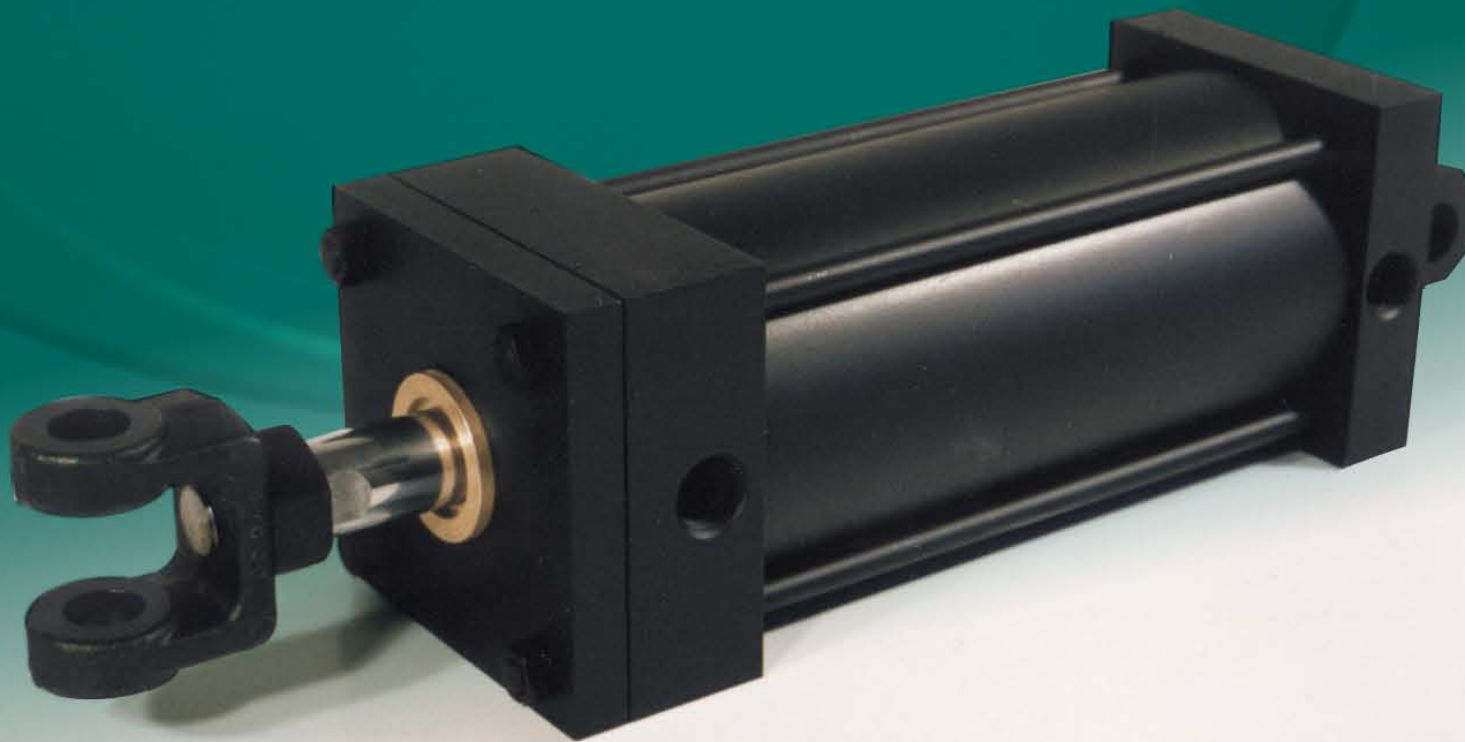




AIR CYLINDERS & MEDIUM DUTY HYDRAULIC



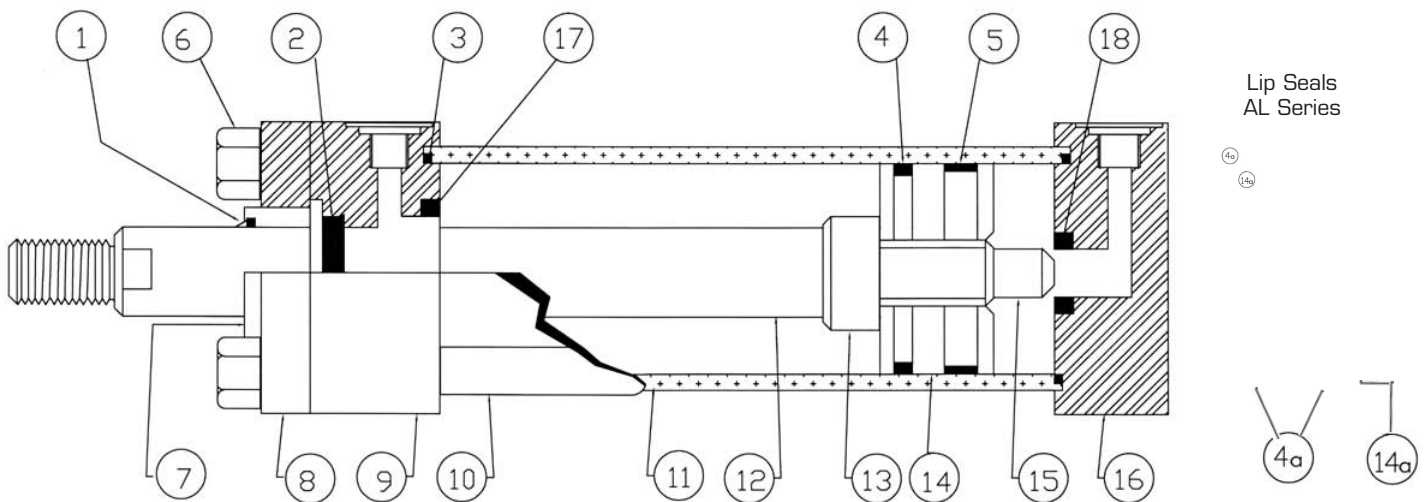
NFPA STYLE

1 1/2" TO 8" BORE

**AIR 250 PSI
HYDRAULIC 1500 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. Supplied in Viton for V option or with metallic scraper [will scrape cement etc. off rod].
2. **Rod Seal** – Polyurethane, disogrin 9250 –40 to +300F, 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. Supplied in Viton for V option.
3. **End Seals** – Buna-N gasket on air and Buna-N O-ring on medium duty hydraulic. Supplied in Teflon for V option.
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 Seals** – Buna-N 90 duro. –65 to +220F Supplied with AL Series for low pressure break-away. Supplied in Viton for V option –20 to +400F.
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. Note: Not used with Lip or Viton seals.
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. **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** – Air cylinder has an aluminum alloy tube with a hard-coated “Alumite” smooth bore that has excellent resistance to sliding-type wear and abrasion. All air cylinders are pre-lubed for millions of trouble-free cycles. Hydraulic cylinder has a C1026 honed steel tube with a hard “Nitrated” bore for extended life.
12. **Piston Rod** – Chrome plated 1045/1050 steel, .001 min. chrome per side, Rc 69-71, RMS-16.
13. **Head Cushion Sleeve** [optional] – Aluminum 6061T6 machined, tapered for longer seal life.
14. **Piston** – Aluminum 6061T6 machined one piece, anaerobically and mechanically locked to the piston rod.
- 14a. **Lip Seal Piston** - Aluminum 6061T6 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.
16. **Head & Cap** – Steel. 1018 MS machined.
17. **Cushion Seals** [optional] – Canned wiper Buna-N.
18. **Cushion Seals** [optional] – Canned wiper Buna-N.



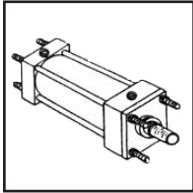
Lip Seals
AL Series

PRESSURE RATING PSI

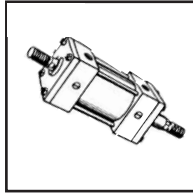
Bore	1.1/2	2	2.1/2	3.1/4	4	5	6	8
Air	250	250	250	250	250	250	250	250
Hydraulic	1500	1500	1500	1200	845*	780*	660*	600

* oversized rod should be considered consult factory if maximum pressure is used

MF1 mount has a reduced maximum pressure due to flange deflection - consult factory

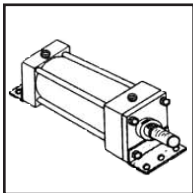


MX1, 2 & 3

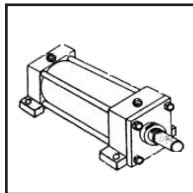


MDX

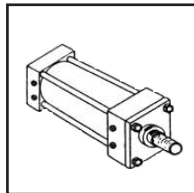
TIE ROD MOUNTED CYLINDERS 3-4
1 1/2" to 8" Bore Series AA and MH &
Double Rod Cylinders



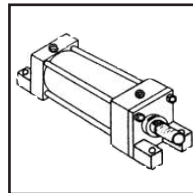
MS1



MS2

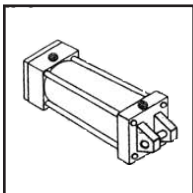


MS4

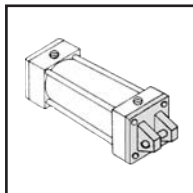


MS7

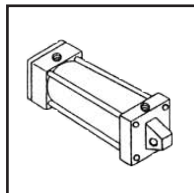
FOOT & FLUSH MOUNTED CYLINDERS 5-6
1 1/2" to 8" Bore Series AA and MH



MP1

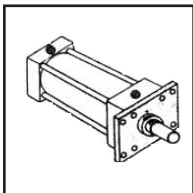


MP2

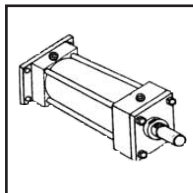


MP3

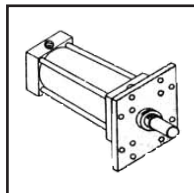
CLEVIS & PIVOT MOUNTED CYLINDERS 7-8
1 1/2" to 8" Bore Series AA and MH



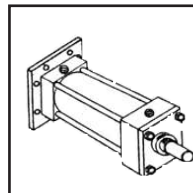
MF1



MF2

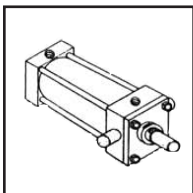


MF5

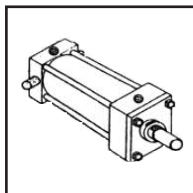


MF6

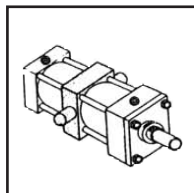
FLANGE MOUNTED CYLINDERS 9-10
1 1/2" to 8" Bore Series AA and MH



MT1



MT2



MT4

TRUNNION MOUNTED CYLINDERS 11-12
1 1/2" to 8" Bore Series AA and MH

ACCESSORIES 13-14

HIGGINSON OPTIONS 15

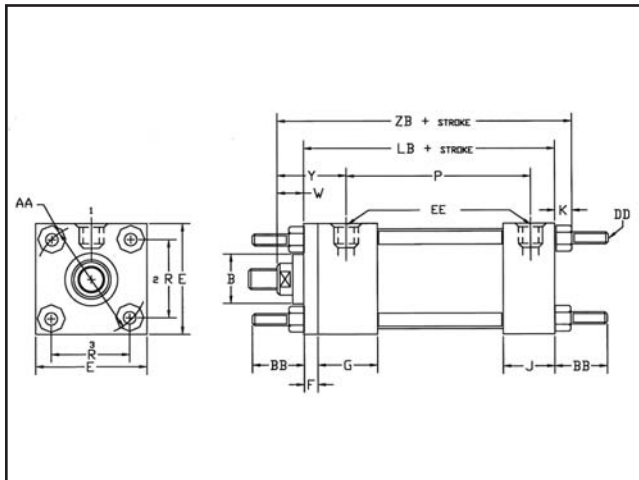
AIR REQUIREMENTS 16

HOW TO ORDER 17

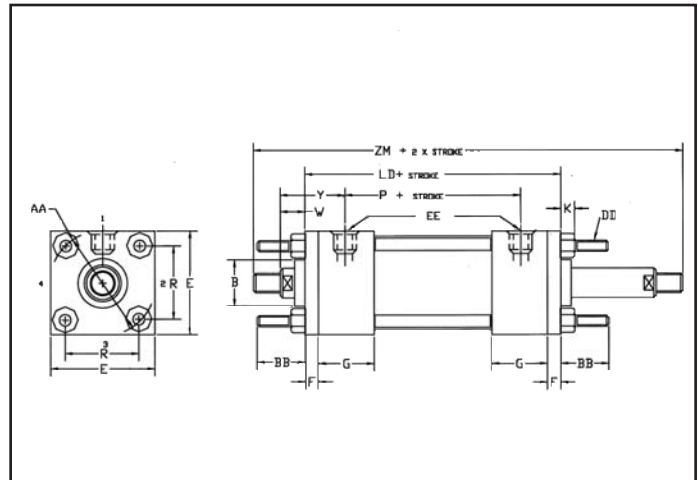
HIGGINSON WARRANTY

TIE ROD MOUNTED CYLINDERS

1 1/2" TO 8" BORE SERIES AA AND MH



NFPA STYLE MX1 (CODE 06)



NFPA STYLE MDX1 (CODE 20)

MOUNTING DESCRIPTION

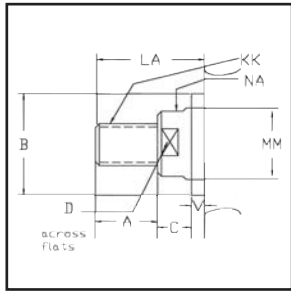
MOUNTING CODE	NFPA MOUNTING STYLE	DESCRIPTION
06	MX1	Tie rods extended both ends (above left) Tie rods extended cap end (use MX1 Dimensions) Tie rods extended head end (use MX1 Dimensions) Tie rods extended both ends (above right) Tie rods extended one end (use MDX1 Dimensions) *Specified Mount in Description
18	MX2	
19	MX3	
20*	MDX1	
20*	MDX3	

ENVELOPE AND MOUNTING DIMENSIONS NOT AFFECTED BY ROD DIAMETER

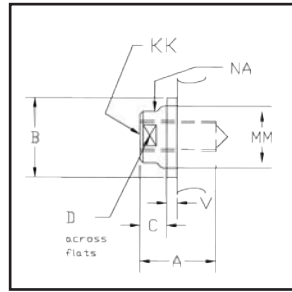
BORE	AA	BB	DD	E	EE (NPTF)	F	G	J	K	R	LB	LD	P
	ADD STROKE												
1 1/2	2.02	1	1/4 - 28	2	3/8	3/8	1 1/2	1	1/4	1.43	4	4 7/8	2 1/4
2	2.60	1 1/8	5/16 - 24	2 1/2	3/8	3/8	1 1/2	1	5/16	1.84	4	4 7/8	2 1/4
2 1/2	3.10	1 1/8	5/16 - 24	3	3/8	3/8	1 1/2	1	5/16	2.19	4 1/8	5	2 3/8
3 1/4	3.90	1 3/8	3/8 - 24	3 3/4	1/2	5/8	1 3/4	1 1/4	3/8	2.76	4 7/8	6	2 5/8
4	4.70	1 3/8	3/8 - 24	4 1/2	1/2	5/8	1 3/4	1 1/4	3/8	3.32	4 7/8	6	2 5/8
5	5.80	1 13/16	1/2 - 20	5 1/2	1/2	5/8	1 3/4	1 1/4	7/16	4.10	5 1/8	6 1/4	2 7/8
6	6.90	1 13/16	1/2 - 20	6 1/2	3/4	3/4	2	1 1/2	7/16	4.88	5 3/4	7	3 1/8
8	9.10	2 5/16	5/8 - 18	8 1/2	3/4	3/4	2	1 1/2	9/16	6.44	5 7/8	7 1/8	3 1/4

TIE ROD MOUNTED CYLINDERS

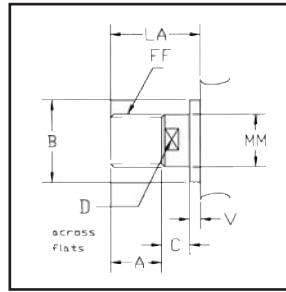
1 1/2" TO 8" BORE SERIES AA AND MH



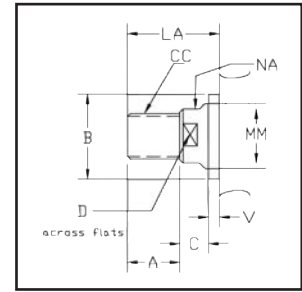
Type A
Standard Male



Type B
Female



Type F
Full Male



Type D
Intermediate Male

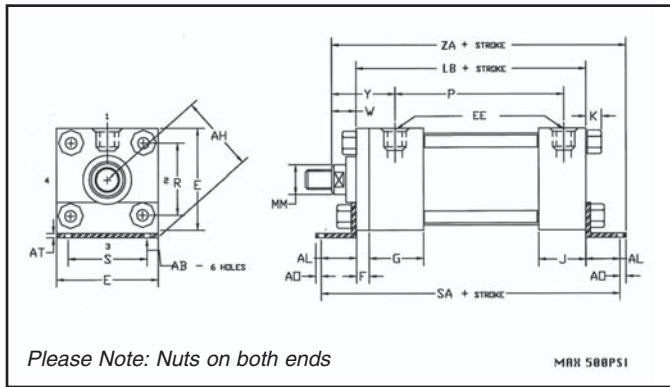
ROD END STYLES

DIMENSIONS AFFECTED BY ROD DIAMETER

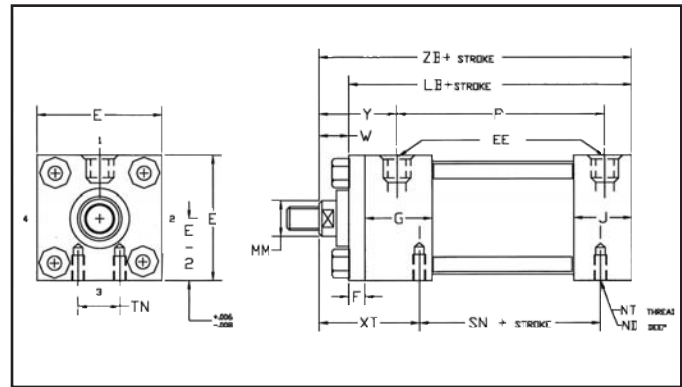
BORE	ROD DIA. MM	Thread Size			Rod Extensions & Pilot Dimensions							Envelope Dimensions			
		KK STD.	CC	FF	A	B +0.000 -0.002	C	D	LA	NA	V	W	Y	ZB ADD STROKE	ZM ADD 2X STROKE
1 1/2	5/8	7/16 - 20	1/2 - 20	5/8 - 18	3/4	1.124	3/8	1/2	1 3/8	9/16	1/4	5/8	1 15/16	4 7/8	6 1/8
	1	3/4 - 16	7/8 - 14	1 - 14	1 1/8	1.499	1/2	7/8	2 1/8	15/16	1/2	1	2 5/16	5 1/4	6 7/8
2	5/8	7/16 - 20	1/2 - 20	5/8 - 18	3/4	1.124	3/8	1/2	1 3/8	9/16	1/4	5/8	1 15/16	4 15/16	6 1/8
	1	3/4 - 16	7/8 - 14	1 - 14	1 1/8	1.499	1/2	7/8	2 1/8	15/16	1/2	1	2 5/16	5 5/16	6 7/8
	1 3/8	1 - 14	1 1/4 - 12	1 3/8 - 12	1 5/8	1.999	5/8	1 1/8	2 7/8	1 5/16	5/8	1 1/4	2 9/16	5 9/16	7 3/8
2 1/2	5/8	7/16 - 20	1/2 - 20	5/8 - 18	3/4	1.124	3/8	1/2	1 3/8	9/16	1/4	5/8	1 15/16	5 1/16	6 1/4
	1	3/4 - 16	7/8 - 14	1 - 14	1 1/8	1.499	1/2	7/8	2 1/8	15/16	1/2	1	2 5/16	5 7/16	7
	1 3/8	1 - 14	1 1/4 - 12	1 3/8 - 12	1 5/8	1.999	5/8	1 1/8	2 7/8	1 5/16	5/8	1 1/4	2 9/16	5 11/16	7 1/2
	1 3/4	1 1/4 - 12	1 1/2 - 12	1 3/4 - 12	2	2.374	3/4	1 1/2	3 1/2	1 11/16	3/4	1 1/2	2 13/16	5 15/16	8
3 1/4	1	3/4 - 16	7/8 - 14	1 - 14	1 1/8	1.499	1/2	7/8	1 7/8	15/16	1/4	3/4	2 7/16	6	7 1/2
	1 3/8	1 - 14	1 1/4 - 12	1 3/8 - 12	1 5/8	1.999	5/8	1 1/8	2 5/8	1 5/16	3/8	1	2 11/16	6 1/4	8
	1 3/4	1 1/4 - 12	1 1/2 - 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 15/16	6 1/2	8 1/2
	2	1 1/2 - 12	1 3/4 - 12	2 - 12	2 1/4	2.624	7/8	1 11/16	3 5/8	1 15/16	1/2	1 3/8	3 1/16	6 5/8	8 3/4
4	1	3/4 - 16	7/8 - 14	1 - 14	1 1/8	1.499	1/2	7/8	1 7/8	15/16	1/4	3/4	2 7/16	6	7 1/2
	1 3/8	1 - 14	1 1/4 - 12	1 3/8 - 12	1 5/8	1.999	5/8	1 1/8	2 5/8	1 5/16	3/8	1	2 11/16	6 1/4	8
	1 3/4	1 1/4 - 12	1 1/2 - 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 15/16	6 1/2	8 1/2
	2	1 1/2 - 12	1 3/4 - 12	2 - 12	2 1/4	2.624	7/8	1 11/16	3 5/8	1 15/16	1/2	1 3/8	3 1/16	6 5/8	8 3/4
5	1	3/4 - 16	7/8 - 14	1 - 14	1 1/8	1.499	1/2	7/8	1 7/8	15/16	1/4	3/4	2 7/16	6 5/16	7 3/4
	1 3/8	1 - 14	1 1/4 - 12	1 3/8 - 12	1 5/8	1.999	5/8	1 1/8	2 5/8	1 5/16	3/8	1	2 11/16	6 9/16	8 1/4
	1 3/4	1 1/4 - 12	1 1/2 - 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 15/16	6 13/16	8 3/4
	2	1 1/2 - 12	1 3/4 - 12	2 - 12	2 1/4	2.624	7/8	1 11/16	3 5/8	1 15/16	1/2	1 3/8	3 1/16	6 15/16	9
6	1 3/8	1 - 14	1 1/4 - 12	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 13/16	7 1/16	8 3/4
	1 3/4	1 1/4 - 12	1 1/2 - 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 1/16	7 5/16	9 1/4
	2	1 1/2 - 12	1 3/4 - 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 3/16	7 7/16	9 1/2
	2 1/2	1 7/8 - 12	2 1/4 - 12	2 1/2 - 12	3	3.124	1	2 1/16	4 1/2	2 3/8	1/2	1 1/2	3 7/16	7 11/16	10
8	1 3/8	1 - 14	1 1/4 - 12	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 13/16	7 5/16	8 7/8
	1 3/4	1 1/4 - 12	1 1/2 - 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 1/16	7 9/16	9 3/8
	2	1 1/2 - 12	1 3/4 - 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 3/16	7 11/16	9 5/8
	2 1/2	1 7/8 - 12	2 1/4 - 12	2 1/2 - 12	3	3.124	1	2 1/16	4 1/2	2 3/8	1/2	1 1/2	3 7/16	7 15/16	10 1/8

FOOT AND FLUSH MOUNTED CYLINDERS

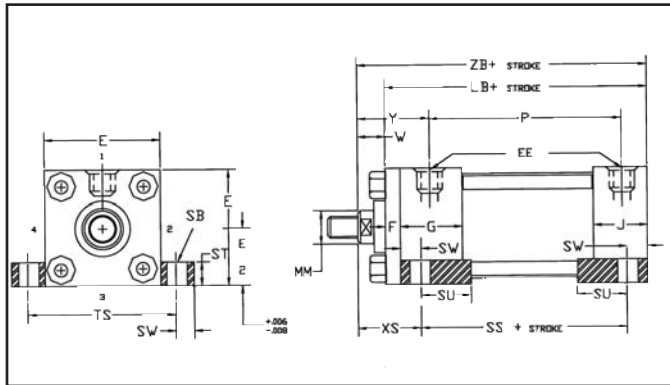
1 1/2" TO 8" BORE SERIES AA AND MH



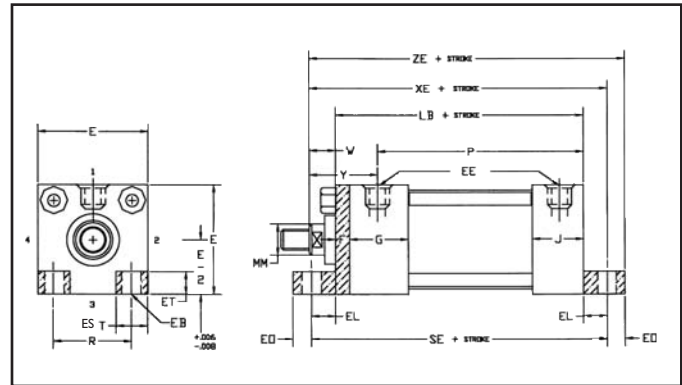
NFPA STYLE MS1 (CODE 05)



NFPA STYLE MS4 (CODE 11)



NFPA STYLE MS2 (CODE 12)



NFPA STYLE MS7 (CODE 25)

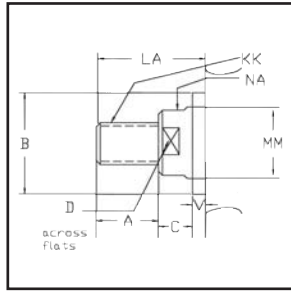
ENVELOPE AND MOUNTING DIMENSIONS NOT AFFECTED BY ROD DIAMETER

BORE	AB	AH	AL	AO	AT	E	EB	EE (NPTF)	EL	EO	ES	ET	F	G	J	K	ND MIN.	NT
1 1/2	7/16	13/16	1	3/8	1/8	2	5/16	3/8	3/4	1/4	9/16	17/32	3/8	1 1/2	1	1/4	1/4	1/4-20
2	7/16	1 7/16	1	3/8	1/8	2 1/2	3/8	3/8	15/16	5/16	5/8	5/8	3/8	1 1/2	1	5/16	3/8	5/16-18
2 1/2	7/16	1 5/8	1	3/8	1/8	3	3/8	3/8	1 1/16	5/16	13/16	25/32	3/8	1 1/2	1	5/16	7/16	3/8-16
3 1/4	9/16	1 15/16	1 1/4	1/2	1/8	3 3/4	7/16	1/2	7/8	3/8	1	15/16	5/8	1 3/4	1 1/4	3/8	1/2	1/2-13
4	9/16	2 1/4	1 1/4	1/2	1/8	4 1/2	7/16	1/2	1	3/8	1 1/4	15/32	5/8	1 3/4	1 1/4	3/8	5/8	1/2-13
5	11/16	2 3/4	1 3/8	5/8	3/16	5 1/2	9/16	1/2	1 1/16	1/2	1 3/8	1 3/8	5/8	1 3/4	1 1/4	7/16	3/4	5/8-11
6	13/16	3 1/4	1 3/8	5/8	3/16	6 1/2	9/16	3/4	1	1/2	1 3/4	1 19/32	3/4	2	1 1/2	7/16	7/8	3/4-10
8	13/16	4 1/4	1 13/16	1 1/16	1/4	8 1/2	1 1/16	3/4	1 1/8	5/8	2 1/4	2 1/32	3/4	2	1 1/2	9/16	1 1/8	3/4-10

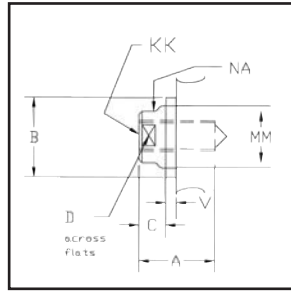
BORE	R	S	SB	ST	SU	SW	TN	TS	US	ADD STROKE						
										LB	P	SA	SE	SN	SS	
1 1/2	1.43	1 1/4	7/16	1/2	15/16	3/8	5/8	2 3/4	3 1/2	4	2 1/4	6	5 1/2	2 1/4	2 7/8	
2	1.84	1 3/4	7/16	1/2	15/16	3/8	7/8	3 1/4	4	4	2 1/4	6	5 7/8	2 1/4	2 7/8	
2 1/2	2.19	2 1/4	7/16	1/2	15/16	3/8	1 1/4	3 3/4	4 1/2	4 1/8	2 3/8	6 1/8	6 1/4	2 3/8	3	
3 1/4	2.76	2 3/4	9/16	3/4	1 1/4	1/2	1 1/2	4 3/4	5 3/4	4 7/8	2 5/8	7 3/8	6 5/8	2 5/8	3 1/4	
4	3.32	3 1/2	9/16	3/4	1 1/4	1/2	2 1/16	5 1/2	6 1/2	4 7/8	2 5/8	7 3/8	6 7/8	2 5/8	3 1/4	
5	4.10	4 1/4	13/16	1	1 9/16	11/16	2 11/16	6 7/8	8 1/4	5 1/8	2 7/8	7 7/8	7 1/4	2 7/8	3 1/8	
6	4.88	5 1/4	13/16	1	1 9/16	11/16	3 1/4	7 7/8	9 1/4	5 3/4	3 1/8	8 1/2	7 3/4	3 1/8	3 5/8	
8	6.44	7 1/8	13/16	1	1 9/16	11/16	4 1/2	9 7/8	11 1/4	5 7/8	3 1/4	8 3/4	8 1/8	3 1/4	3 3/4	

FOOT AND FLUSH MOUNTED CYLINDERS

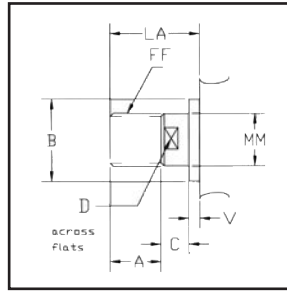
1 1/2" TO 8" BORE SERIES AA AND MH



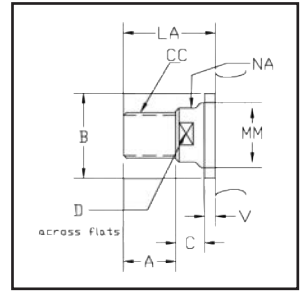
Type A
Standard Male



Type B
Female



Type F
Full Male



Type D
Intermediate Male

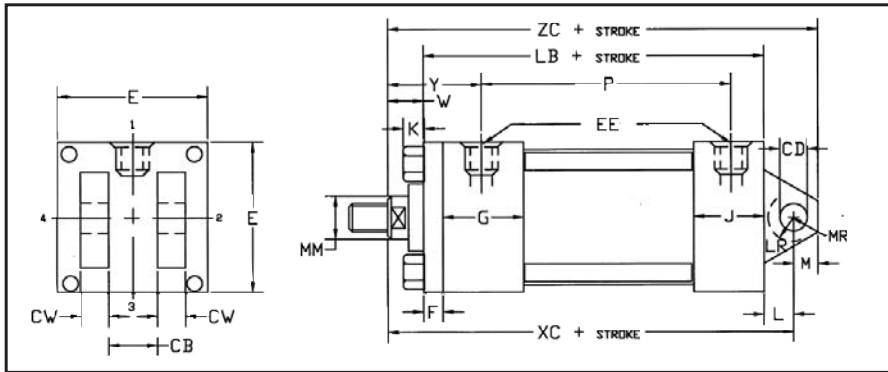
ROD END STYLES

DIMENSIONS AFFECTED BY ROD DIAMETER

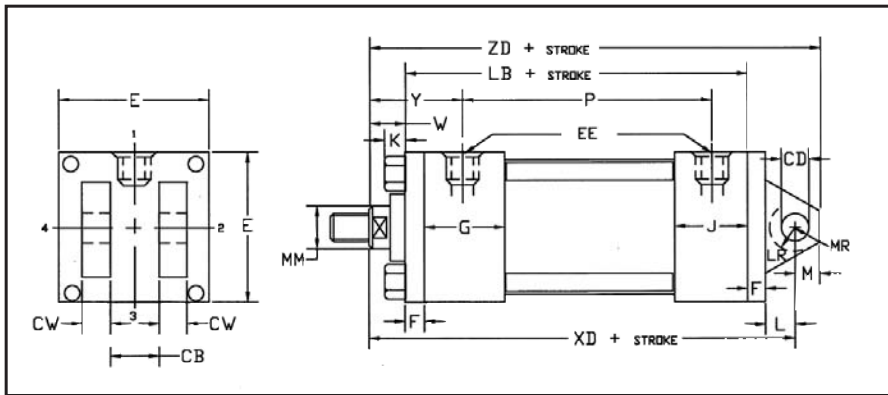
BORE	ROD DIA. MM	Thread Size			Rod Extensions and Pilot Dimensions							Envelope Dimensions									
		KK STD.	CC	FF	A	B +0.000 -0.002	C	D	LA	NA	V	W	XS	XT	Y	XA	XE	ZA	ZB	ZE	
																ADD STROKE					
1 1/2	5/8	7/16-20	1/2-20	5/8-18	3/4	1.124	3/8	1/2	1 3/8	9/16	1/4	5/8	1 3/8	1 15/16	1 15/16	5 5/8	5 3/8	6	4 5/8	5 5/8	
	1	3/4-16	7/8-14	1-14	1 1/8	1.499	1/2	7/8	2 1/8	15/16	1/2	1	1 3/4	2 5/16	2 5/16	6	5 3/4	6 3/8	5	6	
2	5/8	7/16-20	1/2-20	5/8-18	3/4	1.124	3/8	1/2	1 3/8	9/16	1/4	5/8	1 3/8	1 15/16	1 15/16	5 5/8	5 9/16	6	4 5/8	5 7/8	
	1	3/4-16	7/8-14	1-14	1 1/8	1.499	1/2	7/8	2 1/8	15/16	1/2	1	1 3/4	2 5/16	2 5/16	6	5 15/16	6 3/8	5	6 1/4	
	1 3/8	1-14	1 1/4-12	1 3/8-12	1 5/8	1.999	5/8	1 1/8	2 7/8	15/16	5/8	1 1/4	2	2 9/16	2 9/16	6 1/4	6 3/16	6 5/8	5 1/4	6 1/2	
2 1/2	5/8	7/16-20	1/2-20	5/8-18	3/4	1.124	3/8	1/2	1 3/8	9/16	1/4	5/8	1 3/8	1 15/16	1 15/16	5 3/4	5 13/16	6 1/8	4 3/4	6 1/8	
	1	3/4-16	7/8-14	1-14	1 1/8	1.499	1/2	7/8	2 1/8	15/16	1/2	1	1 3/4	2 5/16	2 5/16	6 1/8	6 3/16	6 1/2	5 1/8	6 1/2	
	1 3/8	1-14	1 1/4-12	1 3/8-12	1 5/8	1.999	5/8	1 1/8	2 7/8	15/16	5/8	1 1/4	2	2 9/16	2 9/16	6 3/8	6 7/16	6 3/4	5 3/8	6 3/4	
	1 3/4	1 1/4-12	1 1/2-12	1 3/4-12	2	2.374	3/4	1 1/2	3 1/2	1 11/16	3/4	1 1/2	2 1/4	2 13/16	2 13/16	6 5/8	6 11/16	7	5 5/8	7	
3 1/4	1	3/4-16	7/8-14	1-14	1 1/8	1.499	1/2	7/8	1 7/8	15/16	1/4	3/4	1 7/8	2 7/16	2 7/16	6 7/8	6 1/2	7 3/8	5 5/8	6 7/8	
	1 3/8	1-14	1 1/4-12	1 3/8-12	1 5/8	1.999	5/8	1 1/8	2 5/8	15/16	3/8	1	2 1/8	2 11/16	2 11/16	7 1/8	6 3/4	7 5/8	5 7/8	7 1/8	
	1 3/4	1 1/4-12	1 1/2-12	1 3/4-12	2	2.374	3/4	1 1/2	3 1/4	1 11/16	1/2	1 1/4	2 3/8	2 15/16	2 15/16	7 3/8	7 1/8	7 7/8	6 1/8	7 3/8	
	2	1 1/2-12	1 3/4-12	2-12	2 1/4	2.624	7/8	1 11/16	3 5/8	1 15/16	1/2	1 3/8	2 1/2	3 1/16	3 1/16	7 1/2	7 1/8	8	6 1/4	7 1/2	
4	1	3/4-16	7/8-14	1-14	1 1/8	1.499	1/2	7/8	1 7/8	15/16	1/4	3/4	1 7/8	2 7/16	2 7/16	6 7/8	6 5/8	7 3/8	5 5/8	7	
	1 3/8	1-14	1 1/4-12	1 3/8-12	1 5/8	1.999	5/8	1 1/8	2 5/8	15/16	3/8	1	2 1/8	2 11/16	2 11/16	7 1/8	6 7/8	7 5/8	5 7/8	7 1/4	
	1 3/4	1 1/4-12	1 1/2-12	1 3/4-12	2	2.374	3/4	1 1/2	3 1/4	1 11/16	1/2	1 1/4	2 3/8	2 15/16	2 15/16	7 3/8	7 1/8	7 7/8	6 1/8	7 1/2	
	2	1 1/2-12	1 3/4-12	2-12	2 1/4	2.624	7/8	1 11/16	3 5/8	1 15/16	1/2	1 3/8	2 1/2	3 1/16	3 1/16	7 1/2	7 1/4	8	6 1/4	7 5/8	
5	1	3/4-16	7/8-14	1-14	1 1/8	1.499	1/2	7/8	1 7/8	15/16	1/4	3/4	2 1/16	2 7/16	2 7/16	7 1/4	6 15/16	7 7/8	5 7/8	7 7/16	
	1 3/8	1-14	1 1/4-12	1 3/8-12	1 5/8	1.999	5/8	1 1/8	2 5/8	15/16	3/8	1	2 5/16	2 11/16	2 11/16	7 1/2	7 3/16	8 1/8	6 1/8	7 11/16	
	1 3/4	1 1/4-12	1 1/2-12	1 3/4-12	2	2.374	3/4	1 1/2	3 1/4	1 11/16	1/2	1 1/4	2 9/16	2 15/16	2 15/16	7 3/4	7 7/16	8 3/8	6 3/8	7 15/16	
	2	1 1/2-12	1 3/4-12	2-12	2 1/4	2.624	7/8	1 11/16	3 5/8	1 15/16	1/2	1 3/8	2 11/16	3 1/16	3 1/16	7 7/8	7 9/16	8 1/2	6 1/2	8 1/16	
6	1 3/8	1-14	1 1/4-12	1 3/8-12	1 5/8	1.999	5/8	1 1/8	2 1/2	15/16	1/4	7/8	2 5/16	2 13/16	2 13/16	8	7 5/8	8 5/8	6 5/8	8 1/8	
	1 3/4	1 1/4-12	1 1/2-12	1 3/4-12	2	2.374	3/4	1 1/2	3 1/8	1 11/16	3/8	1 1/8	2 9/16	3 1/16	3 1/16	8 1/4	7 7/8	8 7/8	6 7/8	8 3/8	
	2	1 1/2-12	1 3/4-12	2-12	2 1/4	2.624	7/8	1 11/16	3 1/2	1 15/16	3/8	1 1/4	2 11/16	3 3/16	3 3/16	8 3/8	8	9	7	8 1/2	
	2 1/2	1 7/8-12	2 1/4-12	2 1/2-12	3	3.124	1	2 1/16	4 1/2	2 3/8	1/2	1 1/2	2 15/16	3 7/16	3 7/16	8 5/8	8 1/4	9 1/4	7 1/4	8 3/4	
8	1 3/8	1-14	1 1/4-12	1 3/8-12	1 5/8	1.999	5/8	1 1/8	2 1/2	15/16	1/4	7/8	2 5/16	2 13/16	2 13/16	8 9/16	7 7/8	9 1/4	6 3/4	8 1/2	
	1 3/4	1 1/4-12	1 1/2-12	1 3/4-12	2	2.374	3/4	1 1/2	3 1/8	1 11/16	3/8	1 1/8	2 9/16	3 1/16	3 1/16	8 13/16	8 1/8	9 1/2	7	8 3/4	
	2	1 1/2-12	1 3/4-12	2-12	2 1/4	2.624	7/8	1 11/16	3 1/2	1 15/16	3/8	1 1/4	2 11/16	3 3/16	3 3/16	8 15/16	8 1/4	9 5/8	7 1/4	8 7/8	
	2 1/2	1 7/8-12	2 1/4-12	2 1/2-12	3	3.124	1	2 1/16	4 1/2	2 3/8	1/2	1 1/2	2 15/16	3 7/16	3 7/16	9 3/16	8 1/2	9 7/8	7 3/8	9 1/8	

CLEVIS AND PIVOT MOUNTED CYLINDERS

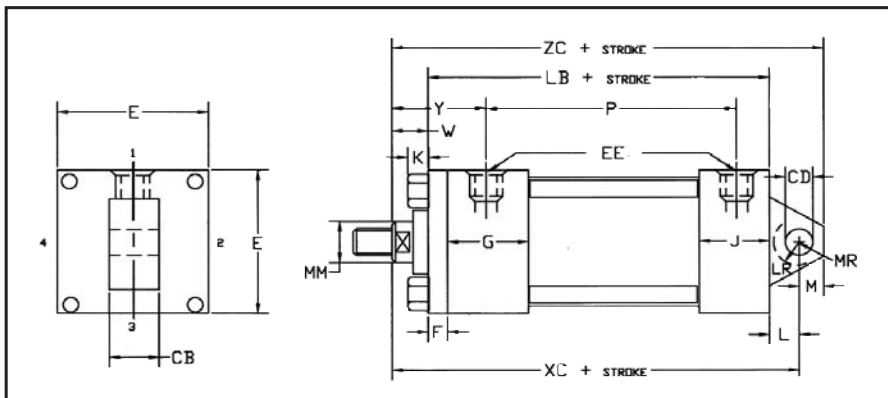
1 1/2" TO 8" BORE SERIES AA AND MH



NFPA STYLE MP1 (CODE 09)
(PIVOT PIN INCLUDED)



NFPA STYLE MP2 (CODE 10)
(PIVOT PIN INCLUDED)



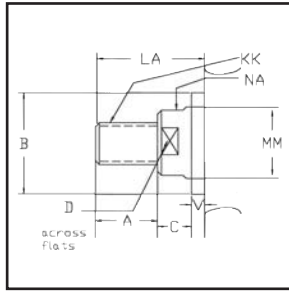
NFPA STYLE MP3 (CODE 13)
(PIVOT PIN INCLUDED)

ENVELOPE AND MOUNTING DIMENSIONS NOT AFFECTED BY ROD DIAMETER

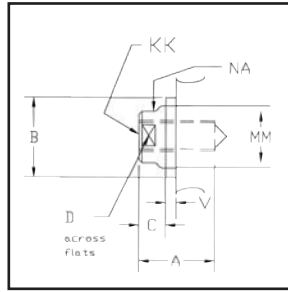
BORE	CB	CD +0.000 -0.002	CW	E	EE (NPTF)	F	G	J	K	L	LR	M	MR	ADD STROKE	
														LB	P
1 1/2	3/4	.501	1/2	2	3/8	3/8	1 1/2	1	1/4	3/4	3/4	1/2	5/8	4	2 1/4
2	3/4	.501	1/2	2 1/2	3/8	3/8	1 1/2	1	5/16	3/4	3/4	1/2	5/8	4	2 1/4
2 1/2	3/4	.501	1/2	3	3/8	3/8	1 1/2	1	5/16	3/4	3/4	1/2	5/8	4 1/8	2 3/8
3 1/4	1 1/4	.751	5/8	3 3/4	1/2	5/8	1 3/4	1 1/4	3/8	1 1/4	1	3/4	15/16	4 7/8	2 5/8
4	1 1/4	.751	5/8	4 1/2	1/2	5/8	1 3/4	1 1/4	3/8	1 1/4	1	3/4	15/16	4 7/8	2 5/8
5	1 1/4	.751	5/8	5 1/2	1/2	5/8	1 3/4	1 1/4	7/16	1 1/4	1	3/4	15/16	5 1/8	2 7/8
6	1 1/2	1.001	3/4	6 1/2	3/4	3/4	2	1 1/2	7/16	1 1/2	1 1/4	1	13/16	5 3/4	3 1/8
8	1 1/2	1.001	3/4	8 1/2	3/4	3/4	2	1 1/2	9/16	1 1/2	1 1/4	1	13/16	5 7/8	3 1/4

CLEVIS AND PIVOT MOUNTED CYLINDERS

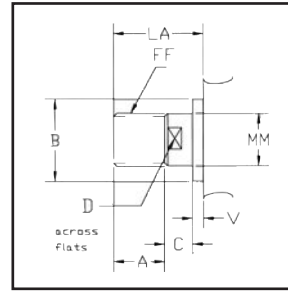
1 1/2" TO 8" BORE SERIES AA AND MH



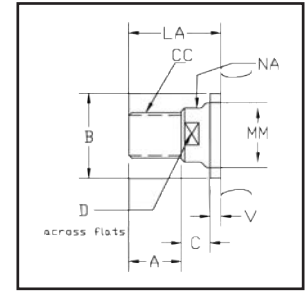
Type A
Standard Male



Type B
Female



Type F
Full Male



Type D
Intermediate Male

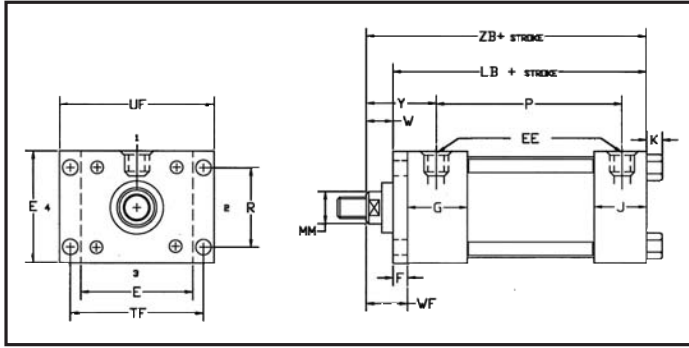
ROD END STYLES

DIMENSIONS AFFECTED BY ROD DIAMETER

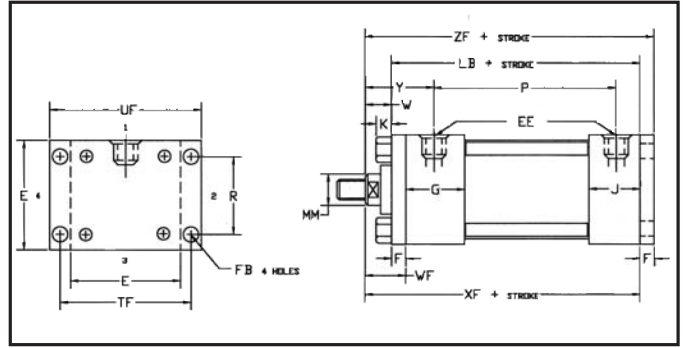
BORE	ROD DIA. MM	Thread Size			Rod Extensions and Pilot Dimensions								Envelope Dimensions					
		KK STD.	CC	FF	A	B +0.000 -0.002	C	D	LA	NA	V	W	Y	XC	XD	ZC	ZD	
																		ADD STROKE
1 1/2	5/8	7/16-20	1/2-20	5/8-18	3/4	1.124	3/8	1/2	1 3/8	9/16	1/4	5/8	1 15/16	5 3/8	5 3/4	5 7/8	6 1/4	
	1	3/4-16	7/8-14	1-14	1 1/8	1.499	1/2	7/8	2 1/8	15/16	1/2	1	2 5/16	5 3/4	6 1/8	6 1/4	6 5/8	
2	5/8	7/16-20	1/2-20	5/8-18	3/4	1.124	3/8	1/2	1 3/8	9/16	1/4	5/8	1 15/16	5 3/8	5 3/4	5 7/8	6 1/4	
	1	3/4-16	7/8-14	1-14	1 1/8	1.499	1/2	7/8	2 1/8	15/16	1/2	1	2 5/16	5 3/4	6 1/8	6 1/4	6 5/8	
	1 3/8	1-14	1 1/4-12	1 3/8-12	1 5/8	1.999	5/8	1 1/8	2 7/8	15/16	5/8	1 1/4	2 9/16	6	6 3/8	6 1/2	6 7/8	
2 1/2	5/8	7/16-20	1/2-20	5/8-18	3/4	1.124	3/8	1/2	1 3/8	9/16	1/4	5/8	1 15/16	5 1/2	5 7/8	6	6 3/8	
	1	3/4-16	7/8-14	1-14	1 1/8	1.499	1/2	7/8	2 1/8	15/16	1/2	1	2 5/16	5 7/8	6 1/4	6 3/8	6 3/4	
	1 3/8	1-14	1 1/4-12	1 3/8-12	1 5/8	1.999	5/8	1 1/8	2 7/8	15/16	5/8	1 1/4	2 9/16	6 1/8	6 1/2	6 5/8	7	
	1 3/4	1 1/4-12	1 1/2-12	1 3/4-12	2	2.374	3/4	1 1/2	3 1/2	1 11/16	3/4	1 1/2	2 13/16	6 3/8	6 3/4	6 7/8	7 1/4	
3 1/4	1	3/4-16	7/8-14	1-14	1 1/8	1.499	1/2	7/8	1 7/8	15/16	1/4	3/4	2 7/16	6 7/8	7 1/2	7 5/8	8 1/4	
	1 3/8	1-14	1 1/4-12	1 3/8-12	1 5/8	1.999	5/8	1 1/8	2 5/8	15/16	3/8	1	2 11/16	7 1/8	7 3/4	7 7/8	8 1/2	
	1 3/4	1 1/4-12	1 1/2-12	1 3/4-12	2	2.374	3/4	1 1/2	3 1/4	1 11/16	1/2	1 1/4	2 15/16	7 3/8	8	8 1/8	8 3/4	
	2	1 1/2-12	1 3/4-12	2-12	2 1/4	2.624	7/8	1 11/16	3 5/8	1 15/16	1/2	1 3/8	3 1/16	7 1/2	8 1/8	8 1/4	8 7/8	
4	1	3/4-16	7/8-14	1-14	1 1/8	1.499	1/2	7/8	1 7/8	15/16	1/4	3/4	2 7/16	6 7/8	7 1/2	7 5/8	8 1/4	
	1 3/8	1-14	1 1/4-12	1 3/8-12	1 5/8	1.999	5/8	1 1/8	2 5/8	15/16	3/8	1	2 11/16	7 1/8	7 3/4	7 7/8	8 1/2	
	1 3/4	1 1/4-12	1 1/2-12	1 3/4-12	2	2.374	3/4	1 1/2	3 1/4	1 11/16	1/2	1 1/4	2 15/16	7 3/8	8	8 1/8	8 3/4	
	2	1 1/2-12	1 3/4-12	2-12	2 1/4	2.624	7/8	1 11/16	3 5/8	1 15/16	1/2	1 3/8	3 1/16	7 1/2	8 1/8	8 1/4	8 7/8	
5	1	3/4-16	7/8-14	1-14	1 1/8	1.499	1/2	7/8	1 7/8	15/16	1/4	3/4	2 7/16	7 1/8	7 3/4	7 7/8	8 1/2	
	1 3/8	1-14	1 1/4-12	1 3/8-12	1 5/8	1.999	5/8	1 1/8	2 5/8	15/16	3/8	1	2 11/16	7 3/8	8	8 1/8	8 3/4	
	1 3/4	1 1/4-12	1 1/2-12	1 3/4-12	2	2.374	3/4	1 1/2	3 1/4	1 11/16	1/2	1 1/4	2 15/16	7 5/8	8 1/4	8 3/8	9	
	2	1 1/2-12	1 3/4-12	2-12	2 1/4	2.624	7/8	1 11/16	3 5/8	1 15/16	1/2	1 3/8	3 1/16	7 3/4	8 3/8	8 1/2	9 1/8	
6	1 3/8	1-14	1 1/4-12	1 3/8-12	1 5/8	1.999	5/8	1 1/8	2 1/2	15/16	1/4	7/8	2 13/16	8 1/8	8 7/8	9 1/8	9 7/8	
	1 3/4	1 1/4-12	1 1/2-12	1 3/4-12	2	2.374	3/4	1 1/2	3 1/8	1 11/16	3/8	1 1/8	3 1/16	8 3/8	9 1/8	9 3/8	10 1/8	
	2	1 1/2-12	1 3/4-12	2-12	2 1/4	2.624	7/8	1 11/16	3 1/2	1 15/16	3/8	1 1/4	3 3/16	8 1/2	9 1/4	9 1/2	10 1/4	
	2 1/2	1 7/8-12	2 1/4-12	2 1/2-12	3	3.124	1	2 1/16	4 1/2	2 3/8	1/2	1 1/2	3 7/16	8 3/4	9 1/2	9 3/4	10 1/2	
8	1 3/8	1-14	1 1/4-12	1 3/8-12	1 5/8	1.999	5/8	1 1/8	2 1/2	15/16	1/4	7/8	2 13/16	8 1/4	9	9 1/4	10	
	1 3/4	1 1/4-12	1 1/2-12	1 3/4-12	2	2.374	3/4	1 1/2	3 1/8	1 11/16	3/8	1 1/8	3 1/16	8 1/2	9 1/4	9 1/2	10 1/4	
	2	1 1/2-12	1 3/4-12	2-12	2 1/4	2.624	7/8	1 11/16	3 1/2	1 15/16	3/8	1 1/4	3 3/16	8 5/8	9 3/8	9 5/8	10 3/8	
	2 1/2	1 7/8-12	2 1/4-12	2 1/2-12	3	3.124	1	2 1/16	4 1/2	2 3/8	1/2	1 1/2	3 7/16	8 7/8	9 5/8	9 7/8	10 5/8	

FLANGE MOUNTED CYLINDERS

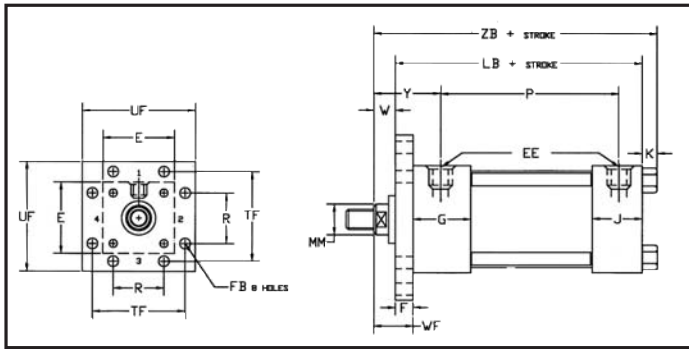
1 1/2" TO 8" BORE SERIES AA AND MH



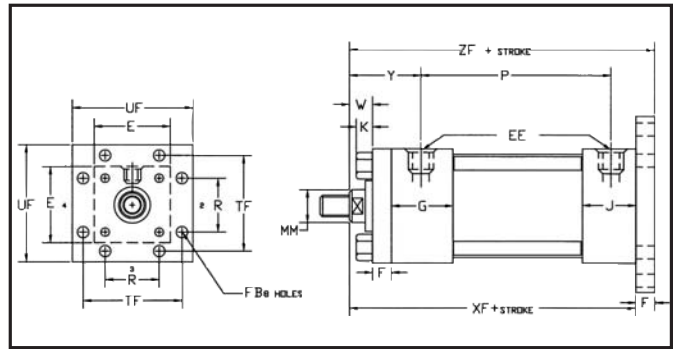
NFPA STYLE MF1 (CODE 07)



NFPA STYLE MF2 (CODE 08)



NFPA STYLE MF5 (CODE 22)



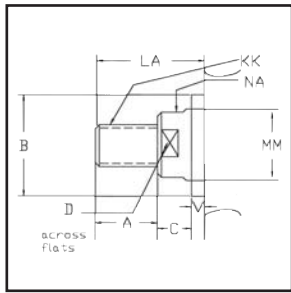
NFPA STYLE MF6 (CODE 26)

ENVELOPE AND MOUNTING DIMENSIONS NOT AFFECTED BY ROD DIAMETER

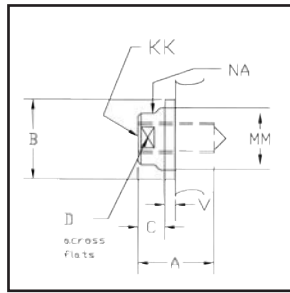
BORE	E	EE (NPTF)	F	FB	G	J	K	R	TF	UF	LB	P
											ADD STROKE	
1 1/2	2	3/8	3/8	5/16	1 1/2	1	1/4	1.43	2 3/4	3 3/8	4	2 1/4
2	2 1/2	3/8	3/8	3/8	1 1/2	1	5/16	1.84	3 3/8	4 1/8	4	2 1/4
2 1/2	3	3/8	3/8	3/8	1 1/2	1	5/16	2.19	3 7/8	4 5/8	4 1/8	2 3/8
3 1/4	3 3/4	1/2	5/8	7/16	1 3/4	1 1/4	3/8	2.76	4 11/16	5 1/2	4 7/8	2 5/8
4	4 1/2	1/2	5/8	7/16	1 3/4	1 1/4	3/8	3.32	5 7/16	6 1/4	4 7/8	2 5/8
5	5 1/2	1/2	5/8	9/16	1 3/4	1 1/4	7/16	4.10	6 5/8	7 5/8	5 1/8	2 7/8
6	6 1/2	3/4	3/4	9/16	2	1 1/2	7/16	4.88	7 5/8	8 5/8	5 3/4	3 1/8
8	8 1/2	3/4	3/4	11/16	2	1 1/2	9/16	6.44	10 1/2	12 1/2	5 7/8	3 1/4

FLANGE MOUNTED CYLINDERS

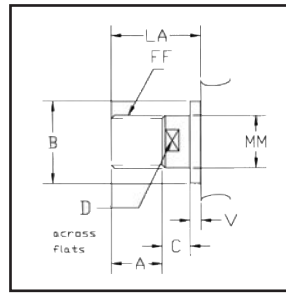
1 1/2" TO 8" BORE SERIES AA AND MH



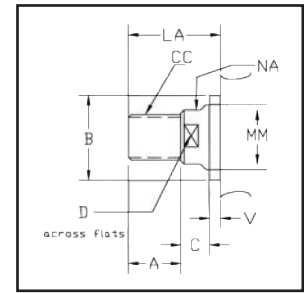
Type A
Standard



Type B
Female



Type F
Full Male



Type D
Intermediate Male

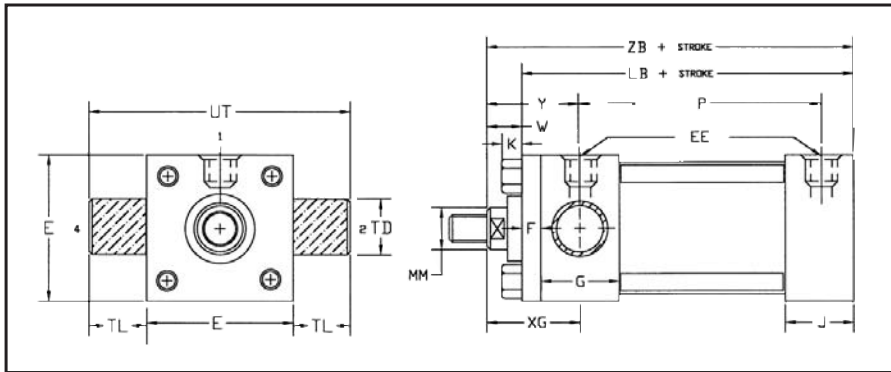
ROD END STYLES

DIMENSIONS AFFECTED BY ROD DIAMETER

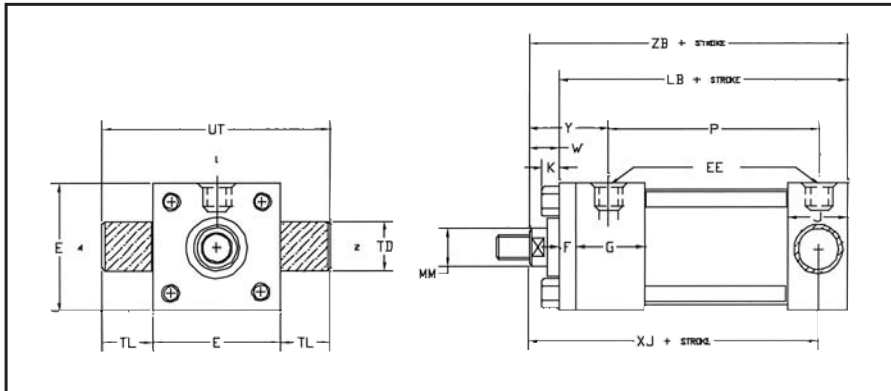
BORE	ROD DIA. MM	Thread Size			Rod Extensions and Pilot Dimensions							Envelope Dimensions					
		KK STD.	CC	FF	A	B +0.000 -0.002	C	D	LA	NA	V	W	WF	Y	ADD STROKE		
															XF	ZB	ZF
1 1/2	5/8	7/16-20	1/2-20	5/8-18	3/4	1.124	3/8	1/2	1 3/8	9/16	1/4	5/8	1	1 15/16	4 5/8	4 7/8	5
	1	3/4 - 16	7/8 - 14	1 - 14	1 1/8	1.499	1/2	7/8	2 1/8	15/16	1/2	1	1 3/8	2 5/16	5	5 1/4	5 3/8
2	5/8	7/16 - 20	1/2 - 20	5/8 - 18	3/4	1.124	3/8	1/2	1 3/8	9/16	1/4	5/8	1	1 15/16	4 5/8	4 15/16	5
	1	3/4 - 16	7/8 - 14	1 - 14	1 1/8	1.499	1/2	7/8	2 1/8	15/16	1/2	1	1 3/8	2 5/16	5	5 15/16	5 3/8
	1 3/8	1 - 14	1 1/4 - 12	1 3/8 - 12	1 5/8	1.999	5/8	1 1/8	2 7/8	1 5/16	5/8	1 1/4	1 5/8	2 9/16	5 1/4	5 9/16	5 5/8
2 1/2	5/8	7/16 - 20	1/2 - 20	5/18 - 18	3/4	1.124	3/8	1/2	1 3/8	9/16	1/4	5/8	1	1 15/16	4 3/4	5 1/16	5 1/8
	1	3/4 - 16	7/8 - 14	1 - 14	1 1/8	1.499	1/2	7/8	2 1/8	15/16	1/2	1	1 3/8	2 5/16	5 1/8	5 7/16	5 1/2
	1 3/8	1 - 14	1 1/4 - 12	1 3/8 - 12	1 5/8	1.999	5/8	1 1/8	2 7/8	1 5/16	5/8	1 1/4	1 5/8	2 9/16	5 3/8	5 11/16	5 3/4
	1 3/4	1 1/4 - 12	1 1/2 - 12	1 3/4 - 12	2	2.374	3/4	1 1/2	3 1/2	1 11/16	3/4	1 1/2	1 7/8	2 13/16	5 5/8	5 15/16	6
3 1/4	1	3/4 - 16	7/8 - 14	1 - 14	1 1/8	1.499	1/2	7/8	1 7/8	15/16	1/4	3/4	1 3/8	2 7/16	5 5/8	6	6 1/4
	1 3/8	1 - 14	1 1/4 - 12	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 11/16	5 7/8	6 1/4	6 1/2
	1 3/4	1 1/4 - 12	1 1/2 - 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 7/8	2 15/16	6 1/8	6 1/2	6 3/4
	2	1 1/2 - 12	1 3/4 - 12	2 - 12	2 1/4	2.624	7/8	1 11/16	3 5/8	1 15/16	1/2	1 3/8	2	3 1/16	6 1/4	6 5/8	6 7/8
4	1	3/4 - 16	7/8 - 14	1 - 14	1 1/8	1.499	1/2	7/8	1 7/8	15/16	1/4	3/4	1 3/8	2 7/16	5 5/8	6	6 1/4
	1 3/8	1 - 14	1 1/4 - 12	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 11/16	5 7/8	6 1/4	6 1/2
	1 3/4	1 1/4 - 12	1 1/2 - 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 7/8	2 15/16	6 1/8	6 1/2	6 3/4
	2	1 1/2 - 12	1 3/4 - 12	2 - 12	2 1/4	2.624	7/8	1 11/16	3 5/8	1 15/16	1/2	1 3/8	2	3 1/16	6 1/4	6 5/8	6 7/8
5	1	3/4 - 16	7/8 - 14	1 - 14	1 1/8	1.499	1/2	7/8	1 7/8	15/16	1/4	3/4	1 3/8	2 7/16	5 7/8	6 5/16	6 1/2
	1 3/8	1 - 14	1 1/4 - 12	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 11/16	6 1/8	6 9/16	6 3/4
	1 3/4	1 1/4 - 12	1 1/2 - 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 7/8	2 15/16	6 3/8	6 13/16	7
	2	1 1/2 - 12	1 3/4 - 12	2 - 12	2 1/4	2.624	7/8	1 11/16	3 5/8	1 15/16	1/2	1 3/8	2	3 1/16	6 1/2	6 15/16	7 1/8
6	1 3/8	1 - 14	1 1/4 - 12	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 13/16	6 5/8	7 1/16	7 3/8
	1 3/4	1 1/4 - 12	1 1/2 - 12	1 3/4 - 12	2	2.374	3/4	1 1/2	3 1/8	1 11/16	3/8	1 1/8	1 7/8	3 1/16	6 7/8	7 5/16	7 5/8
	2	1 1/2 - 12	1 3/4 - 12	2 - 12	2 1/4	2.624	7/8	1 11/16	3 1/2	1 15/16	3/8	1 1/4	2	3 3/16	7	7 7/16	7 3/4
	2 1/2	1 7/8 - 12	2 1/4 - 12	2 1/2 - 12	3	3.124	1	2 1/16	4 1/2	2 3/8	1/2	1 1/2	2 1/4	3 7/16	7 1/4	7 11/16	8
8	1 3/8	1 - 14	1 1/4 - 12	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 13/16	6 3/4	7 5/16	7 1/2
	1 3/4	1 1/4 - 12	1 1/2 - 12	1 3/4 - 12	2	2.374	3/4	1 1/2	3 1/8	1 11/16	3/8	1 1/8	1 7/8	3 1/16	7	7 9/16	7 3/4
	2	1 1/2 - 12	1 3/4 - 12	2 - 12	2 1/4	2.624	7/8	1 11/16	3 1/2	1 15/16	3/8	1 1/4	2	3 3/16	7 1/8	7 11/16	7 7/8
	2 1/2	1 7/8 - 12	2 1/4 - 12	2 1/2 - 12	3	3.124	1	2 1/16	4 1/2	2 3/8	1/2	1 1/2	2 1/4	3 7/16	7 3/8	7 15/16	8 1/8

TRUNNION MOUNTED CYLINDERS

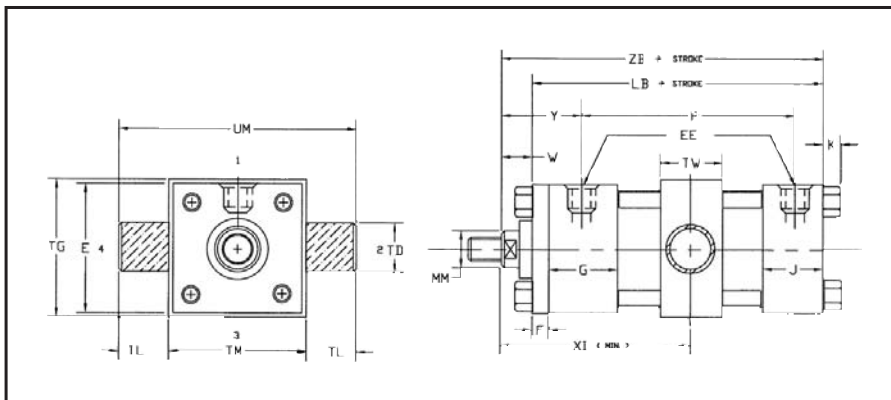
1 1/2" TO 8" BORE SERIES AA AND MH



NFFA STYLE MT1 (CODE 14)



NFFA STYLE MT2 (CODE 23)



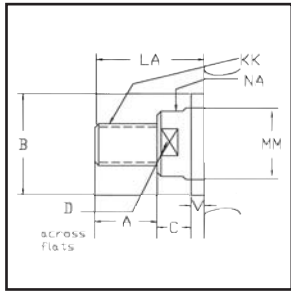
NFFA STYLE MT4 (CODE 24)

ENVELOPE AND MOUNTING DIMENSIONS NOT AFFECTED BY ROD DIAMETER

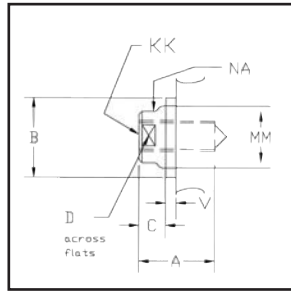
BORE	E	EE (NPTF)	F	G	J	K	TD +0.000 -0.001	TG	TL	TM	TW	UM	UT	ADD STROKE	
														LB	P
1 1/2	2	3/8	3/8	1 1/2	1	1/4	1.000	2 1/2	1	2 1/2	1 1/4	4 1/2	4	4	2 1/4
2	2 1/2	3/8	3/8	1 1/2	1	5/16	1.000	3	1	3	1 1/2	5	4 1/2	4	2 1/4
2 1/2	3	3/8	3/8	1 1/2	1	5/16	1.000	3 1/2	1	3 1/2	1 1/2	5 1/2	5	4 1/8	2 3/8
3 1/4	3 3/4	1/2	5/8	1 3/4	1 1/4	3/8	1.000	4 1/4	1	4 1/2	2	6 1/2	5 3/4	4 7/8	2 5/8
4	4 1/2	1/2	5/8	1 3/4	1 1/4	3/8	1.000	5	1	5 1/4	2	7 1/4	6 1/2	4 7/8	2 5/8
5	5 1/2	1/2	5/8	1 3/4	1 1/4	7/16	1.000	6	1	6 1/4	2	8 1/4	7 1/2	5 1/8	2 7/8
6	6 1/2	3/4	3/4	2	1 1/2	7/16	1.375	7	1 3/8	7 5/8	2 1/2	10 3/8	9 1/4	5 3/4	3 1/8
8	8 1/2	3/4	3/4	2	1 1/2	9/16	1.375	9 1/2	1 3/8	9 3/4	2 1/2	12 1/2	11 1/4	5 7/8	3 1/4

TRUNNION MOUNTED CYLINDERS

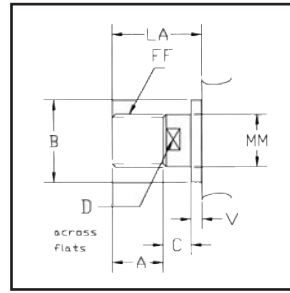
1 1/2" TO 8" BORE SERIES AA AND MH



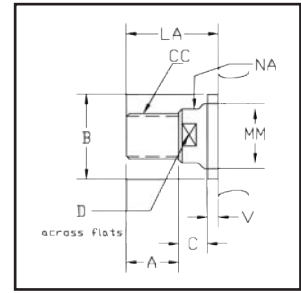
Type A
Standard Male



Type B
Female



Type F
Full Male



Type D
Intermediate Male

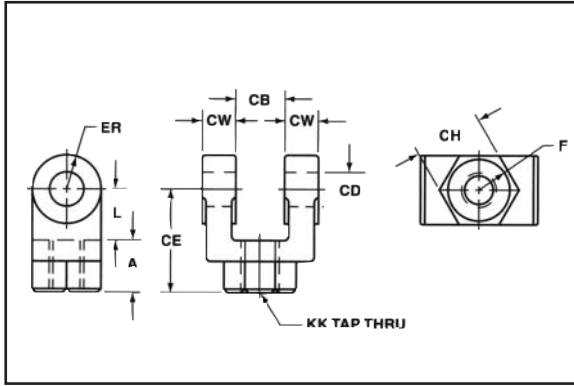
ROD END STYLES

DIMENSIONS AFFECTED BY ROD DIAMETER

BORE	ROD DIA. MM	Thread Size			Rod Extensions and Pilot Dimensions							Envelope Dimensions					
		KK STD.	CC	FF	A	B +0.000 -0.002	C	D	LA	NA	V	W	Y	XG	XI MIN.	XJ	ZB
																ADD STROKE	
1 1/2	5/8	7/16-20	1/2-20	5/8-18	3/4	1.124	3/8	1/2	1 3/8	9/16	1/4	5/8	1 15/16	1 3/4	3 1/8	4 1/8	4 5/8
	1	3/4-16	7/8-14	1-14	1 1/8	1.499	1/2	7/8	2 1/8	15/16	1/2	1	2 5/16	2 1/8	3 1/2	4 1/2	5
2	5/8	7/16-20	1/2-20	5/8-18	3/4	1.124	3/8	1/2	1 3/8	9/16	1/4	5/8	1 15/16	1 3/4	3 1/4	4 1/8	4 5/8
	1	3/4-16	7/8-14	1-14	1 1/8	1.499	1/2	7/8	2 1/8	15/16	1/2	1	2 5/16	2 1/8	3 5/8	4 1/2	5
	1 3/8	1-14	1 1/4-12	1 3/8-12	1 5/8	1.999	5/8	1 1/8	2 7/8	15/16	5/8	1 1/4	2 9/16	2 3/8	3 7/8	4 3/4	5 1/4
2 1/2	5/8	7/16-20	1/2-20	5/8-18	3/4	1.124	3/8	1/2	1 3/8	9/16	1/4	5/8	1 15/16	1 3/4	3 1/4	4 1/4	4 3/4
	1	3/4-16	7/8-14	1-14	1 1/8	1.499	1/2	7/8	2 1/8	15/16	1/2	1	2 5/16	2 1/8	3 5/8	4 5/8	5 1/8
	1 3/8	1-14	1 1/4-12	1 3/8-12	1 5/8	1.999	5/8	1 1/8	2 7/8	1 5/16	5/8	1 1/4	2 9/16	2 3/8	3 7/8	4 7/8	5 3/8
	1 3/4	1 1/4-12	1 1/2-12	1 3/4-12	2	2.374	3/4	1 1/2	3 1/2	1 11/16	3/4	1 1/2	2 13/16	2 5/8	4 1/8	5 1/8	5 5/8
3 1/4	1	3/4-16	7/8-14	1-14	1 1/8	1.499	1/2	7/8	1 7/8	15/16	1/4	3/4	2 7/16	2 1/4	4 1/8	5	5 5/8
	1 3/8	1-14	1 1/4-12	1 3/8-12	1 5/8	1.999	5/8	1 1/8	2 5/8	15/16	3/8	1	2 11/16	2 1/2	4 3/8	5 1/4	5 7/8
	1 3/4	1 1/4-12	1 1/2-12	1 3/4-12	2	2.374	3/4	1 1/2	3 1/4	1 11/16	1/2	1 1/4	2 15/16	2 3/4	4 5/8	5 1/2	6 1/8
	2	1 1/2-12	1 3/4-12	2-12	2 1/4	2.624	7/8	1 11/16	3 5/8	1 15/16	1/2	1 3/8	3 1/16	2 7/8	4 3/4	5 5/8	6 1/4
4	1	3/4-16	7/8-14	1-14	1 1/8	1.499	1/2	7/8	1 7/8	15/16	1/4	3/4	2 7/16	2 1/4	4 1/8	5	5 5/8
	1 3/8	1-14	1 1/4-12	1 3/8-12	1 5/8	1.999	5/8	1 1/8	2 5/8	15/16	3/8	1	2 11/16	2 1/2	4 3/8	5 1/4	5 7/8
	1 3/4	1 1/4-12	1 1/2-12	1 3/4-12	2	2.374	3/4	1 1/2	3 1/4	1 11/16	1/2	1 1/4	2 15/16	2 3/4	4 5/8	5 1/2	6 1/8
	2	1 1/2-12	1 3/4-12	2-12	2 1/4	2.624	7/8	1 11/16	3 5/8	1 15/16	1/2	1 3/8	3 1/16	2 7/8	4 3/4	5 5/8	6 1/4
5	1	3/4-16	7/8-14	1-14	1 1/8	1.499	1/2	7/8	1 7/8	15/16	1/4	3/4	2 7/16	2 1/4	4 1/8	5 1/4	5 7/8
	1 3/8	1-14	1 1/4-12	1 3/8-12	1 5/8	1.999	5/8	1 1/8	2 5/8	15/16	3/8	1	2 11/16	2 1/2	4 3/8	5 1/2	6 1/8
	1 3/4	1 1/4-12	1 1/2-12	1 3/4-12	2	2.374	3/4	1 1/2	3 1/4	1 11/16	1/2	1 1/4	2 15/16	2 3/4	4 5/8	5 3/4	6 3/8
	2	1 1/2-12	1 3/4-12	2-12	2 1/4	2.624	7/8	1 11/16	3 5/8	1 15/16	1/2	1 3/8	3 1/16	2 7/8	4 3/4	5 7/8	6 1/2
6	1 3/8	1-14	1 1/4-12	1 3/8-12	1 5/8	1.999	5/8	1 1/8	2 1/2	15/16	1/4	7/8	2 13/16	2 5/8	4 7/8	5 7/8	6 5/8
	1 3/4	1 1/4-12	1 1/2-12	1 3/4-12	2	2.374	3/4	1 1/2	3 1/8	1 11/16	3/8	1 1/8	3 1/16	2 7/8	5 1/8	6 1/8	6 7/8
	2	1 1/2-12	1 3/4-12	2-12	2 1/4	2.624	7/8	1 11/16	3 1/2	1 15/16	3/8	1 1/4	3 3/16	3	5 1/4	6 1/4	7
	2 1/2	1 7/8-12	2 1/4-12	2 1/2-12	3	3.124	1	2 1/16	4 1/2	2 3/8	1/2	1 1/2	3 7/16	3 1/4	5 1/2	6 1/2	7 1/4
8	1 3/8	1-14	1 1/4-12	1 3/8-12	1 5/8	1.999	5/8	1 1/8	2 1/2	15/16	1/4	7/8	2 13/16	2 5/8	4 7/8	6	6 3/4
	1 3/4	1 1/4-12	1 1/2-12	1 3/4-12	2	2.374	3/4	1 1/2	3 1/8	1 11/16	3/8	1 1/8	3 1/16	2 7/8	5 1/8	6 1/4	7
	2	1 1/2-12	1 3/4-12	2-12	2 1/4	2.624	7/8	1 11/16	3 1/2	1 15/16	3/8	1 1/4	3 3/16	3	5 1/4	6 3/8	7 1/4
	2 1/2	1 7/8-12	2 1/4-12	2 1/2-12	3	3.124	1	2 1/16	4 1/2	2 3/8	1/2	1 1/2	3 7/16	3 1/4	5 1/2	6 5/8	7 3/8

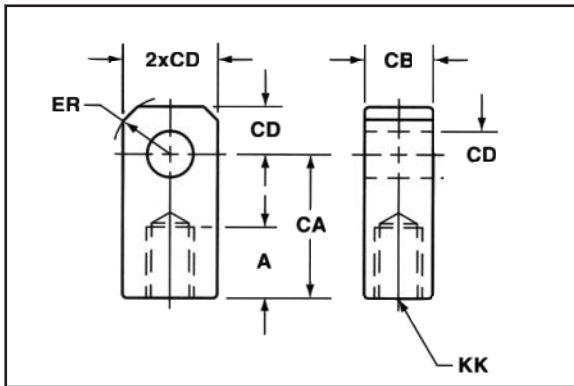
ACCESSORIES

ROD CLEVIS



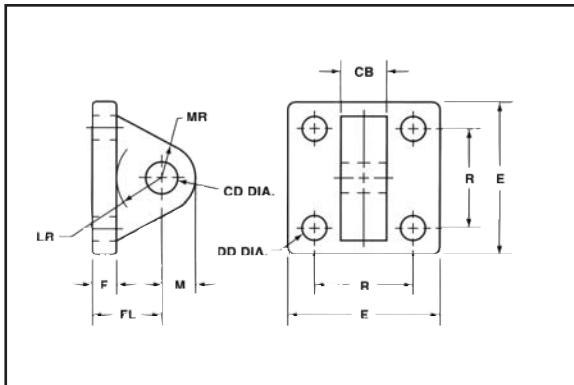
	BDC-05	BDC-07	BDC-07M	BDC-10	BDC-10M	BDC-13	BDC-13M	BDC-17	BDC-20	BDC-25
A	3/4	1 1/8	1 1/8	1 5/8	1 5/8	2	2	2 1/4	3	3 1/2
CB	.765	1.265	1.265	1.515	1.515	2.032	2.032	2.531	2.531	3.032
CD	1/2	3/4	3/4	1	1	1 3/8	1 3/8	1 3/4	2	2 1/2
CE	1 1/2	2 3/8	2 1/8	3 1/8	2 15/16	4 1/8	3 3/4	4 1/2	5 1/2	6 1/2
CH	1	1 1/4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

ROD EYES



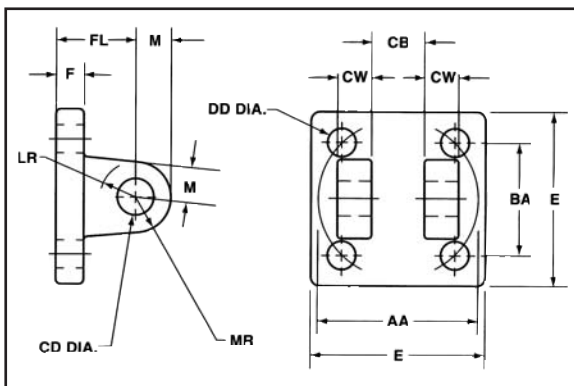
	BDE-05	BDE-07	BDE-10	BDE-10M	BDE-13	BDE-17	BDE-20	BDE-20M	BDE-25
A	3/4	1 1/8	1 5/8	1 1/8	2	2 1/4	3	2 1/4	3 1/2
CA	1 1/2	2 1/16	2 13/16	2 3/8	3 7/16	4	5	4 3/8	5 13/16
CB	3/4	1 1/4	1 1/2	1 1/2	2	2 1/2	2 1/2	2 1/2	3
CD	1/2	3/4	1	1	1 3/8	1 3/4	2	2	2 1/2
ER	5/8	7/8	1 3/16	1 7/16	1 9/16	2	2 1/2	2 7/8	2 13/16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

EYE BRACKETS



	BDEB-05	BDEB-07	BDEB-10	BDEB-10H	BDEB-13	BDEB-17	BDEB-17H	BDEB-20	BDEB-20H	BDEB-25	BDEB-25H
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
CD	1/2	3/4	1	1	1 3/8	1 3/4	1 3/4	2	2	2 1/2	2 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 3/16
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
F	3/8	5/8	3/4	7/8	7/8	7/8	1 1/8	1	1 1/2	1	1 3/4
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	4 3/4
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
M	1/2	3/4	1	1	1 3/8	1 3/4	1 3/4	2	2	2 1/2	2 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
R	1.63	2.56	3.25	3.25	3.81	4.95	4.95	5.75	5.75	6.59	6.59

CLEVIS BRACKETS

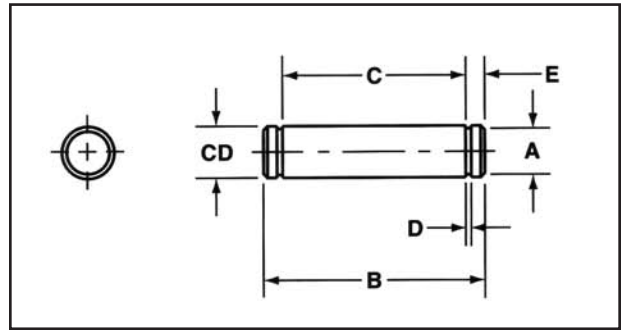


	BDCB-05	BDCB-06	BDCB-07	BDCB-10	BDCB-13	BDCB-17	BDCB-20	BDCB-25
AA	2.3	2.9	3.6	4.6	5.4	7.0	8.1	9.3
BA	1 5/8	2 1/16	2 9/16	3 1/4	3 13/16	4 15/16	5 3/4	6 19/32
CB	.765	1.265	1.265	1.515	2.032	2.531	2.531	3.032
CD	1/2	3/4	3/4	1	1 3/8	1 3/4	2	2 1/2
CW	1/2	5/8	5/8	3/4	1	1 1/4	1 1/4	1 1/2
DD	3/8 - 24	1/2 -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

ACCESSORIES

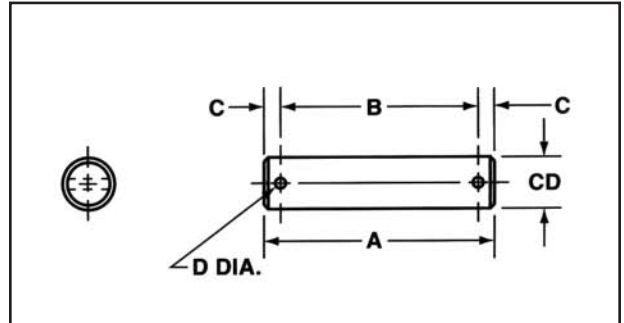
PIVOT PIN GROOVES (STANDARD)

	BDP-05G	BDP-07G	BDP-10G	BDP-13G	BDP-17G	BDP-20G	BDP-25G
CD	.500	.750	1.000	1.375	1.750	2.000	2.500
A	.468	.704	.940	1.291	1.650	1.886	2.360
B	2.094	2.875	3.375	4.485	5.547	5.547	6.625
C	1.875	2.625	3.125	4.187	5.188	5.188	6.188
D	.041	.048	.048	.056	.068	.068	.086
E	.109	.125	.125	.149	.180	.180	.219



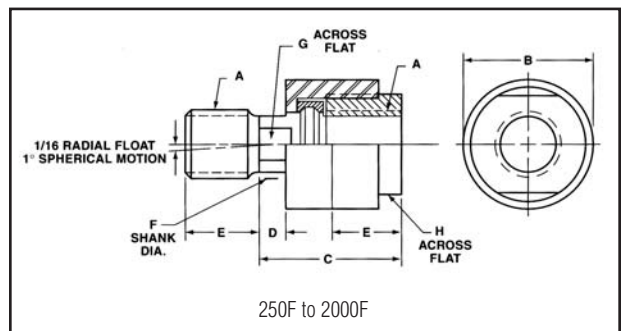
PIVOT PIN HOLES

	BDP-05H	BDP-07H	BDP-10H	BDP-13H	BDP-17H	BDP-20H	BDP-25H
CD	.500	.750	1.000	1.375	1.750	2.000	2.500
A	2.281	3.094	3.594	4.656	5.656	5.719	6.781
B	1.938	2.719	3.219	4.250	5.250	5.281	6.313
C	.172	.188	.188	.203	.203	.219	.234
D	.106	.140	.140	.173	.173	.204	.219



ALIGNMENT COUPLERS

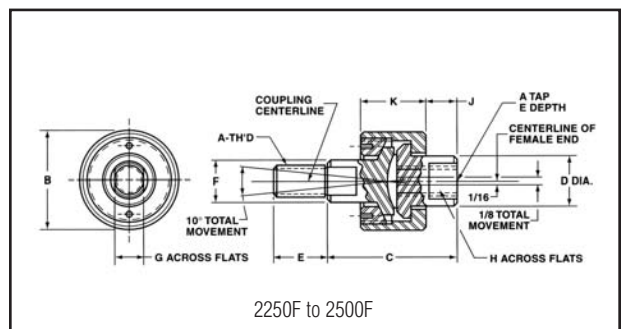
	250F	312F	375C	375F	437F	500C	500F	625F	750C	750F	875F
A	1/4-28	5/16-24	3/8-16	3/8-24	7/16-20	1/2-13	1/2-20	5/8-18	3/4-10	3/4-16	7/8-14
B	7/8	7/8	7/8	7/8	1 1/4	1 1/4	1 1/4	1 1/4	1 3/4	1 3/4	1 3/4
C	1 1/4	1 1/4	1 1/4	1 1/4	2	2	2	2	2 5/16	2 5/16	2 5/16
D	1/4	1/4	1/4	1/4	1/2	1/2	1/2	1/2	5/16	5/16	5/16
E	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



250F to 2000F

ALIGNMENT COUPLERS

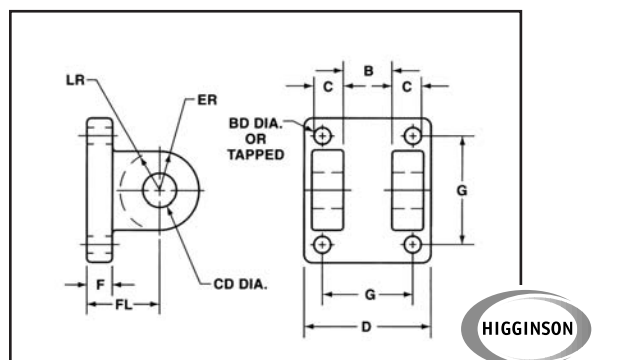
	1000C	1000F	1250F	1375F	1500F	1750F	1875F	2000F	2250F	2500F
A	1-8	1-14	1 1/4-12	1 3/8-12	1 1/2-12	1 3/4-12	1 7/8-12	2-12	2 1/4-12	2 1/2-12
B	2 1/2	2 1/2	2 1/2	2 1/2	3 1/4	3 1/4	3 3/4	3 3/4	6 3/4	7
C	2 15/16	2 15/16	2 15/16	2 15/16	4 3/8	4 3/8	5 7/16	5 7/16	6 3/8	6 1/2
D	1/2	1/2	1/2	1/2	13/16	13/16	11/16	11/16	3/4	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
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
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
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
J	-	-	-	-	-	-	-	-	1 5/8	1 5/8
K	-	-	-	-	-	-	-	-	3 3/4	3 7/8
Max Pull at Yield	64,000	64,000	64,000	64,000	120,000	120,000	240,000	240,000	397,000	495,000



2250F to 2500F

MP2 DETACHABLE MOUNTS

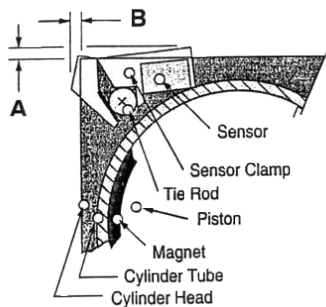
	BMP2-15	BMP2-2	BMP2-25	BMP2-32	BMP2-4	BMP2-5	BMP2-6
B	.76	.76	.76	1.26	1.26	1.26	1.51
C	.50	.50	.50	.62	.62	.62	.75
CD	.502	.502	.502	.752	.752	.752	1.002
D	2.00	2.50	3.00	3.75	4.50	5.50	6.50
ER	.62	.62	.62	.87	.87	.87	1.12
F	.38	.38	.38	.63	.63	.63	.75
FL	1.13	1.13	1.13	1.88	1.88	1.88	2.25
G	1.43	1.84	2.19	2.77	3.32	4.10	4.88
TAPPED	1/4-28	5/16-24	5/16-24	3/8-24	3/8-24	1/2-20	1/2-20
B-D DIA.	.28	.34	.34	.41	.41	.53	.53



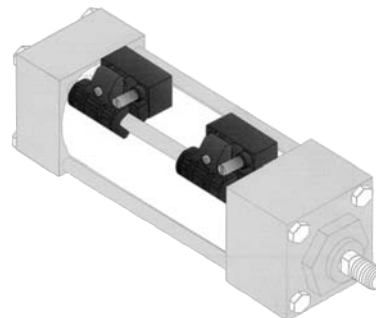
OPTIONS

Reed and Electronic Sensors

Proximity sensors are used to sense position on air cylinders only from 1.1/2 to 8" bore. A magnet is required on the piston. (use M in our model number code see pg. 17). All switches feature a Canfield patented self-adjusting clamp that grips the tie rod for easy positioning and has a 2-metre lead. Three standard types are shown; however many more enclosures and connector options are available.



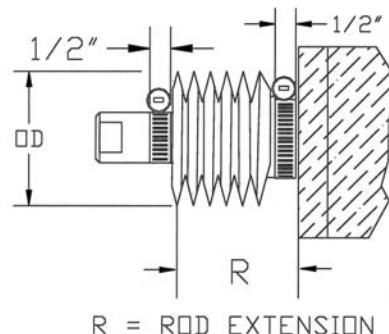
Bore	A	B
1 1/2	0.75	0.30
2	0.75	0.30
2 1/2	0.75	0.30
3 1/4	0.70	0.13
4	0.70	0.13
5	0.55	0
6	0.40	0
8	0.25	0



Part Number	Type	Function	Switching Voltage	Switching Current	Switching Power	Switching Speed	Voltage Drop
749-000-004	Reed, MOV	normally open	5 - 240 VDC/VAC	1 Amp max.	30 watts max.	0.6ms operate	3 volts
	LED, 2 wire	SPST	50/60 Hz	.005 Amp min.		0.05ms release	
749-000-031	electronic, sourcing LED, 3 wire	normally open PNP output	6 - 24 VDC	1 Amp max.	24 watts max	1.5u operate 0.5u release	0.5 volts
749-000-032	electronic, sinking LED, 3 wire	normally open NPN output	6 - 24 VDC	1 Amp max.	24 watts max	1.5u operate 0.5u release	0.5 volts

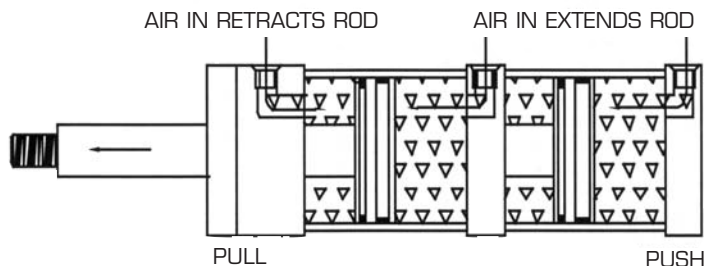
ROD BOOTS

Provide maximum protection against rod scoring from chips, abrasive particles and other damaging objects. Manufactured of rugged neoprene coated nylon fabric to give millions of trouble free cycles in temperature ranges of -40 F to 220 F. To calculate the extra rod (rod extension) needed use the following formula; Stroke X .0625. Also check the boot OD against the cylinder "E" dimension for MS mounts to make sure you have enough clearance. Other boot sizes and materials are available. Consult factory.

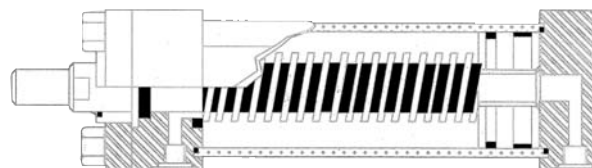


Rod Size	5/8	1	1 3/8	1 3/4	2	2 1/2
Boot OD	3	3 3/8	3 3/4	4 1/8	4 5/8	5 1/8

TANDEM CYLINDER



SPRING RETRACT



Available in 1 1/2" to 3 1/4" bore.
3" maximum stroke.
Consult factory for more details.

BORE SIZE	ROD SIZE	65PSI	80PSI	100PSI	BORE SIZE	65PSI	80PSI	100PSI
1.50	5/8	190	234	292	1.50	230	284	354
2.0	5/8	368	452	566	2.0	408	502	628
2.50	5/8	598	736	920	2.50	638	786	982
3.25	1.0	978	1198	1502	3.25	1080	1328	1660
4.0	1.0	1532	1882	2356	4.0	1364	2012	2514
5.0	1.0	2452	3012	3770	5.0	2554	3142	3928
6.0	1 3/8	3482	4268	5356	6.0	3676	4524	5654

AIR REQUIREMENTS

The amount of air required to operate a cylinder is determined from the volume of the cylinder and its cycle in strokes per minute. This is calculated using the following formula, which applies to a single acting cylinder.

V = Cylinder volume, cu.in.
 L = Cylinder stroke length, in.
 D = Bore of cylinder
 C = Air required, CFM
 f = Number of strokes per minute

Note: The air requirements of a double acting cylinder are almost double that of a single acting cylinder except for the volume of the piston rod.

$$V = \frac{3.1416 \times L \times D^2}{4} \quad C = \frac{f \times V}{1728}$$

BORE & VALVE C^v SELECTION

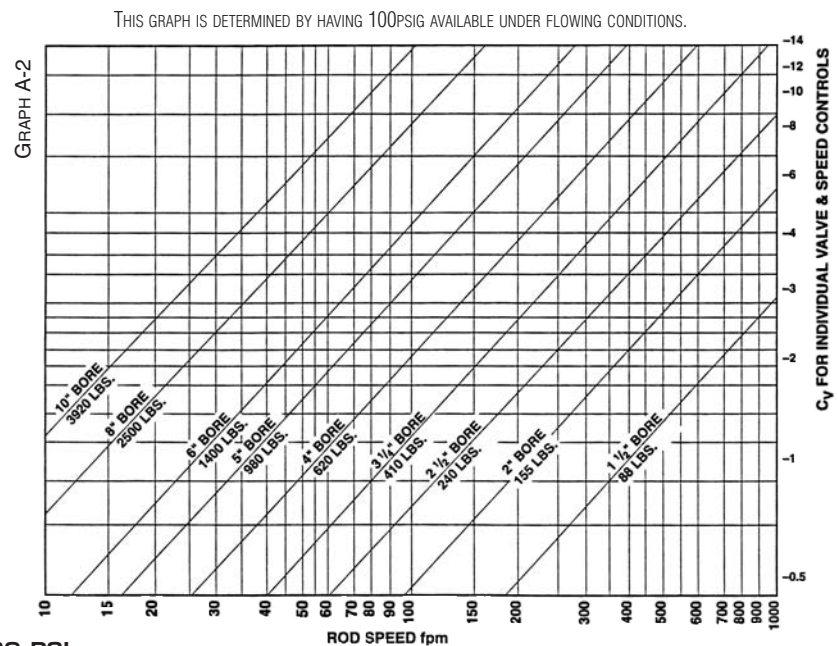
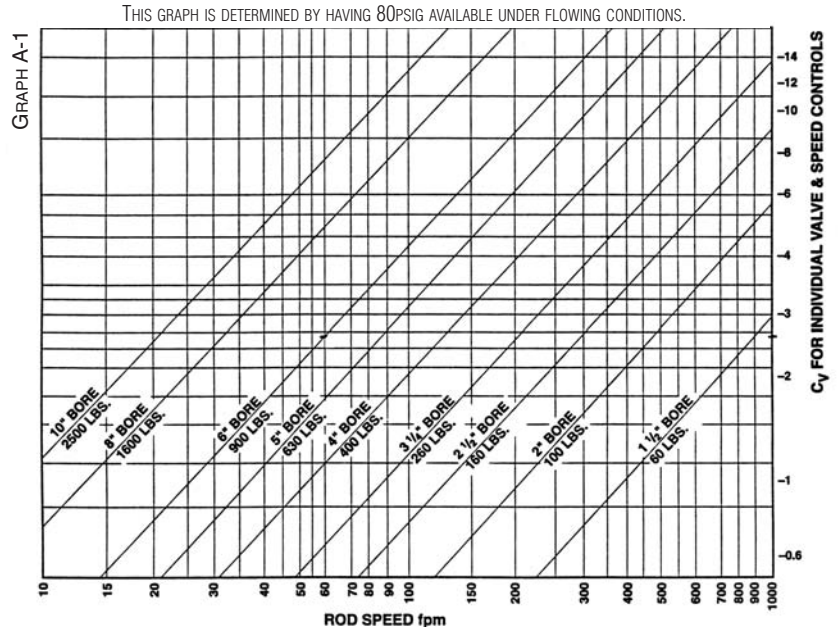
Graphs A-1, A-2 offer a simple way to select Pneumatic components for dynamic cylinder applications. It is only necessary to know the force required, the desired rod speed and the pressure at the cylinder inlet. This graph assumes average conditions and Standard port sizes, friction etc.

1 - Determine appropriate cylinder bore. The value under the diagonal cylinder bore line, indicates the maximum recommended dynamic thrust developed while the cylinder is in motion. Graph B-1 & B-2 show the static force available for clamping applications at two different air pressures.

2 - Read upward on required rod speed line to intersect with diagonal cylinder bore line. Read Graph A-1 right from intersection point to determine the required C^v of valve or speed control. Both the valve and speed control must have this C^v to achieve the selected speed.

Example 1: Raise an 800 lb load 24" in 2 seconds with 80 PSI. Graph A-1 shows that a 6" bore cylinder is capable of lifting this load while in motion. Since 24 inches in two seconds is equal to 60 fpm read upward on the 60 fpm line to intersect at the 6" bore line. Reading right will show that a valve with 2.6 C^v is required.

Example 2: Similar conditions to example 1 except that the load is being moved in a horizontal plane. With a coefficient of sliding friction of 0.2. Only a 160 lb thrust is now required (800 X 0.2). Using the graphs a 2 1/2" bore cylinder and a valve with a C^v of 0.5 (approx.) will be required



For 80 PSI

Bore Size	1 1/2	2	2 1/2	3 1/4	4	5	6	8
Dynamic Thrust (lbs)	60	100	160	260	400	630	900	1600
Static Thrust (lbs)	141	251	393	663	1000	1570	2260	4010

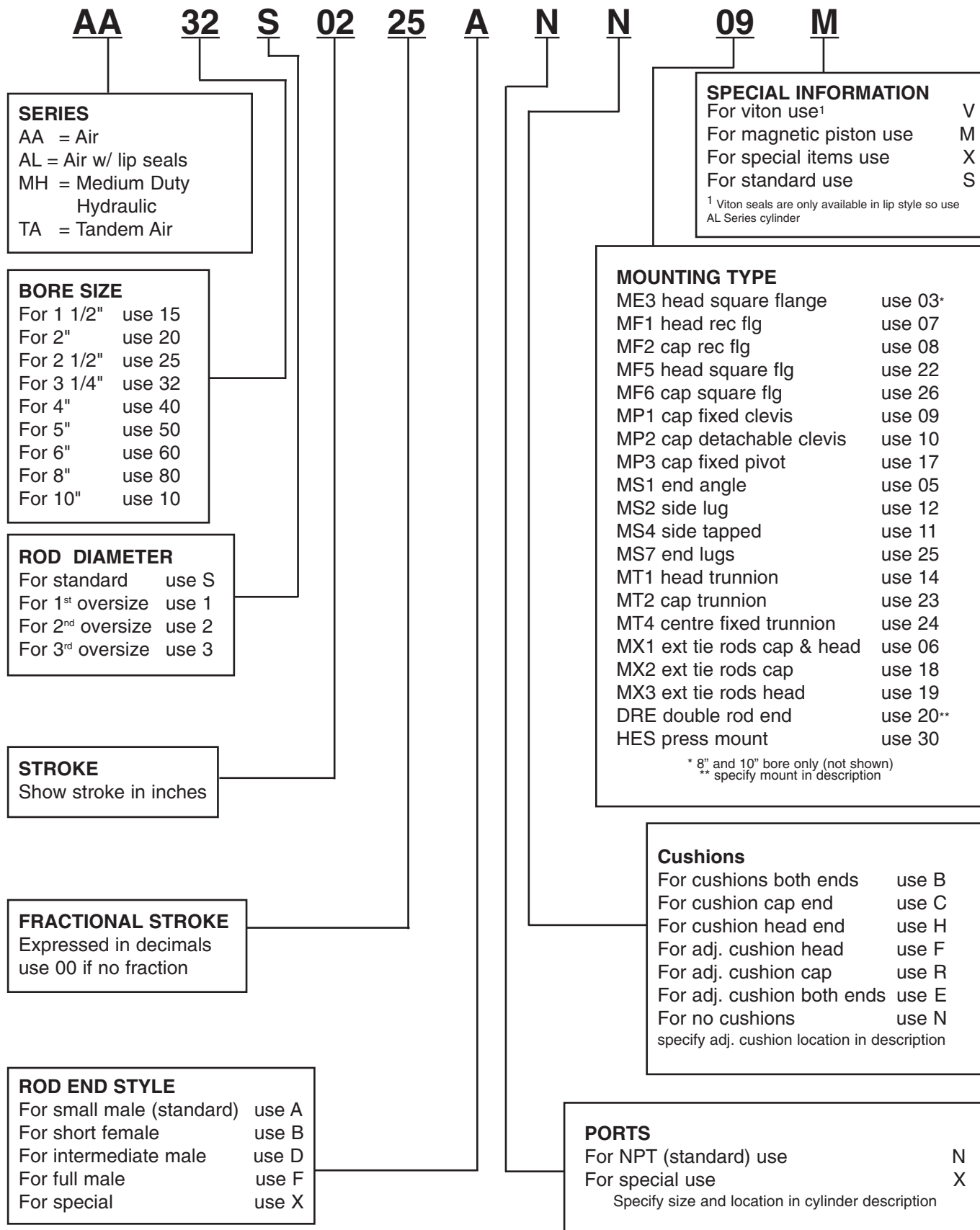
GRAPH B-1

For 100 PSI

Bore Size	1 1/2	2	2 1/2	3 1/4	4	5	6	8
Dynamic Thrust (lbs)	88	155	240	410	620	980	1400	2500
Static Thrust (lbs)	177	314	491	830	1250	1960	2820	5020

GRAPH B-2

HOW TO ORDER AIR & MEDIUM DUTY HYDRAULIC CYLINDERS



Viton seals are only available in lip style so use AL Series cylinder.
 Magnetic piston not available with lip seals.
 ME3 mount is only available on 8" and 10" bore.

HIGGINSON WARRANTY

Higginson warrants for one year from date of delivery that this product is free from any component defect due to faulty material or workmanship. Higginson assumes no responsibility for damage or faulty performance caused by misuse, careless handling or where repairs have been made or attempted by others. No other warranties written, or verbal, are authorized. The sole remedy for breach of this warranty and the sole obligation of Higginson hereunder is the repair or replacement of the defective component at Higginson's option. Higginson shall have no liability whatsoever at anytime for any personal injury or property damages, or for any special, indirect, or consequential damages of any kind how ever arising.

This warranty is strictly limited to its terms and is in lieu of any and all other warranties and conditions, written or oral, whether expressed or implied.





HIGGINSON EQUIPMENT SALES
BURLINGTON, ONTARIO
Phone: 905-335-2211 • Toll Free: 1-877-CALL-HES
Fax: 905-335-8756 • Toll Free Fax: 1-800-858-0893

DISTRIBUTED BY:



W W W . H I G G I N S O N . C A