



CASCADE PRECISION INC.

Pneumatic Cylinders

True Non-Lube

High Speed / High Temperature

**Built To Conquer Hostile
Environments**



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www.cascadeprecision.com

A SUPERIOR CYLINDER DESIGN

The Cascade Precision cylinder is manufactured for the quality oriented OEM. Our flexible design incorporates high tolerances and today's most durable components. Cascade Precision uses the latest in seal and surface technology to provide the best equipment for your most demanding applications. The self-lubricating design is more than just a pre-lubricated cylinder. The Cascade Precision cylinder is designed to last millions of cycles in harsh conditions **without any in-line lubrication**. When heat, moisture-laden air, and high particulate would destroy most cylinders, the Cascade Precision design will continue to perform.

EXTRUDER

A Teflon® enhanced scraper provides excellent protection from gritty slurries and high particulate environments.

CHROME PLATED STAINLESS ROD

A chrome plated stainless steel rod provides a hard wear surface for improved seal life and excellent corrosion resistance at the wrench flats and threads.

FLEXIBLE DESIGN

The Cascade Precision cylinder can be custom built to your specifications with your logo printed on the barrel.

AIR CUSHION SEAL

Our proprietary fixed cushion provides smooth end of stroke deceleration. This design handles high particulate, side-load and acts as an internal check for instant cylinder start-up.

COMPOSITE ROD BEARING

New technology in composite marine bearings has allowed us to increase the radial load capacity and operating temperature, even in the absence of in-line lubrication.

TEFLON® COMPONENTS

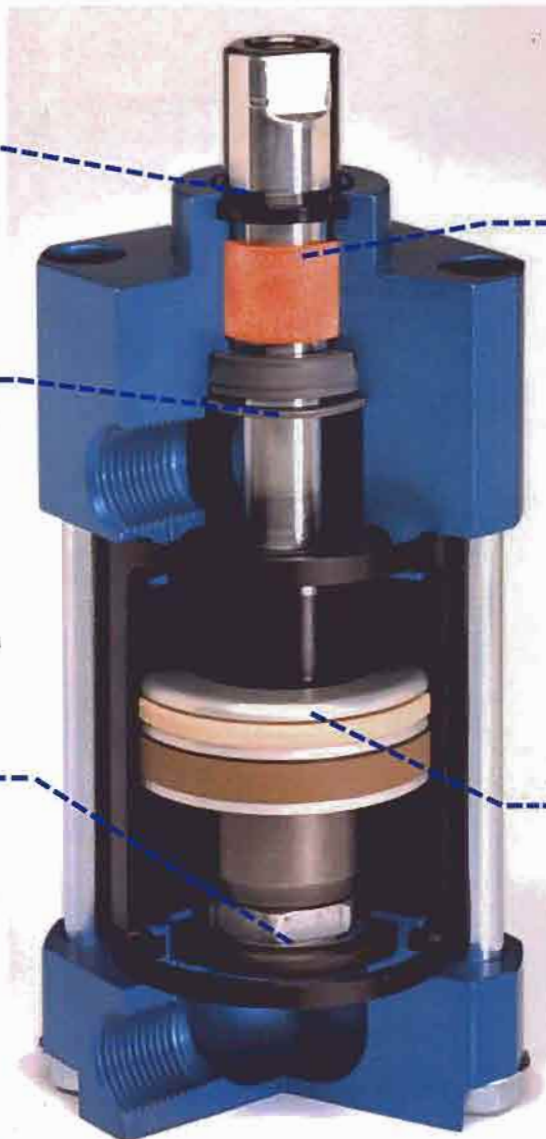
The dynamic seals are Teflon® enhanced to produce low coefficient, excellent heat resistance and eliminate the need for external lubrication. Teflon® is also mechanically bonded to some components for a smooth, hard, corrosion resistant surface.

NEW SEAL TECHNOLOGY

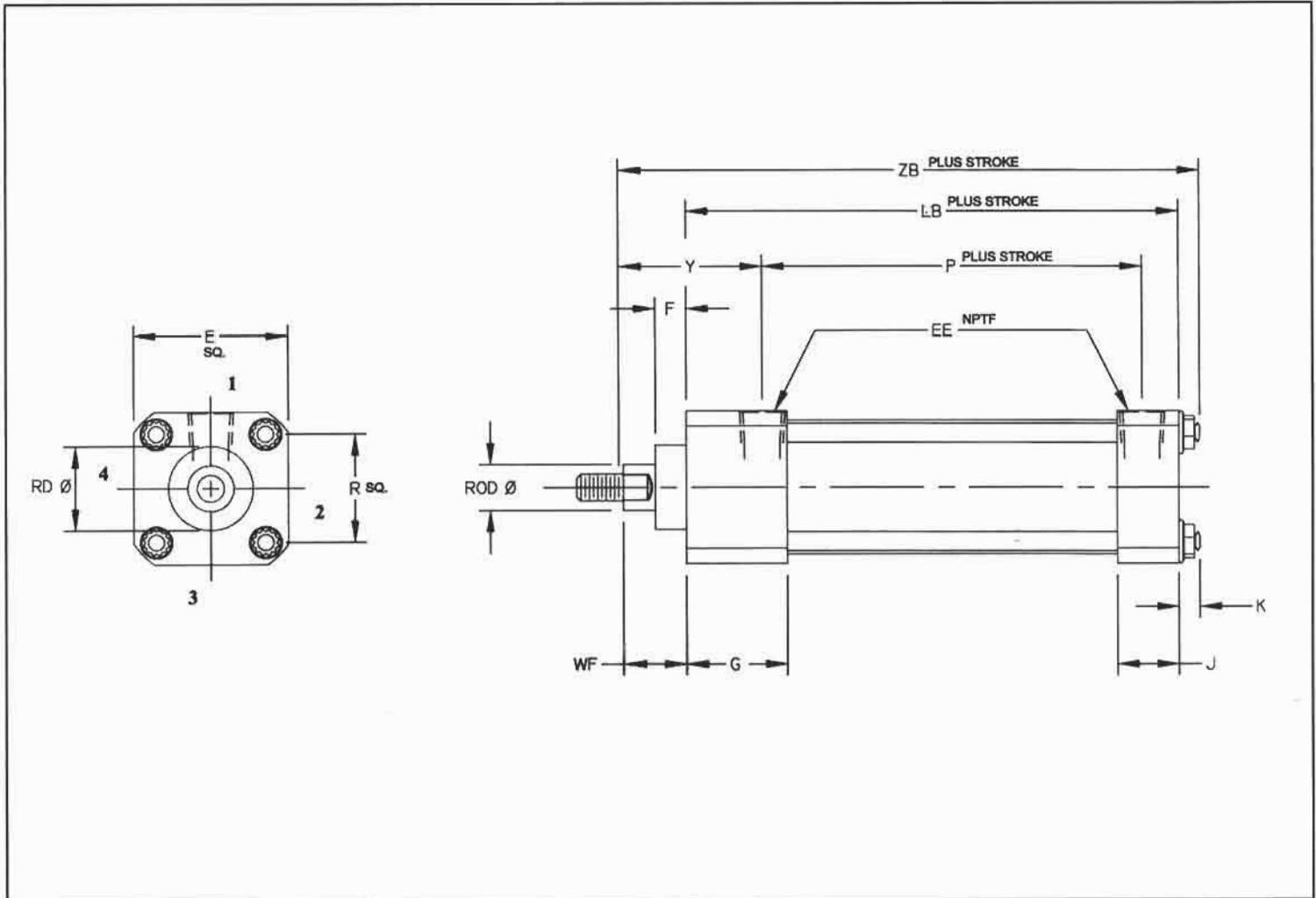
New technology in compact seal design incorporates integral elastomers and high performance fills to provide long life even in the most demanding applications.

HIGH PERFORMANCE SEALS

The most common cause of pneumatic cylinder failure is lack of lubrication. Most cylinder companies pre-lubricate their cylinders and call them "non-lube". This alone does not solve the problem. Over time, the pre-lubricant will wash out. This can happen quickly with high heat and/or moisture problems. The only solution is seals that require no lubrication at all. The seal on the right is a typical high temperature O-ring after 16,000 cycles without lubrication. The Cascade Precision seal on the left has over 2,000,000 cycles and is still going strong.



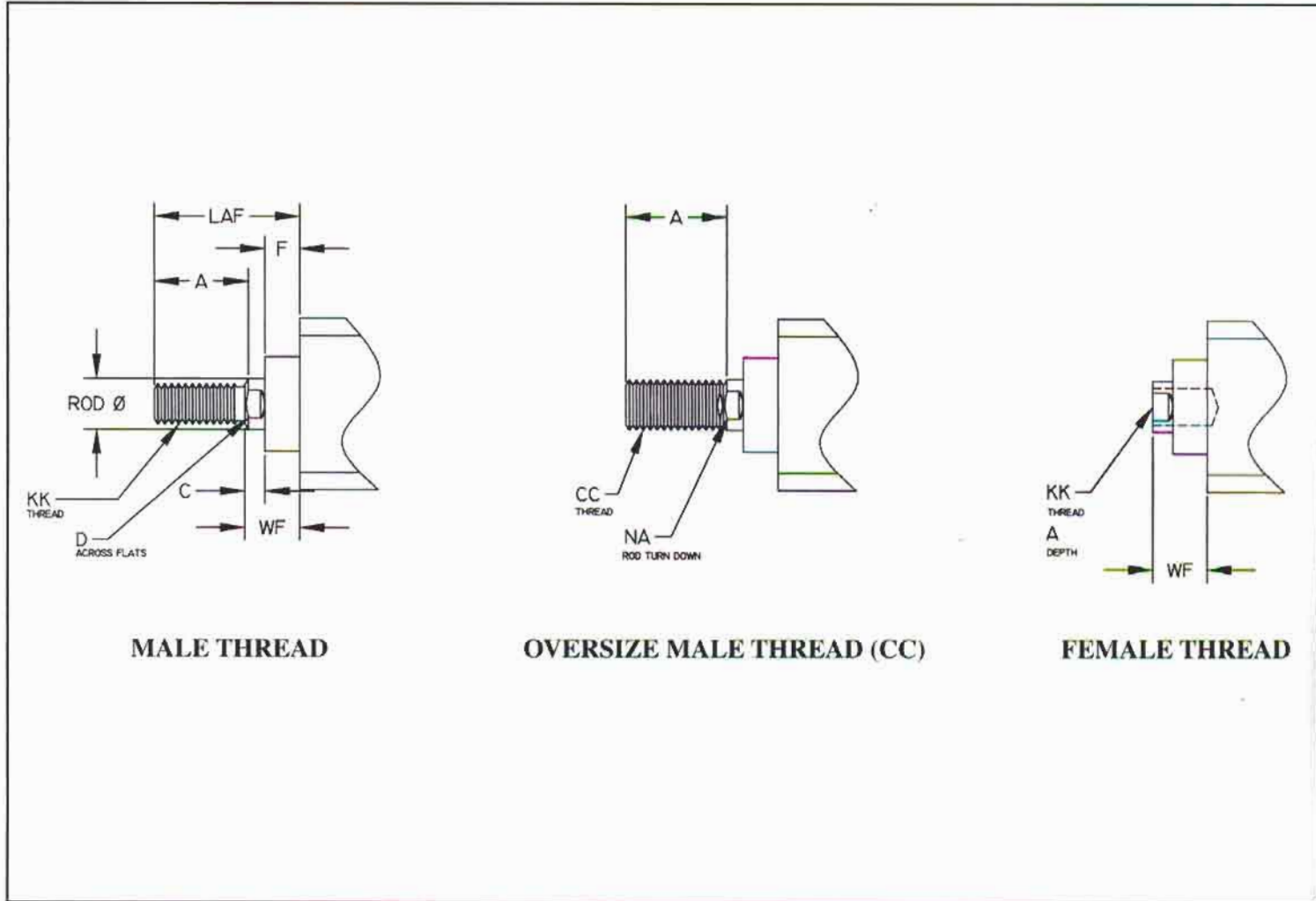
Tie Rod Design - Basic No Mount (MXO)



BASIC CYLINDER DIMENSIONS

BORE	ROD	E	EE	F	G	J	K	LB	P	R	RD	WF	Y	ZB
2.00	.750	2.500	.375	.500	1.500	1.000	.313	3.625	2.250	1.840	1.375	1.000	1.938	4.938
	1.000	2.500	.375	.500	1.500	1.000	.313	3.625	2.250	1.840	2.500	1.375	2.313	5.313
2.50	.750	3.000	.375	.500	1.500	1.000	.313	3.750	2.375	2.190	1.375	1.000	1.938	5.062
	1.000	3.000	.375	.500	1.500	1.000	.313	3.750	2.375	2.190	3.000	1.375	2.313	5.438
3.25	1.000	3.750	.500	.625	1.750	1.250	.375	4.250	2.625	2.760	2.706	1.375	2.438	6.000
	1.375	3.750	.500	.625	1.750	1.250	.375	4.250	2.625	2.760	3.125	1.625	2.688	6.250
4.00	1.000	4.500	.500	.625	1.750	1.250	.375	4.250	2.625	3.320	2.706	1.375	2.438	6.000
	1.375	4.500	.500	.625	1.750	1.250	.375	4.250	2.625	3.320	3.125	1.625	2.688	6.250
6.00	1.375	6.500	.750	.625	2.000	1.500	.500	5.000	3.125	4.880	3.125	1.625	2.813	7.125
	1.750	6.500	.750	.750	2.000	1.500	.500	5.000	3.125	4.880	3.788	1.875	3.063	7.375

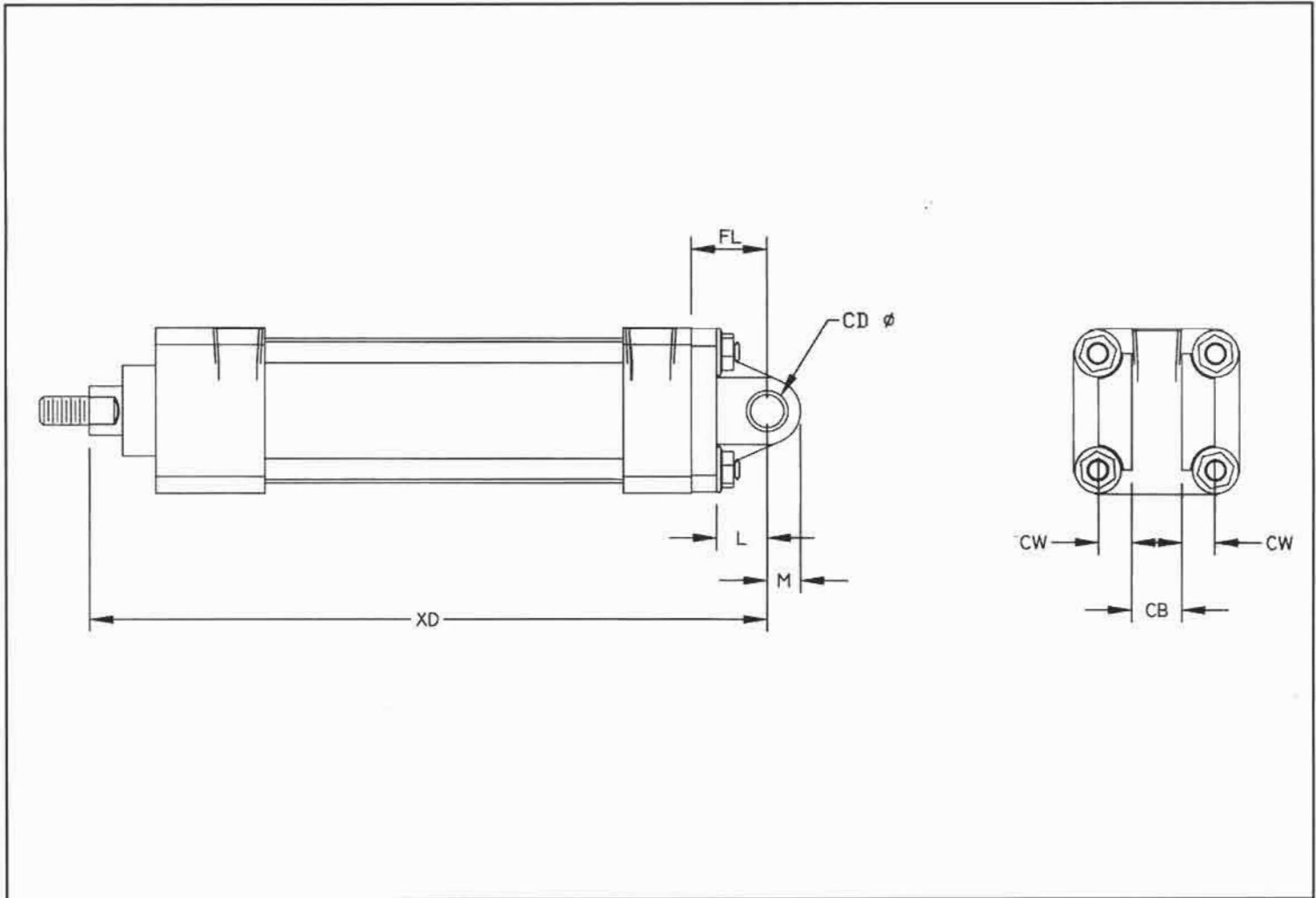
Tie Rod Design - Standard And Optional Rod Ends



ROD DIMENSIONS

BORE	ROD	KK (1)	CC (2)	KK (3)	A	C	D	NA	LAF	WF
2.00	.750	7/16 - 20	3/4 - 10	5/8 - 14	.750	.375	.625	.585	1.750	1.000
	1.000	3/4 - 16	7/8 - 14	3/4 - 16	1.125	.500	.813	.960	2.500	1.375
2.50	.750	7/16 - 20	3/4 - 10	5/8 - 14	.750	.375	.625	.585	1.750	1.000
	1.000	3/4 - 16	7/8 - 14	3/4 - 16	1.125	.500	.813	.960	2.500	1.375
3.25	1.000	3/4 - 16	7/8 - 14	3/4 - 16	1.125	.500	.813	.960	2.500	1.375
	1.375	1 - 14	1 1/4 - 12	1 - 14	1.625	.625	1.125	1.313	3.250	1.625
4.00	1.000	3/4 - 16	7/8 - 14	3/4 - 16	1.125	.500	.813	.960	2.500	1.375
	1.375	1 - 14	1 1/4 - 12	1 - 14	1.625	.625	1.125	1.313	3.250	1.625
6.00	1.375	1 - 14	1 1/4 - 12	1 - 14	1.625	.625	1.125	1.313	3.250	1.625
	1.750	1 1/4 - 12	1 1/2 - 12	1 1/4 - 12	2.000	.750	1.500	1.688	3.875	1.875

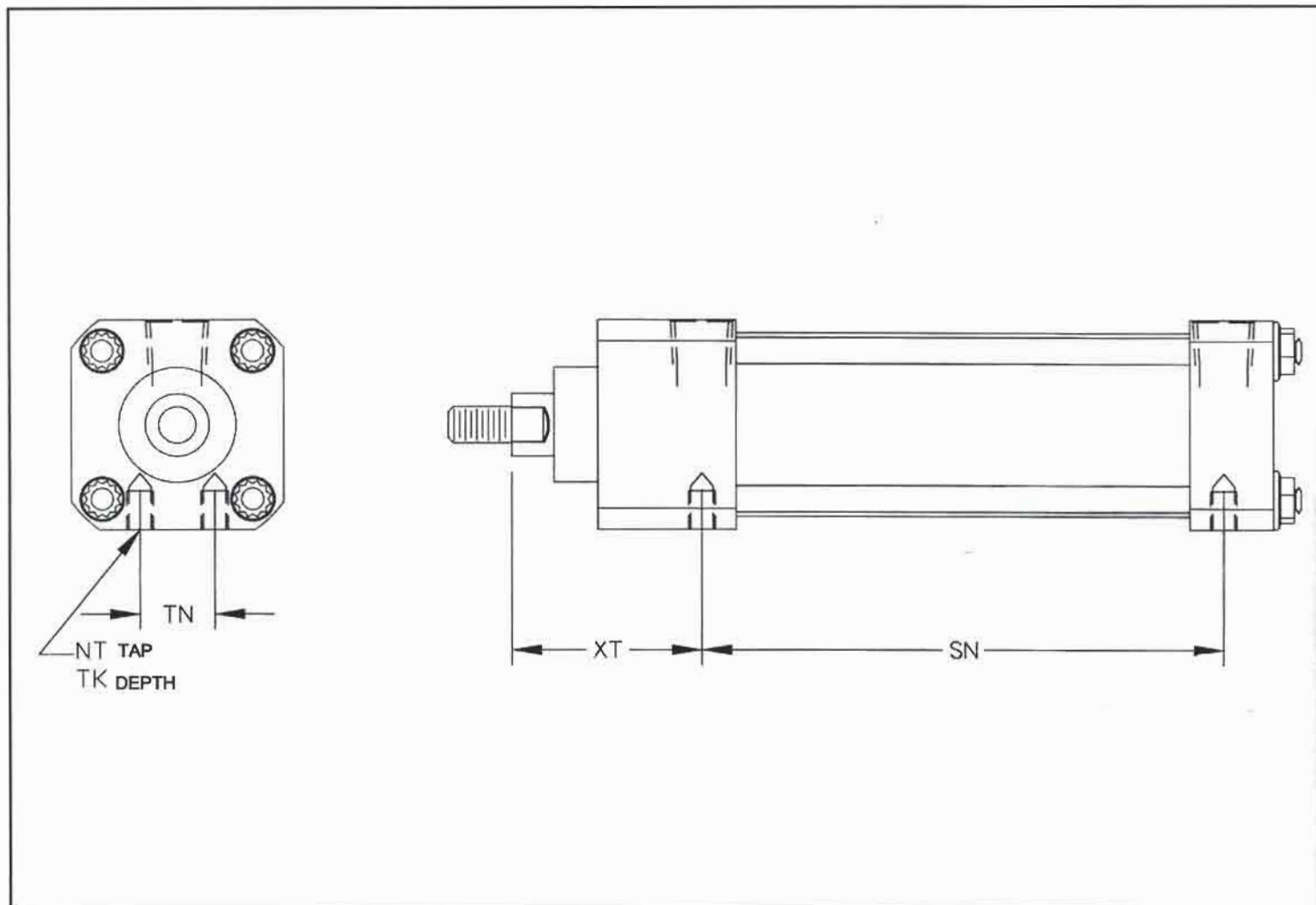
Tie Rod Design - Cap Clevis Mount (MP2)



DIMENSIONS

BORE	ROD	CB	CD	CW	FL	L	M	XC	XD
2.00	.750	.750	.500	.500	1.125	.750	.500	5.375	5.750
	1.000	.750	.500	.500	1.125	.750	.500	5.750	6.125
2.50	.750	.750	.500	.500	1.125	.750	.500	5.500	5.875
	1.000	.750	.500	.500	1.125	.750	.500	5.875	6.250
3.25	1.000	1.250	.750	.625	1.875	1.250	.750	6.875	7.500
	1.375	1.250	.750	.625	1.875	1.250	.750	7.125	7.750
4.00	1.000	1.250	.750	.625	1.875	1.250	.750	6.875	7.500
	1.375	1.250	.750	.625	1.875	1.250	.750	7.125	7.750
6.00	1.375	1.500	1.000	.750	2.250	1.500	1.000	8.125	8.875
	1.750	1.500	1.000	.750	2.250	1.500	1.000	8.375	9.125

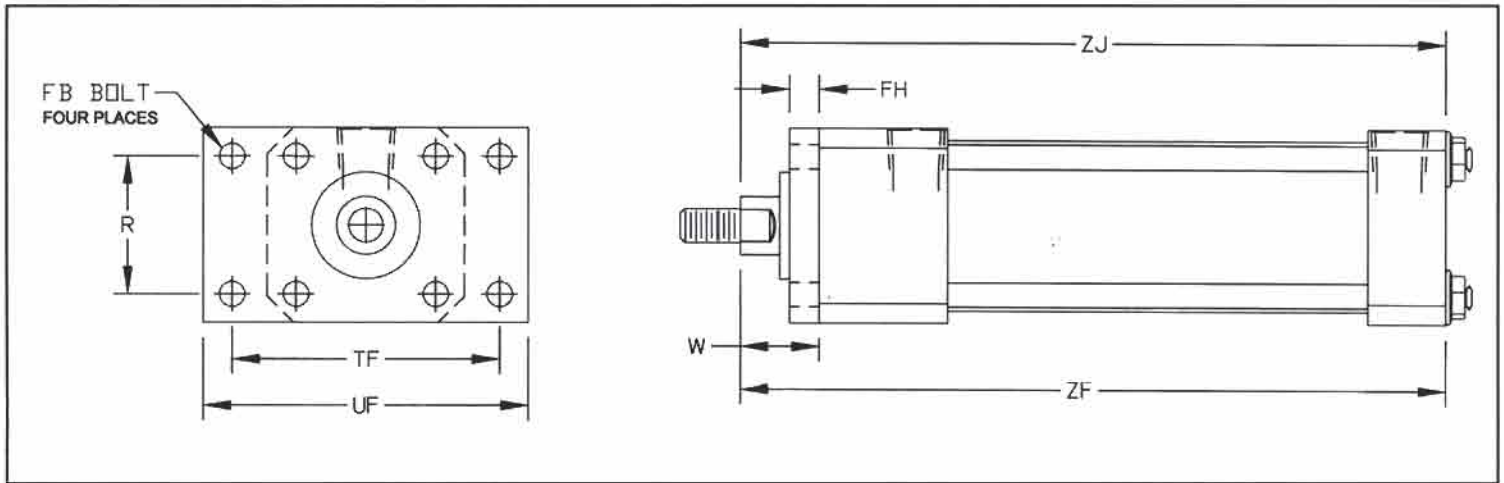
Tie Rod Design - Bottom Tap Mount (MS4)



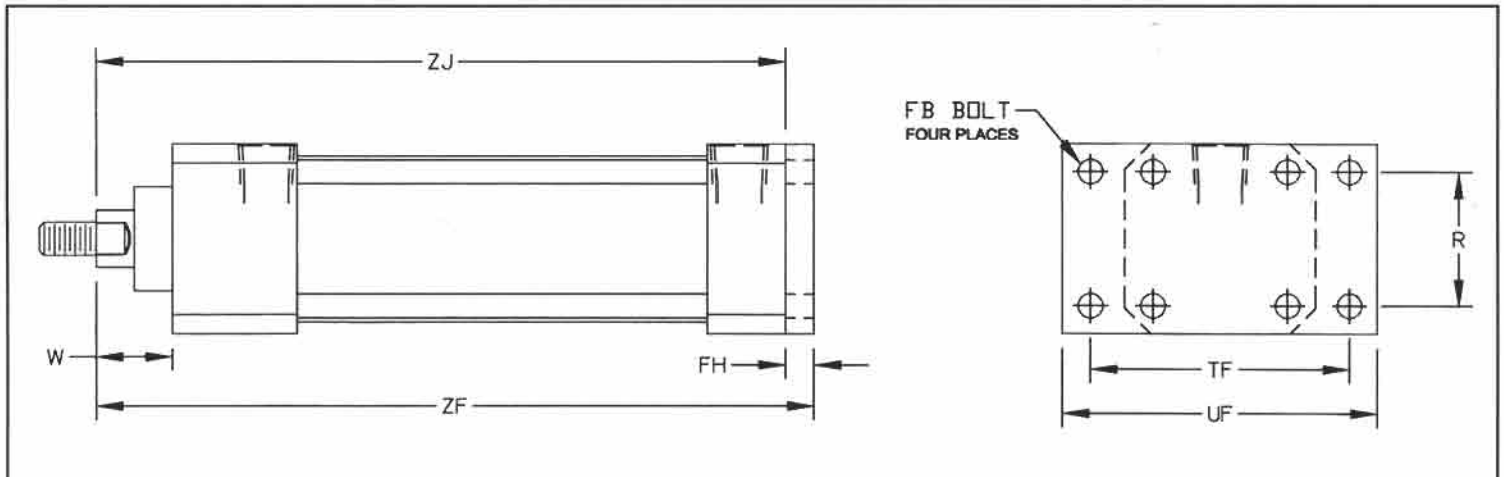
DIMENSIONS

BORE	ROD	NT	TK	TN	SN	XT
2.00	.750	5/16 - 18	.500	.875	2.250	1.938
	1.000	5/16 - 18	.500	.875	2.250	2.313
2.50	.750	3/8 - 16	.625	1.250	2.375	1.938
	1.000	3/8 - 16	.625	1.250	2.375	2.313
3.25	1.000	1/2 - 13	.750	1.500	2.625	2.438
	1.375	1/2 - 13	.750	1.500	2.625	2.688
4.00	1.000	1/2 - 13	.750	2.063	2.625	2.438
	1.375	1/2 - 13	.750	2.063	2.625	2.688
6.00	1.375	3/4 - 10	1.125	3.250	3.125	2.813
	1.750	3/4 - 10	1.125	3.250	3.125	3.063

Tie Rod Design - Cap Flange (MF2)



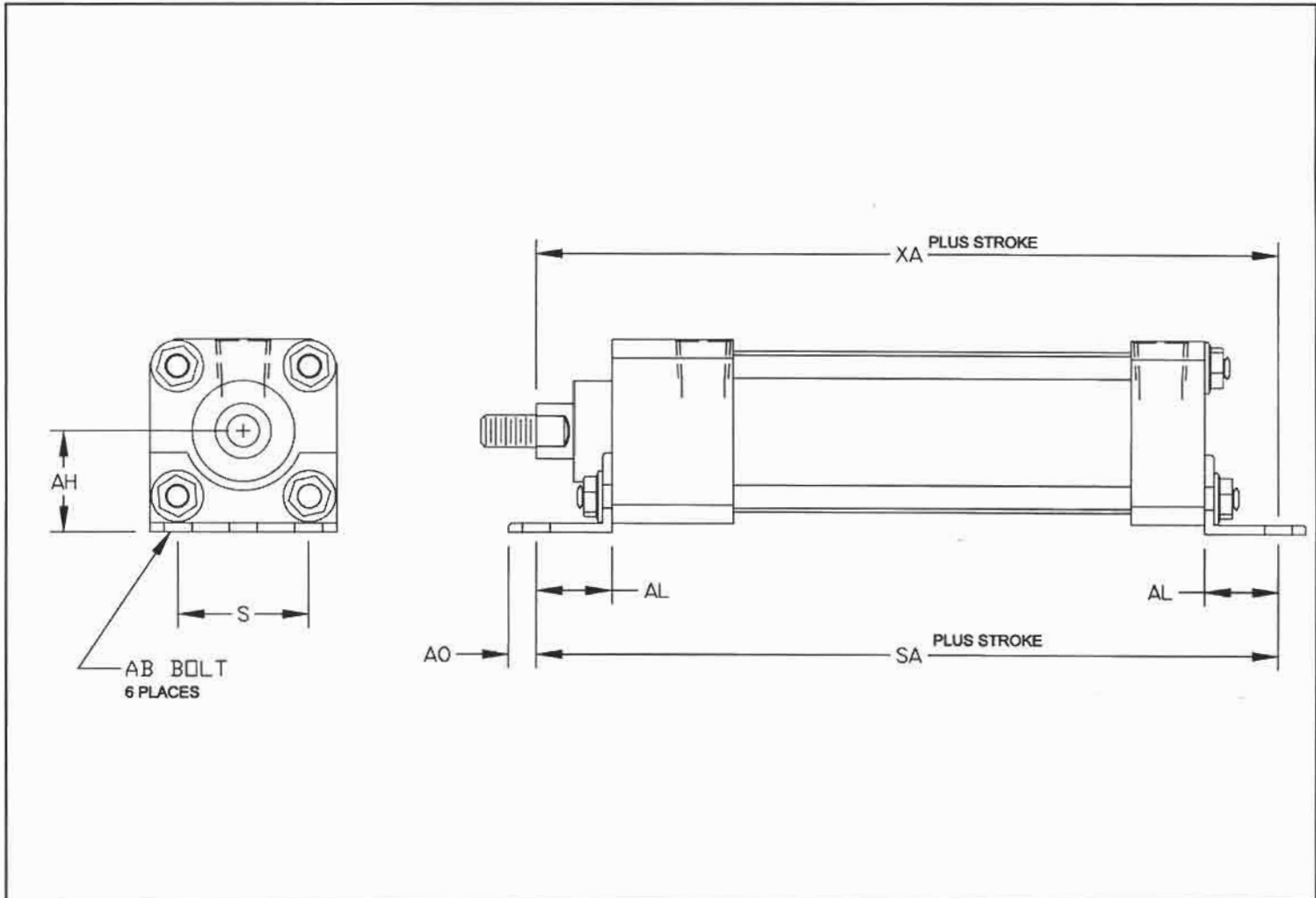
Tie Rod Design - Head Flange (MF1)



DIMENSIONS

BORE	ROD	FB	FH	R	TF	UF	W	ZJ	ZF
2.00	.750	.313	.375	1.840	3.375	4.125	.625	4.625	5.000
	1.000	.313	.375	1.840	3.375	4.125	1.000	5.000	5.375
2.50	.750	.313	.375	2.190	3.875	4.625	.625	4.750	5.125
	1.000	.313	.375	2.190	3.875	4.625	1.000	5.125	5.500
3.25	1.000	3.750	.625	2.760	4.688	5.500	.750	5.625	6.250
	1.375	3.750	.625	2.760	4.688	5.500	1.000	5.875	6.500
4.00	1.000	3.750	.625	3.320	5.438	6.250	.750	5.625	6.250
	1.375	3.750	.625	3.320	5.438	6.250	1.000	5.875	6.500
6.00	1.375	.500	.750	4.880	7.625	8.625	.875	6.625	7.375
	1.750	.500	.750	4.880	7.625	8.625	1.125	6.875	7.625

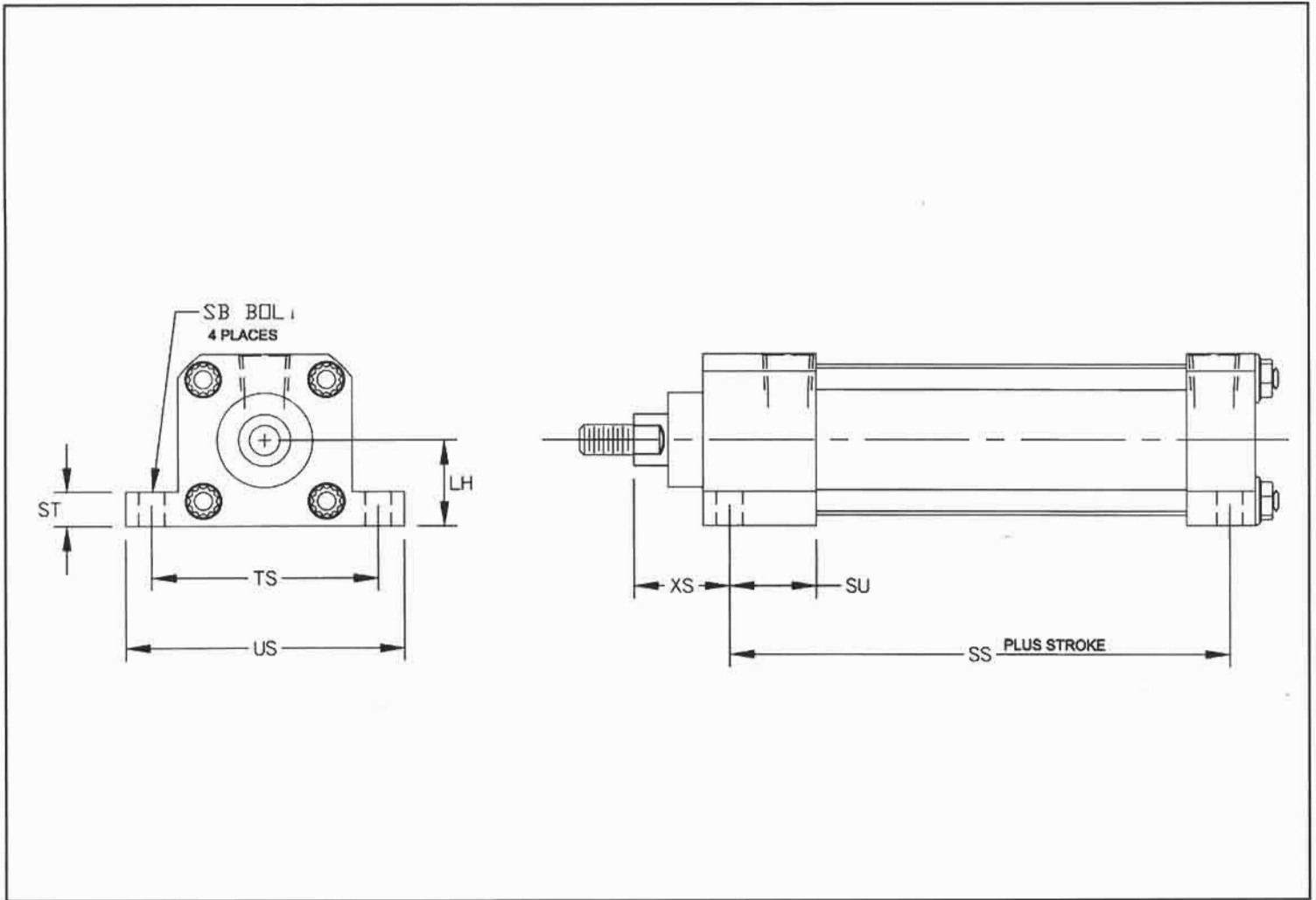
Tie Rod Design - End Angle Mount (MS1)



DIMENSIONS

BORE	ROD	AB	AH	AL	AO	AT	S	SA	XA
2.00	.750	.375	1.438	1.000	.375	.125	1.750	6.000	5.625
	1.000	.375	1.438	1.000	.375	.125	1.750	6.000	6.000
2.50	.750	.375	1.625	1.000	.375	.125	2.250	6.125	5.750
	1.000	.375	1.625	1.000	.375	.125	2.250	6.125	6.125
3.25	1.000	.500	1.938	1.250	.500	.125	2.750	7.375	6.875
	1.375	.500	1.938	1.250	.500	.125	2.750	7.375	7.125
4.00	1.000	.500	2.250	1.250	.500	.125	3.500	7.375	6.875
	1.375	.500	2.250	1.250	.500	.125	3.500	7.375	7.125
6.00	1.375	.750	3.250	1.375	.625	.188	5.250	8.500	8.000
	1.750	.750	3.250	1.375	.625	.188	5.250	8.500	8.250

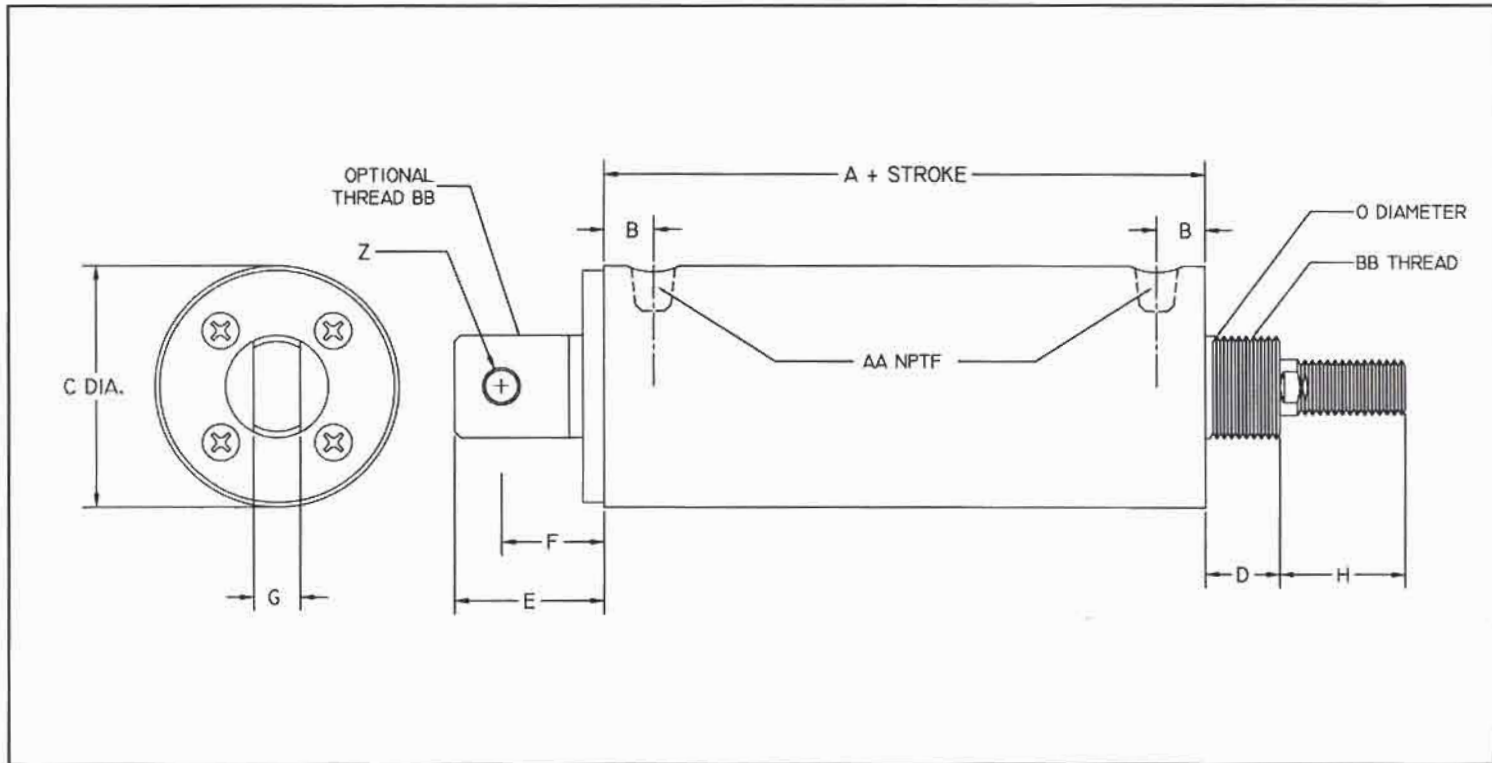
Tie Rod Design - Side Lug Mount (MS2)



DIMENSIONS

BORE	ROD	LH	SB	SJ	SS	ST	SU	SW	TS	US	XS
2.00	.750	1.250	.375	.625	2.875	.500	1.125	.375	3.250	4.000	1.375
	1.000	1.250	.375	.625	2.875	.500	1.125	.375	3.250	4.000	1.750
2.50	.750	1.500	.375	.625	3.000	.500	1.125	.375	3.750	4.500	1.375
	1.000	1.500	.375	.625	3.000	.500	1.125	.375	3.750	4.500	1.750
3.25	1.000	1.875	.500	.750	3.250	.750	1.250	.500	4.750	5.750	1.875
	1.375	1.875	.500	.750	3.250	.750	1.250	.500	4.750	5.750	2.125
4.00	1.000	2.250	.500	.750	3.250	.750	1.250	.500	5.500	6.500	1.875
	1.375	2.250	.500	.750	3.250	.750	1.250	.500	5.500	6.500	2.125
6.00	1.375	3.250	.750	.813	3.625	1.000	1.313	.688	7.875	9.250	2.313
	1.750	3.250	.750	.813	3.625	1.000	1.313	.688	7.875	9.250	2.563

Snap Ring Design



DIMENSIONS

BORE	ROD	A (COMPACT)	A (NFPA Interchange)	B	C	D	E	F	G	H	O	Z	AA	BB
2.5"	.75	3.75+stroke	3.75+stroke	.65	2.75	1.00	2.0	1.38	.625	1.68	1.38	.438	3/8	1.38-12
3.0"	.75	3.75+stroke	3.88+stroke	.65	3.25	1.00	2.0	1.38	.625	1.68	1.38	.438	3/8	1.38-12
3.0"	1.0	3.75+stroke	3.88+stroke	.65	3.25	1.00	2.0	1.38	.625	1.68	1.75	.438	3/8	1.75-12
4.0"	1.0	4.34+stroke	4.88+stroke	.80	4.25	1.12	2.38	1.44	.75	2.25	1.75	.50	1/2	1.75-12
4.0"	1.25	4.34+stroke	4.88+stroke	.80	4.25	1.25	2.38	1.44	.75	2.25	2.25	.50	1/2	2.25-12

ROD DIMENSIONS

OVERSIZED MALE THREAD (CC)

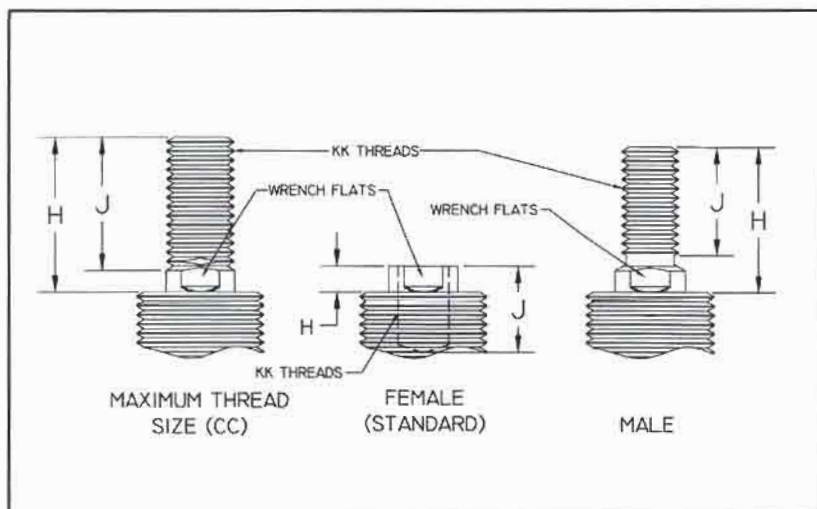
ROD SIZE	J" DIMENSION	H" DIMENSION	KK THREADS	WRENCH FLATS
.75"	1.45	1.69	3/4 - 10	5/8
1.0"	1.65	2.25	1 - 14	7/8

FEMALE THREAD (STANDARD)

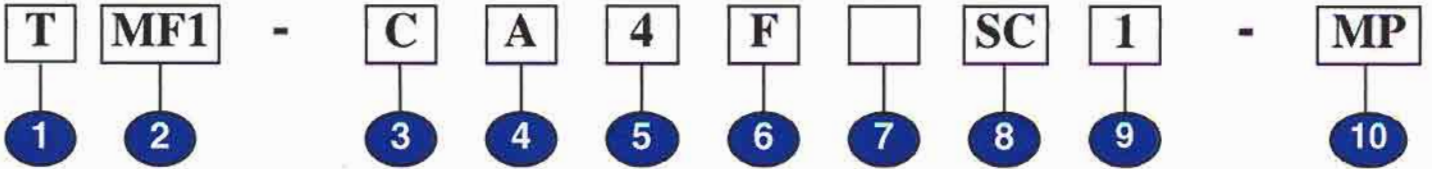
ROD SIZE	J" DIMENSION	H" DIMENSION	KK THREADS	WRENCH FLATS
1.0"	1.5	.38	5/8 - 18	7/8
1.25"	1.5	.65	7/8 - 14	15/16

MALE THREAD

ROD SIZE	J" DIMENSION	H" DIMENSION	KK THREADS	WRENCH FLATS
.75"	1.5	1.69	5/8 - 14	5/8
1.0"	1.5	2.25	7/8 - 14	7/8
1.25"	1.65	2.25	1 1/4 - 12	15/16



how to order



1 **CYLINDER TYPE**

T = Tie Rod	S = Snap Ring
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2 **CYLINDER MOUNTING**

Tie Rod	Snap Ring
MF1 = Head Flange	1 = Standard Tang
MF2 = Cap Flange	2 = Threaded Tang
MP1 = Base Clevis	3 = No Tang
MP2 = Cap Clevis	
MP3 = Base Tang	
MT1 = Trunnion, Rod	
MT2 = Trunnion, Cap	
MT4 = Trunnion, Intermediate	
MS1 = End Angle Mount	
MS2 = Side Lug Mount	
MS4 = Bottom Tap	
MX2 = Ext. Tie Rod, Rod End	
MX3 = Ext. Tie Rod, Cap End	

3 **CYLINDER BORE**

C = 2.00	F = 3.25
D = 2.50	G = 4.00
E = 3.00 (snap ring only)	H = 6.00

4 **ROD Dia.**

A = 3/4	D = 1 3/8
B = 1	E = 1 3/4
C = 1.25 (snap ring only)	F = 2

5 **STROKE**

1/4" INCREMENTS TO 40"
(max. snap ring stroke 36")

6 **ROD END**

F = Female Thread
M = Male Thread
CC = Max. Thread

7 **ROD EXTENSION**

BLANK = Standard Rod Extension
0.00? = Total Dimension Desired (When Cylinder is Retracted)

8 **CUSHIONS**

SC = Standard (Fixed) Cushions
NC = No Cushions

9 **PORTS LOCATION**

Choose Port Location:

1, 2, 3, or 4

10 **OPTIONS**

AS = Adjustable Stroke
 AC = Adjustable Cushions
 BB = Bumpers, Both Ends
 BH = Bumper, Head Only
 BC = Bumper, Cap Only
 CC = Cushions Cap End
 CR = Cushions Rod End
 DL = Dry Assembled
 DR = Double Rod
 EX = Excluder
 HT = High Temp Static Seals
 MP = Magnetic Piston
 NR = Non - Rotating
 OP = Over Sized or Special Ports
 ST = Stop Tube
 SH = Stainless Heads
 SP = Special Ports
 TC = Teflon Coated Heads

OTHER OPTIONS CONSULT CPI

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