



HEAVY DUTY HYDRAULIC CYLINDERS

HIGGINSON



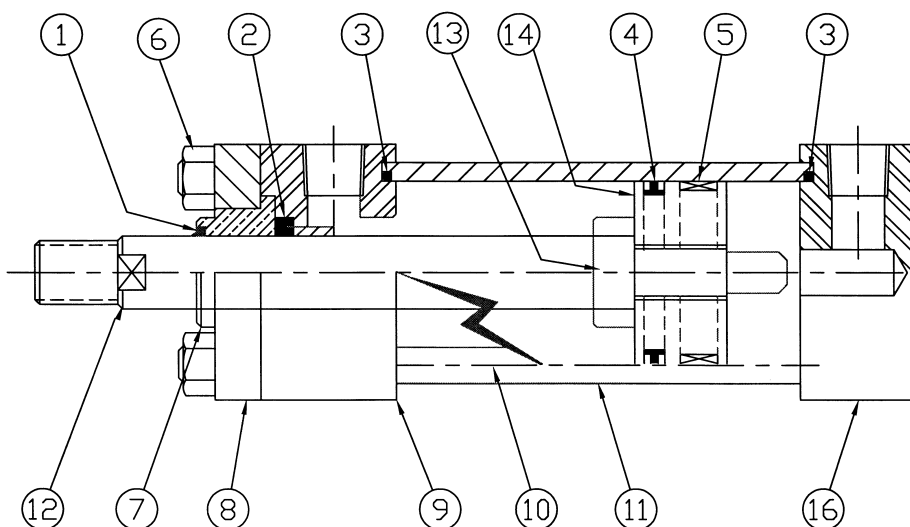
NFPA STYLE

1 1/2" TO 8" BORE

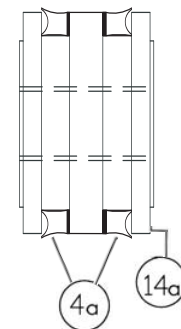
HYDRAULIC
3000 PSI

CONSTRUCTION FEATURES

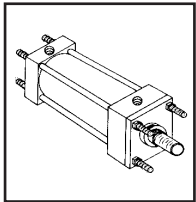
1. **Rod Wiper** – Urethane 90A –65 to + 220F, large cross section lip type wiper designed to protect the bearing and piston rod. Also available in Viton or with metallic scraper (will scrape cement etc. off rod)
2. **Rod Seal** – Polyurethane, –40 to + 225F, double lip D-seal with high dynamic lip force and lower friction for increased sealing against outside contaminants while keeping the air or fluid in.
3. **End Seals** – Buna-N O-ring
4. **Piston Seal** – Buna-N T-seal – 65 to +220F, combination of hard, split back-up ring on each side of sealing element provides a non-spiraling, extrusion resistant and extremely durable seal for long life.
- 4a. **Lip Seal** - Buna-N 90 duro. -20 to +400F. Supplied in Viton for V option.
5. **Wear Strip** – Glass reinforced nylon with physical properties similar to bronze yet it has a high wear rate due to non-scoring properties and ability to ingest metal chips. Compressive strength of 35,000 psi. Wear strip is located at cap end of piston for maximum bearing support.
6. **Nuts** – Steel. Grade 5.
7. **Bearing** – Bronze solid 660 captured with retainer. **Note:** Almost the full bearing length is utilized as the rod seal is located in the cap providing longer bearing life and increased rod support.
8. **Retainer** – Steel. 1018 MS machined.
9. 16. **Head & Cap** – Steel. 1018 MS machined.
10. **Tie Rods** – Stress proof steel 4140. 100,000 psi minimum yield pre-stressed to prevent elongation.
11. **Tube** – Steel C1026 honed heavy wall tube.
12. **Piston Rod** – Chrome plated 1045/1050 steel, .001 min. chrome per side, Rc 69-71, RMS-16
13. **Head Cushion Sleeve** (optional) – 1045/1050 steel machined one piece tapered for longer seal life.
14. **Piston** – Cast Iron machined one piece, anaerobically and mechanically locked to the piston rod.
- 14a. **Lip Seal Piston** - Cast Iron machined one piece, anaerobically and mechanically locked to the piston rod.
15. **Cap Cushion Pin** (optional) – Steel 1045/1050 machined as part of the piston rod, tapered for longer life.



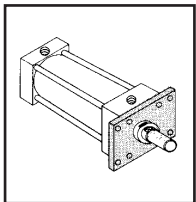
Lip Seals
V Option



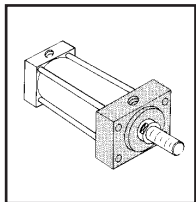
INDEX



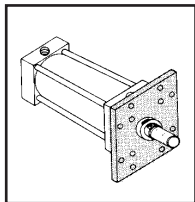
MX1, MX2, MX3



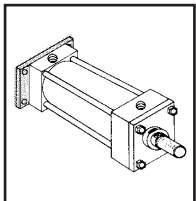
MF1



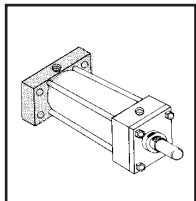
ME5



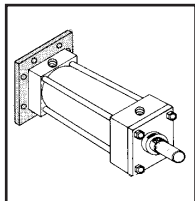
MF5



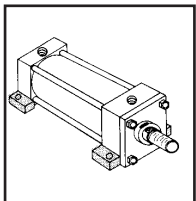
MF2



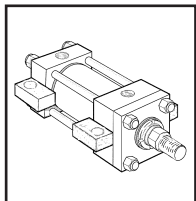
ME6



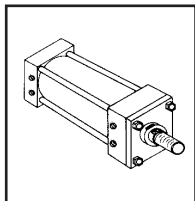
MF6



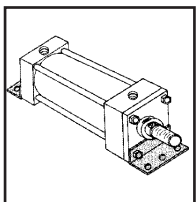
MS2



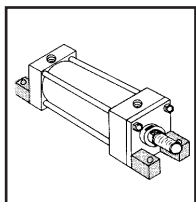
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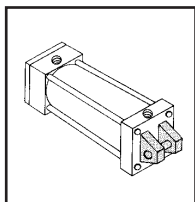
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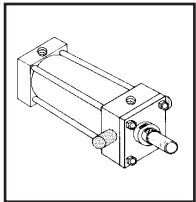
MS1



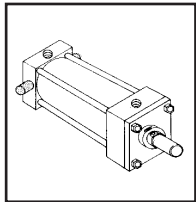
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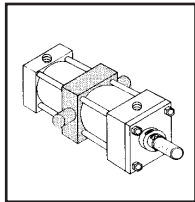
MP1



MT1



MT2



MT4

CONSTRUCTION FEATURES

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TIE ROD MOUNTED CYLINDERS

3-4

1 1/2" to 8" Bore Series HD

HEAD FLANGE MOUNTED CYLINDERS

5-6

1 1/2" to 8" Bore Series HD

CAP FLANGE MOUNTED CYLINDERS

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1 1/2" to 8" Bore Series HD

LUG & TAPPED MOUNTED CYLINDERS

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1 1/2" to 8" Bore Series HD

ANGLES, END LUGS & LEVIS MOUNTED CYLINDERS

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1 1/2" to 8" Bore Series HD

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1 1/2" to 8" Bore Series HD

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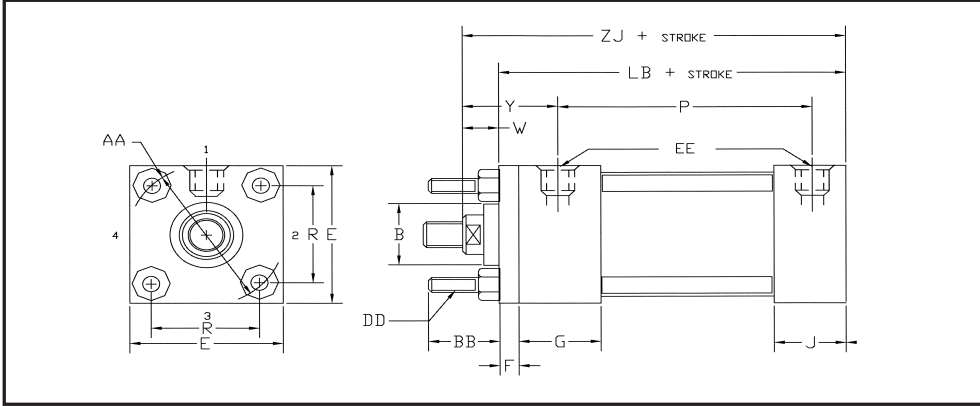
STOP TUBE

20

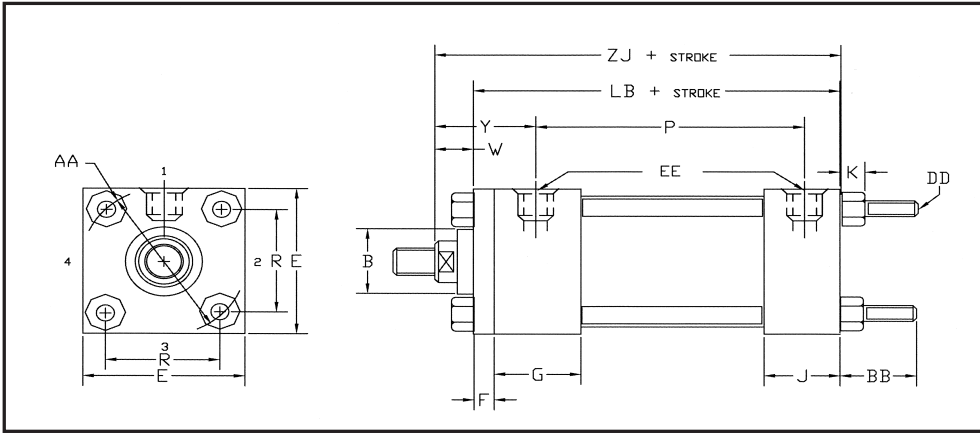
HOW TO ORDER

21

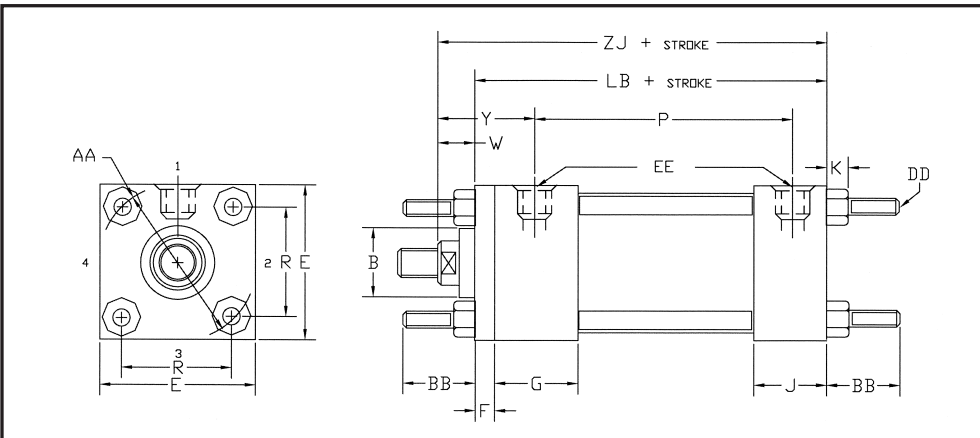
TIE ROD 1 1/2" TO 8"



TIE RODS EXTENDED
HEAD END
MX3



TIE RODS EXTENDED
CAP END
MX2



TIE RODS EXTENDED
BOTH ENDS
MX1

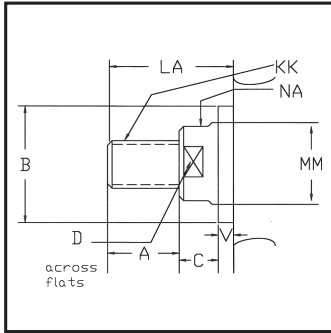
ENVELOPE AND MOUNTING DIMENSIONS NOT AFFECTED BY ROD DIAMETER

Bore	AA	BB	DD	E	EE		F	G	J	K	R	Add Stroke	
					NPTF*	SAE						LB	P
1 1/2	2.3	1 3/8	3/8 - 24	2 1/2	1/2	10	3/8	1 3/4	1 1/2	3/8	1.63	5	2 7/8
2	2.9	1 13/16	1/2 - 20	3	1/2	10	5/8	1 3/4	1 1/2	7/16	2.05	5 1/4	2 7/8
2 1/2	3.6	1 13/16	1/2 - 20	3 1/2	1/2	10	5/8	1 3/4	1 1/2	7/16	2.55	5 3/8	3
3 1/4	4.6	2 5/16	5/8 - 18	4 1/2	3/4	12	3/4	2	1 3/4	9/16	3.25	6 1/4	3 1/2
4	5.4	2 5/16	5/8 - 18	5	3/4	12	7/8	2	1 3/4	9/16	3.82	6 5/8	3 3/4
5	7	3 3/16	7/8 - 14	6 1/2	3/4	12	7/8	2	1 3/4	13/16	4.95	7 1/8	4 1/4
6	8.1	3 5/8	1 - 14	7 1/2	1	16	1	2 1/4	2 1/4	7/8	5.73	8 3/8	4 7/8
8	10.6	4 1/2	1 1/4 - 12	9 1/2	1 1/2	24	1	3	3	1 1/2	7.50	10 1/2	6 1/4

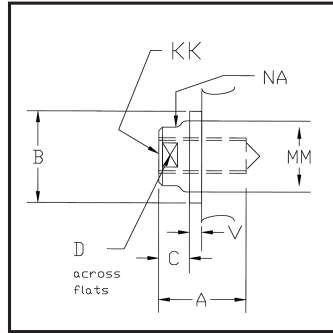
* This is not a standard option, please consult factory for availability



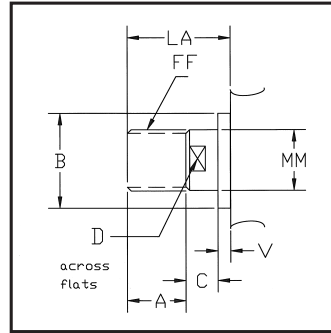
TIE ROD 1 1/2" TO 8"



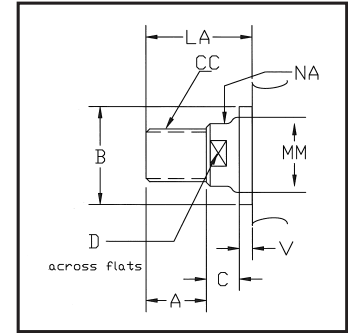
Style A
Standard Male



Style B
Female



Style C
Full Male



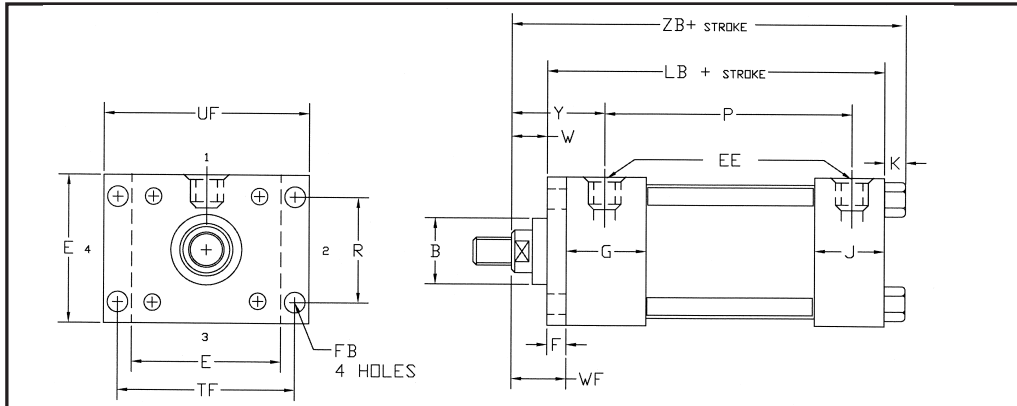
Style D
Intermediate Male

ROD END STYLES

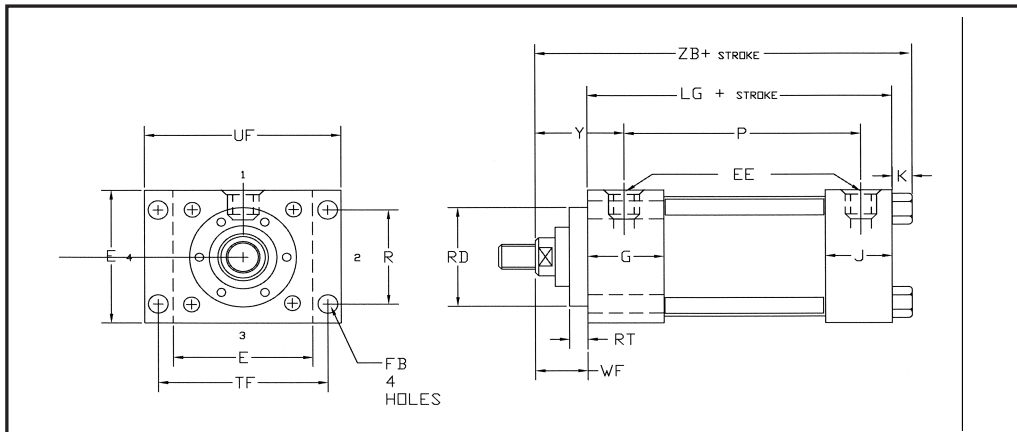
DIMENSIONS AFFECTED BY ROD DIAMETER

Bore	Rod Dia. MM	Thread			Rod Extensions and Pilot Dimensions										Add Stroke	
		Style D CC	Style A & B KK	Style C FF	A	+0.000 -0.002 B	C	D	LA	LAF	NA	V	W	Y	ZJ	
1 1/2	5/8	1/2 - 20	7/16 - 20	5/8 - 18	3/4	1.124	3/8	1/2	1 3/8	-	9/16	1/4	5/8	2	5 5/8	
	1	7/8 - 14	3/4 - 16	1 - 14	1 1/8	1.499	1/2	7/8	2 1/8	-	15/16	1/2	1	2 3/8	6	
2	1	7/8 - 14	3/4 - 16	1 - 14	1 1/8	1.499	1/2	7/8	1 7/8	-	15/16	1/4	3/4	2 3/8	6	
	1 3/8	1 1/4 - 12	1 - 14	1 3/8 - 12	1 5/8	1.999	5/8	1 1/8	2 5/8	-	1 5/16	3/8	1	2 5/8	6 1/4	
2 1/2	1	7/8 - 14	3/4 - 16	1 - 14	1 1/8	1.499	1/2	7/8	1 7/8	-	15/16	1/4	3/4	2 3/8	6 1/8	
	1 3/8	1 1/4 - 12	1 - 14	1 3/8 - 12	1 5/8	1.999	5/8	1 1/8	2 5/8	-	1 5/16	3/8	1	2 5/8	6 3/8	
	1 3/4	1 1/2 - 12	1 1/4 - 12	1 3/4 - 12	2	2.374	3/4	1 1/2	3 1/4	-	1 11/16	1/2	1 1/4	2 7/8	6 5/8	
3 1/4	1 3/8	1 1/4 - 12	1 - 14	1 3/8 - 12	1 5/8	1.999	5/8	1 1/8	2 1/2	-	1 5/16	1/4	7/8	2 3/4	7 1/8	
	1 3/4	1 1/2 - 12	1 1/4 - 12	1 3/4 - 12	2	2.374	3/4	1 1/2	3 1/8	-	1 11/16	3/8	1 1/8	3	7 3/8	
	2	1 3/4 - 12	1 1/2 - 12	2 - 12	2 1/4	2.624	7/8	1 11/16	3 1/2	-	1 15/16	3/8	1 1/4	3 1/8	7 1/2	
4	1 3/4	1 1/2 - 12	1 1/4 - 12	1 3/4 - 12	2	2.374	3/4	1 1/2	3	-	1 11/16	1/4	1	3	7 5/8	
	2	1 3/4 - 12	1 1/2 - 12	2 - 12	2 1/4	2.624	7/8	1 11/16	3 3/8	-	1 15/16	1/4	1 1/8	3 1/8	7 3/4	
	2 1/2	2 1/4 - 12	1 7/8 - 12	2 1/2 - 12	3	3.124	1	2 1/16	4 3/8	-	2 3/8	3/8	1 3/8	3 3/8	8	
5	2	1 3/4 - 12	1 1/2 - 12	2 - 12	2 1/4	2.624	7/8	1 11/16	3 3/8	-	1 15/16	1/4	1 1/8	3 1/8	8 1/4	
	2 1/2	2 1/4 - 12	1 7/8 - 12	2 1/2 - 12	3	3.124	1	2 1/16	4 3/8	-	2 3/8	3/8	1 3/8	3 3/8	8 1/2	
	3	2 3/4 - 12	2 1/4 - 12	3 - 12	3 1/2	3.749	1	2 5/8	4 7/8	-	2 7/8	3/8	1 3/8	3 3/8	8 1/2	
	3 1/2	3 1/4 - 12	2 1/2 - 12	3 1/2 - 12	3 1/2	4.249	1	3	4 7/8	-	3 3/8	3/8	1 3/8	3 3/8	8 1/2	
6	2 1/2	2 1/4 - 12	1 7/8 - 12	2 1/2 - 12	3	3.124	1	2 1/16	4 1/4	-	2 3/8	1/4	1 1/4	3 1/2	9 5/8	
	3	2 3/4 - 12	2 1/4 - 12	3 - 12	3 1/2	3.749	1	2 5/8	4 3/4	-	2 7/8	1/4	1 1/4	3 1/2	9 5/8	
	3 1/2	3 1/4 - 12	2 1/2 - 12	3 1/2 - 12	3 1/2	4.249	1	3	4 3/4	-	3 3/8	1/4	1 1/4	3 1/2	9 5/8	
	4	3 3/4 - 12	3 - 12	4 - 12	4	4.749	1	3 3/8	5 1/4	-	3 7/8	1/4	1 1/4	3 1/2	9 5/8	
8	3 1/2	3 1/4 - 12	2 1/2 - 12	3 1/2 - 12	3 1/2	4.249	1	3	-	5 3/4	3 3/8	5/8	1 1/4	3 7/8	11 3/4	
	4	3 3/4 - 12	3 - 12	4 - 12	4	4.749	1	3 3/8	-	6 1/4	3 7/8	1/2	1 1/4	3 7/8	11 3/4	
	4 1/2	4 1/4 - 12	3 1/4 - 12	4 1/2 - 12	4 1/2	5.249	1	-	-	6 3/4	4 3/8	1/2	1 1/4	3 7/8	11 3/4	
	5	4 3/4 - 12	3 1/2 - 12	5 - 12	5	5.749	1	-	-	7 1/4	4 7/8	1/4	1 1/4	3 7/8	11 3/4	
	5 1/2	5 1/4 - 12	4 - 12	5 1/2 - 12	5 1/2	6.249	1	-	-	7 3/4	5 3/8	1/4	1 1/4	3 7/8	11 3/4	

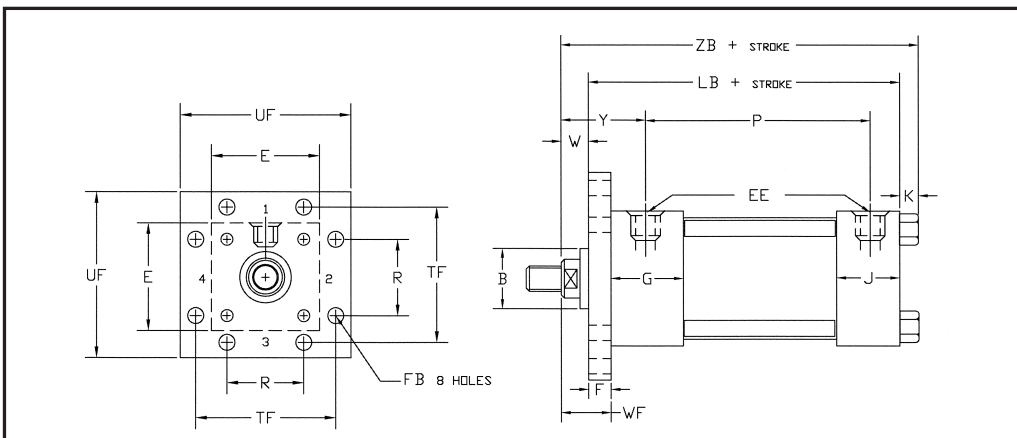
RECTANGULAR FLANGE & HEAD MOUNTING 1 1/2" TO 8"



HEAD RECTANGULAR
FLANGE
MF1



HEAD RECTANGULAR
HEAVY DUTY FLANGE
ME5



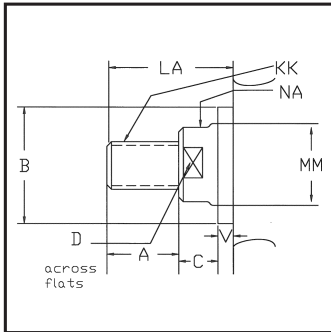
HEAD SQUARE
FLANGE
MF5

ENVELOPE AND MOUNTING DIMENSIONS NOT AFFECTED BY ROD DIAMETER

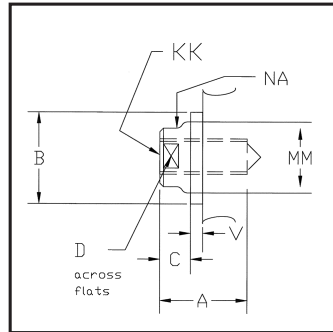
Bore	EE				Add Stroke									
	E	NPTF*	SAE	F	FB	G	J	K	R	TF	UF	LB	LG	P
1 1/2	2 1/2	1/2	10	3/8	7/16	1 3/4	1 1/2	3/8	1.63	3 7/16	4 1/4	5	4 5/8	2 7/8
2	3	1/2	10	5/8	9/16	1 3/4	1 1/2	7/16	2.05	4 1/8	5 1/8	5 1/4	4 5/8	2 7/8
2 1/2	3 1/2	1/2	10	5/8	9/16	1 3/4	1 1/2	7/16	2.55	4 5/8	5 5/8	5 3/8	4 3/4	3
3 1/4	4 1/2	3/4	12	3/4	11/16	2	1 3/4	9/16	3.25	5 7/8	7 1/8	6 1/4	5 1/2	3 1/2
4	5	3/4	12	7/8	11/16	2	1 3/4	9/16	3.82	6 3/8	7 5/8	6 5/8	5 3/4	3 3/4
5	6 1/2	3/4	12	7/8	15/16	2	1 3/4	13/16	4.95	8 3/16	9 3/4	7 1/8	6 1/4	4 1/4
6	7 1/2	1	16	1	1 1/16	2 1/4	2 1/4	7/8	5.73	9 7/16	11 1/4	8 3/8	7 3/8	4 7/8
8	9 1/2	1 1/2	24	1	1 5/16	3	3	1 1/2	7.50	11 13/16	14	10 1/2	9 1/2	6 1/4

* This is not a standard option, please consult factory for availability

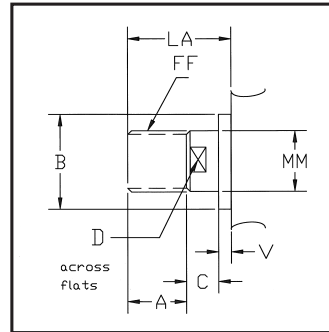
RECTANGULAR FLANGE & HEAD MOUNTING 1 1/2" TO 8"



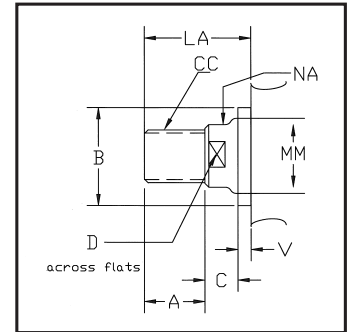
Style A
Standard Male



Style B
Female



Style C
Full Male



Style D
Intermediate Male

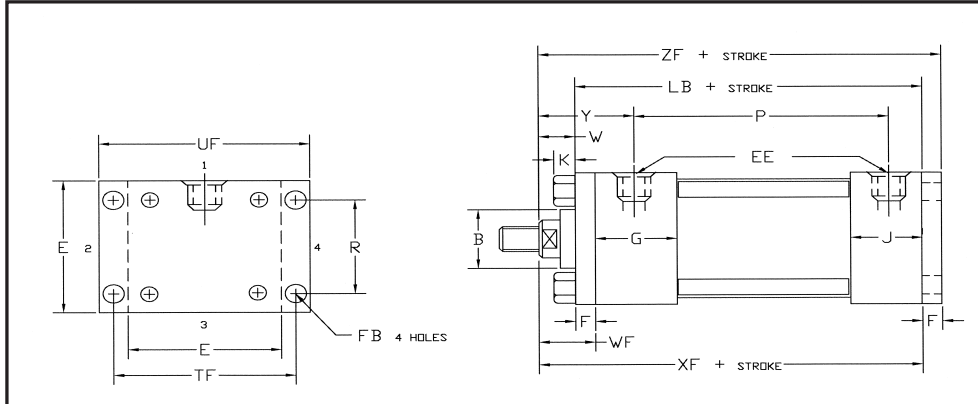
ROD END STYLES

DIMENSIONS AFFECTED BY ROD DIAMETER

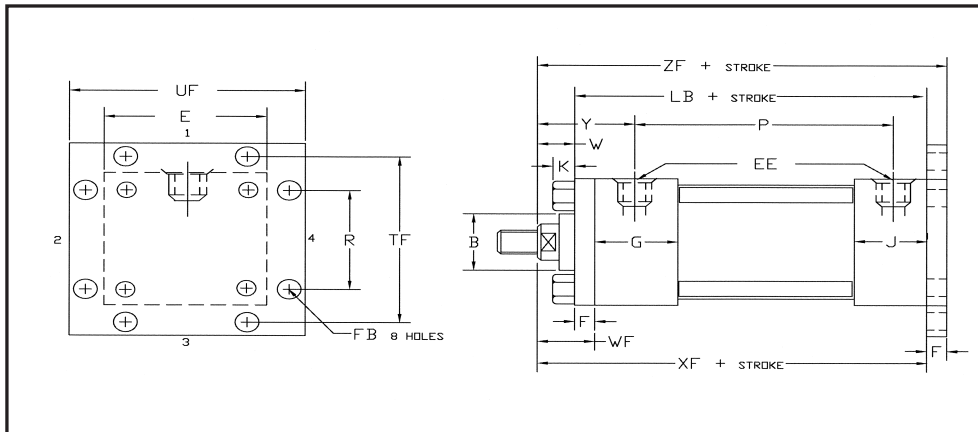
Bore	Rod Dia. MM	Thread			Rod Extensions and Pilot Dimensions													Add Stroke	
		Style D CC	Style A & B KK	Style C FF	A	+0.000 -0.002 B	C	D	LA	LAF	NA	V	W	RD	RT*	WF	Y	ZB	
1 1/2	5/8	1/2 - 20	7/16 - 20	5/8 - 18	3/4	1.124	3/8	1/2	1 3/8	-	9/16	1/4	5/8	2 1/8	3/8	1	2	6	
	1	7/8 - 14	3/4 - 16	1 - 14	1 1/8	1.499	1/2	7/8	2 1/8	-	15/16	1/2	1	2 1/2	5/8	1 3/8	2 3/8	6 3/8	
2	1	7/8 - 14	3/4 - 16	1 - 14	1 1/8	1.499	1/2	7/8	1 7/8	-	15/16	1/4	3/4	2 1/2	5/8	1 3/8	2 3/8	6 7/16	
	1 3/8	1 1/4 - 12	1 - 14	1 3/8 - 12	1 5/8	1.999	5/8	1 1/8	2 5/8	-	15/16	3/8	1	3	3/4	1 5/8	2 5/8	6 11/16	
2 1/2	1	7/8 - 14	3/4 - 16	1 - 14	1 1/8	1.499	1/2	7/8	1 7/8	-	15/16	1/4	3/4	2 1/2	5/8	1 3/8	2 3/8	6 9/16	
	1 3/8	1 1/4 - 12	1 - 14	1 3/8 - 12	1 5/8	1.999	5/8	1 1/8	2 5/8	-	15/16	3/8	1	3	3/4	1 5/8	2 5/8	6 13/16	
	1 3/4	1 1/2 - 12	1 1/4 - 12	1 3/4 - 12	2	2.374	3/4	1 1/2	3 1/4	-	1 11/16	1/2	1 1/4	3 1/2	7/8	1 7/8	2 7/8	7 1/16	
3 1/4	1 3/8	1 1/4 - 12	1 - 14	1 3/8 - 12	1 5/8	1.999	5/8	1 1/8	2 1/2	-	15/16	1/4	7/8	3	3/4	1 5/8	2 3/4	7 11/16	
	1 3/4	1 1/2 - 12	1 1/4 - 12	1 3/4 - 12	2	2.374	3/4	1 1/2	3 1/8	-	1 11/16	3/8	1 1/8	3 1/2	7/8	1 7/8	3	7 15/16	
	2	1 3/4 - 12	1 1/2 - 12	2 - 12	2 1/4	2.624	7/8	1 11/16	3 1/2	-	1 15/16	3/8	1 1/4	4	7/8	2	3 1/8	8 1/16	
4	1 3/4	1 1/2 - 12	1 1/4 - 12	1 3/4 - 12	2	2.374	3/4	1 1/2	3	-	1 11/16	1/4	1	3 1/2	7/8	1 7/8	3	8 3/16	
	2	1 3/4 - 12	1 1/2 - 12	2 - 12	2 1/4	2.624	7/8	1 11/16	3 3/8	-	1 15/16	1/4	1 1/8	4	7/8	2	3 1/8	8 5/16	
	2 1/2	2 1/4 - 12	1 7/8 - 12	2 1/2 - 12	3	3.124	1	2 1/16	4 3/8	-	2 3/8	3/8	1 3/8	4 1/2	1	2 1/4	3 3/8	8 9/16	
5	2	1 3/4 - 12	1 1/2 - 12	2 - 12	2 1/4	2.624	7/8	1 11/16	3 3/8	-	1 15/16	1/4	1 1/8	4	7/8	2	3 1/8	9 1/16	
	2 1/2	2 1/4 - 12	1 7/8 - 12	2 1/2 - 12	3	3.124	1	2 1/16	4 3/8	-	2 3/8	3/8	1 3/8	4 1/2	1	2 1/4	3 3/8	9 5/16	
	3	2 3/4 - 12	2 1/4 - 12	3 - 12	3 1/2	3.749	1	2 5/8	4 7/8	-	2 7/8	3/8	1 3/8	5 1/4	1	2 1/4	3 3/8	9 5/16	
	3 1/2	3 1/4 - 12	2 1/2 - 12	3 1/2 - 12	3 1/2	4.249	1	3	4 7/8	-	3 3/8	3/8	1 3/8	5 3/4	1	2 1/4	3 3/8	9 5/16	
6	2 1/2	2 1/4 - 12	1 7/8 - 12	2 1/2 - 12	3	3.124	1	2 1/16	4 1/4	-	2 3/8	1/4	1 1/4	4 1/2	1	2 1/4	3 1/2	10 1/2	
	3	2 3/4 - 12	2 1/4 - 12	3 - 12	3 1/2	3.749	1	2 5/8	4 3/4	-	2 7/8	1/4	1 1/4	5 1/4	1	2 1/4	3 1/2	10 1/2	
	3 1/2	3 1/4 - 12	2 1/2 - 12	3 1/2 - 12	3 1/2	4.249	1	3	4 3/4	-	3 3/8	1/4	1 1/4	5 3/4	1	2 1/4	3 1/2	10 1/2	
	4	3 3/4 - 12	3 - 12	4 - 12	4	4.749	1	3 3/8	5 1/4	-	3 7/8	1/4	1 1/4	6 1/2	1	2 1/4	3 1/2	10 1/2	
8	3 1/2	3 1/4 - 12	2 1/2 - 12	3 1/2 - 12	3 1/2	4.249	1	3	-	5 3/4	3 3/8	5/8	1 1/4	5 3/4	5/8	2 1/4	3 7/8	13 1/4	
	4	3 3/4 - 12	3 - 12	4 - 12	4	4.749	1	3 3/8	-	6 1/4	3 7/8	1/2	1 1/4	6 1/2	3/4	2 1/4	3 7/8	13 1/4	
	4 1/2	4 1/4 - 12	3 1/4 - 12	4 1/2 - 12	4 1/2	5.249	1	-	-	6 3/4	4 3/8	1/2	1 1/4	7	3/4	2 1/4	3 7/8	13 1/4	
	5	4 3/4 - 12	3 1/2 - 12	5 - 12	5	5.749	1	-	-	7 1/4	4 7/8	1/4	1 1/4	7 1/4	1	2 1/4	3 7/8	13 1/4	
	5 1/2	5 1/4 - 12	4 - 12	5 1/2 - 12	5 1/2	6.249	1	-	-	7 3/4	5 3/8	1/4	1 1/4	8 1/4	1	2 1/4	3 7/8	13 1/4	

* Socket heads extend beyond RT on some bore sizes (not shown) consult factory for dimension

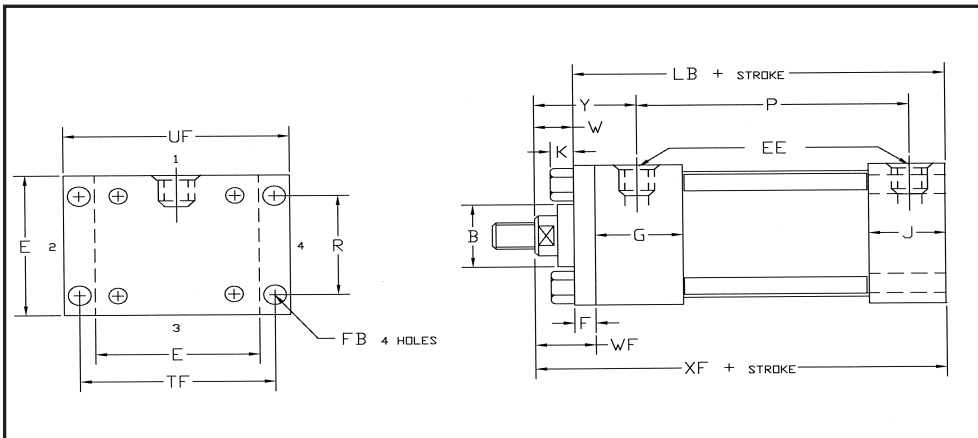
RECTANGULAR FLANGE & CAP MOUNTING 1 1/2" TO 8"



CAP RECTANGULAR FLANGE
MF2



CAP SQUARE FLANGE
MF6



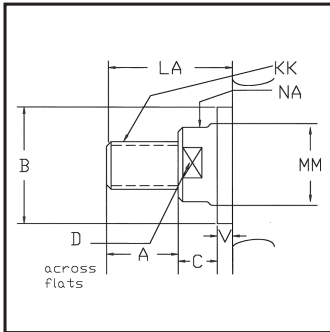
CAP RECTANGULAR HEAVY DUTY FLANGE
ME6

ENVELOPE AND MOUNTING DIMENSIONS NOT AFFECTED BY ROD DIAMETER

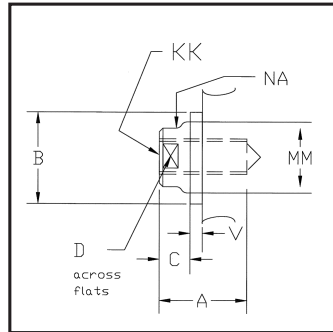
Bore	EE				Add Stroke								
	E	NPTF*	SAE	F	FB	G	J	K	R	TF	UF	LB	P
1 1/2	2 1/2	1/2	10	3/8	7/16	1 3/4	1 1/2	3/8	1.63	3 7/16	4 1/4	5	2 7/8
2	3	1/2	10	5/8	9/16	1 3/4	1 1/2	7/16	2.05	4 1/8	5 1/8	5 1/4	2 7/8
2 1/2	3 1/2	1/2	10	5/8	9/16	1 3/4	1 1/2	7/16	2.55	4 5/8	5 5/8	5 3/8	3
3 1/4	4 1/2	3/4	12	3/4	11/16	2	1 3/4	9/16	3.25	5 7/8	7 1/8	6 1/4	3 1/2
4	5	3/4	12	7/8	11/16	2	1 3/4	9/16	3.82	6 3/8	7 5/8	6 5/8	3 3/4
5	6 1/2	3/4	12	7/8	15/16	2	1 3/4	13/16	4.95	8 3/16	9 3/4	7 1/8	4 1/4
6	7 1/2	1	16	1	1 1/16	2 1/4	2 1/4	7/8	5.73	9 7/16	11 1/4	8 3/8	4 7/8
8	9 1/2	1 1/2	24	1	1 5/16	3	3	1 1/2	7.50	11 13/16	14	10 1/2	6 1/4

* This is not a standard option, please consult factory for availability

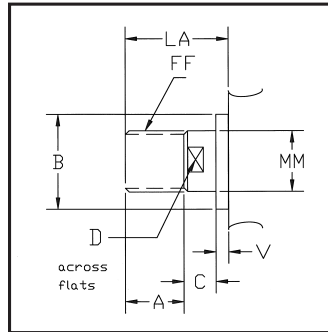
RECTANGULAR FLANGE & CAP MOUNTING 1 1/2" TO 8"



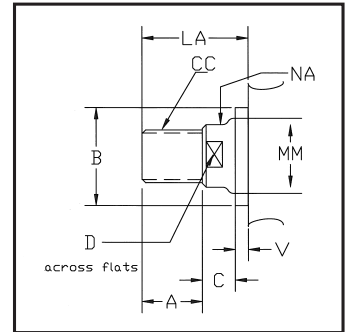
Style A
Standard Male



Style B
Female



Style C
Full Male



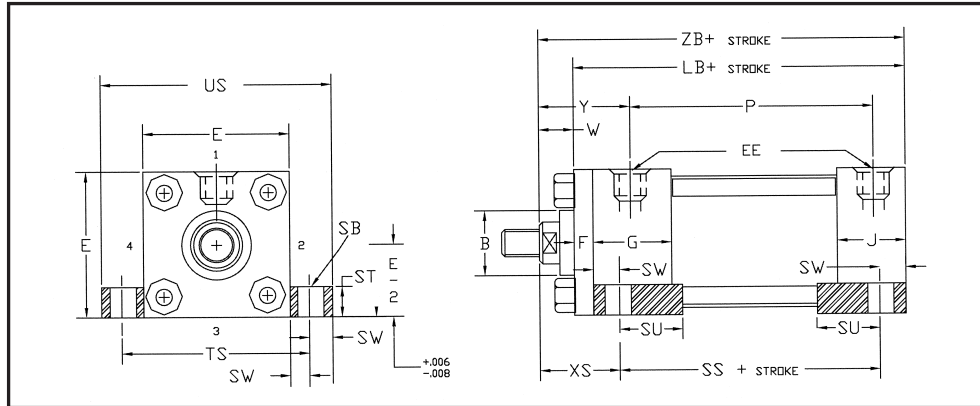
Style D
Intermediate Male

ROD END STYLES

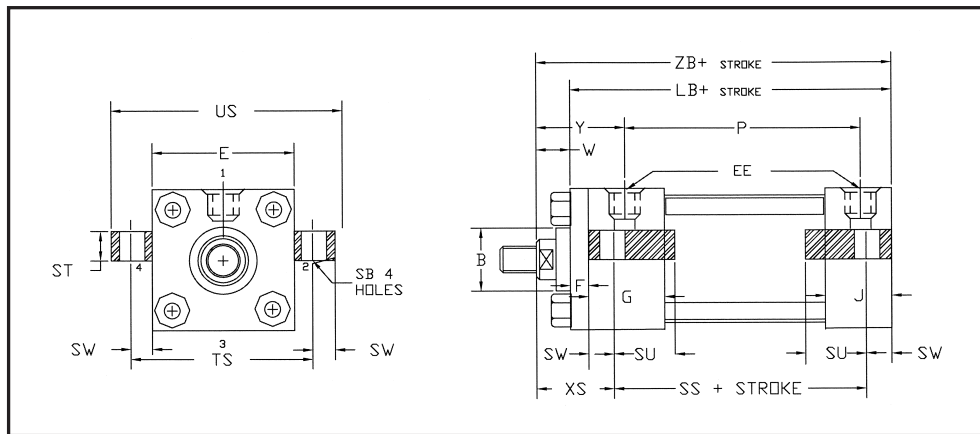
DIMENSIONS AFFECTED BY ROD DIAMETER

Bore	Rod Dia. MM	Thread			Rod Extensions and Pilot Dimensions										Add Stroke		
		Style D CC	Style A & B KK	Style C FF	A	+0.000 -0.002 B	C	D	LA	LAF	NA	V	W	WF	Y	XF	ZF
1 1/2	5/8	1/2 - 20	7/16 - 20	5/8 - 18	3/4	1.124	3/8	1/2	1 3/8	-	9/16	1/4	5/8	1	2	5 5/8	6
	1	7/8 - 14	3/4 - 16	1 - 14	1 1/8	1.499	1/2	7/8	2 1/8	-	15/16	1/2	1	1 3/8	2 3/8	6	6 3/8
2	1	7/8 - 14	3/4 - 16	1 - 14	1 1/8	1.499	1/2	7/8	1 7/8	-	15/16	1/4	3/4	1 3/8	2 3/8	6	6 7/16
	1 3/8	1 1/4 - 12	1 - 14	1 3/8 - 12	1 5/8	1.999	5/8	1 1/8	2 5/8	-	1 5/16	3/8	1	1 5/8	2 5/8	6 1/4	6 11/16
2 1/2	1	7/8 - 14	3/4 - 16	1 - 14	1 1/8	1.499	1/2	7/8	1 7/8	-	15/16	1/4	3/4	1 3/8	2 3/8	6 1/8	6 9/16
	1 3/8	1 1/4 - 12	1 - 14	1 3/8 - 12	1 5/8	1.999	5/8	1 1/8	2 5/8	-	1 5/16	3/8	1	1 7/8	2 5/8	6 3/8	6 13/16
3 1/4	1 3/4	1 1/2 - 12	1 1/4 - 12	1 3/4 - 12	2	2.374	3/4	1 1/2	3 1/4	-	1 11/16	1/2	1 1/4	1 5/8	2 7/8	6 5/8	7 1/16
	1 3/8	1 1/4 - 12	1 - 14	1 3/8 - 12	1 5/8	1.999	5/8	1 1/8	2 1/2	-	1 5/16	1/4	7/8	1 5/8	2 3/4	7 1/8	7 11/16
4	1 3/4	1 1/2 - 12	1 1/4 - 12	1 3/4 - 12	2	2.374	3/4	1 1/2	3 1/8	-	1 11/16	3/8	1 1/8	2	3	7 3/8	7 15/16
	2	1 3/4 - 12	1 1/2 - 12	2 - 12	2 1/4	2.624	7/8	1 11/16	3 1/2	-	1 15/16	3/8	1 1/4	1 7/8	3 1/8	7 1/2	8 1/16
5	1 3/4	1 1/2 - 12	1 1/4 - 12	1 3/4 - 12	2	2.374	3/4	1 1/2	3	-	1 11/16	1/4	1	1 7/8	3	7 5/8	8 3/16
	2	1 3/4 - 12	1 1/2 - 12	2 - 12	2 1/4	2.624	7/8	1 11/16	3 3/8	-	1 15/16	1/4	1 1/8	2 1/4	3 1/8	7 3/4	8 5/16
6	2 1/2	2 1/4 - 12	1 7/8 - 12	2 1/2 - 12	3	3.124	1	2 1/16	4 3/8	-	2 3/8	3/8	1 3/8	2	3 3/8	8	8 9/16
	2	1 3/4 - 12	1 1/2 - 12	2 - 12	2 1/4	2.624	7/8	1 11/16	3 3/8	-	1 15/16	1/4	1 1/8	2	3 1/8	8 1/4	9 1/16
7	2 1/2	2 1/4 - 12	1 7/8 - 12	2 1/2 - 12	3	3.124	1	2 1/16	4 3/8	-	2 3/8	3/8	1 3/8	2 1/4	3 3/8	8 1/2	9 5/16
	3	2 3/4 - 12	2 1/4 - 12	3 - 12	3 1/2	3.749	1	2 5/8	4 7/8	-	2 7/8	3/8	1 3/8	2 1/4	3 3/8	8 1/2	9 5/16
8	3 1/2	3 1/4 - 12	2 1/2 - 12	3 1/2 - 12	3 1/2	4.249	1	3	4 7/8	-	3 3/8	3/8	1 3/8	2 1/4	3 3/8	8 1/2	9 5/16
	2 1/2	2 1/4 - 12	1 7/8 - 12	2 1/2 - 12	3	3.124	1	2 1/16	4 1/4	-	2 3/8	1/4	1 1/4	2 1/4	3 1/2	9 5/8	10 1/2
9	3	2 3/4 - 12	2 1/4 - 12	3 - 12	3 1/2	3.749	1	2 5/8	4 3/4	-	2 7/8	1/4	1 1/4	2 1/4	3 1/2	9 5/8	10 1/2
	3 1/2	3 1/4 - 12	2 1/2 - 12	3 1/2 - 12	3 1/2	4.249	1	3	4 3/4	-	3 3/8	1/4	1 1/4	2 1/4	3 1/2	9 5/8	10 1/2
10	4	3 3/4 - 12	3 - 12	4 - 12	4	4.749	1	3 3/8	5 1/4	-	3 7/8	1/4	1 1/4	2 1/4	3 1/2	9 5/8	10 1/2
	3 1/2	3 1/4 - 12	2 1/2 - 12	3 1/2 - 12	3 1/2	4.249	1	3	-	5 3/4	3 3/8	5/8	1 1/4	2 1/4	3 7/8	11 3/4	12 3/4
11	4	3 3/4 - 12	3 - 12	4 - 12	4	4.749	1	3 3/8	-	6 1/4	3 7/8	1/2	1 1/4	2 1/4	3 7/8	11 3/4	12 3/4
	4 1/2	4 1/4 - 12	3 1/4 - 12	4 1/2 - 12	4 1/2	5.249	1	-	-	6 3/4	4 3/8	1/2	1 1/4	2 1/4	3 7/8	11 3/4	12 3/4
12	5	4 3/4 - 12	3 1/2 - 12	5 - 12	5	5.749	1	-	-	7 1/4	4 7/8	1/4	1 1/4	2 1/4	3 7/8	11 3/4	12 3/4
	5 1/2	5 1/4 - 12	4 - 12	5 1/2 - 12	5 1/2	6.249	1	-	-	7 3/4	5 3/8	1/4	1 1/4	2 1/4	3 7/8	11 3/4	12 3/4

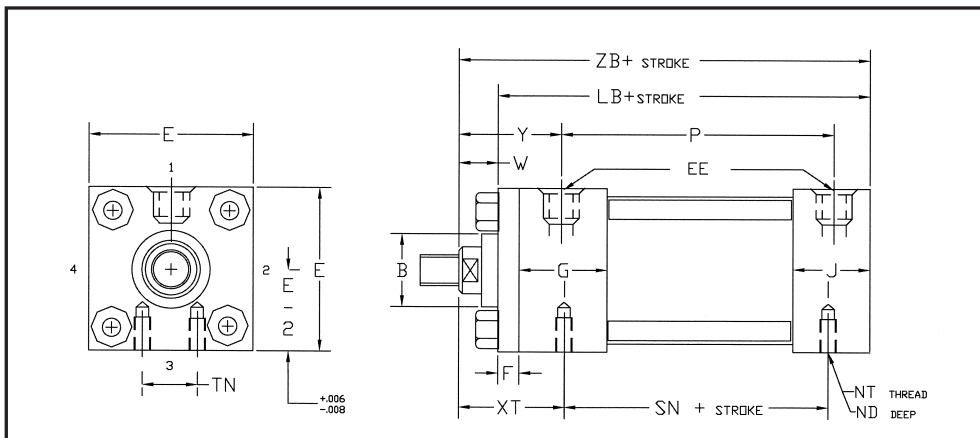
SIDE LUGS, CENTRELINE LUGS & SIDE TAPPED MOUNTINGS 1 1/2" TO 8"



SIDE LUG
MS2



CENTRELINE LUG
MS3



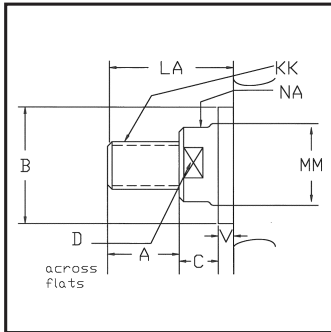
SIDE TAPPED
MS4

ENVELOPE AND MOUNTING DIMENSIONS NOT AFFECTED BY ROD DIAMETER

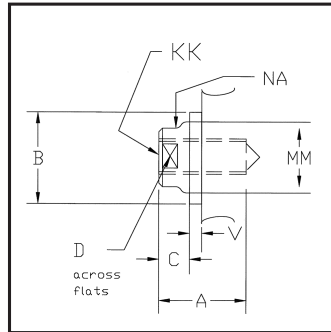
Bore	EE														Add Stroke				
	E	NPTF*	SAE	F	G	J	K	NT	SB	ST	SU	SW	TN	TS	US	LB	P	SN	SS
1 1/2	2 1/2	1/2	10	3/8	1 3/4	1 1/2	3/8	3/8 - 16	7/16	1/2	15/16	3/8	3/4	3 1/4	4	5	2 7/8	2 7/8	3 7/8
2	3	1/2	10	5/8	1 3/4	1 1/2	7/16	1/2 - 13	9/16	3/4	1 1/4	1/2	15/16	4	5	5 1/4	2 7/8	2 7/8	3 5/8
2 1/2	3 1/2	1/2	10	5/8	1 3/4	1 1/2	7/16	5/8 - 11	13/16	1	1 9/16	11/16	1 5/16	4 7/8	6 1/4	5 3/8	3	3	3 3/8
3 1/4	4 1/2	3/4	12	3/4	2	1 3/4	9/16	3/4 - 10	13/16	1	1 9/16	11/16	1 1/2	5 7/8	7 1/4	6 1/4	3 1/2	3 1/2	4 1/8
4	5	3/4	12	7/8	2	1 3/4	9/16	1 - 8	1 1/16	1 1/4	2	7/8	2 1/16	6 3/4	8 1/2	6 5/8	3 3/4	3 3/4	4
5	6 1/2	3/4	12	7/8	2	1 3/4	13/16	1 - 8	1 1/16	1 1/4	2	7/8	2 15/16	8 1/4	10	7 1/8	4 1/4	4 1/4	4 1/2
6	7 1/2	1	16	1	2 1/4	2 1/4	7/8	1 1/4 - 7	1 5/16	1 1/2	2 1/2	1 1/8	3 5/16	9 3/4	12	8 3/8	4 7/8	5 1/8	5 1/8
8	9 1/2	1 1/2	24	1	3	3	1 1/2	1 1/2 - 6	1 9/16	1 3/4	2 7/8	1 3/8	4 1/4	12 1/4	15	10 1/2	6 1/4	6 5/8	6 3/4

* This is not a standard option, please consult factory for availability

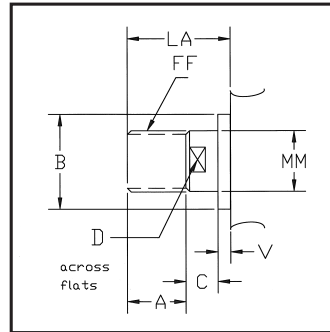
SIDE LUG, CENTRELINE LUG & SIDE TAPPED MOUNTINGS 1 1/2" TO 8"



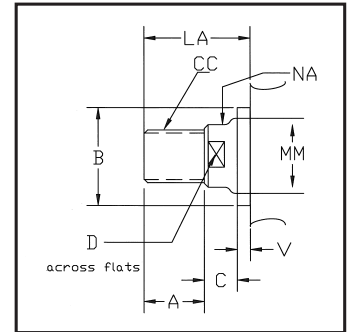
Style A
Standard Male



Style B
Female



Style C
Full Male



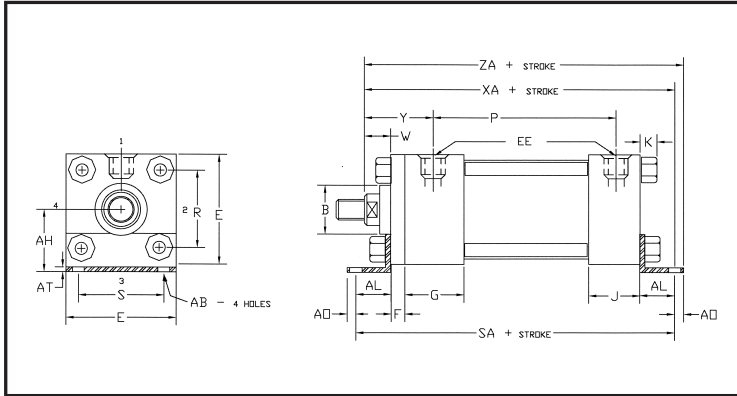
Style D
Intermediate Male

ROD END STYLES

DIMENSIONS AFFECTED BY ROD DIAMETER

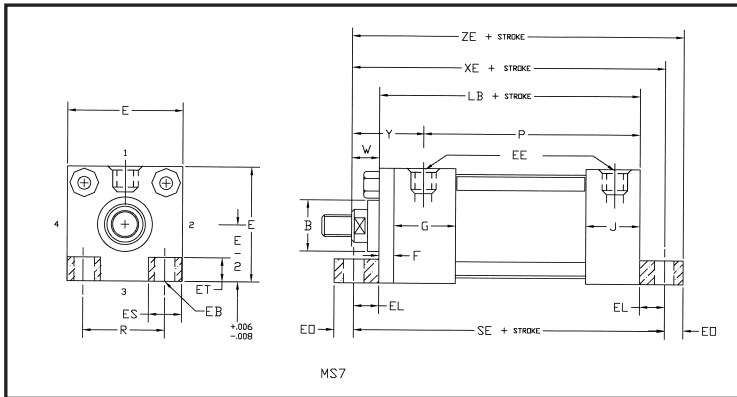
Bore	Rod Dia. MM	Thread			Rod Extensions and Pilot Dimensions													Add Stroke	
		Style D CC	Style A & B KK	Style C FF	A	+0.000 -0.002 B	C	D	LA	LAF	NA	V	W	ND	XS	XT	Y	ZB	
1 1/2	5/8	1/2 - 20	7/16 - 20	5/8 - 18	3/4	1.124	3/8	1/2	1 3/8	-	9/16	1/4	5/8	3/8	1 3/8	2	2	5 5/8	
	1	7/8 - 14	3/4 - 16	1 - 14	1 1/8	1.499	1/2	7/8	2 1/8	-	15/16	1/2	1	3/8	1 3/4	2 3/8	2 3/8	6	
2	1	7/8 - 14	3/4 - 16	1 - 14	1 1/8	1.499	1/2	7/8	1 7/8	-	15/16	1/4	3/4	7/16	1 7/8	2 3/8	2 3/8	6	
	1 3/8	1 1/4 - 12	1 - 14	1 3/8 - 12	1 5/8	1.999	5/8	1 1/8	2 5/8	-	1 5/16	3/8	1	7/16	2 1/8	2 5/8	2 5/8	6 1/4	
2 1/2	1	7/8 - 14	3/4 - 16	1 - 14	1 1/8	1.499	1/2	7/8	1 7/8	-	15/16	1/4	3/4	1/2	2 1/16	2 3/8	2 3/8	6 1/8	
	1 3/8	1 1/4 - 12	1 - 14	1 3/8 - 12	1 5/8	1.999	5/8	1 1/8	2 5/8	-	1 5/16	3/8	1	1/2	2 5/16	2 5/8	2 5/8	6 3/8	
	1 3/4	1 1/2 - 12	1 1/4 - 12	1 3/4 - 12	2	2.374	3/4	1 1/2	3 1/4	-	1 11/16	1/2	1 1/4	1/2	2 9/16	2 7/8	2 7/8	6 5/8	
3 1/4	1 3/8	1 1/4 - 12	1 - 14	1 3/8 - 12	1 5/8	1.999	5/8	1 1/8	2 1/2	-	1 5/16	1/4	7/8	11/16	2 5/16	2 3/4	2 3/4	7 1/8	
	1 3/4	1 1/2 - 12	1 1/4 - 12	1 3/4 - 12	2	2.374	3/4	1 1/2	3 1/8	-	1 11/16	3/8	1 1/8	11/16	2 9/16	3	3	7 3/8	
	2	1 3/4 - 12	1 1/2 - 12	2 - 12	2 1/4	2.624	7/8	1 11/16	3 1/2	-	1 15/16	3/8	1 1/4	11/16	2 11/16	3 1/8	3 1/8	7 1/2	
4	1 3/4	1 1/2 - 12	1 1/4 - 12	1 3/4 - 12	2	2.374	3/4	1 1/2	3	-	1 11/16	1/4	1	11/16	2 3/4	3	3	7 5/8	
	2	1 3/4 - 12	1 1/2 - 12	2 - 12	2 1/4	2.624	7/8	1 11/16	3 3/8	-	1 15/16	1/4	1 1/8	11/16	2 7/8	3 1/8	3 1/8	7 3/4	
	2 1/2	2 1/4 - 12	1 7/8 - 12	2 1/2 - 12	3	3.124	1	2 1/16	4 3/8	-	2 3/8	3/8	1 3/8	11/16	3 1/8	3 3/8	3 3/8	8	
5	2	1 3/4 - 12	1 1/2 - 12	2 - 12	2 1/4	2.624	7/8	1 11/16	3 3/8	-	1 15/16	1/4	1 1/8	1	2 7/8	3 1/8	3 1/8	8 1/4	
	2 1/2	2 1/4 - 12	1 7/8 - 12	2 1/2 - 12	3	3.124	1	2 1/16	4 3/8	-	2 3/8	3/8	1 3/8	1	3 1/8	3 3/8	3 3/8	8 1/2	
	3	2 3/4 - 12	2 1/4 - 12	3 - 12	3 1/2	3.749	1	2 5/8	4 7/8	-	2 7/8	3/8	1 3/8	1	3 1/8	3 3/8	3 3/8	8 1/2	
6	3 1/2	3 1/4 - 12	2 1/2 - 12	3 1/2 - 12	3 1/2	4.249	1	3	4 7/8	-	3 3/8	3/8	1 3/8	1	3 1/8	3 3/8	3 3/8	8 1/2	
	2 1/2	2 1/4 - 12	1 7/8 - 12	2 1/2 - 12	3	3.124	1	2 1/16	4 1/4	-	2 3/8	1/4	1 1/4	1 1/4	3 3/8	3 1/2	3 1/2	9 5/8	
	3	2 3/4 - 12	2 1/4 - 12	3 - 12	3 1/2	3.749	1	2 5/8	4 3/4	-	2 7/8	1/4	1 1/4	1 1/4	3 3/8	3 1/2	3 1/2	9 5/8	
	3 1/2	3 1/4 - 12	2 1/2 - 12	3 1/2 - 12	3 1/2	4.249	1	3	4 3/4	-	3 3/8	1/4	1 1/4	1 1/4	3 3/8	3 1/2	3 1/2	9 5/8	
8	4	3 3/4 - 12	3 - 12	4 - 12	4	4.749	1	3 3/8	5 1/4	-	3 7/8	1/4	1 1/4	1 1/4	3 3/8	3 1/2	3 1/2	9 5/8	
	3 1/2	3 1/4 - 12	2 1/2 - 12	3 1/2 - 12	3 1/2	4.249	1	3	-	5 3/4	3 3/8	5/8	1 1/4	1 1/2	3 5/8	3 15/16	3 7/8	13 1/4	
	4	3 3/4 - 12	3 - 12	4 - 12	4	4.749	1	3 3/8	-	6 1/4	3 7/8	1/2	1 1/4	1 1/2	3 5/8	3 15/16	3 7/8	13 1/4	
	4 1/2	4 1/4 - 12	3 1/4 - 12	4 1/2 - 12	4 1/2	5.249	1	-	-	6 3/4	4 3/8	1/2	1 1/4	1 1/2	3 5/8	3 15/16	3 7/8	13 1/4	
	5	4 3/4 - 12	3 1/2 - 12	5 - 12	5	5.749	1	-	-	7 1/4	4 7/8	1/4	1 1/4	1 1/2	3 5/8	3 15/16	3 7/8	13 1/4	
5 1/2	5 1/4 - 12	4 - 12	5 1/2 - 12	5 1/2	6.249	1	-	-	7 3/4	5 3/8	1/4	1 1/4	1 1/2	3 5/8	3 15/16	3 7/8	13 1/4		

END ANGLES, END LUGS & CAP FIXED CLEVIS MOUNTINGS 1 1/2" TO 8"

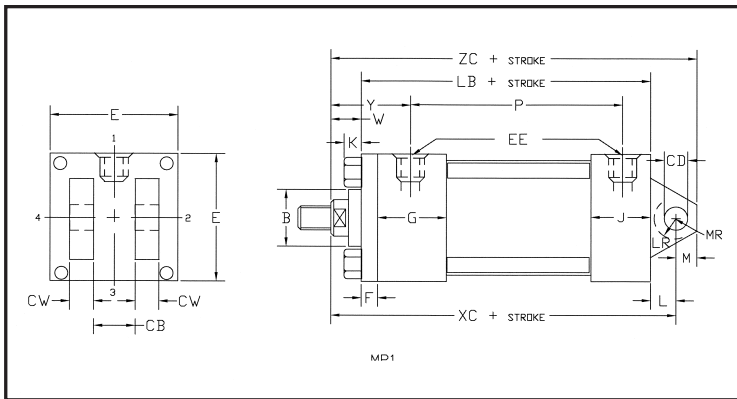


END ANGLES
MS1

NOTE: Maximum 500PSI for this mounting style



END LUGS
MS7



CAP FIXED CLEVIS
MP1

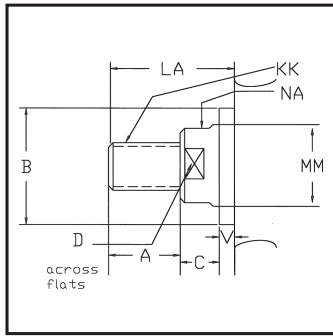
ENVELOPE AND MOUNTING DIMENSIONS NOT AFFECTED BY ROD DIAMETER

Bore	AB	AH	AL	AO	AT	CB	+.000 -.002 CD	CW	E	EB	EE		EL	EO	ES	ET	F	G	J	K	L	LR	M	MR	R	S	Add Strokes			
											NPT*	SAE															LB	P	SA	SE
1 1/2	7/16	13/8	1	3/8	1/8	3/4	.501	1/2	2 1/2	7/16	1/2	10	7/8	3/8	7/8	3/4	3/8	1 3/4	1 1/2	3/8	3/4	9/16	1/2	5/8	1.63	1 3/4	5	2 7/8	7	6 3/4
2	9/16	1 11/16	1 1/4	1/2	1/8	1 1/4	.751	5/8	3	9/16	1/2	10	15/16	1/2	15/16	13/16	5/8	1 3/4	1 1/2	7/16	1 1/4	1	3/4	15/16	2.05	2	5 1/4	2 7/8	7 3/4	7 1/8
2 1/2	1 1/16	1 15/16	1 3/16	9/16	1/8	1 1/4	.751	5/8	3 1/2	9/16	1/2	10	15/16	1/2	15/16	13/16	5/8	1 3/4	1 1/2	7/16	1 1/4	15/16	3/4	15/16	2.55	2 3/8	5 3/8	3	7 3/4	7 1/4
3 1/4	1 3/16	2 9/16	1 13/16	11/16	1/4	1 1/2	1.001	3/4	4 1/2	11/16	3/4	12	1 1/8	5/8	1 1/4	1 1/8	3/4	2	1 3/4	9/16	1 1/2	1 1/4	1	1 3/16	3.25	3 1/8	6 1/4	3 1/2	9 7/8	8 1/2
4	1 1/16	2 13/16	2 1/8	7/8	1/4	2	1.376	1	5	11/16	3/4	12	1 1/8	5/8	1 1/4	1 1/16	7/8	2	1 3/4	9/16	2 1/8	1 3/4	1 3/8	1 5/8	3.82	3 1/4	6 5/8	3 3/4	10 7/8	8 7/8
5	1 1/16	3 11/16	2 1/8	7/8	5/16	2 1/2	1.751	1 1/4	6 1/2	15/16	3/4	12	1 1/2	3/4	1 1/2	1 7/16	7/8	2	1 3/4	13/16	2 1/4	2 1/16	1 3/4	2 1/8	4.95	4 3/4	7 1/8	4 1/4	11 3/8	10 1/8
6	15/16	4 1/4	2 7/16	11/16	3/8	2 1/2	2.001	1 1/4	7 1/2	1 1/16	1	16	1 11/16	7/8	1 3/4	1 5/8	1	2 1/4	2 1/4	7/8	2 1/2	2 5/16	2	2 3/8	5.73	5 3/8	8 3/8	4 7/8	13 1/4	11 3/4
8	-	-	-	-	-	3	3.001	1 1/2	9 1/2	-	1 1/2	24	-	-	-	-	1	3	3	1 1/2	3 1/4	3 1/4	2 3/4	3 1/8	-	-	10 1/2	6 1/4	-	-

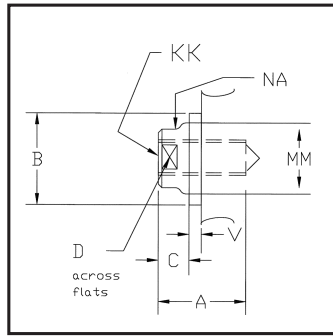
* This is not a standard option, please consult factory for availability



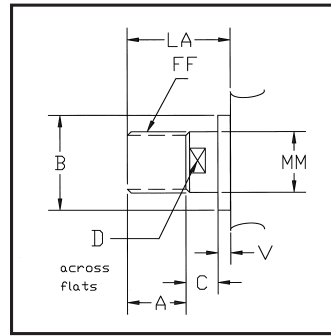
END ANGLES, END LUGS & CAP FIXED CLEVIS MOUNTINGS 1 1/2" TO 8"



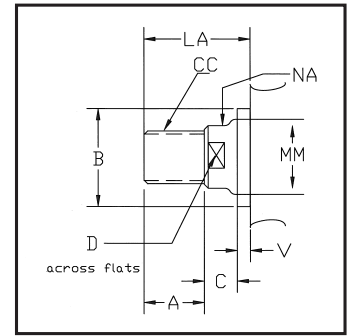
Style A
Standard Male



Style B
Female



Style C
Full Male



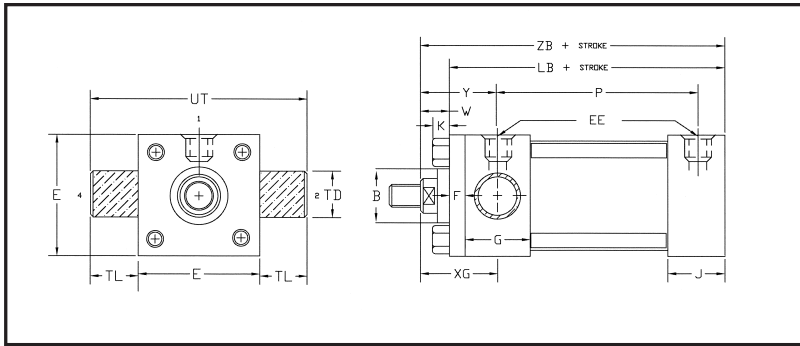
Style D
Intermediate Male

ROD END STYLES

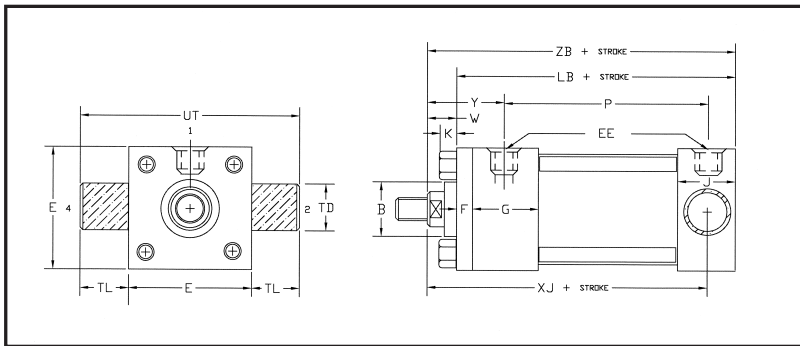
DIMENSIONS AFFECTED BY ROD DIAMETER

Bore	Rod Dia. MM	Thread			Rod Extensions and Pilot Dimensions									Add Stroke						
		Style D CC	Style A & B KK	Style C FF	A	+0.000 -0.002 B	C	D	LA	LAF	NA	V	W	Y	XA	XC	XE	ZA	ZC	ZE
1 1/2	5/8	1/2 - 20	7/16 - 20	5/8 - 18	3/4	1.124	3/8	1/2	1 3/8	-	9/16	1/4	5/8	2	6 5/8	6 3/8	6 1/2	7	6 7/8	6 7/8
	1	7/8 - 14	3/4 - 16	1 - 14	1 1/8	1.499	1/2	7/8	2 1/8	-	15/16	1/2	1	2 3/8	7	6 3/4	6 7/8	7 3/8	7 1/4	7 1/4
2	1	7/8 - 14	3/4 - 16	1 - 14	1 1/8	1.499	1/2	7/8	1 7/8	-	15/16	1/4	3/4	2 3/8	7 1/4	7 1/4	6 15/16	7 3/4	8	7 7/16
	1 3/8	1 1/4 - 12	1 - 14	1 3/8 - 12	1 5/8	1.999	5/8	1 1/8	2 5/8	-	1 5/16	3/8	1	2 5/8	7 1/2	7 1/2	7 3/16	8	8 1/4	7 11/16
2 1/2	1	7/8 - 14	3/4 - 16	1 - 14	1 1/8	1.499	1/2	7/8	1 7/8	-	15/16	1/4	3/4	2 3/8	7 5/16	7 3/8	7 1/16	7 7/8	8 1/8	7 9/16
	1 3/8	1 1/4 - 12	1 - 14	1 3/8 - 12	1 5/8	1.999	5/8	1 1/8	2 5/8	-	1 5/16	3/8	1	2 5/8	7 9/16	7 5/8	7 5/16	8 1/8	8 3/8	7 13/16
3 1/4	1 3/8	1 1/4 - 12	1 - 14	1 3/8 - 12	1 5/8	1.999	5/8	1 1/8	2 1/2	-	1 5/16	1/4	7/8	2 3/4	8 15/16	8 5/8	8 1/4	9 5/8	9 5/8	8 7/8
	1 3/4	1 1/2 - 12	1 1/4 - 12	1 3/4 - 12	2	2.374	3/4	1 1/2	3 1/8	-	1 11/16	3/8	1 1/8	3	9 3/16	8 7/8	8 1/2	9 7/8	9 7/8	9 1/8
4	2	1 3/4 - 12	1 1/2 - 12	2 - 12	2 1/4	2.624	7/8	1 11/16	3 1/2	-	1 15/16	3/8	1 1/4	3 1/8	9 5/16	9	8 5/8	10	10	9 1/4
	1 3/4	1 1/2 - 12	1 1/4 - 12	1 3/4 - 12	2	2.374	3/4	1 1/2	3	-	1 11/16	1/4	1	3	9 3/4	9 3/4	8 3/4	10 5/8	11 1/8	9 3/8
5	2 1/2	2 1/4 - 12	1 7/8 - 12	2 1/2 - 12	2 1/4	2.624	7/8	1 11/16	3 3/8	-	1 15/16	1/4	1 1/8	3 1/8	10 3/8	10 1/2	9 3/4	11 1/4	12 1/4	10 1/2
	2	1 3/4 - 12	1 1/2 - 12	2 - 12	2 1/4	2.624	7/8	1 11/16	3 3/8	-	1 15/16	1/4	1 1/8	3 1/8	10 3/8	10 1/2	9 3/4	11 1/4	12 1/4	10 1/2
6	2 1/2	2 1/4 - 12	1 7/8 - 12	2 1/2 - 12	3	3.124	1	2 1/16	4 3/8	-	2 3/8	3/8	1 3/8	3 3/8	10 1/8	10 1/8	9 1/8	11	11 1/2	9 3/4
	3	2 3/4 - 12	2 1/4 - 12	3 - 12	3 1/2	3.749	1	2 5/8	4 7/8	-	2 7/8	3/8	1 3/8	3 3/8	10 5/8	10 3/4	10	11 1/2	12 1/2	10 3/4
8	3 1/2	3 1/4 - 12	2 1/2 - 12	3 1/2 - 12	3 1/2	4.249	1	3	4 7/8	-	3 3/8	3/8	1 3/8	3 3/8	10 5/8	10 3/4	10	11 1/2	12 1/2	10 3/4
	2 1/2	2 1/4 - 12	1 7/8 - 12	2 1/2 - 12	3	3.124	1	2 1/16	4 1/4	-	2 3/8	1/4	1 1/4	3 1/2	12 1/16	12 1/8	11 5/16	13 1/8	14 1/8	12 3/16
8	3	2 3/4 - 12	2 1/4 - 12	3 - 12	3 1/2	3.749	1	2 5/8	4 3/4	-	2 7/8	1/4	1 1/4	3 1/2	12 1/16	12 1/8	11 5/16	13 1/8	14 1/8	12 3/16
	3 1/2	3 1/4 - 12	2 1/2 - 12	3 1/2 - 12	3 1/2	4.249	1	3	4 3/4	-	3 3/8	1/4	1 1/4	3 1/2	12 1/16	12 1/8	11 5/16	13 1/8	14 1/8	12 3/16
8	4	3 3/4 - 12	3 - 12	4 - 12	4	4.749	1	3 3/8	5 1/4	-	3 7/8	1/4	1 1/4	3 1/2	12 1/16	12 1/8	11 5/16	13 1/8	14 1/8	12 3/16
	3 1/2	3 1/4 - 12	2 1/2 - 12	3 1/2 - 12	3 1/2	4.249	1	3	-	5 3/4	3 3/8	5/8	1 1/4	3 7/8	-	15	-	-	17 3/4	-
	4	3 3/4 - 12	3 - 12	4 - 12	4	4.749	1	3 3/8	-	6 1/4	3 7/8	1/2	1 1/4	3 7/8	-	15	-	-	17 3/4	-
	4 1/2	4 1/4 - 12	3 1/4 - 12	4 1/2 - 12	4 1/2	5.249	1	-	-	6 3/4	4 3/8	1/2	1 1/4	3 7/8	-	15	-	-	17 3/4	-
8	5	4 3/4 - 12	3 1/2 - 12	5 - 12	5	5.749	1	-	-	7 1/4	4 7/8	1/4	1 1/4	3 7/8	-	15	-	-	17 3/4	-
	5 1/2	5 1/4 - 12	4 - 12	5 1/2 - 12	5 1/2	6.249	1	-	-	7 3/4	5 3/8	1/4	1 1/4	3 7/8	-	15	-	-	17 3/4	-

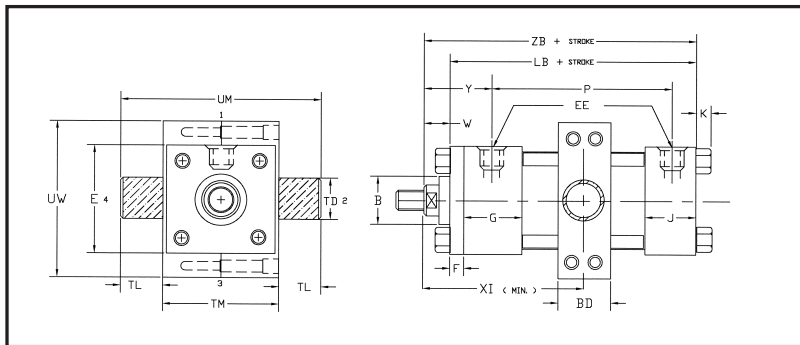
TRUNNION MOUNTINGS 1 1/2" TO 8"



HEAD TRUNNION
MT1



CAP TRUNNION
MT2



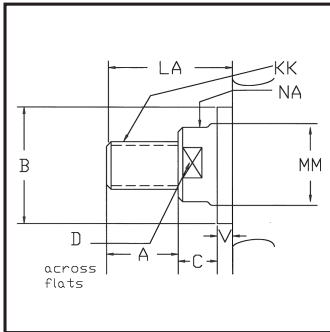
INTERMEDIATE
FIXED TRUNNION
MT4

ENVELOPE AND MOUNTING DIMENSIONS NOT AFFECTED BY ROD DIAMETER

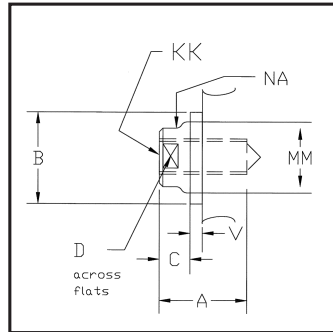
Bore	BD	E	EE		F	G	J	K	+.000 .001 TD	TL	TM	UM	UT	UW	Add Stroke	
			NPTF*	SAE											LB	P
1 1/2	1 1/4	2 1/2	1/2	10	3/8	1 3/4	1 1/2	3/8	1.000	1	3	5	4 1/2	3 3/8	5	2 7/8
2	1 1/2	3	1/2	10	5/8	1 3/4	1 1/2	7/16	1.375	1 3/8	3 1/2	6 1/4	5 3/4	4 1/8	5 1/4	2 7/8
2 1/2	1 1/2	3 1/2	1/2	10	5/8	1 3/4	1 1/2	7/16	1.375	1 3/8	4	6 3/4	6 1/4	4 5/8	5 3/8	3
3 1/4	2	4 1/2	3/4	12	3/4	2	1 3/4	9/16	1.750	1 3/4	5	8 1/2	8	5 13/16	6 1/4	3 1/2
4	2	5	3/4	12	7/8	2	1 3/4	9/16	1.750	1 3/4	5 1/2	9	8 1/2	6 3/8	6 5/8	3 3/4
5	2	6 1/2	3/4	12	7/8	2	1 3/4	13/16	1.750	1 3/4	7	10 1/2	10	7 3/4	7 1/8	4 1/4
6	3	7 1/2	1	16	1	2 1/4	2 1/4	7/8	2.000	2	8 1/2	12 1/2	11 1/2	10 3/8	8 3/8	4 7/8
8	3 1/2	9 1/2	1 1/2	24	1	3	3	1 1/2	3.000	3	11	17	15 1/2	13 3/8	10 1/2	6 1/4

* This is not a standard option, please consult factory for availability

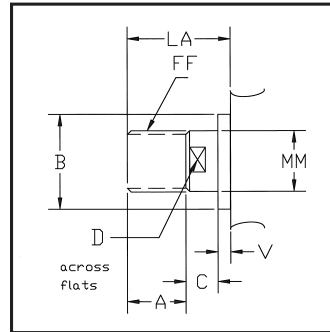
TRUNNION MOUNTINGS 1 1/2" TO 8"



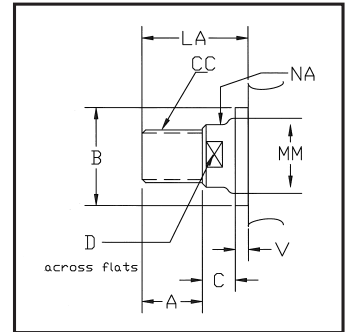
Style A
Standard Male



Style B
Female



Style C
Full Male



Style D
Intermediate Male

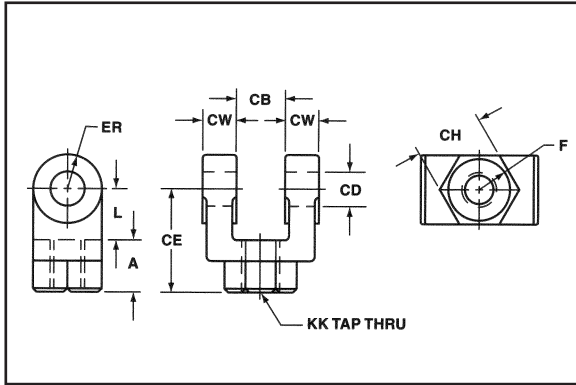
ROD END STYLES

DIMENSIONS AFFECTED BY ROD DIAMETER

Bore	Rod Dia. MM	Thread			Rod Extensions and Pilot Dimensions											Add Stroke		
		Style D CC	Style A & B KK	Style C FF	A	+0.000 -0.002 B	C	D	LA	LAF	NA	V	W	Y	Min ** XG	XI	XJ	ZB
1 1/2	5/8	1/2 - 20	7/16 - 20	5/8 - 18	3/4	1.124	3/8	1/2	1 3/8	-	9/16	1/4	5/8	2	1 7/8	3 7/16	4 7/8	5 5/8
	1	7/8 - 14	3/4 - 16	1 - 14	1 1/8	1.499	1/2	7/8	2 1/8	-	15/16	1/2	1	2 3/8	2 1/4	3 13/16	5 1/4	6
2	1	7/8 - 14	3/4 - 16	1 - 14	1 1/8	1.499	1/2	7/8	1 7/8	-	15/16	1/4	3/4	2 3/8	2 1/4	3 15/16	5 1/4	6
	1 3/8	1 1/4 - 12	1 - 14	1 3/8 - 12	1 5/8	1.999	5/8	1 1/8	2 5/8	-	1 5/16	3/8	1	2 5/8	2 1/2	4 3/16	5 1/2	6 1/4
2 1/2	1	7/8 - 14	3/4 - 16	1 - 14	1 1/8	1.499	1/2	7/8	1 7/8	-	15/16	1/4	3/4	2 3/8	2 1/4	3 15/16	5 3/8	6 1/8
	1 3/8	1 1/4 - 12	1 - 14	1 3/4 - 12	1 5/8	1.999	5/8	1 1/8	2 5/8	-	1 5/16	3/8	1	2 5/8	2 1/2	4 3/16	5 5/8	6 5/8
	1 3/4	1 1/2 - 12	1 1/4 - 12	1 3/8 - 12	2	2.374	3/4	1 1/2	3 1/4	-	1 11/16	1/2	1 1/4	2 7/8	2 3/4	4 7/16	5 7/8	6 3/8
3 1/4	1 3/8	1 1/4 - 12	1 - 14	1 3/8 - 12	1 5/8	1.999	5/8	1 1/8	2 1/2	-	1 5/16	1/4	7/8	2 3/4	2 5/8	4 11/16	6 1/4	7 1/8
	1 3/4	1 1/2 - 12	1 1/4 - 12	1 3/4 - 12	2	2.374	3/4	1 1/2	3 1/8	-	1 11/16	3/8	1 1/8	3	2 7/8	4 15/16	6 1/2	7 3/8
	2	1 3/4 - 12	1 1/2 - 12	2 - 12	2 1/4	2.624	7/8	1 11/16	3 1/2	-	1 15/16	3/8	1 1/4	3 1/8	3	5 1/16	6 5/8	7 1/2
4	1 3/4	1 1/2 - 12	1 1/4 - 12	1 3/4 - 12	2	2.374	3/4	1 1/2	3	-	1 11/16	1/4	1	3	2 7/8	4 15/16	6 3/4	7 5/8
	2	1 3/4 - 12	1 1/2 - 12	2 - 12	2 1/4	2.624	7/8	1 11/16	3 3/8	-	1 15/16	1/4	1 1/8	3 1/8	3	5 1/16	6 7/8	7 3/4
	2 1/2	2 1/4 - 12	1 7/8 - 12	2 1/2 - 12	3	3.124	1	2 1/16	4 3/8	-	2 3/8	3/8	1 3/8	3 3/8	3 1/4	5 5/16	7 1/8	8
5	2	1 3/4 - 12	1 1/2 - 12	2 - 12	2 1/4	2.624	7/8	1 11/16	3 3/8	-	1 15/16	1/4	1 1/8	3 1/8	3	5 1/16	7 3/8	8 1/4
	2 1/2	2 1/4 - 12	1 7/8 - 12	2 1/2 - 12	3	3.124	1	2 1/16	4 3/8	-	2 3/8	3/8	1 3/8	3 3/8	3 1/4	5 5/16	7 5/8	8 1/2
	3	2 3/4 - 12	2 1/4 - 12	3 - 12	3 1/2	3.749	1	2 5/8	4 7/8	-	2 7/8	3/8	1 3/8	3 3/8	3 1/4	5 5/16	7 5/8	8 1/2
	3 1/2	3 1/4 - 12	2 1/2 - 12	3 1/2 - 12	3 1/2	4.249	1	3	4 7/8	-	3 3/8	3/8	1 3/8	3 3/8	3 1/4	5 5/16	7 5/8	8 1/2
6	2 1/2	2 1/4 - 12	1 7/8 - 12	2 1/2 - 12	3	3.124	1	2 1/16	4 1/4	-	2 3/8	1/4	1 1/4	3 1/2	3 3/8	6 1/16	8 3/8	9 5/8
	3	2 3/4 - 12	2 1/4 - 12	3 - 12	3 1/2	3.749	1	2 5/8	4 3/4	-	2 7/8	1/4	1 1/4	3 1/2	3 3/8	6 1/16	8 3/8	9 5/8
	3 1/2	3 1/4 - 12	2 1/2 - 12	3 1/2 - 12	3 1/2	4.249	1	3	4 3/4	-	3 3/8	1/4	1 1/4	3 1/2	3 3/8	6 1/16	8 3/8	9 5/8
	4	3 3/4 - 12	3 - 12	4	4	4.749	1	3 3/8	5 1/4	-	3 7/8	1/4	1 1/4	3 1/2	3 3/8	6 1/16	8 3/8	9 5/8
8	3 1/2	3 1/4 - 12	2 1/2 - 12	3 1/2 - 12	3 1/2	4.249	1	3	-	5 3/4	3 3/8	5/8	1 1/4	3 7/8	3 3/4	7 1/16	10 1/4	13 1/4
	4	3 3/4 - 12	3 - 12	4 - 12	4	4.749	1	3 3/8	-	6 1/4	3 7/8	1/2	1 1/4	3 7/8	3 3/4	7 1/16	10 1/4	13 1/4
	4 1/2	4 1/4 - 12	3 1/4 - 12	4 1/2 - 12	4 1/2	5.249	1	-	-	6 3/4	4 3/8	1/2	1 1/4	3 7/8	3 3/4	7 1/16	10 1/4	13 1/4
	5	4 3/4 - 12	3 1/2 - 12	5 - 12	5	5.749	1	-	-	7 1/4	4 7/8	1/4	1 1/4	3 7/8	3 3/4	7 1/16	10 1/4	13 1/4
	5 1/2	5 1/4 - 12	4 - 12	5 1/2 - 12	5 1/2	6.249	1	-	-	7 3/4	5 3/8	1/4	1 1/4	3 7/8	3 3/4	7 1/16	10 1/4	13 1/4

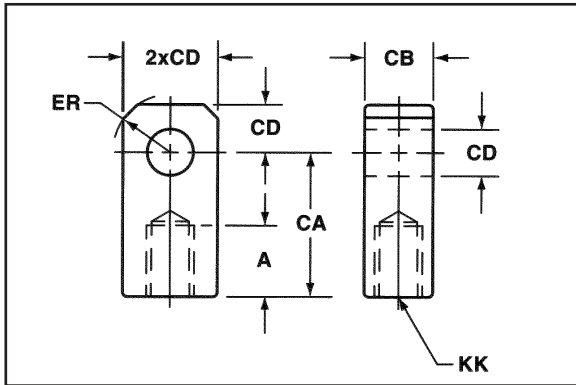
** Dimension XI to be specified by customer for MT4 Mount

ACCESSORIES



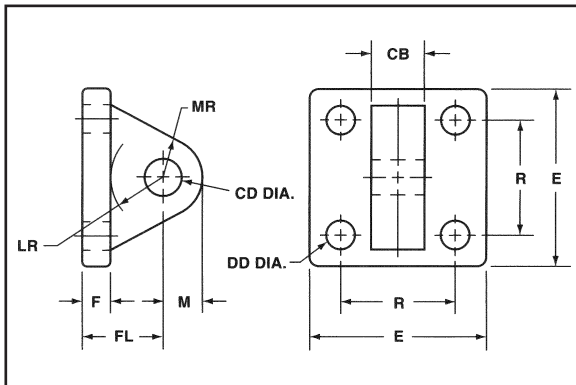
ROD CLEVIS

	BDC-05	BDC-07	BDC-07M	BDC-10	BDC-10M	BDC-13	BDC-13M	BDC-17	BDC-20	BDC-25	BDC-30	BDC-35M
A	3/4	1 1/8	1 1/8	1 5/8	1 5/8	2	2	2 1/4	3	3 1/2	3 1/2	3 1/2
CB	.765	1.265	1.265	1.515	1.515	2.032	2.032	2.531	2.531	3.032	3.032	4.032
CD	1/2	3/4	3/4	1	1	1 3/8	1 3/8	1 3/4	2	2 1/2	3	3 1/2
CE	1 1/2	2 3/8	2 1/8	3 1/8	2 15/16	4 1/8	3 3/4	4 1/2	5 1/2	6 1/2	6 3/4	7 3/4
CH	1	1 1/4	1 3/8	1 1/2	1 1/2	2	2	2 3/8	2 15/16	3 1/2	3 7/8	5
CW	1/2	5/8	5/8	3/4	3/4	1	1	1 1/4	1 1/4	1 1/2	1 1/2	2
ER	1/2	3/4	3/4	1	1	1 3/8	1 3/8	1 3/4	2	2 1/2	2 3/4	3 1/2
F	1	1 1/4	1 1/4	1 1/2	1 5/8	2	2	2 3/8	2 15/16	3 1/2	3 7/8	5
KK	7/16-20	3/4-16	3/4-16	1-14	1-14	1 1/4-12	1 1/4-12	1 1/2-12	1 7/8-12	2 1/4-12	2 1/2-12	3 1/4-12
L	3/4	1 1/4	1	1 1/2	1 5/16	2 1/8	1 3/4	2 1/4	2 1/2	3	3 1/4	4 1/4



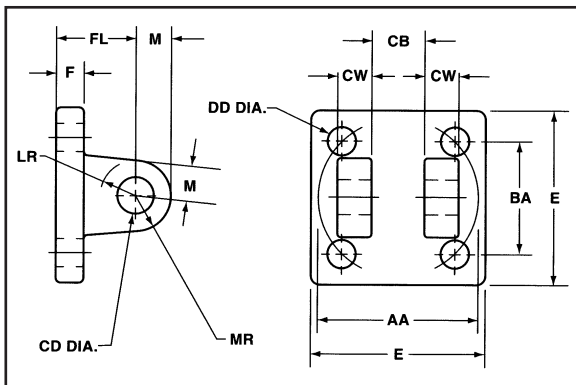
ROD EYES

	BDE-05	BDE-07	BDE-10	BDE-10M	BDE-13	BDE-17	BDE-20	BDE-20M	BDE-25	BDE-30	BDE-35
A	3/4	1 1/8	1 5/8	1 1/8	2	2 1/4	3	2 1/4	3 1/2	3 1/2	4 1/2
CA	1 1/2	2 1/16	2 13/16	2 3/8	3 7/16	4	5	4 3/8	5 13/16	6 1/8	7 5/8
CB	3/4	1 1/4	1 1/2	1 1/2	2	2 1/2	2 1/2	2 1/2	3	3	4
CD	1/2	3/4	1	1	1 3/8	1 3/4	2	2	2 1/2	3	3 1/2
ER	5/8	7/8	1 3/16	1 7/16	1 9/16	2	2 1/2	2 7/8	2 13/16	3 1/4	3 7/8
KK	7/16-20	3/4-16	1-14	7/8-14	1 1/4-12	1 1/2-12	1 7/8-12	1 3/4-12	2 1/4-12	2 1/2-12	3 1/4-12



EYE BRACKETS

	BDEB-05	BDEB-07	BDEB-10	BDEB-10H	BDEB-13	BDEB-17	BDEB-17H	BDEB-20	BDEB-20H	BDEB-25H	BDEB-30H	BDEB-35
CB	3/4	1 1/4	1 1/2	1 1/2	2	2 1/2	2 1/2	2 1/2	2 1/2	3	3	4
CD	1/2	3/4	1	1	1 3/8	1 3/4	1 3/4	2	2	2 1/2	3	3 1/2
DD	13/32	17/32	21/32	21/32	21/32	29/32	29/32	1 1/16	1 1/16	1 3/16	1 5/16	1 13/16
E	2 1/2	3 1/2	4 1/2	4 1/2	5	6 1/2	6 1/2	7 1/2	7 1/2	8 1/2	8 1/2	12 5/8
F	3/8	5/8	3/4	7/8	7/8	7/8	1 1/8	1	1 1/2	1 3/4	2	1 11/16
FL	1 1/8	1 7/8	2 1/4	2 3/8	3	3 1/8	3 3/8	3 1/2	4	4 3/4	5 1/4	5 11/16
LR	3/4	1 1/4	1 1/2	1 1/2	2 1/8	2 1/4	2 1/4	2 1/2	2 1/2	3	3 1/4	4
M	1/2	3/4	1	1	1 3/8	1 3/4	1 3/4	2	2	2 1/2	3	3 1/2
MR	9/16	7/8	1 1/4	1 1/4	1 5/8	2 1/8	2 1/8	2 7/16	2 7/16	3	3 1/4	4 1/8
R	1.63	2.56	3.25	3.25	3.81	4.95	4.95	5.75	5.75	6.59	7.50	9.62



CLEVIS BRACKETS

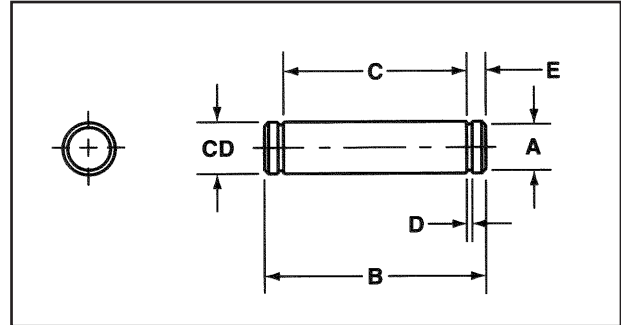
	BDCB-05	BDCB-06	BDCB-07	BDCB-10	BDCB-13	BDCB-17	BDCB-20	BDCB-25	BDCB-30	BDCB-35
AA	2.3	2.9	3.6	4.6	5.4	7.0	8.1	9.3	10.6	13.6
BA	1 5/8	2 1/16	2 9/16	3 1/4	3 13/16	4 15/16	5 3/4	6 19/32	7 1/2	9 5/8
CB	.765	1.265	1.265	1.515	1.515	2.032	2.531	2.531	3.032	4.032
CD	1/2	3/4	3/4	1	1 3/8	1 3/4	2	2 1/2	3	3 1/2
CW	1/2	5/8	5/8	3/4	1	1 1/4	1 1/4	1 1/2	1 1/2	2
DD	3/8 - 24	1/2 - 20	1/2 - 20	5/8 - 18	5/8 - 18	7/8 - 14	1 - 14	1 1/8 - 12	1 1/4 - 12	1 3/4 - 12
E	2 1/2	3	3 1/2	4 1/2	5	6 1/2	7 1/2	8 1/2	9 1/2	12 5/8
F	3/8	5/8	5/8	3/4	7/8	7/8	1	1	1	1 11/16
FL	1 1/8	1 7/8	1 7/8	2 1/4	3	3 1/8	3 1/2	4	4 1/4	5 11/16
LR	1/2	1	1 1/16	1 1/4	1 7/8	2	2 1/8	2 5/8	2 7/8	3 5/8
M	1/2	3/4	3/4	1	1 3/8	1 3/4	2	2 1/2	2 3/4	3 1/2
MR	9/16	1 1/16	1 1/16	1 1/8	1 3/4	1 7/8	2 1/8	2 1/2	2 3/4	3 1/2

ACCESSORIES

PIVOT PIN

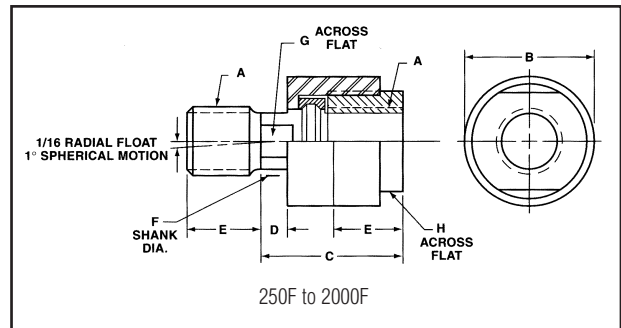
	BDP-05G	BDP-07G	BDP-10G	BDP-13G	BDP-17G	BDP-20G	BDP-25G	BDP-30G	BDP-35G
CD	.500	.750	1.000	1.375	1.750	2.000	2.500	3.000	3.500
A	.468	.704	.940	1.291	1.650	1.886	2.360	2.838	3.316
B	2.094	2.875	3.375	4.485	5.547	5.547	6.625	6.780	8.854
C	1.875	2.625	3.125	4.187	5.188	5.188	6.188	6.250	8.125
D	.041	.048	.048	.056	.068	.068	.086	.103	.120
E	.109	.125	.125	.149	.180	.180	.219	.266	.360

ALSO AVAILABLE WITH HOLES FOR COTTER PINS



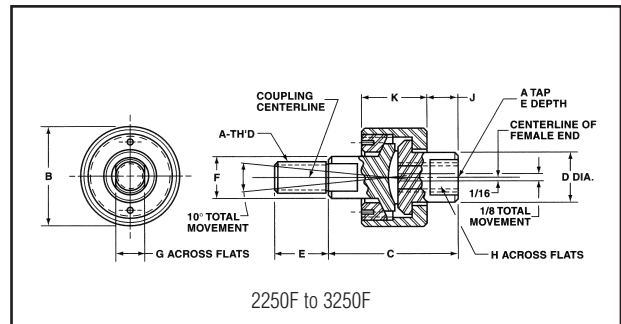
ALIGNMENT COUPLERS

	250F	312F	375C	375F	437F	500C	500F	625F	750C	750F	875F
A	1/4-28	5/16-24	3/8-16	3/8-24	7/16-20	1/2-13	1/2-20	5/8-18	3/4-10	3/4-16	7/8-14
B	7/8	7/8	7/8	7/8	1 1/4	1 1/4	1 1/4	1 1/4	1 3/4	1 3/4	1 3/4
C	1 1/4	1 1/4	1 1/4	1 1/4	2	2	2	2	2 5/16	2 5/16	2 5/16
D	1/4	1/4	1/4	1/4	1/2	1/2	1/2	1/2	5/16	5/16	5/16
E	5/8	5/8	5/8	5/8	3/4	3/4	3/4	3/4	1 1/8	1 1/8	1 1/8
F	.245	.308	.369	.370	5/8	5/8	5/8	5/8	31/32	31/32	31/32
G	3/16	1/4	5/16	5/16	9/16	9/16	9/16	1/2	7/8	7/8	7/8
H	13/16	13/16	13/16	13/16	1 1/8	1 1/8	1 1/8	1 1/8	1 1/2	1 1/2	1 1/2
Max Pull at Yield	4,000	4,000	5,000	5,000	10,000	14,000	14,000	14,000	34,000	34,000	34,000



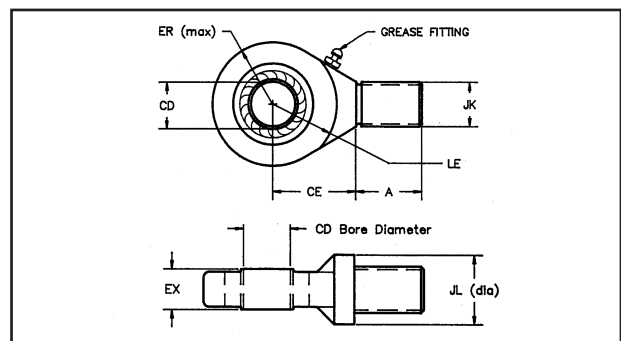
ALIGNMENT COUPLERS

	1000C	1000F	1250F	1375F	1500F	1750F	1875F	2000F	2250F	2500F	2750F	3000F	3250F
A	1-8	1-14	1 1/4-12	1 3/8-12	1 1/2-12	1 3/4-12	1 7/8-12	2-12	2 1/4-12	2 1/2-12	2 3/4-12	3-12	3 1/4-12
B	2 1/2	2 1/2	2 1/2	2 1/2	3 1/4	3 1/4	3 3/4	3 3/4	6 3/4	7	7	7	9 1/4
C	2 15/16	2 15/16	2 15/16	2 15/16	4 3/8	4 3/8	5 7/16	5 7/16	6 3/8	6 1/2	6 1/2	6 1/2	8 1/2
D	1/2	1/2	1/2	1/2	13/16	13/16	11/16	11/16	3/4	4	4	4	5 1/4
E	1 5/8	1 5/8	1 5/8	1 5/8	2 1/4	2 1/4	3	3	3 1/2	3 1/2	3 1/2	3 1/2	4 1/2
F	1 3/8	1 3/8	1 3/8	1 3/8	1 3/4	1 3/4	2 1/4	2 1/4	2 3/4	3 1/4	3 1/4	3 1/4	4
G	1 1/4	1 1/4	1 1/4	1 1/4	1 1/2	1 1/2	1 7/8	1 7/8	2 3/8	2 7/8	2 7/8	2 7/8	3 3/8
H	2 1/4	2 1/4	2 1/4	2 1/4	3	3	3 1/2	3 1/2	2 7/8	3 3/8	3 3/8	3 3/8	4 1/2
J	-	-	-	-	-	-	-	-	1 5/8	1 5/8	1 5/8	1 5/8	2
K	-	-	-	-	-	-	-	-	3 3/4	3 7/8	3 7/8	3 7/8	5 1/2
Max Pull at Yield	64,000	64,000	64,000	64,000	120,000	120,000	240,000	240,000	397,000	495,000	603,800	723,400	853,800



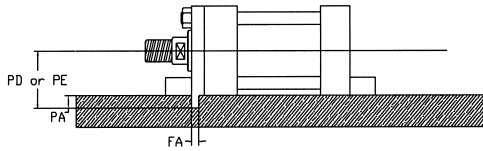
SPHERICAL ROD EYES

	RES-05	RES-07	RES-10	RES-13	RES-17	RES-20
A	11/16	1	1 1/2	2	2 1/8	2 7/8
CD-.0005	.500	.7500	1.0000	1.3750	1.7500	2.0000
CE	7/8	1 1/4	1 7/8	2 1/8	2 1/2	2 3/4
EX	7/16	21/32	7/8	1 3/16	1 17/32	1 3/4
ER	7/8	1 1/4	1 3/8	1 13/16	2 3/16	2 5/8
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



THRUST KEY MOUNTINGS

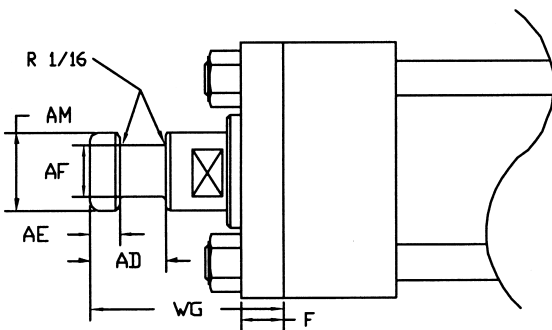
Thrust Key Mounting eliminates the need of using fitted bolts or external keys on side mounted cylinders. Available in cylinders with mounting styles MS1, MS2, MS4 and MS7. Can be provided with the retainer plate extended below the mounting side of the cylinder (see illustration below). This extended retainer plate can then be fitted in to a keyway milled into the mounting surface of the machine member. To order, specify in description. Consult factory for adder.



Bore	DIM. FA	DIM. PA	DIM MS2, MS4, MS7	DIM. PE MTG. Style MS1
1 1/2	.312 +.000 -.002	3/16	1 7/16	1 9/16
2	.562 +.000 -.002	5/16	1 13/16	2
2 1/2	.562 +.000 -.002	5/16	2 1/16	2 1/4
3 1/4	.687 +.000 -.002	3/8	2 5/8	2 15/16
4	.812 +.000 -.002	7/16	2 15/16	3 1/4
5	.812 +.000 -.002	7/16	3 11/16	4 1/8
6	.937 +.000 -.002	1/2	4 1/4	4 3/4
8	.937 +.000 -.002	1/2	5 1/4	6

STYLE 55 ROD END

- Allows full rate hydraulic pressure in push and pull directions
- Available in 5/8" through 4" piston rod diameters
- Simplifies Alignment
- Reduces assembly time



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 1/5	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

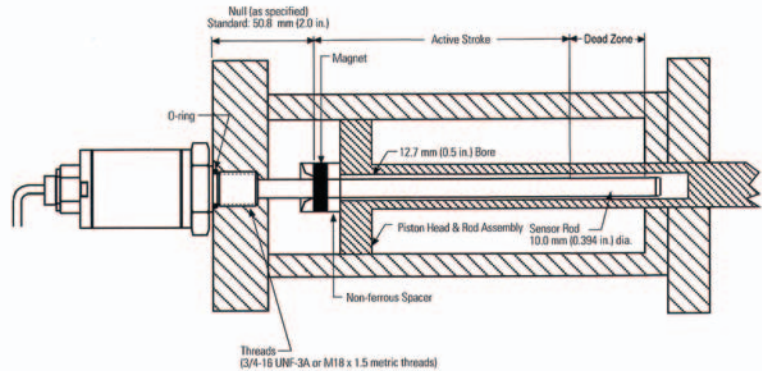
OTHER OPTIONS (consult factory)

- Special seal materials
- Cast iron piston rings
- Bleed ports
- Locking cylinder
- Custom cylinders
- Special coatings
- Non-rotating rod

TEMPOSONICS LINEAR POSITION SENSORS

Temposonics Linear Positions Sensors provide accurate, non-contact position sensing in a wide array of output configurations and application housing styles. They are available in Analog, Digital, SSI, Device Net, CANbus or Profibus outputs. A magnet is mounted inside the piston and the stroke is only affected by the "null" length. An interrogation pulse travels along the wave guide inside the sensor rod at sonic speed, which is inside the piston rod in a gun drill hole. The position of the magnet is detected with high precision and speed by measuring the elapsed time between pulses. Using the elapsed time to determine position of the cylinder rod (magnet) provides an absolute position reading that never needs recalibrating or re-homing after a power loss. Non-contact sensing eliminates wear and guarantees durability and output repeatability. Contact Higginson for selection criteria.

Full range of position sensors are available. Consult factory for details.

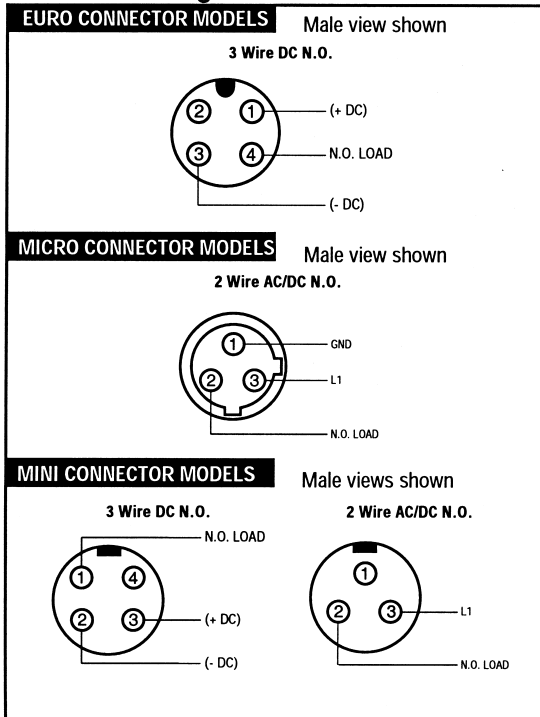


PROXIMITY SENSORS

Low Profile Rotatable -LPR				
Continuous Pressure Rating			3000PSI	
	3-PIN MINI		4-PIN MINI	4-PIN EURO
Voltage/Leakage Current	AC/DC 2W, 20-230V, NO 1.7mA	AC/DC 2W, 20-230V, NO 4.5mA	DC Sourcing 3W, 10-30V, NO 10µA	DC, PNP 3W, 10-30V, NO 10µA
Probe Length	*EE230-	EE260-	EE210-	EE210-

* standard (stock)

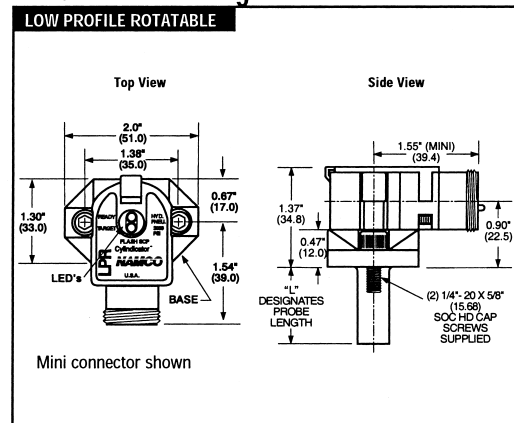
Circuit Drawings



CYLINDICATOR® SENSORS WELD FIELD IMMUNE

- Weld Field and Electrical Noise Immunity
- Standard Latching Short Circuit Protection
- Predictable, Consistent Electrical Performance
- 100% Tested and burned - in
- Purpose Designed Housing and Materials

Dimensional Drawings DC, AC/DC



ROD SIZING

The selection of the correct rod size is one of the most important factors in selecting a cylinder. The standard rod size is sufficient to handle the maximum tension force (pull) developed by that particular bore size, but for compression (push) loading, long strokes and high compression applications the column strength needs to be considered.

Rod Size Selection:

- 1- Select the cylinder bore size required from Table 3 based on the force needed and available pressure.
- 2- Determine the distance between mounting points "L" from the Table 4
- 3- Using the thrust force from Table 3 read across on Table 1 to the corresponding "L" value (use next highest number) previously calculated. Read up to find the corresponding recommended rod size.

TABLE 1 - VALUE OF "L" IN INCHES

THRUST FORCE IN LBS.	PISTON ROD DIAMETER												
	5/8"	1"	1 3/8"	1 3/4"	2"	2 1/2"	3"	3 1/2"	4"	4 1/2"	5"	5 1/2"	7"
400	35	84	134	-	-	-	-	-	-	-	-	-	-
700	30	68	119	-	-	-	-	-	-	-	-	-	-
1000	26	60	105	156	190	-	-	-	-	-	-	-	-
1400	24	54	93	144	1756	244	308	-	-	-	-	-	-
1800	23	48	84	127	160	230	294	366	-	-	-	-	-
2400	18	45	75	114	145	214	281	347	-	-	-	-	-
3200	16	40	68	103	131	196	262	329	398	-	-	-	-
4000	12	38	63	93	119	174	240	310	373	446	-	-	-
5000	9	36	60	87	112	163	225	289	359	426	-	-	-
6000	-	30	56	82	102	152	209	274	342	411	476	-	-
8000	-	25	51	76	93	136	186	244	310	3375	448	-	-
10000	-	21	45	70	89	125	172	221	279	349	412	-	-
12000	-	17	41	64	85	117	155	210	2270	326	388	455	-
16000	-	-	35	57	75	110	141	188	233	291	350	421	-
20000	-	-	28	52	66	103	136	173	218	270	325	385	-
30000	-	-	-	39	56	87	120	156	190	232	285	330	-
40000	-	-	-	24	43	75	108	142	177	210	248	293	-
50000	-	-	-	-	30	66	97	131	165	201	234	268	408
60000	-	-	-	-	-	57	88	119	154	190	226	256	384
80000	-	-	-	-	-	36	71	104	136	170	204	240	336
100000	-	-	-	-	-	-	56	91	120	154	199	224	324

TABLE 2 - DEDUCTIONS FOR PULL STROKE FORCE AND DISPLACEMENT

PISTON ROD DIA	PISTON ROD AREA	CYLINDER FORCE IN POUNDS FOR VARIOUS PRESSURES										DISPLACEMENT PER INCH OF STROKE OIL GALLONS DISPLACED
		50PSI	100PSI	200PSI	250PSI	500PSI	750PSI	1000PSI	1500PSI	2000PSI	3000PSI	
		5/8	.307	15	37	61	77	154	230	307	461	
1	.785	39	79	157	196	393	589	785	1179	1570	2355	.00340
1 3/8	1.485	74	149	297	371	743	1114	1485	2228	2970	4455	.00643
1 3/4	2.405	120	241	481	601	1203	1804	2405	3608	4810	7215	.01041
2	3.142	157	314	628	786	1571	2357	3142	4113	6284	9426	.01360
2 1/2	4.909	245	491	982	1227	2455	3682	4909	7364	9818	14730	.02125
3	7.069	353	707	1414	1767	3535	5302	7069	10600	14140	21210	.03060
3 1/2	9.621	486	962	1924	2405	4811	7216	9621	14430	19240	28860	.04165
4	12.57	629	1257	2514	3143	6285	9428	12570	18855	25140	37710	.05442
4 1/2	15.90	795	1590	3180	3975	7950	11925	15900	23850	31800	47700	.06883
5	19.64	982	1964	3928	4910	9820	14730	19640	29460	39280	58920	.08502

TABLE 3 - THRUST FORCE AND DISPLACEMENT

CYLIND. BORE	PISTON AREA	CYLINDER FORCE IN POUNDS FOR VARIOUS PRESSURES										DISPLACEMENT PER INCH OF STROKE OIL GALLONS DISPLACED
		50PSI	100PSI	200PSI	250PSI	500PSI	750PSI	1000PSI	1500PSI	2000PSI	3000PSI	
		1 1/2	1.767	88	177	353	442	884	1325	1767	2651	
2	3.142	157	314	628	786	1571	2357	3142	4713	6284	9426	.01360
2 1/2	4.909	245	491	982	1227	2455	3682	4909	7364	9818	14730	.02125
3 1/4	8.296	415	830	1659	2074	4148	622	8296	12440	16590	24890	.03591
4	12.57	629	1257	2514	3143	6285	9428	12570	18860	25140	37710	.05442
5	19.64	982	1964	3928	4910	9820	14730	19640	29460	39280	58920	.08502
6	28.27	1414	2827	5654	7068	14140	21200	28270	42400	56540	84810	.12238
8	50.27	2514	5027	10054	12568	25135	37703	50270	75405	100540	150810	.21762



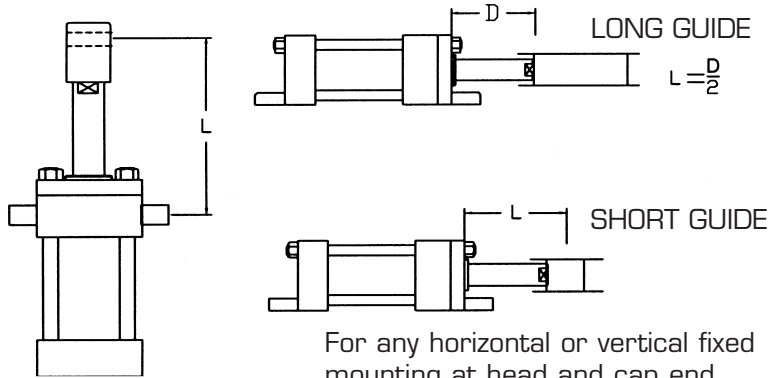
STOP TUBE

Long stroke cylinders (over 40"), tend to jackknife on the push stroke causing side load on the bearing and piston. Use of a stop tube, lengthens the distance between the rod bearing and piston to provide more rod support.

STOP TUBE LENGTH SELECTION:

- 1- Determine if your cylinder corresponds to group "A" or "B" from illustration below
- 2- If cylinder falls into Group A, a stop tube is not required but an oversized rod may be needed. See Rod Sizing Table. For Group B cylinders follow step 3.
- 3- Determine the value of "L" from group B illustration. Be sure cylinder is measured with rod extended

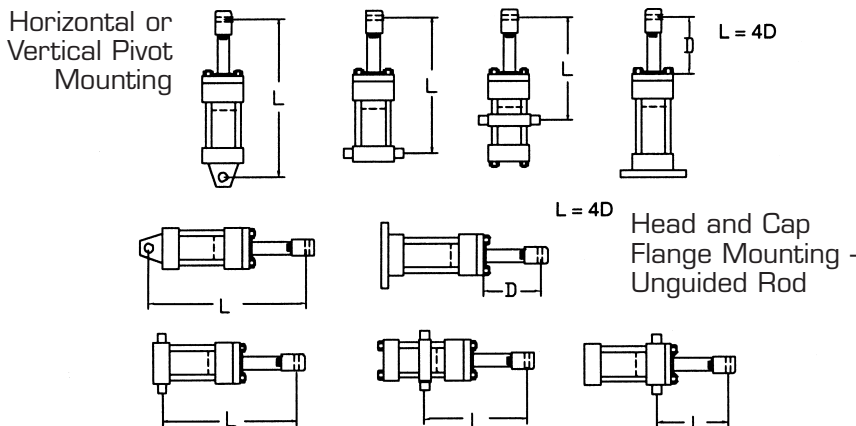
GROUP A - With piston rod extended. To be checked for rod diameter only. Stop Tube not required.



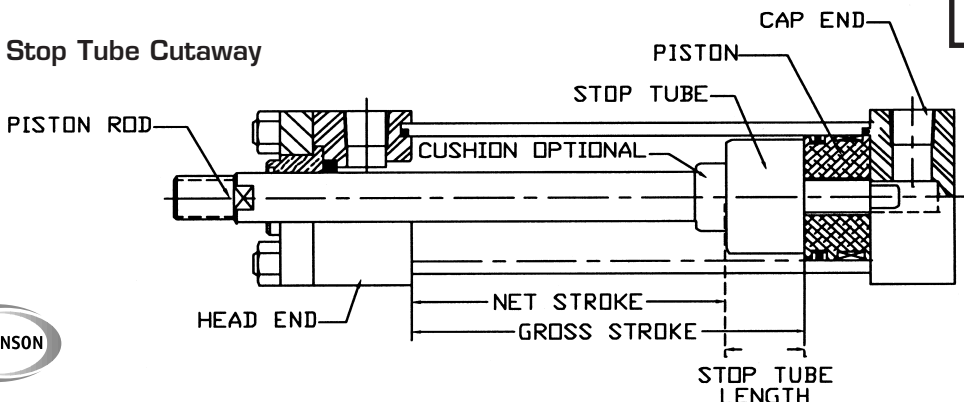
Vertical Pivot Mounting
Head End Only

For any horizontal or vertical fixed mounting at head and cap end with Piston Rod guided.

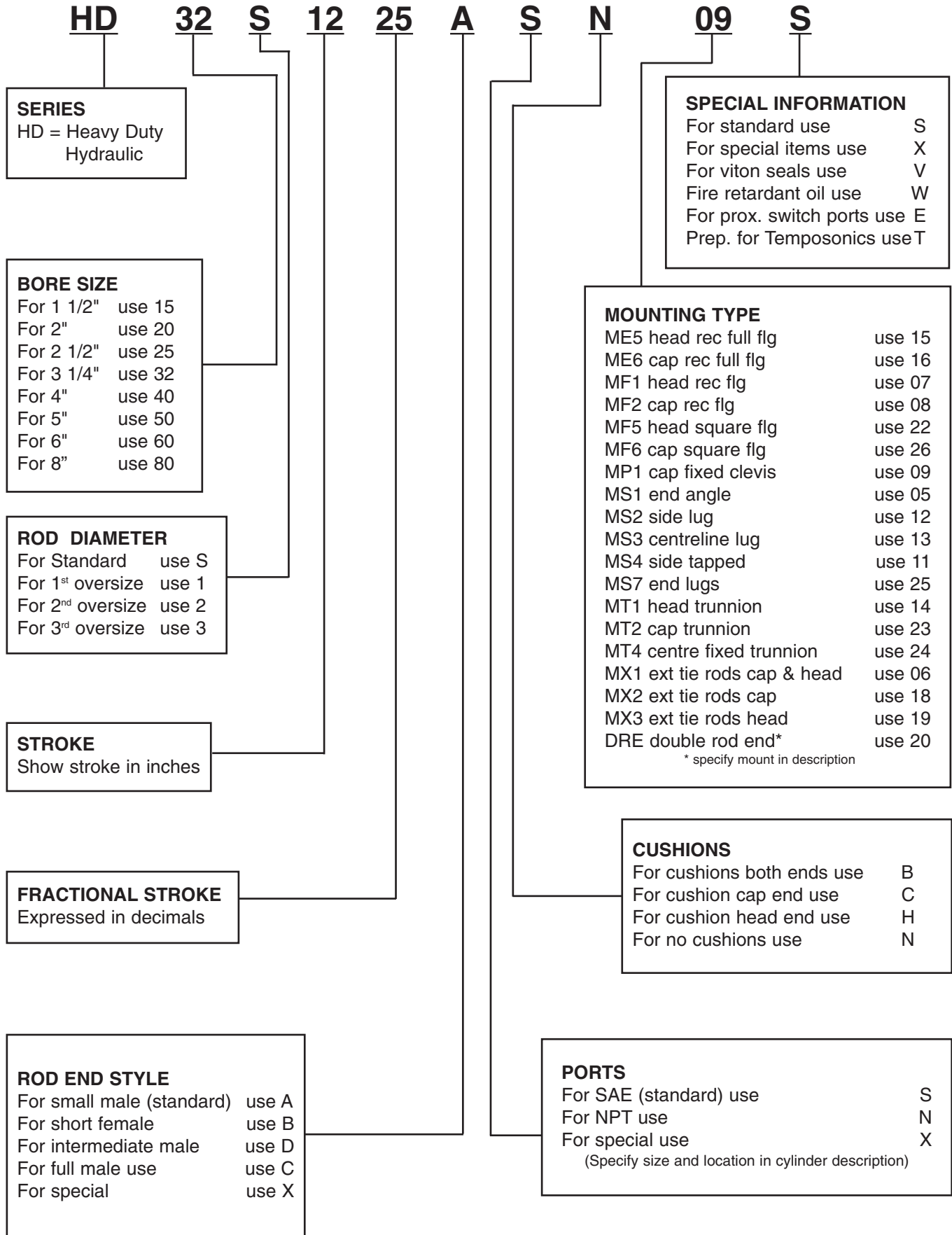
GROUP B - To avoid rod buckling or cylinder jackknifing, check for stop tube and rod diameter requirements with piston rod extended. Use Cylinder dimensional charts.



"L" Inches	Stop Tube Length (inches)
0 - 40	0
41 - 50	1
51 - 60	2
61 - 70	3
71 - 80	4
81 - 90	5
91 - 100	6
101 - 110	7
111 - 120	8
121 - 130	9
131 - 140	10
141 - 150	11
151 - 160	12
161 - 170	13
171 - 180	14
181 - 190	15
191 - 200	16
201 - 210	17
211 - 220	18
221 - 230	19



HOW TO ORDER HIGGINSON HEAVY DUTY CYLINDERS



HIGGINSON WARRANTY

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