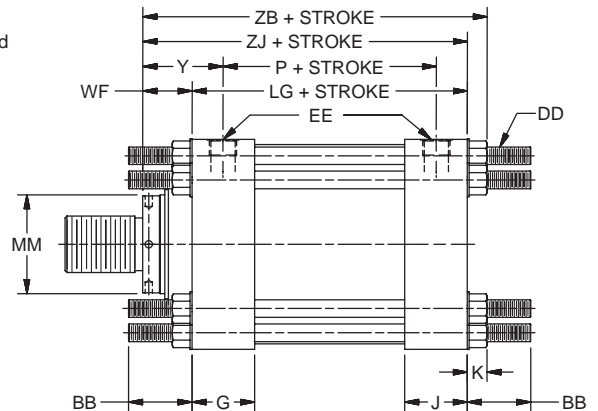
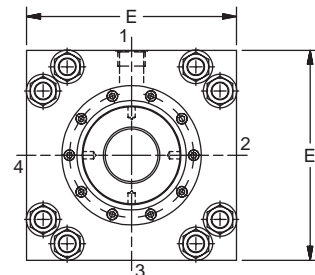
**Tie Rods Extended Cap End Mount
(NFFA Style MX2)**



**Tie Rods Extended
Both Ends Mount
(NFFA Style MX1)**

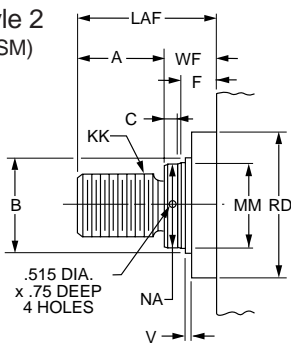


Basic Mounting (MX0) — Not shown is no tie rod extended and can be supplied upon request.



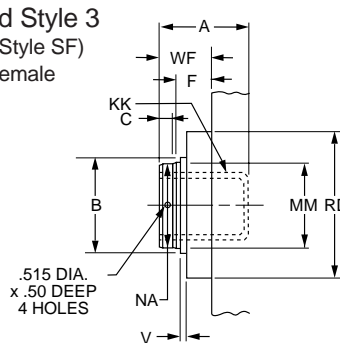
Rod End Dimensions — see table 2

**Thread Style 2
(NFFA Style SM)
Small Male**



If rod end is not specified, Style 2 will be furnished.

**Thread Style 3
(NFFA Style SF)
Short Female**



Use Style 3 for applications where female rod ends are required.

**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 and WF.

If otherwise special, furnish dimensional sketch.

Style 3 stroke restrictions may apply. See Style 3 Minimum Stroke page for details.

Table 1—Envelope and Mounting Dimensions

Bore	BB	DD	E	EE* NPTF	EEf▲ S.A.E. FLANGE PORT	EE** S.A.E. STRAIGHT THREAD	G	J	K	RA	RB	RC	RR	Add Stroke	
														LG	P
10	4 ¹ / ₈	1 ¹ / ₈ -12	12 ⁵ / ₈	2	2	24	3 ¹¹ / ₁₆	3 ¹¹ / ₁₆	1 ⁹ / ₃₂	5.291	3.775	—	2 ¹ / ₈	12 ¹ / ₈	8 ¹ / ₂
12	4 ¹ / ₂	1 ¹ / ₄ -12	14 ⁷ / ₈	2 ¹ / ₂	2 ¹ / ₂	24	4 ⁷ / ₁₆	4 ⁷ / ₁₆	1 ¹³ / ₃₂	6.270	4.555	—	2 ³ / ₈	14 ¹ / ₂	10 ¹ / ₈
14	4 ¹ / ₂	1 ¹ / ₄ -12	17 ¹ / ₈	2 ¹ / ₂	2 ¹ / ₂	24	4 ⁷ / ₈	4 ⁷ / ₈	1 ¹³ / ₃₂	7.485	6.143	4.409	2 ¹ / ₄	15 ⁵ / ₈	10 ⁷ / ₈

* NPTF ports are available at no extra charge.

▲ Optional SAE flange ports may be specified – flange to be supplied by customer. See Table 4 for flange port pattern dimensions.

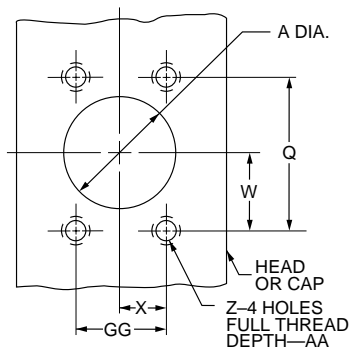
** SAE straight thread ports are standard and are indicated by port number.

Table 2—Rod Dimensions

Bore	Rod Dia. MM	Thread KK	Rod Extensions and Pilot Dimensions										Add Stroke		
			A	+0.000 -0.005 B	C	F	LAF	NA	RD	V	WF	Y	ZB	ZJ	
10	4 ¹ / ₂	3 ¹ / ₄ -12	4 ¹ / ₂	5.249	1	1 ¹⁵ / ₁₆	7 ⁷ / ₁₆	4 ³ / ₈	8 ¹ / ₄	1 ¹ / ₄	2 ¹⁵ / ₁₆	4 ³ / ₄	16 ¹¹ / ₃₂	15 ¹ / ₁₆	
	7	5-12	7	7.999	1	1 ¹⁵ / ₁₆	10 ¹ / ₂	6 ⁷ / ₈	10 ¹ / ₂	3 ³ / ₈	3 ¹ / ₂	5 ⁵ / ₁₆	16 ²⁹ / ₃₂	15 ⁵ / ₈	
	5	3 ¹ / ₂ -12	5	5.749	1	1 ¹⁵ / ₁₆	8 ³ / ₁₆	4 ⁷ / ₈	8 ⁷ / ₈	1 ¹ / ₄	3 ³ / ₁₆	5	16 ¹⁹ / ₃₂	15 ⁵ / ₁₆	
	5 ¹ / ₂	4-12	5 ¹ / ₂	6.249	1	1 ¹⁵ / ₁₆	8 ¹¹ / ₁₆	5 ³ / ₈	9 ³ / ₈	1 ¹ / ₄	3 ³ / ₁₆	5	16 ¹⁹ / ₃₂	15 ⁵ / ₁₆	
12	5 ¹ / ₂	4-12	5 ¹ / ₂	6.249	1	1 ¹⁵ / ₁₆	8 ¹¹ / ₁₆	5 ³ / ₈	9 ³ / ₈	1 ¹ / ₄	3 ³ / ₁₆	5 ³ / ₈	19 ⁹ / ₃₂	17 ¹¹ / ₁₆	
	8	5 ³ / ₄ -12	8	8.999	1	1 ¹⁵ / ₁₆	12	7 ⁷ / ₈	12 ¹ / ₂	3 ³ / ₈	4	6 ³ / ₁₆	19 ²⁹ / ₃₂	18 ¹ / ₂	
	7	5-12	7	7.999	1	1 ¹⁵ / ₁₆	10 ¹ / ₂	6 ⁷ / ₈	10 ¹ / ₂	3 ³ / ₈	3 ¹ / ₂	5 ¹¹ / ₁₆	19 ¹³ / ₃₂	18	
14	7	5-12	7	7.999	1	1 ¹⁵ / ₁₆	10 ¹ / ₂	6 ⁷ / ₈	10 ¹ / ₂	3 ³ / ₈	3 ¹ / ₂	5 ⁷ / ₈	20 ¹⁷ / ₃₂	19 ¹ / ₈	
	10	7 ¹ / ₄ -12	10	10.999	1	1 ¹⁵ / ₁₆	14 ¹ / ₂	9 ⁷ / ₈	14 ¹ / ₂	3 ³ / ₈	4 ¹ / ₂	6 ⁷ / ₈	21 ¹⁷ / ₃₂	20 ¹ / ₈	
	8	5 ³ / ₄ -12	8	8.999	1	1 ¹⁵ / ₁₆	12	7 ⁷ / ₈	12 ¹ / ₂	3 ³ / ₈	4	6 ³ / ₈	21 ¹ / ₃₂	19 ⁵ / ₈	

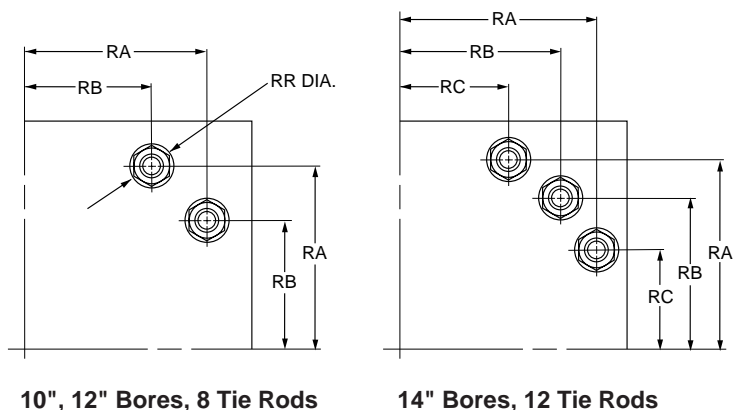
Table 3 —
Envelope and
Mounting
Dimensions

Table 4—Optional SAE Flange Port Pattern



Nom. Flange Size	S.A.E. Flange Dash Size	A	Q	GG	W	X	Z-THD UNC-2B	AA Min.
1 ¹ / ₂	- 24	1.50	2.750	1.406	1.38	0.70	1/2-13	1.06
2	- 32	2.00	3.062	1.688	1.53	0.84	1/2-13	1.06
2 ¹ / ₂	- 40	2.50	3.500	2.000	1.75	1.00	1/2-13	1.19
3	- 48	3.00	4.188	2.438	2.09	1.22	5/8-11	1.19

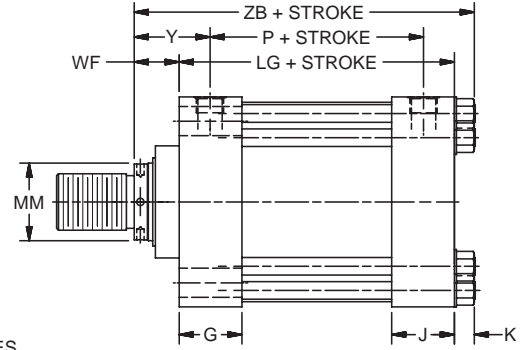
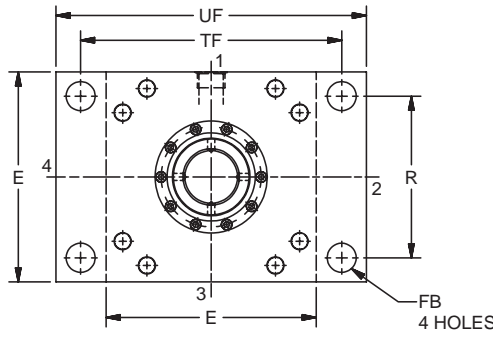
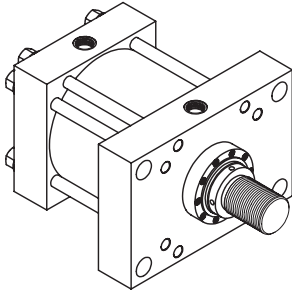
Table 5—Tie Rod Information
see table 1 for dimensions



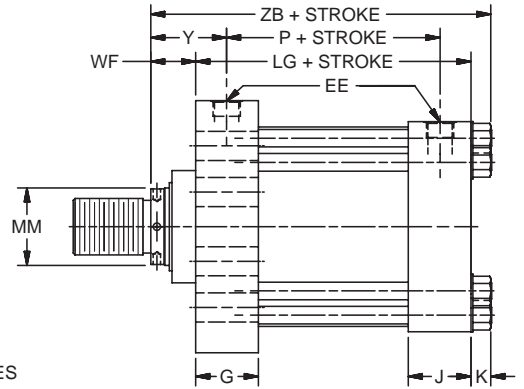
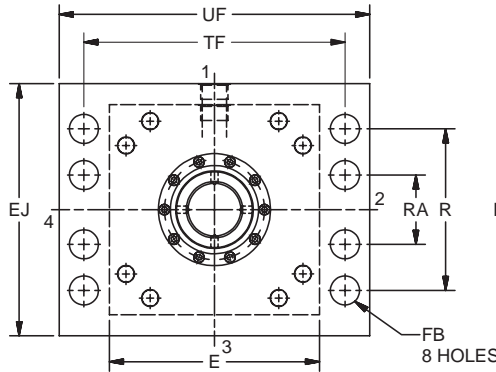
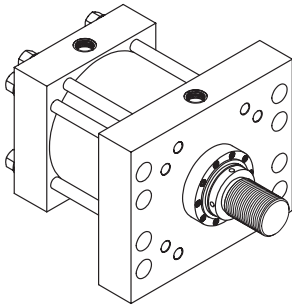
10", 12" Bores, 8 Tie Rods

14" Bores, 12 Tie Rods

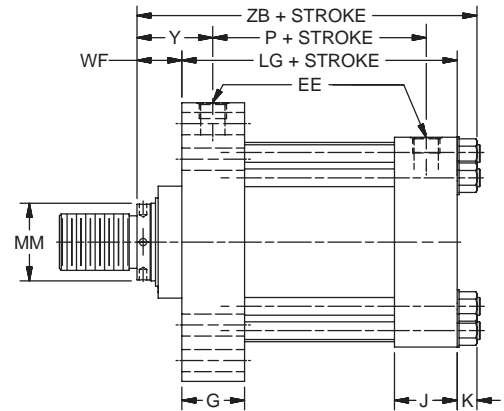
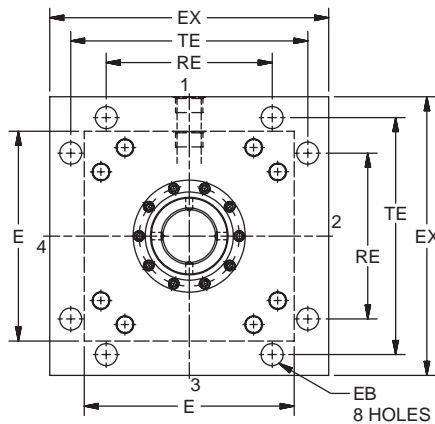
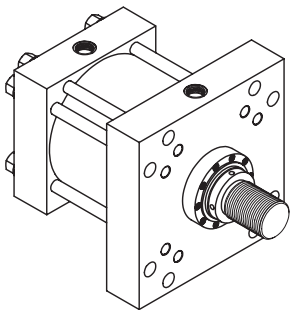
**Head Rectangular Mount
(10"-14" Bore)
(NFPA Style ME5)**



**Head Rectangular Mount
(16"-20" Bore)
(NFPA Style ME5)**

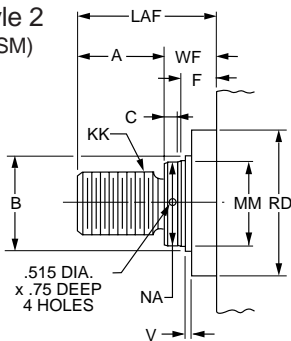


**Head Square Mount
(NFPA Style MF5)**



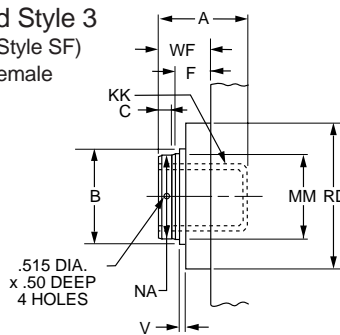
Rod End Dimensions — see table 2

**Thread Style 2
(NFPA Style SM)
Small Male**



If rod end is not specified, Style 2 will be furnished.

**Thread Style 3
(NFPA Style SF)
Short Female**



Use Style 3 for applications where female rod ends are required.

**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 and WF.

If otherwise special, furnish dimensional sketch.

Style 3 stroke restrictions may apply. See Style 3 Minimum Stroke page for details.

Table 1—Envelope and Mounting Dimensions

Bore	E	EB	EE* NPTF	EE† S.A.E. FLANGE PORT	EE** S.A.E. STRAIGHT THREAD	EX	FB	G	J	K	R	RE	TE	TF	UF	Add Stroke	
																LG	P
10	12 ⁵ / ₈	1 ⁵ / ₁₆	2	2	24	16 ⁵ / ₈	1 ¹³ / ₁₆	3 ¹¹ / ₁₆	3 ¹¹ / ₁₆	1 ⁹ / ₃₂	9.62	9.89	14.13	15 ⁷ / ₈	19	12 ¹ / ₈	8 ¹ / ₂
12	14 ⁷ / ₈	1 ⁹ / ₁₆	2 ¹ / ₂	2 ¹ / ₂	24	19 ³ / ₄	2 ¹ / ₁₆	4 ⁷ / ₁₆	4 ⁷ / ₁₆	1 ¹³ / ₃₂	11.45	11.75	16.79	18 ¹ / ₂	22	14 ¹ / ₂	10 ¹ / ₈
14	17 ¹ / ₈	1 ¹³ / ₁₆	2 ¹ / ₂	2 ¹ / ₂	24	21 ³ / ₄	2 ⁵ / ₁₆	4 ⁷ / ₈	4 ⁷ / ₈	1 ¹³ / ₃₂	13.26	12.90	18.43	21	25	15 ⁵ / ₈	10 ⁷ / ₈

Table 1A—Envelope and Mounting Dimensions

Bore	E	EB	EE (SAE)	EE (FLANGE)	EJ	EX	FB	G	J	K	R	RA	RE	TE	TF	UF	Add Stroke	
																	LG	P
16	19	1 ¹³ / ₁₆	24	3	20	24 ¹ / ₂	1 ¹³ / ₁₆	5 ⁷ / ₈	5 ⁷ / ₈	1 ²⁹ / ₃₂	15 ¹ / ₂	8	15.28	21.03	21	24 ¹ / ₂	18 ¹ / ₈	12 ¹ / ₈
18	22	2 ¹ / ₁₆	24	3	23	26 ¹ / ₂	2 ¹ / ₁₆	6 ⁷ / ₈	6 ⁷ / ₈	1 ²⁹ / ₃₂	18	7 ¹ / ₄	16.45	22.65	24 ¹ / ₄	28 ¹ / ₄	21 ¹ / ₈	15 ¹ / ₈
20	24	2 ¹ / ₁₆	24	3	25	29	2 ¹ / ₁₆	7 ⁷ / ₈	7 ⁷ / ₈	1 ²⁹ / ₃₂	20	8	18.07	24.87	26 ¹ / ₂	30 ¹ / ₂	23 ⁵ / ₈	17 ⁵ / ₈

* NPTF ports are available at no extra charge.

† Optional SAE flange ports may be specified – flange to be supplied by customer. See Table 4 for flange port pattern dimensions.

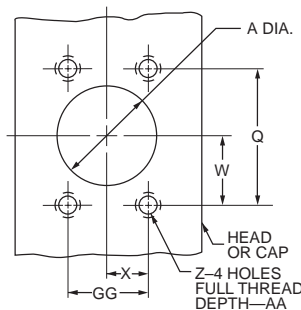
** SAE straight thread ports are standard and are indicated by port number.

Table 2—Rod Dimensions

Bore	Rod Dia. MM	Thread KK	Rod Extensions and Pilot Dimensions										Add Stroke	
			A	+0.000 -0.005 B	C	F	LAF	NA	RD	V	WF	Y	ZB	
10	4 ¹ / ₂	3 ¹ / ₄ -12	4 ¹ / ₂	5.249	1	1 ¹⁵ / ₁₆	7 ⁷ / ₁₆	4 ³ / ₈	8 ¹ / ₄	1 ¹ / ₄	2 ¹⁵ / ₁₆	4 ³ / ₄	16 ¹¹ / ₃₂	
	7	5-12	7	7.999	1	1 ¹⁵ / ₁₆	10 ¹ / ₂	6 ⁷ / ₈	10 ¹ / ₂	3 ³ / ₈	3 ¹ / ₂	5 ⁵ / ₁₆	16 ²⁹ / ₃₂	
	5	3 ¹ / ₂ -12	5	5.749	1	1 ¹⁵ / ₁₆	8 ³ / ₁₆	4 ⁷ / ₈	8 ⁷ / ₈	1 ¹ / ₄	3 ³ / ₁₆	5	16 ¹⁹ / ₃₂	
	5 ¹ / ₂	4-12	5 ¹ / ₂	6.249	1	1 ¹⁵ / ₁₆	8 ¹¹ / ₁₆	5 ³ / ₈	9 ³ / ₈	1 ¹ / ₄	3 ³ / ₁₆	5	16 ¹⁹ / ₃₂	
12	5 ¹ / ₂	4-12	5 ¹ / ₂	6.249	1	1 ¹⁵ / ₁₆	8 ¹¹ / ₁₆	5 ³ / ₈	9 ³ / ₈	1 ¹ / ₄	3 ³ / ₁₆	5 ³ / ₈	19 ³ / ₃₂	
	8	5 ³ / ₄ -12	8	8.999	1	1 ¹⁵ / ₁₆	12	7 ⁷ / ₈	12 ¹ / ₂	3 ³ / ₈	4	6 ³ / ₁₆	19 ²⁹ / ₃₂	
	7	5-12	7	7.999	1	1 ¹⁵ / ₁₆	10 ¹ / ₂	6 ⁷ / ₈	10 ¹ / ₂	3 ³ / ₈	3 ¹ / ₂	5 ¹¹ / ₁₆	19 ¹³ / ₃₂	
14	7	5-12	7	7.999	1	1 ¹⁵ / ₁₆	10 ¹ / ₂	6 ⁷ / ₈	10 ¹ / ₂	3 ³ / ₈	3 ¹ / ₂	5 ⁷ / ₈	20 ¹⁷ / ₃₂	
	10	7 ¹ / ₄ -12	10	10.999	1	1 ¹⁵ / ₁₆	14 ¹ / ₂	9 ⁷ / ₈	14 ¹ / ₂	3 ³ / ₈	4 ¹ / ₂	6 ⁷ / ₈	21 ¹⁷ / ₃₂	
	8	5 ³ / ₄ -12	8	8.999	1	1 ¹⁵ / ₁₆	12	7 ⁷ / ₈	12 ¹ / ₂	3 ³ / ₈	4	6 ³ / ₈	21 ¹ / ₃₂	
16	8	5 ³ / ₄ -12	8	8.999	1	1 ¹⁵ / ₁₆	12	7 ⁷ / ₈	12 ¹ / ₂	3 ³ / ₈	4	7	24 ¹ / ₃₂	
	9	6 ¹ / ₂ -12	9	9.999	1	1 ¹⁵ / ₁₆	13 ¹ / ₄	8 ⁷ / ₈	13 ¹ / ₂	3 ³ / ₈	4 ¹ / ₄	7 ¹ / ₄	24 ⁹ / ₃₂	
18	10	7 ¹ / ₄ -12	10	10.999	1	1 ¹⁵ / ₁₆	14 ¹ / ₂	9 ⁷ / ₈	14 ¹ / ₂	3 ³ / ₈	4 ¹ / ₂	7 ¹ / ₂	24 ¹⁷ / ₃₂	
	9	6 ¹ / ₂ -12	9	9.999	1	1 ¹⁵ / ₁₆	13 ¹ / ₄	8 ⁷ / ₈	13 ¹ / ₂	3 ³ / ₈	4 ¹ / ₄	7 ¹ / ₄	27 ⁹ / ₃₂	
	10	7 ¹ / ₄ -12	10	10.999	1	1 ¹⁵ / ₁₆	14 ¹ / ₂	9 ⁷ / ₈	14 ¹ / ₂	3 ³ / ₈	4 ¹ / ₂	7 ¹ / ₂	27 ¹⁷ / ₃₂	
20	10	7 ¹ / ₄ -12	10	10.999	1	1 ¹⁵ / ₁₆	14 ¹ / ₂	9 ⁷ / ₈	14 ¹ / ₂	3 ³ / ₈	4 ¹ / ₂	7 ¹ / ₂	30 ¹ / ₃₂	

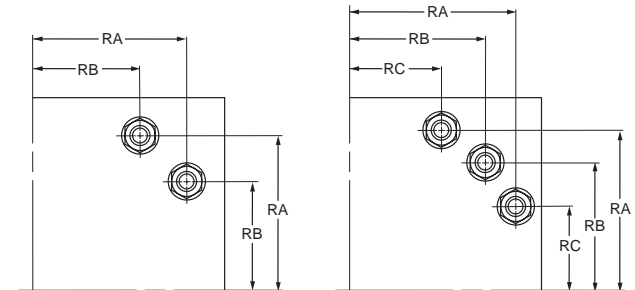
Table 3—Envelope and Mounting Dimensions

Table 4—Optional SAE Flange Port Pattern



Nom. Flange Size	S.A.E. Flange Dash Size	A	Q	GG	W	X	Z-THD UNC-2B	AA Min.
1 ¹ / ₂	- 24	1.50	2.750	1.406	1.38	0.70	1/2-13	1.06
2	- 32	2.00	3.062	1.688	1.53	0.84	1/2-13	1.06
2 ¹ / ₂	- 40	2.50	3.500	2.000	1.75	1.00	1/2-13	1.19
3	- 48	3.00	4.188	2.438	2.09	1.22	5/8-11	1.19

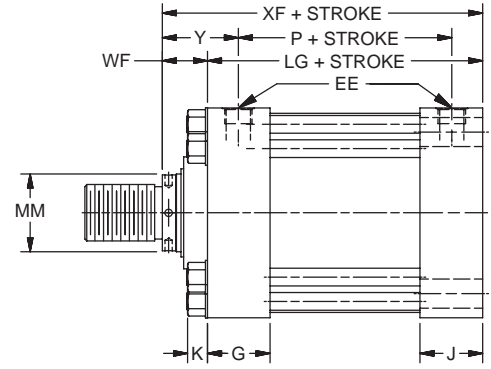
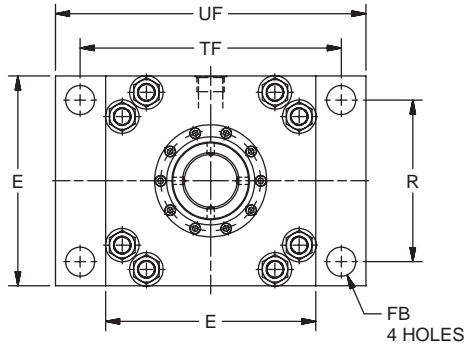
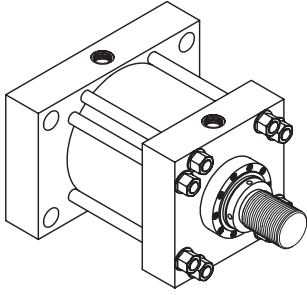
Table 5—Tie Rod Information



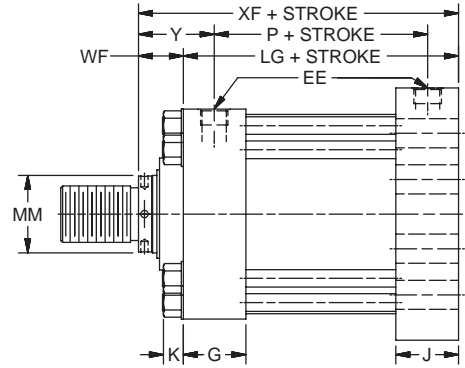
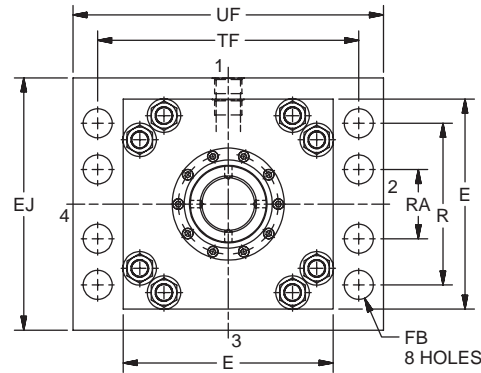
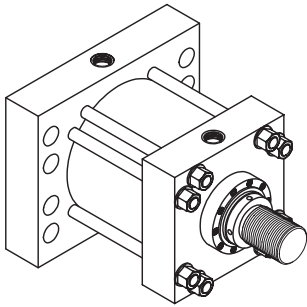
Bore	10	12	14	16	18	20
Tie Rod Thread	1 ¹ / ₈ -12	1 ¹ / ₄ -12	1 ¹ / ₄ -12	*	*	*
RA	5.291	6.270	7.485	*	*	*
RB	3.775	4.555	6.143	*	*	*
RC	—	—	4.409	*	*	*

*Consult factory for dimensions

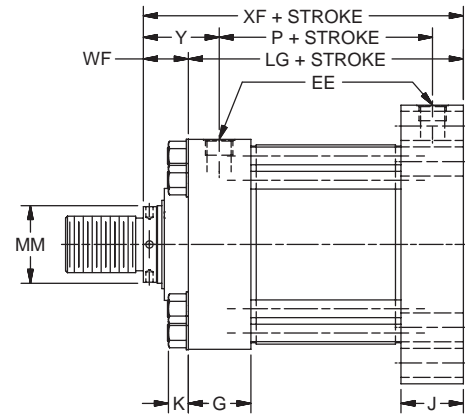
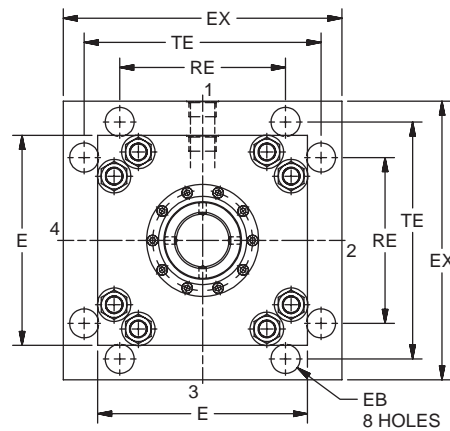
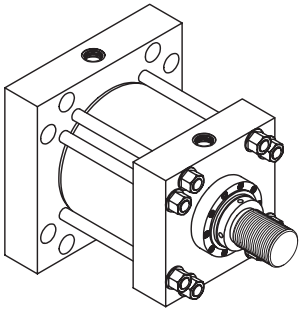
Cap Rectangular Mount
10"-14" Bore
(NFPA Style ME6)



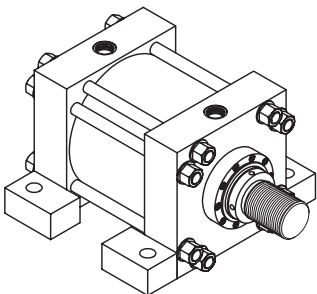
Cap Rectangular Mount
16"-20" Bore
(NFPA Style ME6)



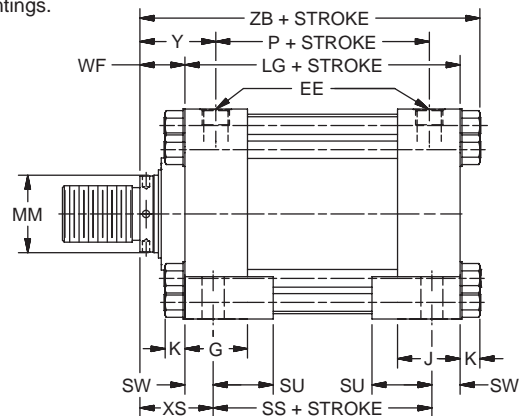
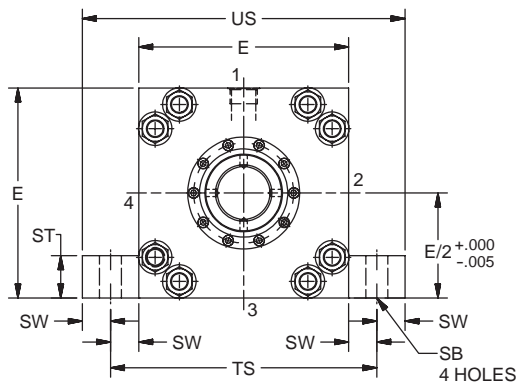
Cap Square Mount
(NFPA Style MF6)



Side Lug Mount
10"-14" Bore only
(NFPA Style MS2)

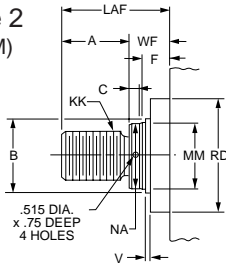


Note: Stroke lengths on lug mounted cylinders should not be shorter than the cylinder bore diameter. Consult factory for recommendations on shorter stroke lengths. See Engineering Section for further recommendations on side lug mountings.



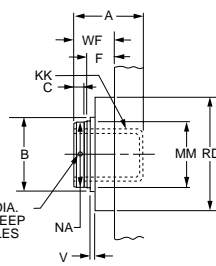
Rod End Dimensions — see table 2

Thread Style 2
(NFPA Style SM)
Small Male



If rod end is not specified, Style 2 will be furnished.

Thread Style 3
(NFPA Style SF)
Short Female



Use Style 3 for applications where female rod ends are required.

Style 3 stroke restrictions may apply. See Style 3 Minimum Stroke page for details.

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 and LAF or WF. If otherwise special, furnish dimensional sketch.

Table 1—Envelope and Mounting Dimensions

Bore	E	EB	EE* NPTF	EE† S.A.E. FLANGE PORT	EE** S.A.E. STRAIGHT THREAD	EX	FB	G	J	K	R	RE	SB	ST	SU	SW	TE	TF	TS	UF	US	Add Stroke		
																						LG	P	SS
10	12 ⁵ / ₈	1 ⁵ / ₁₆	2	2	24	16 ⁵ / ₈	1 ¹³ / ₁₆	3 ¹¹ / ₁₆	3 ¹¹ / ₁₆	1 ⁹ / ₃₂	9.62	9.89	1 ⁹ / ₁₆	2 ¹ / ₄	3 ¹ / ₂	1 ⁵ / ₈	14.13	15 ⁷ / ₈	15 ⁷ / ₈	19	19 ¹ / ₈	12 ¹ / ₈	8 ¹ / ₂	8 ⁷ / ₈
12	14 ⁷ / ₈	1 ⁹ / ₁₆	2 ¹ / ₂	2 ¹ / ₂	24	19 ³ / ₄	2 ¹ / ₁₆	4 ⁷ / ₁₆	4 ⁷ / ₁₆	1 ¹³ / ₃₂	11.45	11.75	1 ⁹ / ₁₆	3	4 ¹ / ₄	2	16.79	18 ¹ / ₂	18 ⁷ / ₈	22	22 ⁷ / ₈	14 ¹ / ₂	10 ¹ / ₈	10 ¹ / ₂
14	17 ¹ / ₈	1 ¹³ / ₁₆	2 ¹ / ₂	2 ¹ / ₂	24	21 ³ / ₄	2 ⁵ / ₁₆	4 ⁷ / ₈	4 ⁷ / ₈	1 ¹³ / ₃₂	13.26	12.90	2 ⁵ / ₁₆	4	4 ³ / ₄	2 ¹ / ₄	18.43	21	21 ⁵ / ₈	25	26 ¹ / ₈	15 ⁵ / ₈	10 ⁷ / ₈	11 ¹ / ₈

Table 1A—Envelope and Mounting Dimensions

Bore	E	EB	EE (SAE)	EE (FLANGE)	EJ	EX	FB	G	J	K	R	RA	RE	TE	TF	UF	Add Stroke		
																	LG	P	
16	19	1 ¹³ / ₁₆	24	3	20	24 ¹ / ₂	1 ¹³ / ₁₆	5 ⁷ / ₈	5 ⁷ / ₈	1 ²⁹ / ₃₂	15 ¹ / ₂	8	15.28	21.03	21	24 ¹ / ₂	18 ¹ / ₈	12 ¹ / ₈	
18	22	2 ¹ / ₁₆	24	3	23	26 ¹ / ₂	2 ¹ / ₁₆	6 ⁷ / ₈	6 ⁷ / ₈	1 ²⁹ / ₃₂	18	7 ¹ / ₄	16.45	22.65	24 ¹ / ₄	28 ¹ / ₄	21 ¹ / ₈	15 ¹ / ₈	
20	24	2 ¹ / ₁₆	24	3	25	29	2 ¹ / ₁₆	7 ⁷ / ₈	7 ⁷ / ₈	1 ²⁹ / ₃₂	20	8	18.07	24.87	26 ¹ / ₂	30 ¹ / ₂	23 ⁵ / ₈	17 ⁵ / ₈	

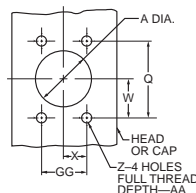
* NPTF ports are available at no extra charge.
 † Optional SAE flange ports may be specified – flange to be supplied by customer. See Table 4 for flange port pattern dimensions.
 ** SAE straight thread ports are standard and are indicated by port number.

Table 2—Rod Dimensions

Bore	Rod Dia. MM	Thread KK	Rod Extensions and Pilot Dimensions									Add Stroke				
			A	+0.005 -0.005 B	C	F	LAF	NA	RD	V	WF	Y	XS	XF	ZB	
10	4 ¹ / ₂	3 ¹ / ₄ -12	4 ¹ / ₂	5.249	1	1 ¹⁵ / ₁₆	7 ⁷ / ₁₆	4 ³ / ₈	8 ¹ / ₄	8 ¹ / ₄	1 ¹ / ₄	2 ¹⁵ / ₁₆	4 ³ / ₄	4 ⁹ / ₁₆	15 ¹ / ₁₆	16 ¹ / ₃₂
	7	5-12	7	7.999	1	1 ¹⁵ / ₁₆	10 ¹ / ₂	6 ⁷ / ₈	10 ¹ / ₂	3 ³ / ₈	3 ¹ / ₂	5 ⁵ / ₁₆	5 ¹ / ₈	15 ⁵ / ₈	16 ²⁹ / ₃₂	
	5	3 ¹ / ₂ -12	5	5.749	1	1 ¹⁵ / ₁₆	8 ³ / ₁₆	4 ⁷ / ₈	8 ⁷ / ₈	1 ¹ / ₄	3 ³ / ₁₆	5	4 ¹³ / ₁₆	15 ⁵ / ₁₆	16 ¹⁹ / ₃₂	
12	5 ¹ / ₂	4-12	5 ¹ / ₂	6.249	1	1 ¹⁵ / ₁₆	8 ¹¹ / ₁₆	5 ³ / ₈	9 ³ / ₈	1 ¹ / ₄	3 ³ / ₁₆	5	4 ¹³ / ₁₆	15 ⁵ / ₁₆	16 ¹⁹ / ₃₂	
	8	5 ³ / ₄ -12	8	8.999	1	1 ¹⁵ / ₁₆	12	7 ⁷ / ₈	12 ¹ / ₂	3 ³ / ₈	4	6 ³ / ₁₆	6	18 ¹ / ₂	19 ²⁹ / ₃₂	
	7	5-12	7	7.999	1	1 ¹⁵ / ₁₆	10 ¹ / ₂	6 ⁷ / ₈	10 ¹ / ₂	3 ³ / ₈	3 ¹ / ₂	5 ¹¹ / ₁₆	5 ¹ / ₂	18	19 ¹³ / ₃₂	
14	7	5-12	7	7.999	1	1 ¹⁵ / ₁₆	10 ¹ / ₂	6 ⁷ / ₈	10 ¹ / ₂	3 ³ / ₈	3 ¹ / ₂	5 ⁷ / ₈	5 ³ / ₄	19 ¹ / ₈	20 ¹⁷ / ₃₂	
	10	7 ¹ / ₄ -12	10	10.999	1	1 ¹⁵ / ₁₆	14 ¹ / ₂	9 ⁷ / ₈	14 ¹ / ₂	3 ³ / ₈	4 ¹ / ₂	6 ⁷ / ₈	6 ³ / ₄	20 ¹ / ₈	21 ¹⁷ / ₃₂	
	8	5 ³ / ₄ -12	8	8.999	1	1 ¹⁵ / ₁₆	12	7 ⁷ / ₈	12 ¹ / ₂	3 ³ / ₈	4	6 ³ / ₈	6 ¹ / ₄	19 ⁵ / ₈	21 ¹ / ₃₂	
16	8	5 ³ / ₄ -12	8	8.999	1	1 ¹⁵ / ₁₆	12	7 ⁷ / ₈	12 ¹ / ₂	3 ³ / ₈	4	7	*	22 ¹ / ₈	*	
	9	6 ¹ / ₂ -12	9	9.999	1	1 ¹⁵ / ₁₆	13 ¹ / ₄	8 ⁷ / ₈	13 ¹ / ₂	3 ³ / ₈	4 ¹ / ₄	7 ¹ / ₄	*	22 ³ / ₈	*	
	10	7 ¹ / ₄ -12	10	10.999	1	1 ¹⁵ / ₁₆	14 ¹ / ₂	9 ⁷ / ₈	14 ¹ / ₂	3 ³ / ₈	4 ¹ / ₂	7 ¹ / ₂	*	22 ⁵ / ₈	*	
18	9	6 ¹ / ₂ -12	9	9.999	1	1 ¹⁵ / ₁₆	13 ¹ / ₄	8 ⁷ / ₈	13 ¹ / ₂	3 ³ / ₈	4 ¹ / ₄	7 ¹ / ₄	*	25 ³ / ₈	*	
	10	7 ¹ / ₄ -12	10	10.999	1	1 ¹⁵ / ₁₆	14 ¹ / ₂	9 ⁷ / ₈	14 ¹ / ₂	3 ³ / ₈	4 ¹ / ₂	7 ¹ / ₂	*	25 ⁵ / ₈	*	
20	10	7 ¹ / ₄ -12	10	10.999	1	1 ¹⁵ / ₁₆	14 ¹ / ₂	9 ⁷ / ₈	14 ¹ / ₂	3 ³ / ₈	4 ¹ / ₂	7 ¹ / ₂	*	28 ¹ / ₈	*	

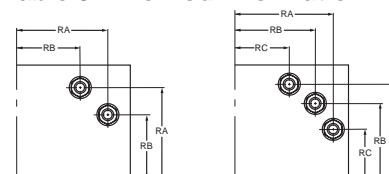
*Consult Factory

Table 4—Optional SAE Flange Port Pattern



Nom. Flange Size	S.A.E. Flange Dash Size	A	Q	GG	W	X	Z-THD UNC-2B	AA Min.
1 ¹ / ₂	- 24	1.50	2.750	1.406	1.38	0.70	1/2-13	1.06
2	- 32	2.00	3.062	1.688	1.53	0.84	1/2-13	1.06
2 ¹ / ₂	- 40	2.50	3.500	2.000	1.75	1.00	1/2-13	1.19
3	- 48	3.00	4.188	2.438	2.09	1.22	5/8-11	1.19

Table 5—Tie Rod Information



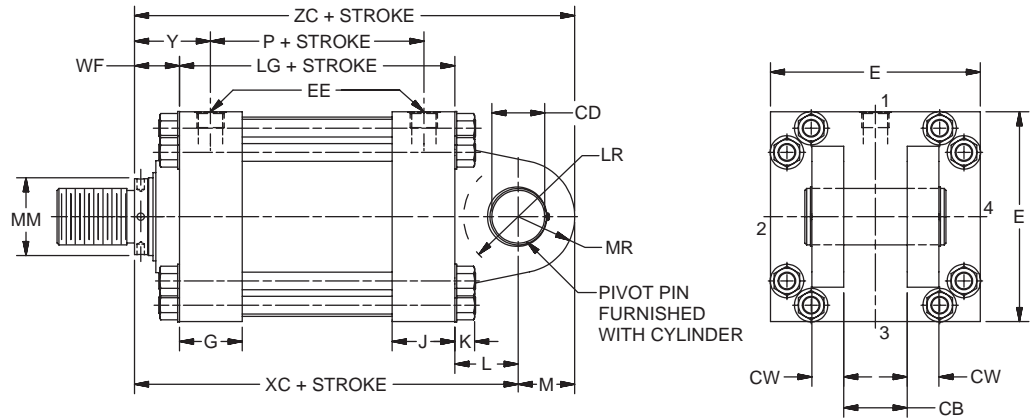
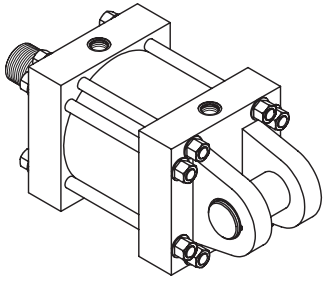
Bore	10	12	14	16	18	20
Tie Rod Thread	1 ¹ / ₈ -12	1 ¹ / ₄ -12	1 ¹ / ₄ -12	*	*	*
RA	5.291	6.270	7.485	*	*	*
RB	3.775	4.555	6.143	*	*	*
RC	—	—	4.409	*	*	*

*Consult factory for dimensions

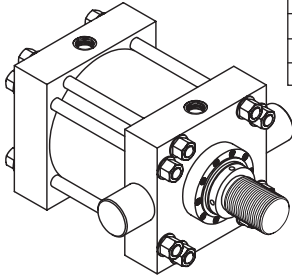
B
PL-2
PH-2
PH-3
PHX
SHM
CHE/CHD

Mountings – Large Bore Sizes

Cap Fixed Clevis Mount
(NFA Style MP1)

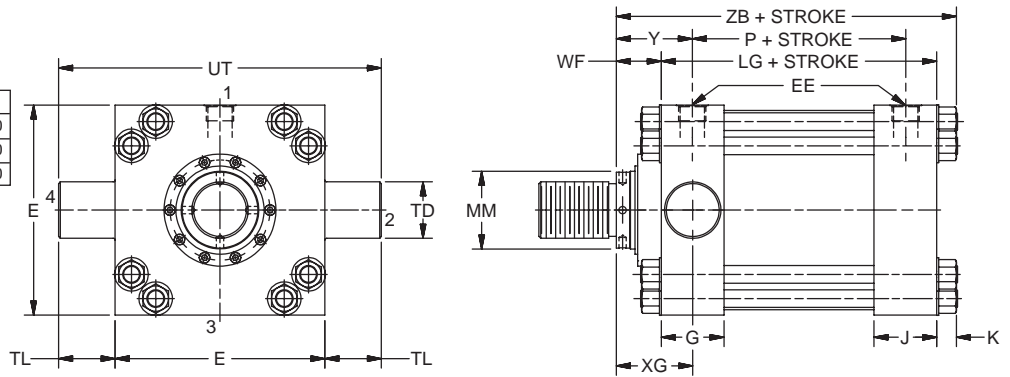


Head Trunnion Mount
10"-14" Bore only
(NFA Style MT1)

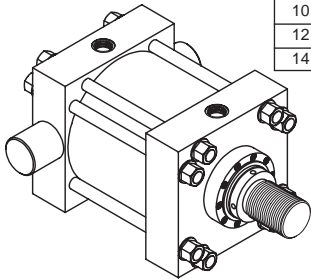


Maximum Pressure Rating - PSI

Bore	PSI
10	2800
12	2350
14	2200

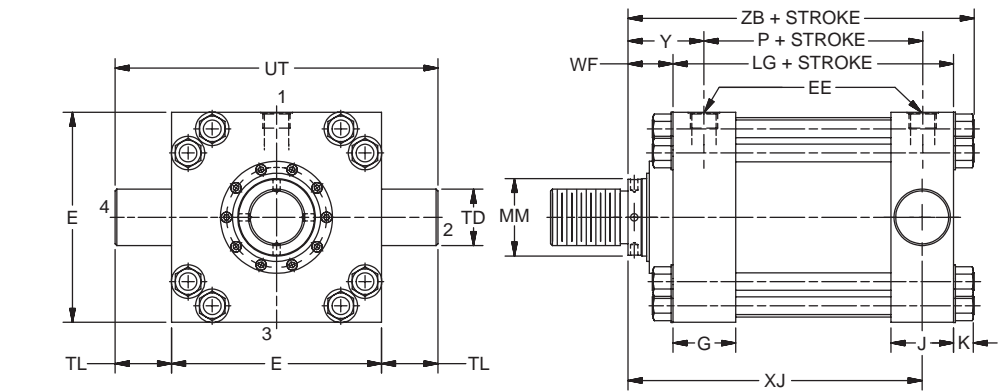


Cap Trunnion Mount
10"-14" Bore only
(NFA Style MT2)

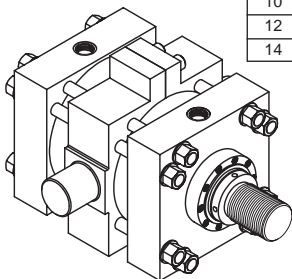


Maximum Pressure Rating - PSI

Bore	PSI
10	2800
12	2350
14	2200

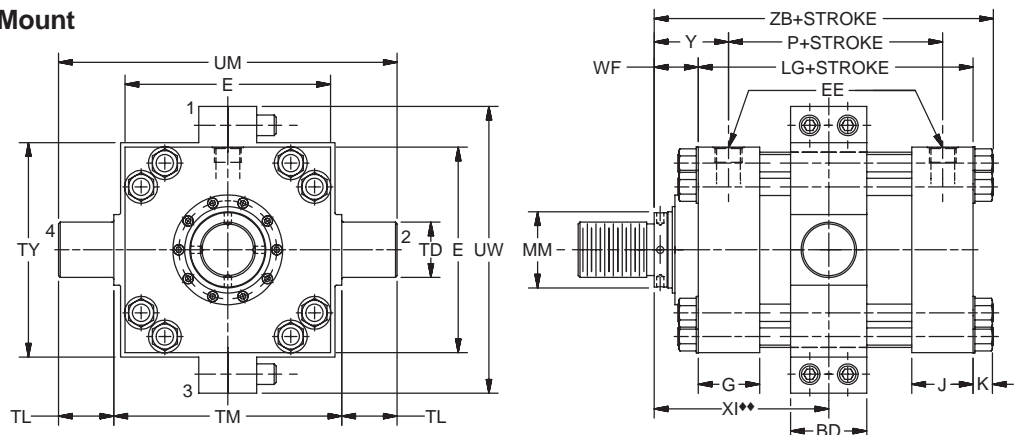


Intermediate Fixed Trunnion Mount
10"-14" Bore only
(NFA Style MT4)



Maximum Pressure Rating - PSI

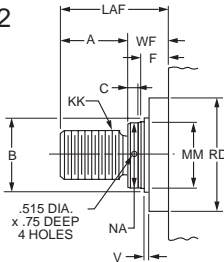
Bore	PSI
10	2800
12	2350
14	2200



♦♦ Dimension XI to be specified by customer.

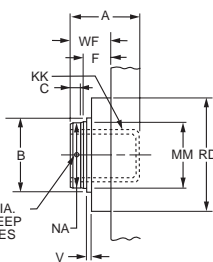
Rod End Dimensions — see table 2

Thread Style 2
(NFPA Style SM)
Small Male



If rod end is not specified, Style 2 will be furnished.

Thread Style 3
(NFPA Style SF)
Short Female



Use Style 3 for applications where female rod ends are required.

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 and LAF or WF. If otherwise special, furnish dimensional sketch.

Style 3 stroke restrictions may apply. See Style 3 Minimum Stroke page for details.

Table 1—Envelope and Mounting Dimensions

Bore	BD	CB	+0.001 -0.003 CD	CW	E	EE* NPTF	EE† S.A.E. FLANGE PORT	EE** S.A.E. STRAIGHT THREAD	G	J	K	L	LR	M	MR	+0.000 -0.001 TD	TL	TM	TY	UM	UT	UW	Add Stroke	
																							LG	P
10	4 1/2	4	3.500	2	12 5/8	2	2	24	3 11/16	3 11/16	1 9/32	4	3 3/8	3 1/2	3 1/2	3.500	3 1/2	14	13	21	19 5/8	17 1/2	12 1/8	8 1/2
12	5 1/2	4 1/2	4.000	2 1/4	14 7/8	2 1/2	2 1/2	24	4 7/16	4 7/16	1 13/32	4 1/2	3 7/8	4	4	4.000	4	16 1/2	15 1/2	24 1/2	22 7/8	20 3/4	14 1/2	10 1/8
14	5 1/2	6	5.000	3	17 1/8	2 1/2	2 1/2	24	4 7/8	4 7/8	1 13/32	5 3/4	4 3/16	5	5	4.500	4 1/2	19 1/2	19 1/4	28 1/2	26 1/8	24 3/4	15 5/8	10 7/8

Table 1A—Envelope and Mounting Dimensions (Style MP1 only)

Bore	E	EE (SAE)	EE (FLANGE)	CB	CD	CW	G	J	K	L	LR	M	MD	MR	Add Stroke	
															LG	P
16	19	24	3	7	6	3 1/2	5 7/8	5 7/8	1 29/32	7	6 1/4	6	16	6	18 1/8	12 1/8
18	22	24	3	8	6 1/2	4	6 7/8	6 7/8	1 29/32	7 5/8	6 3/4	6 1/2	18	6 1/2	21 1/8	15 1/8
20	24	24	3	9	7 1/2	4 1/2	7 7/8	7 7/8	1 29/32	8 3/4	7 3/4	7 1/2	20	7 1/2	23 5/8	17 5/8

* NPTF ports are available at no extra charge.

▲ Optional SAE flange ports may be specified – flange to be supplied by customer. See Table 4 for flange port pattern dimensions.

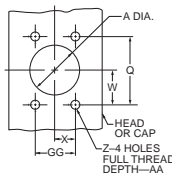
** SAE straight thread ports are standard and are indicated by port number.

Table 2—Rod Dimensions

Bore	Rod Dia. MM	Thread KK	Rod Extensions and Pilot Dimensions									Add Stroke						
			A	+0.000 -0.005 B	C	F	LAF	NA	RD	V	WF	XG	Min. XI*	Y	XC	XJ	ZB	ZC
10	4 1/2	3 1/4-12	4 1/2	5.249	1	1 15/16	7 7/16	4 3/8	8 1/4	1/4	2 15/16	4 3/4	9 1/16	4 3/4	19 1/16	13 3/8	16 11/32	22 9/16
	5	5-12	7	7.999	1	1 15/16	10 1/2	6 7/8	10 1/2	3/8	3 1/2	5 5/16	9 5/8	5 5/16	19 5/8	13 15/16	16 29/32	23 1/8
	5 1/2	4-12	5 1/2	6.249	1	1 15/16	8 11/16	4 7/8	8 7/8	1/4	3 3/16	5	9 5/16	5	19 5/16	13 5/8	16 19/32	22 13/16
12	5 1/2	4-12	5 1/2	6.249	1	1 15/16	8 11/16	5 3/8	9 3/8	1/4	3 3/16	5 3/8	10 5/8	5 3/8	22 3/16	15 1/2	19 3/32	26 3/16
	8	5 3/4-12	8	8.999	1	1 15/16	12	7 7/8	12 1/2	3/8	4	6 3/16	11 1/2	6 3/16	23	16 5/16	19 29/32	27
14	7	5-12	7	7.999	1	1 15/16	10 1/2	6 7/8	10 1/2	3/8	3 1/2	5 11/16	10 5/16	5 11/16	22 1/2	15 13/16	19 13/32	26 1/2
	10	7 1/4-12	10	10.999	1	1 15/16	14 1/2	9 7/8	14 1/2	3/8	4 1/2	6 15/16	12 7/16	6 7/8	24 7/8	16 11/16	20 17/32	29 7/8
	8	5 3/4-12	8	8.999	1	1 15/16	12	7 7/8	12 1/2	3/8	4	6 7/16	11 15/16	6 3/8	25 3/8	17 3/16	21 1/32	30 3/8
16	8	5 3/4-12	8	8.999	1	1 15/16	12	7 7/8	12 1/2	3/8	4	**	**	7	29 1/8	**	**	35 1/8
	9	6 1/2-12	9	9.999	1	1 15/16	13 1/4	8 7/8	13 1/2	3/8	4 1/4	**	**	7 1/4	29 3/8	**	**	35 3/8
18	10	7 1/4-12	10	10.999	1	1 15/16	14 1/2	9 7/8	14 1/2	3/8	4 1/2	**	**	7 1/2	29 5/8	**	**	35 5/8
	9	6 1/2-12	9	9.999	1	1 15/16	13 1/4	8 7/8	13 1/2	3/8	4 1/4	**	**	7 1/4	33	**	**	39 1/2
20	10	7 1/4-12	10	10.999	1	1 15/16	14 1/2	9 7/8	14 1/2	3/8	4 1/2	**	**	7 1/2	33 1/4	**	**	39 3/4
	10	7 1/4-12	10	10.999	1	1 15/16	14 1/2	9 7/8	14 1/2	3/8	4 1/2	**	**	7 1/2	36 7/8	**	**	44 3/8

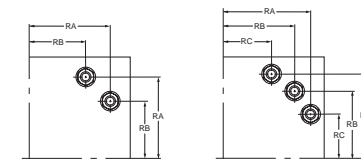
* Dimension XI to be specified by customer. **Consult Factory.

Table 4—Optional SAE Flange Port Pattern



Nom. Flange Size	S.A.E. Flange Dash Size	A	Q	GG	W	X	Z-TH UNC-2B	AA Min.
1 1/2	- 24	1.50	2.750	1.406	1.38	0.70	1/2-13	1.06
2	- 32	2.00	3.062	1.688	1.53	0.84	1/2-13	1.06
2 1/2	- 40	2.50	3.500	2.000	1.75	1.00	1/2-13	1.19
3	- 48	3.00	4.188	2.438	2.09	1.22	5/8-11	1.19

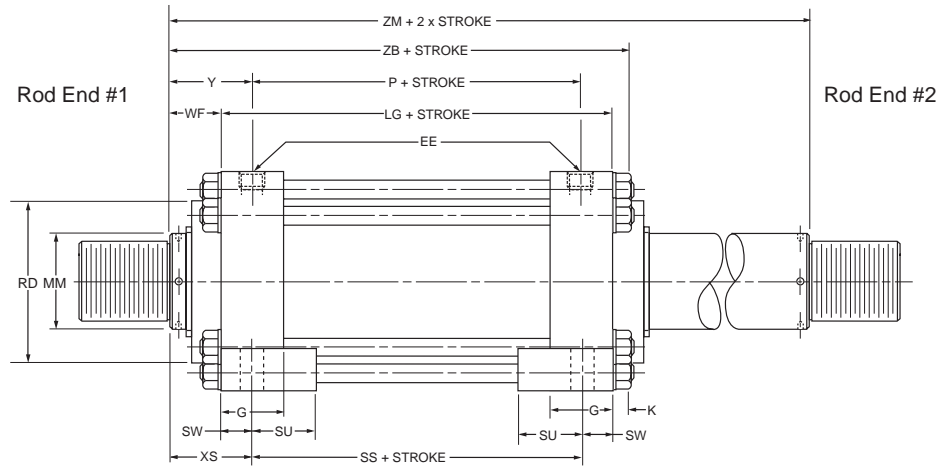
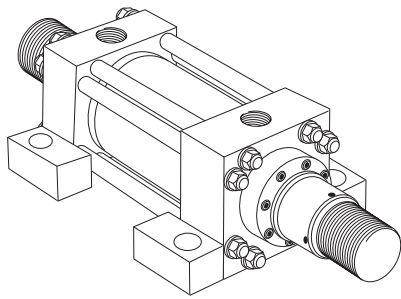
Table 5—Tie Rod Information



Bore	10	12	14	16	18	20
Tie Rod Thread	1 1/8-12	1 1/4-12	1 1/4-12	*	*	*
RA	5.291	6.270	7.485	*	*	*
RB	3.775	4.555	6.143	*	*	*
RC	—	—	4.409	*	*	*

*Consult factory for dimensions

How to Use Double Rod Cylinder Dimensioned Drawings



Mounting Styles for Single Rod Models	Mounting Styles for Corresponding Double Rod Models*	Dimension Shown on This Page Supplement Dimensions on Pages Listed Below
MX0	MDX0	110, 111
MX3	MDX3	110, 111
MX1	MDX1	110, 111
ME5	MDE5	112, 113
MF5	MDF5	112, 113
MS2	MDS2	114, 115
MT1	MDT1	116, 117
MT4‡	MDT4	116, 117

* 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.

To obtain dimensioning information on a double rod cylinder, first select the desired mounting style and refer to the corresponding single rod cylinder model shown on the preceding pages. (See table at left.) After you have determined all necessary dimensions from that drawing, turn back to this page and supplement those dimensions with additional ones from the drawing above and table at right. These added dimensions differ from, or are in addition to, those shown on the preceding pages and provide the additional information needed to completely dimension a double rod cylinder model.

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 pos. 2, 3 or 4 when viewed from rod end #1 only. See port position information in Section C.

Bore	Rod Dia.	Add 2X Stroke ZM
10	4 1/2	18
	7	19 1/8
	5	18 1/2
12	5 1/2	18 1/2
	8	22 1/2
	7	21 1/2
14	7	22 5/8
	10	24 5/8
	8	23 5/8
16	8	26 1/8
	9	26 5/8
	10	27 1/8
18	9	29 5/8
	10	30 1/8
20	10	32 5/8

Mounting Recommendations and Other Mountings

In addition to the standard mountings dimensioned on the preceding pages, the following information covers mounting ideas that may prove helpful in your applications. When needed, special heads, caps, and flanges can be provided. Sketches of your requirements, together with specifications relative to the application and forces involved should be submitted.

Mounting Bolts — High tensile socket head screws are recommended for all mounting styles. Use 1/16" smaller than hole size.

Flange Mountings — Cylinders can be properly centered by measuring from piston rod diameter. After mounting, the flange may be drilled for pins or dowels to prevent shifting.

Side Lug Mountings — Caution, cylinders which do not absorb force on their centerline (Group 3) tend to sway when under load. Short stroke, non-centerline mounted cylinders can subject mounting bolts to large tension forces which when combined with shear forces can overstress standard mounting bolts. Side lug mounted cylinders should always be prevented from shifting through use of shear keys so located as to resist the major load, whether push or pull.

Trunnion Mountings — Cylinders require lubricated pillow blocks with minimum bearing clearances. Pillow blocks should be carefully aligned and rigidly mounted so the trunnions will not be subjected to bending moments. The rod end connection should also be pivoted, with the customer's pin in the piston rod knuckle parallel to the trunnions.

Clevis Mountings — Cylinders should be pivoted at both ends, with the customer's pin in the piston rod knuckle parallel to the pivot pin supplied with the clevis.

Metallic Rod Wiper

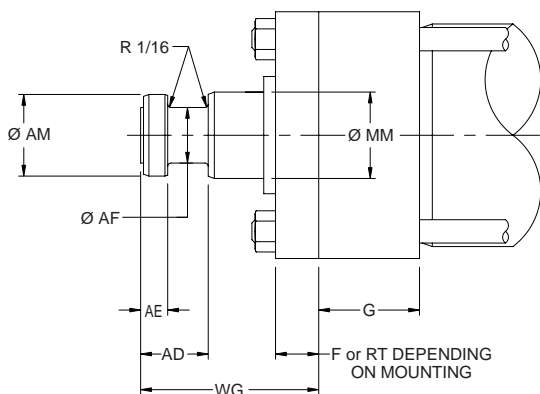
When specified, metallic rod wipers can be supplied at extra cost, instead of the standard synthetic rubber wiperseal. Recommended in applications where atmospheric particles or splashing tend to cling to the extended piston rod and otherwise damage the synthetic rubber wiperseal. Installation of metallic rod wiper does not affect cylinder dimensions.

Schrader Bellows “Style 6” Piston Rod End

Rod end flange coupling for Schrader Bellows PH-3 Series Large Bore Hydraulic Cylinders

- Simplifies alignment
- Reduces assembly time
- Allows full rated hydraulic pressure in push and pull directions
- Available in 4-1/2" through 5-1/2" piston rod diameters

Style 6 Rod End



Dimensions Style 6 Rod End

MM Rod Dia.	AD	AE	AF	AM	WG
4.500	3.19	1.50	3.50	4.45	6.50
5.000	3.19	1.50	3.88	4.95	6.63
5.500	3.94	1.88	4.38	5.45	7.50
7.000	4.06	2.00	5.75	6.95	8.44
8.000	4.06	2.00	6.50	7.95	8.69
9.000	4.63	2.38	7.25	8.95	8.75
10.000	4.63	2.38	8.00	9.95	9.75

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

Consult Factory for availability of mounting accessories and Hardware.

How To Order

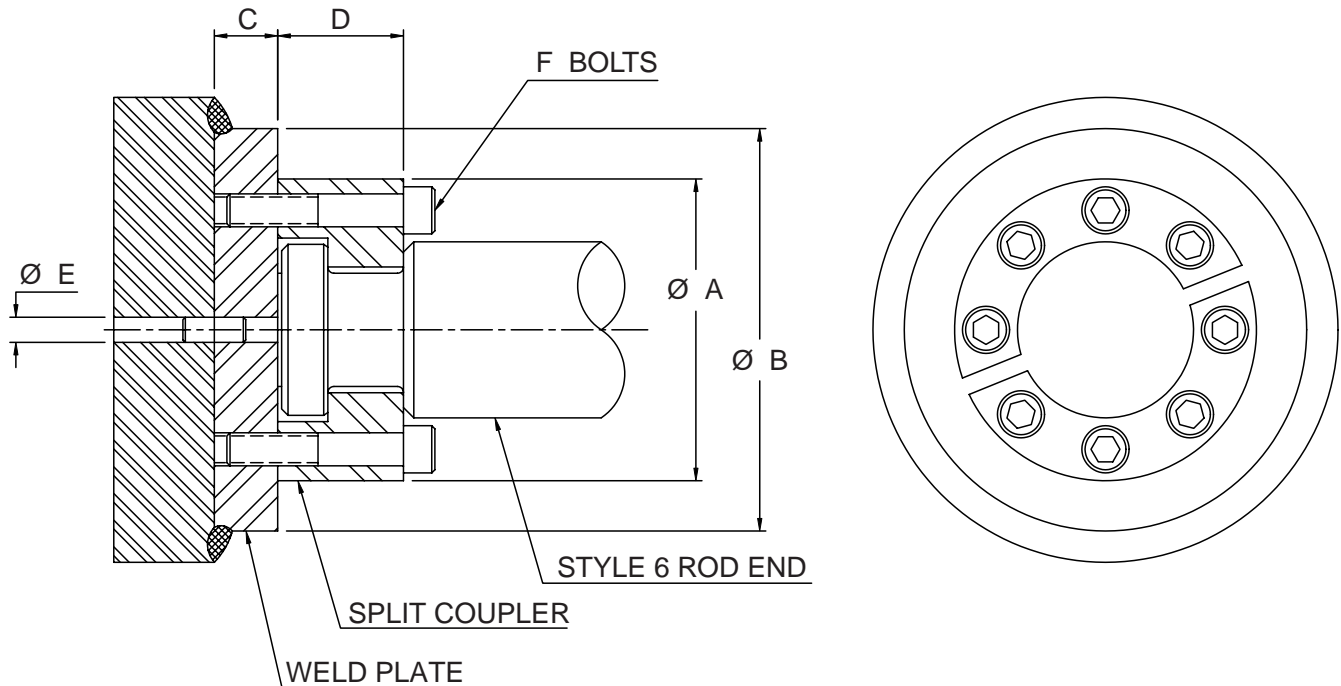
Complete Model Number and place a “6” in the Piston Rod End designator position.

Example: PHK193561x12.00



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 Ø	A Ø	B Ø	C	D	E Ø	F	Bolt Size	Bolt Circle	Split Coupler Part No.	Weld Plate Part No.
4.500	6.88	8.00	1.00	3.13	.375	12	.625-11 x 4.00 LG	5.687	147234 0450	148174 0450
5.000	7.38	8.00	1.00	3.13	.375	12	.625-11 x 4.00 LG	6.187	147234 0500	148174 0500
5.500	8.25	9.00	1.25	3.88	.375	12	.750-10 x 5.00 LG	6.875	147234 0550	148174 0550
7.000	10.38	11.00	1.75	4.00	.500	12	1.00-8 x 5.50 LG	8.750	147234 0700	148174 0700
8.000	11.38	12.00	2.00	4.00	.500	16	1.00-8 x 5.50 LG	9.750	147234 0800	148174 0800
8.500	12.38	13.00	2.00	4.00	.500	16	1.00-8 x 5.50 LG	10.750	147234 0850	148174 0850
9.000	13.12	14.00	2.25	4.00	.500	12	1.25-7 x 6.00 LG	11.125	147234 0900	148174 0900
10.000	14.12	15.00	2.50	4.50	.500	16	1.25-7 x 6.50 LG	12.125	147234 1000	148174 1000

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

How to Order By Model Number

PH-3 Hydraulic Cylinders can be specified by model number by using the tables shown at right.

1. TYPE

Select the Model Number Code which identifies the single or double rod end & port specification.

2. BORE & ROD DIAMETER

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

3. MOUNTING & CUSHIONING

Select the Model Number Code which identifies the desired mounting style & 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. Hi-Load piston seals are standard.

6. STROKE LENGTH

It is necessary to specify the stroke length desired following the Model Number. For example: PHA100823 with 6" stroke.

THE EXAMPLE WOULD IDENTIFY:

A single rod end hydraulic cylinder with S.A.E. flange ports, 10" bore size, 4 1/2" diameter piston rod, side lug mounting, cushioned both ends, with a small male rod end thread, high load piston with Buna-N seals & a 6" stroke.

SPECIFYING THE DESIRED TRUNNION LOCATION: (Style MT4 Mounting)

For cylinders with intermediate trunnion mounting, specify the distance between the piston rod reference point & the centerline of the trunnion pin. (Dimension "X1")

OPTIONAL MOUNTING ACCESSORIES

Specify separately by part number the desired optional mounting or rod end accessories.

SPECIAL MODIFICATIONS

For special modifications other than piston rod end, use "S" in the 10th position of the model number & describe the special feature required.

Example: PHK190825S 6" Stroke

Ports to be in position # 2.

1	Model Number
Type	PH-3 Series Hydraulic
Single End with SAE Straight Thread Ports	PH
Double End with SAE Straight Thread Ports	PJ
Single End with NPTF Ports	PF
Double End with NPTF Ports	PK
Single End with SAE Flange Ports	PX
Double End with SAE Flange Ports	PY

2					
Bore Size	Rod Dia.	Model Number Code	Bore Size	Rod Dia.	Model Number Code
10"	4-1/2"	K19	16"	8"	R45
	5"	K41		9"	R47
	5-1/2"	K42		10"	R46
	7"	K43		9"	T47
12"	5-1/2"	L42	18"	10"	T46
	7"	L43		20"	10"
	8"	L45			
14"	7"	M43			
	8"	M45			
	10"	M46			

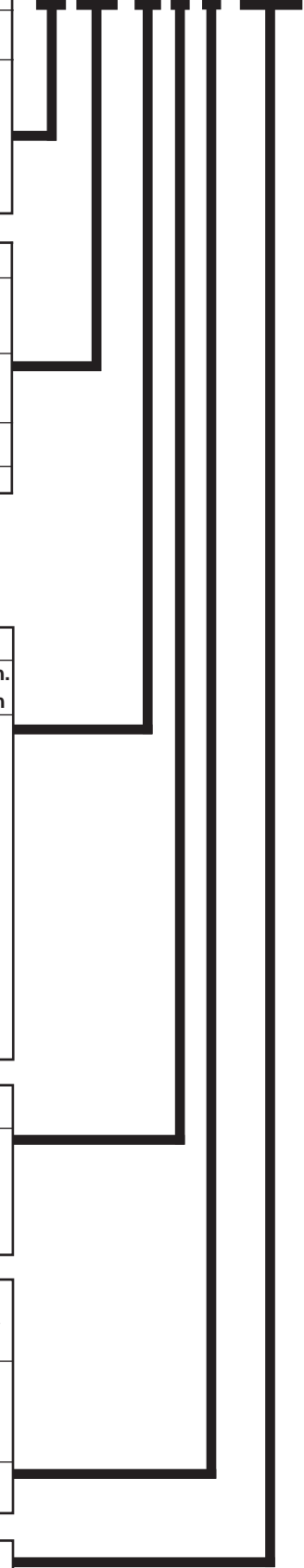
3	Mounting Style	Model Number Code				
		NFPA Style	Non-Cush.	Cush. Head	Cush. Cap	Cush. Both
	Side Lug	MS2	05	06	07	08
	Head Square	MF5	29	30	31	32
	Cap Square	MF6	33	34	35	36
	Head Rectangular	ME5	45	46	47	48
	Cap Rectangular	ME6	49	50	51	52
	Tie Rods Extended Both Ends	MX1	53	54	55	56
	Cap Tie Rods Extended	MX2	57	58	59	60
	Head Tie Rods Extended	MX3	61	62	63	64
	Head Trunnion	MT1	69	70	71	72
	Cap Trunnion	MT2	73	74	75	76
	Intermediate Fixed Trunnion	MT4	77	78	79	80
	Cap Fixed Clevis	MP1	81	82	83	84

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

5	Seal Type	Available on Bore Sizes	Model Number Code
	Buna N Seals w/Lipseal Piston		1
	Fluorocarbon Seals w/Lipseal Piston	Optional on 10" thru 14" only	2
	Buna N Seals w/Piston Rings		3
	Fluorocarbon Seals w/Piston Rings		4
	Buna N Seals w/Hi-Load Piston	10" thru 20"	5
	Fluorocarbon Seals w/Hi-Load Piston		6

6	Specify Stroke Length	6"
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Model Number Example:
PH K19 08 2 5 w/6"



NOTES