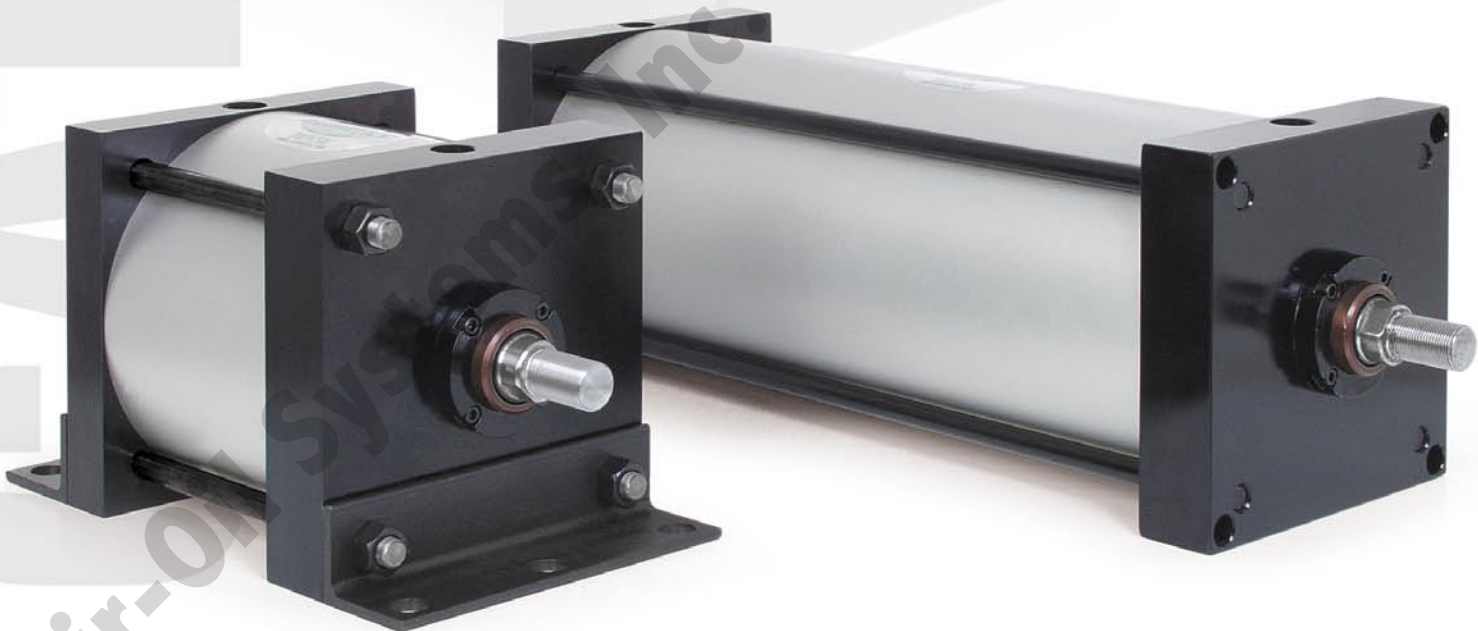


cylinders

# Large Bore A Series

NFPA Interchangeable Cylinder Line



# NUMATICS®

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The **Large Bore A Series** is an NFPA Interchangeable cylinder line that is designed and built to excel in the most demanding applications. The Large Bore A Series encompasses many of the proven design features of the A Series.

### Tube

The 8" bore **tube** is hard coat anodized aluminum. The hard coating is an electro-chemical process, which produces a very dense surface of aluminum oxide. This surface has extreme hardness (60 RC.), excellent wear and corrosion resistance, and a low coefficient of friction. The 10", 12", and 14" bores use a honed, chrome plated steel tube.

### End Caps

The **end caps** are accurately machined from (6061-T6) solid aluminum bar stock. They are anodized for corrosion resistance. Additionally, a recess on the piston-mating surface (at both ends) enables the air to work on a larger piston area for effortless breakaway.

### Rod Bushing

The 8" bore includes a graphite filled, cast iron **rod bushing**. The 10", 12", and 14" bores are equipped with a bronze bushing. Both bushing types are extra long in length. The added length adds superior alignment and support of the piston rod as well as provides maximum load bearing support. Both bushing materials offer an excellent bearing surface for a hard chrome plated piston rod.

### Rod Seal

The carboxylated nitrile with Teflon® compound **rod seal** is self-lubricating and durable. The rounded lip design ensures proper sealing and long life.

### Rod Wiper

The standard **rod wiper** construction is a highly durable polyurethane.

### Piston Rod

High strength steel (100,000 psi minimum yield) **piston rod** has a ground, polished, and chrome plated surface. This surface provides maximum life for both the rod bushing and the seals.

### Bushing Retainer

The **bushing retainer** allows cartridge removal (cylinder repair) without complete disassembly.

### Tie Rods

The **tie rods** are 100,000 psi minimum yield steel for maximum holding power. The threads are roll formed for superior strength and engagement.

### Piston Seal

The **piston seal** is a carboxylated nitrile with Teflon® compound making it self-lubricating. The "T" seal with back-up ring configuration is standard on the 8" bore design. A lip seal configuration is used on 10", 12", and 14" bores. Both seal types prevent rolling and are designed to seal at all pressures.

### Wear Band

The **wear band** is a stable, lubricating strip located on the piston. We separated the load bearing points by locating the wear band at the rear of the piston. This maximizes column strength at full extension.

### Piston

The solid aluminum alloy **piston** is strong and durable. On the 10", 12", and 14" bores we use a nylon locking insert nut to attach the piston to the piston rod. This enables piston rod disassembly if necessary.



### Cushion Seal

The floating **cushion seal** design enables rapid stroke reversal by providing instantaneous full flow to the piston. Each cushion has a flush, retained adjustment needle.

### Tube End Seal

The **tube end seals** are compression type and reusable.

### Ports

Our enhanced **port** design enables the cylinder to work more efficiently. Through the use of precise machining depths and tool shape, we are able to smooth the flow path into and out of the cylinder.

Teflon® is a registered trademark of DuPont™.

### Standard Specifications:

- Meets NFPA specifications
- Bore sizes from 8" through 14"
- Piston rod diameters from 1-3/8" through 2-1/2"
- Nominal pressure rating is 250 psi air
- Standard temperature -10°F to 165°F (-23°C to 74°C)
- NPTF ports
- Flexible port and cushion location
- Multitude of mounting options



## Large Bore A Series NFPA Interchangeable

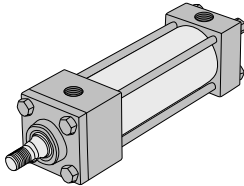
# NUMATICS®

### Standard Large Bore A Series Mounts

#### Centerline Mounts

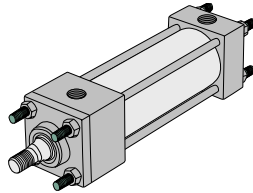
##### X0 Mount

Basic No Mount



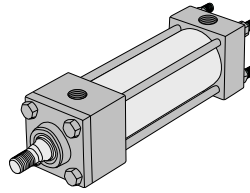
##### X1 Mount

Extended Tie Rods – Both Ends



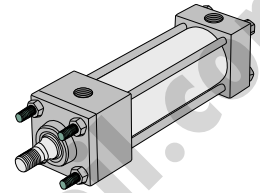
##### X2 Mount

Extended Tie Rods – Cap End



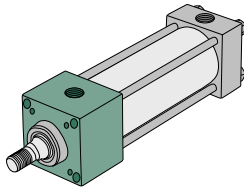
##### X3 Mount

Extended Tie Rods – Head End



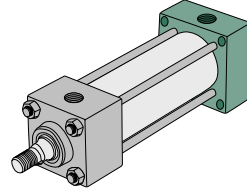
##### E3 Mount

Head Square Mount



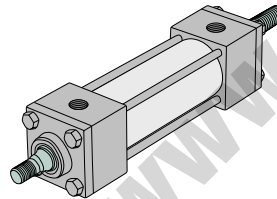
##### E4 Mount

Cap Square Mount



##### DA Mount

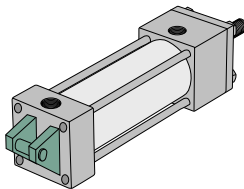
Double Rod End



#### Pivot Mounts

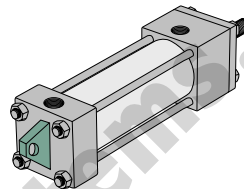
##### P1 Mount

Fixed Clevis



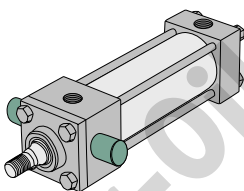
##### P3 Mount

Fixed Eye



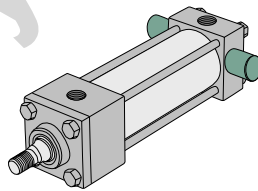
##### T1 Mount

Head Trunnion



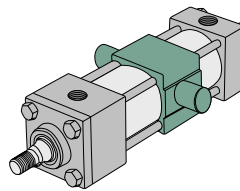
##### T2 Mount

Cap Trunnion



##### T4 Mount

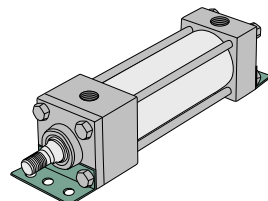
Intermediate Trunnion



#### Foot Mounts

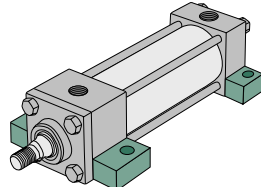
##### S1 Mount

Angle Mount



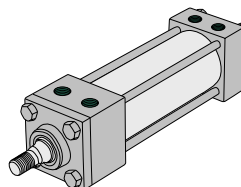
##### S2 Mount

Side Lugs



##### S4 Mount

Bottom Tapped





### How to Order

**E3 A W - 06 A 1 F - C AA 0**

#### Mount

- E3 = Head Square Mount
  - E4 = Cap Square Mount
  - P1 = Fixed Clevis
  - P2 = Removeable Clevis (8" bore only)
  - P3 = Fixed Eye
  - S1 = Angle Mount
  - S2 = Side Lug Mount
  - S4 = Bottom Tap
  - X0 = Basic No Mount
  - X1 = Extended Tie Rods Both Ends
  - X2 = Extended Tie Rod Cap
  - X3 = Extended Tie Rod Head
  - T1 = Head Trunnion
  - T2 = Cap Trunnion
  - T4 = Mid Trunnion\*
  - U3 = Spherical Mount
- \* Specify "X1" length.

#### Type

- A = Large Bore A Series  
NFFPA Interchangeable

#### Bore

- W = 8"
- X = 10"
- Y = 12"
- B = 14"

#### Full Inches of Stroke

- 00 = 0" Stroke
- 01 = 1" Stroke
- 02 = 2" Stroke
- 03 = 3" Stroke
- 99 = 99" Stroke

NOTE: Consult factory for strokes greater than 99".

#### Fractional Inches of Stroke

- A = 0"      I = 1/2"
- B = 1/16"    J = 9/16"
- C = 1/8"      K = 5/8"
- D = 3/16"    L = 11/16"
- E = 1/4"      M = 3/4"
- F = 5/16"    N = 13/16"
- G = 3/8"      O = 7/8"
- H = 7/16"    P = 15/16"

#### Magnet

- 0 = No Magnet
- 2 = Magnet

#### Options

- AA = No Option
  - DA = Double Rod
  - MA = Metallic Rod Scraper
  - 1A\* = Rod Extension
  - 2A\* = Thread Extension
  - 3A = Studded Rod End
  - 4A\* = Stop Tube
  - CT = Composite Tube
  - AT = Aluminum Tube (Standard on 8")
  - SA = Stainless Steel Rod
  - SS = Stainless Steel Rod and Tie Rods
  - ST = Stainless Steel Tie Rods
- \*Must specify length.

#### Cushions

Position	1	2	3	4
No Cushion	A	A	A	A
Head and Cap	B	C	D	E
Head Only	F	G	H	J
Cap Only	K	L	M	N

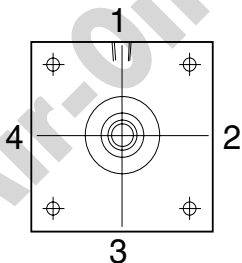
#### Ports

Position	3/4"	1"	1 1/4"
1	F	G	1
2	L	M	2
3	R	S	3
4	X	Y	4

#### Rod End Codes

- 1 = #1 Standard Rod Diameter
  - 2 = #2 Standard Rod Diameter
  - 3 = #3 Standard Rod Diameter
  - 4\* = Special Standard Rod Diameter
  - 5\* = Special Oversize Rod Diameter
  - 6 = #1 Oversize Rod Diameter
  - 7 = #2 Oversize Rod Diameter
  - 8 = #3 Oversize Rod Diameter
  - A = #1 Second Oversize Rod Diameter
  - B = #2 Second Oversize Rod Diameter
  - C = #3 Second Oversize Rod Diameter
- \* Must specify threads.

### Cylinder Orientation



Ports Normally in Position 1

Ports are normally located in position 1.

Cushions are normally located in position 2.

NOTE: Ports -

8" Bore-standard port size is 3/4" NPTF.

10" & 12" Bore-standard port size is 1" NPTF, smaller port sizes available.

14" Bore-standard port size is 1 1/4" NPTF, smaller port sizes available.

### Rod End Styles, Diameters and Threads

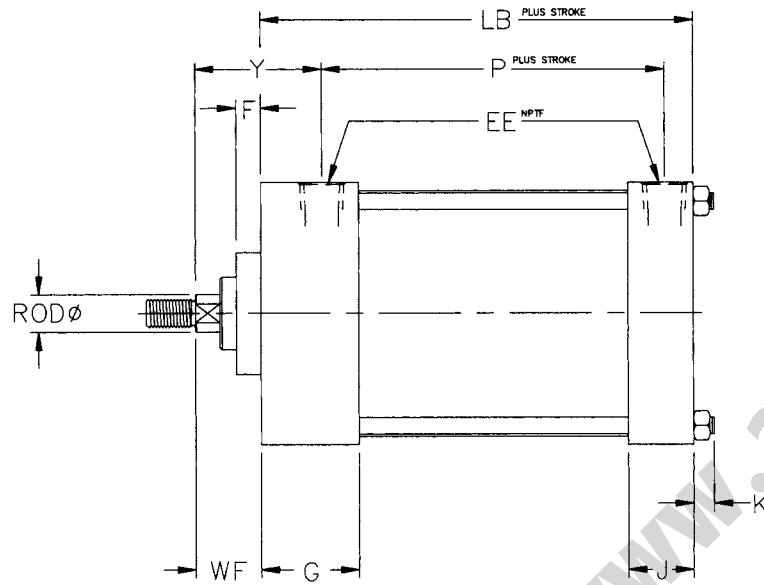
DIAMETER	STYLE #1 STANDARD MALE	STYLE #2 OPTIONAL MALE	STYLE #3 OPTIONAL FEMALE
1.38	1-14	1 1/4-12	1-14
1.75	1 1/4-12	1 1/2-12	1 1/4-12
2.00	1 1/2-12	1 3/4-12	1 1/2-12
2.50	1 7/8-12	2 1/4-12	1 7/8-12



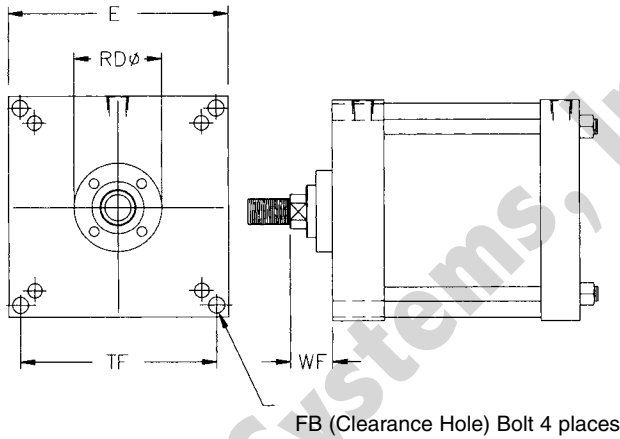
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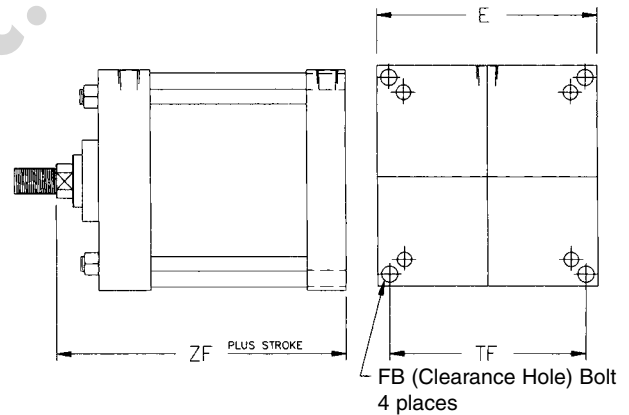
Basic Mount Cylinder



Mount Code X0 NFPA MX0



Mount Code E3 NFPA ME3



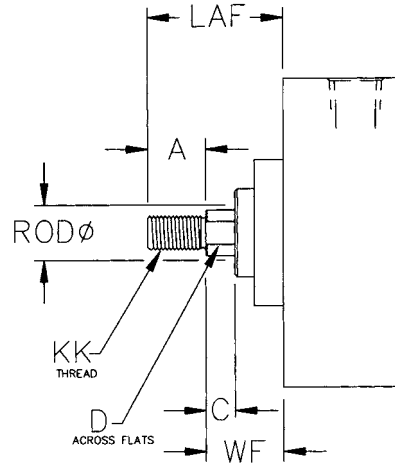
Mount Code E4 NFPA ME4

Dimensions

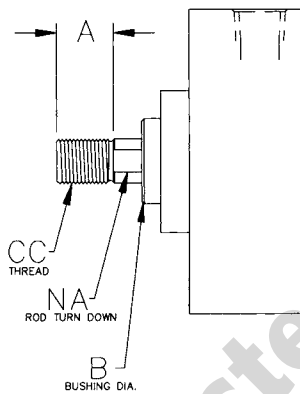
BORE	ROD	E	EE	F	FB	G	J	K	LB	P	RD	TF	WF	Y	ZF
8"	1.375	8.500	0.750	0.630	0.630	2.000	1.500	0.630	5.125	3.250	3.130	7.580	1.630	2.810	6.750
	1.750	8.500	0.750	0.750	0.630	2.000	1.500	0.630	5.125	3.250	3.790	7.580	1.880	3.060	7.000
10"	1.750	10.630	1.000	0.750	0.750	2.250	2.000	0.750	6.375	4.130	5.500	9.400	1.880	3.130	8.250
	2.000	10.630	1.000	0.750	0.750	2.250	2.000	0.750	6.375	4.130	5.500	9.400	2.000	3.250	8.380
12"	2.500	10.630	1.000	0.750	0.750	2.250	2.000	0.750	6.375	4.130	5.500	9.400	2.250	3.500	8.630
	2.000	12.750	1.000	0.750	0.750	2.250	2.000	0.750	6.875	4.630	5.500	11.100	2.000	3.250	8.880
14"	2.500	12.750	1.000	0.750	0.750	2.250	2.000	0.750	6.875	4.630	5.500	11.100	2.250	3.500	9.130
	2.500	14.750	1.250	0.750	0.880	2.750	2.250	0.880	8.125	5.500	5.500	12.870	2.250	3.810	10.380



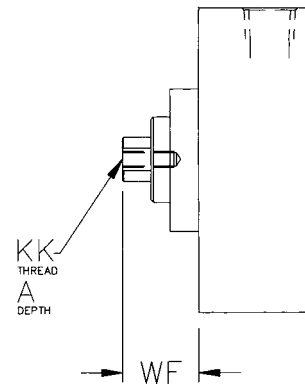
## Standard and Optional Rod Ends



Style #1 (Standard Male)



Style #2 (Optional Male)



Style #3 (Optional Female)

### Dimensions

BORE	ROD*	KK(1)	CC(2)	KK(3)	A	B	C	D	NA	LAF	WF
8"	1.375	1-14	1 1/4-12	1-14	1.625	2.000	0.630	1.130	1.310	3.250	1.630
	1.750	1 1/4-12	1 1/2-12	1 1/4-12	2.000	2.380	0.750	1.500	1.690	3.880	1.880
10"	1.750	1 1/4-12	1 1/2-12	1 1/4-12	2.000	3.120	0.750	1.500	1.690	3.880	1.880
	2.000	1 1/2-12	1 3/4-12	1 1/2-12	2.250	3.120	0.880	1.750	1.940	4.250	2.000
12"	2.500	1 7/8-12	2 1/4-12	1 7/8-12	3.000	3.120	1.000	2.060	2.440	5.250	2.250
	2.000	1 1/2-12	1 3/4-12	1 1/2-12	2.250	3.120	0.880	1.750	1.940	4.250	2.000
14"	2.500	1 7/8-12	2 1/4-12	1 7/8-12	3.000	3.120	1.000	2.060	2.440	5.250	2.250
	2.500	1 7/8-12	2 1/4-12	1 7/8-12	3.000	3.120	1.000	2.060	2.440	5.250	2.250

\*Other rod sizes available. Consult factory for details.

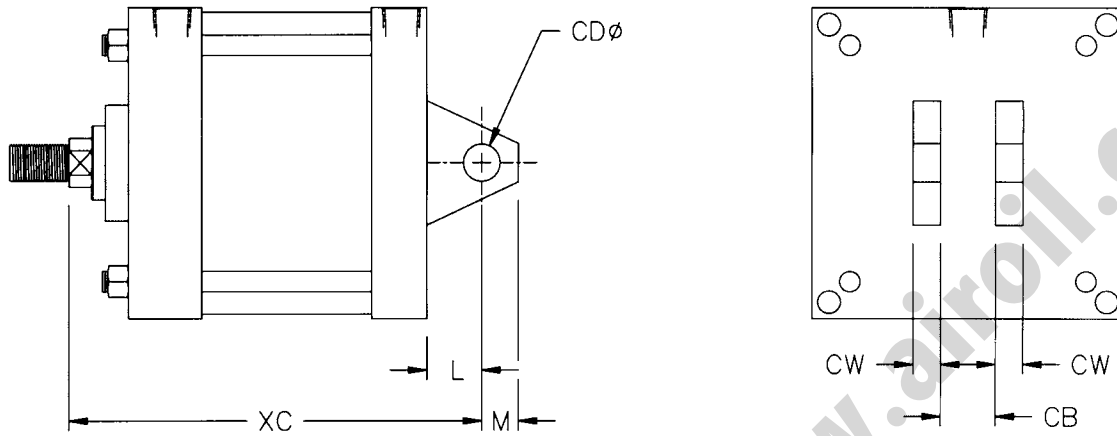




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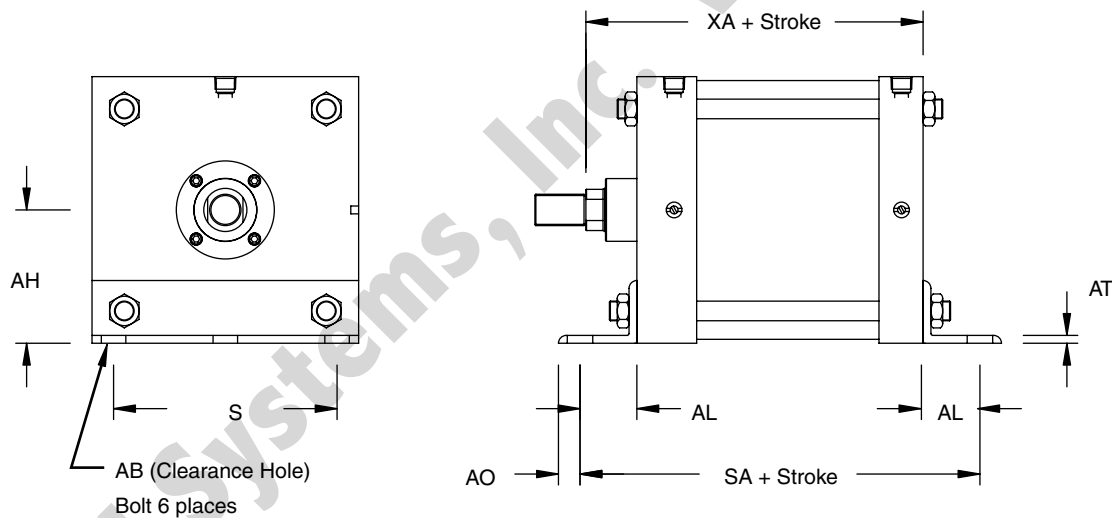
NUMATICS®

Clevis and Angle Mount



Mount Code P1

NFPA MP1



Mount Code S1

NFPA MS1

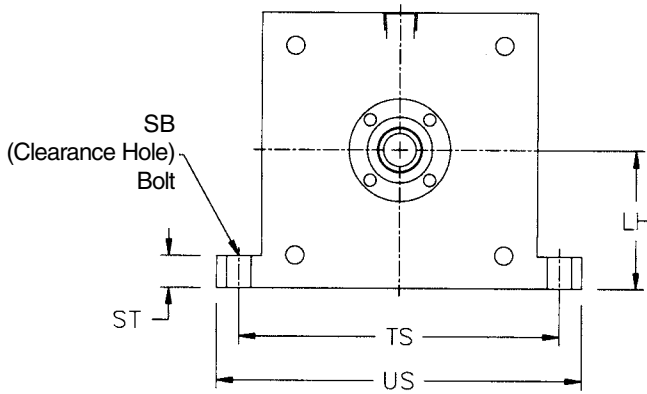
Dimensions

BORE	ROD	AB	AH	AL	AO	AT	CB	CD	CW	L	M	S	SA	XA	XC
8"	1.375	0.750	4.250	1.810	0.690	0.250	1.500	1.000	0.750	1.500	1.000	7.130	8.750	8.560	8.250
	1.750	0.750	4.250	1.810	0.690	0.250	1.500	1.000	0.750	1.500	1.000	7.130	8.750	8.810	8.500
10"	1.750	1.000	5.310	2.130	0.880	0.250	2.000	1.375	1.000	2.130	1.380	8.880	10.630	10.380	10.380
	2.000	1.000	5.310	2.130	0.880	0.250	2.000	1.375	1.000	2.130	1.380	8.880	10.630	10.500	10.500
12"	2.000	1.000	6.380	2.130	0.880	0.380	2.500	1.750	1.250	2.250	1.750	11.000	11.130	11.000	11.130
	2.500	1.000	6.380	2.130	0.880	0.380	2.500	1.750	1.250	2.250	1.750	11.000	11.130	11.250	11.380
14"	2.500	1.250	7.380	2.440	1.060	0.380	2.500	2.000	1.250	2.500	2.000	12.630	13.000	12.810	12.880

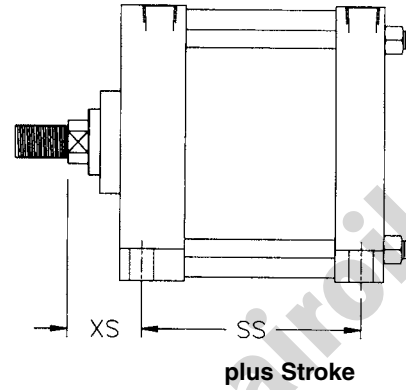




## Side Lug and Bottom Tap Mount

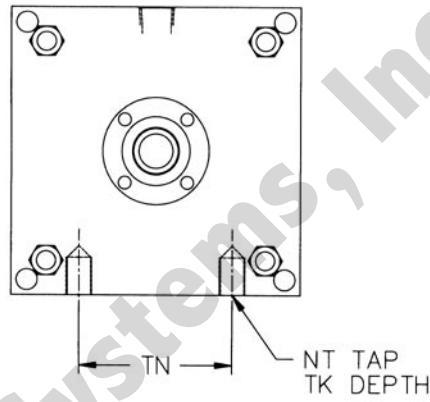


Mount Code S2

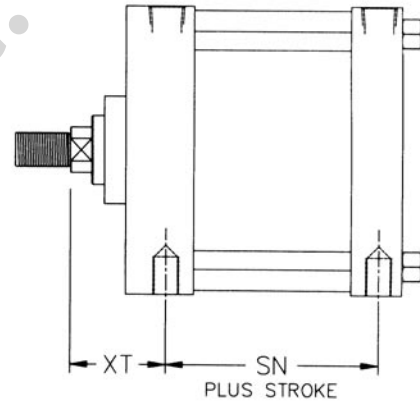


NFPA MS2

NOTE: Use this "drawing" below as well. Note on the one below, the drawing is the only change the letter call outs will remain the same.



Mount Code S4



NFPA MS4

### Dimensions

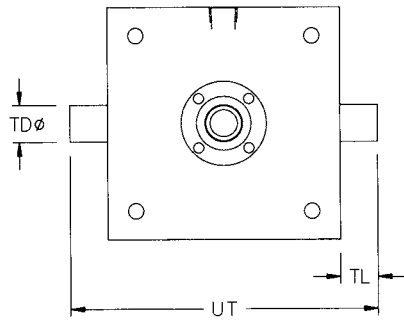
BORE	ROD	LH	NT	SB	SN	SS	ST	TK	TN	TS	US	XS	XT
8"	1.375	4.250	3/4-10	0.750	3.250	3.750	1.000	1.130	4.500	9.880	11.250	2.310	2.810
	1.750	4.250	3/4-10	0.750	3.250	3.750	1.000	1.130	4.500	9.880	11.250	2.560	3.060
10"	1.750	5.313	1-8	1.000	4.130	4.630	1.250	2.000	5.500	12.380	14.130	2.750	3.130
	2.000	5.313	1-8	1.000	4.130	4.630	1.250	2.000	5.500	12.380	14.130	2.880	3.250
	2.500	5.313	1-8	1.000	4.130	4.630	1.250	2.000	5.500	12.380	14.130	3.130	3.500
12"	2.000	6.375	1-8	1.000	4.630	5.130	1.250	2.000	7.250	14.500	16.250	2.880	3.250
	2.500	6.375	1-8	1.000	4.630	5.130	1.250	2.000	7.250	14.500	16.250	3.130	3.500
14"	2.500	7.375	1 1/4-7	1.250	5.500	5.880	1.500	2.500	8.380	17.000	19.250	3.380	3.810



Large Bore A Series  
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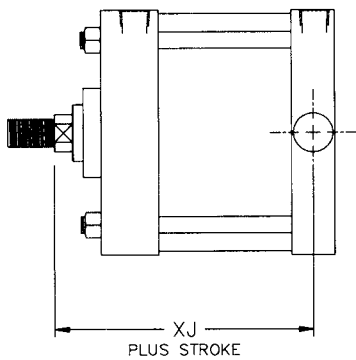
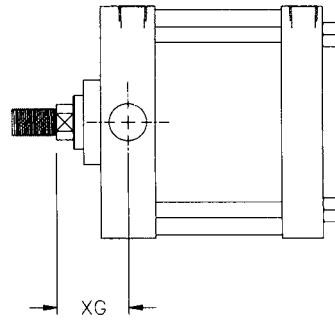
NUMATICS®

Trunnion Mounts



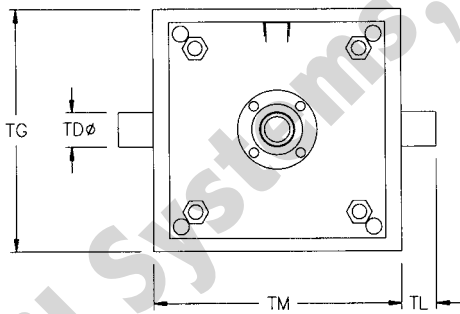
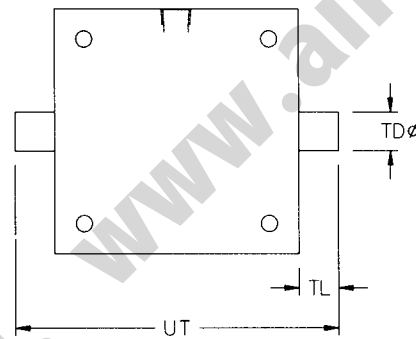
Mount Code T1

NFPA MT1



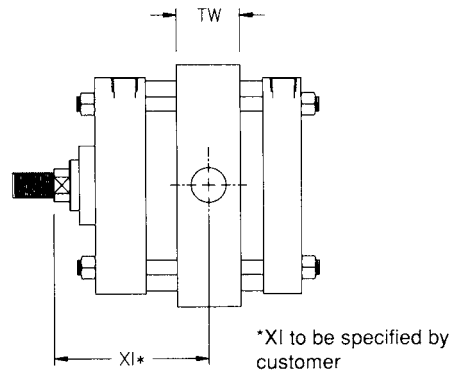
Mount Code T2

NFPA MT2



Mount Code T4

NFPA MT4



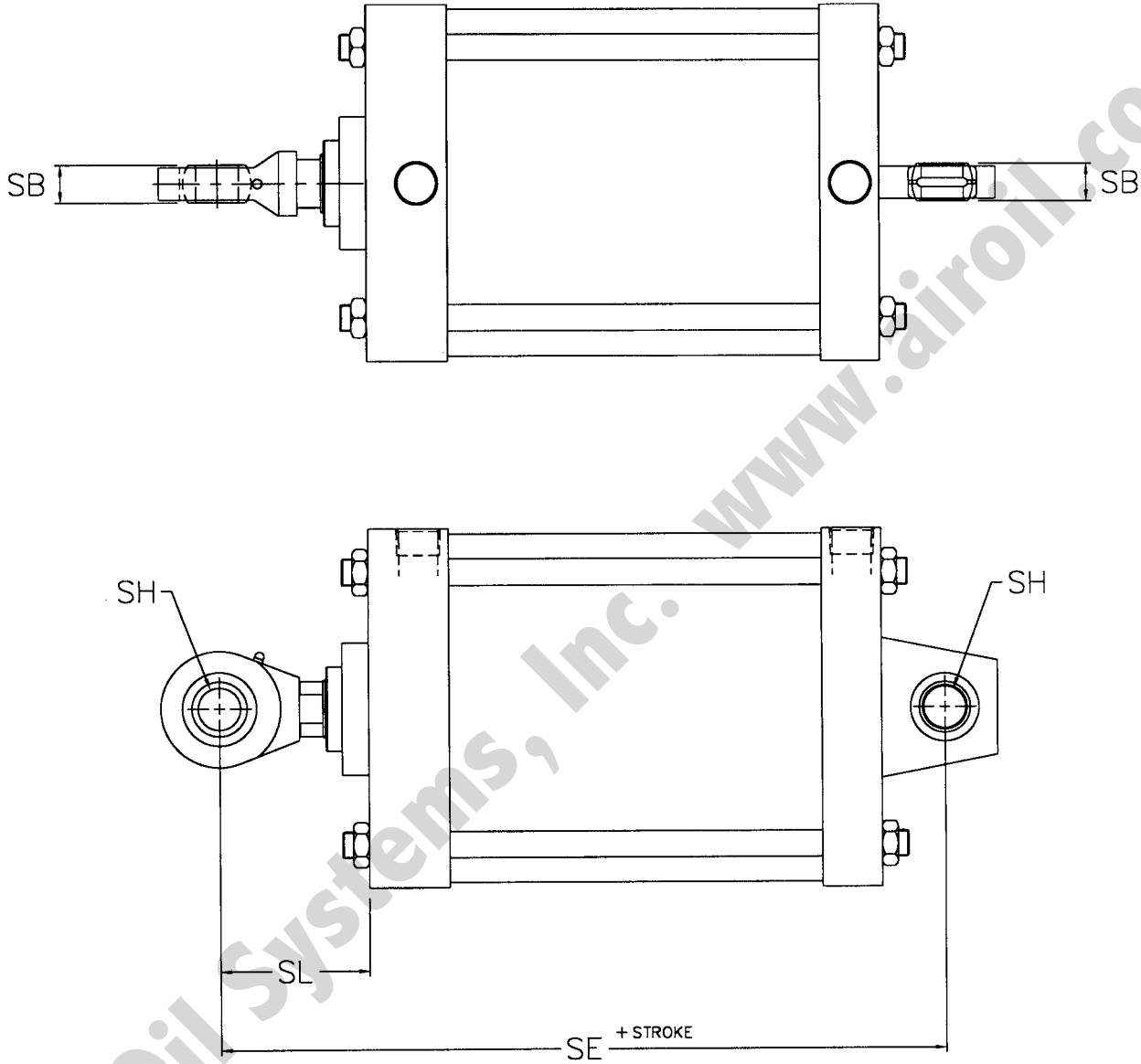
NOTE: All Large Bore A Series trunnion mounts are one piece machined steel.

Dimensions

BORE	ROD	TD	TG	TL	TM	TW	UT	XG	XI (MIN.)	XJ
8"	1.375	1.375	9.500	1.380	9.750	2.500	11.250	2.630	4.880	6.000
	1.750	1.375	9.500	1.380	9.750	2.500	11.250	2.880	5.130	6.250
10"	1.750	1.750	11.750	1.750	12.000	3.000	14.130	3.000	5.630	7.250
	2.000	1.750	11.750	1.750	12.000	3.000	14.130	3.130	5.750	7.380
12"	2.500	1.750	11.750	1.750	12.000	3.000	14.130	3.380	6.000	7.630
	2.000	1.750	13.750	1.750	14.000	3.000	16.250	3.130	5.750	7.880
14"	2.500	1.750	13.750	1.750	14.000	3.000	16.250	3.380	6.000	8.130
	2.500	2.000	16.000	2.000	16.250	3.500	18.750	3.630	6.750	9.250



## Spherical Mount



### Dimensions

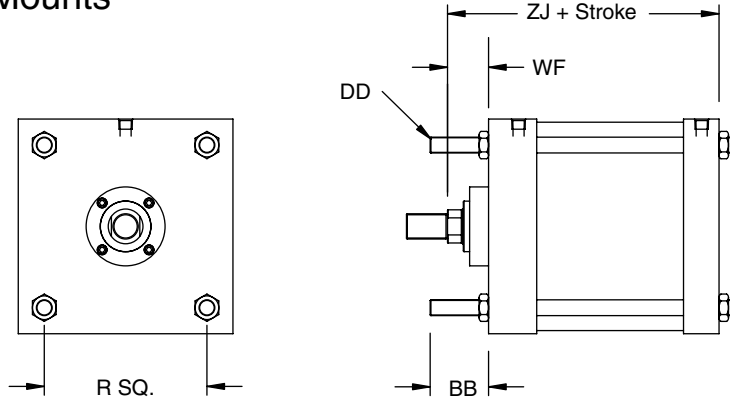
BORE	ROD	SH	SB	SL	SE
8"	1.375	1.000	0.875	3.500	10.130
	1.750	1.000	0.875	3.750	10.380
10"	1.750	1.375	1.188	4.000	12.500
	2.000	1.375	1.188	4.130	12.630
	2.500	1.375	1.188	4.380	12.880
12"	2.000	1.750	1.531	4.500	13.630
	2.500	1.750	1.531	4.750	13.880
14"	2.500	2.000	1.750	5.000	15.630



**Large Bore A Series  
NFPA Interchangeable**

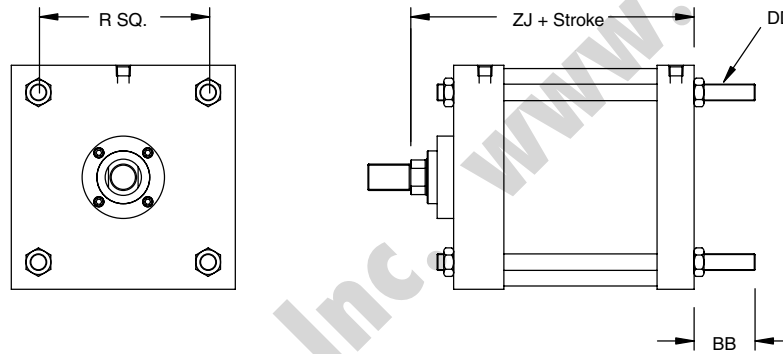
**NUMATICS®**

**Extended Tie Rod Mounts**



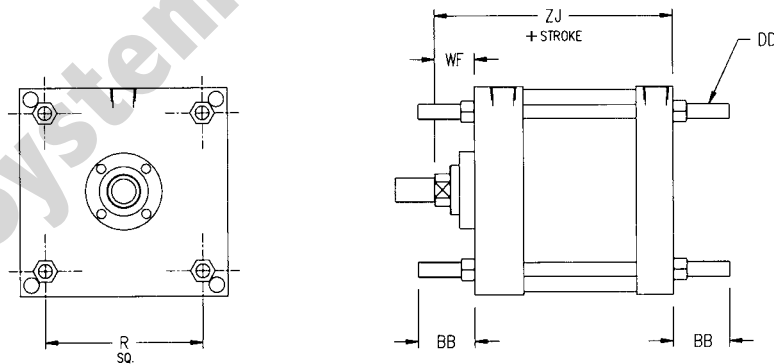
Mount Code X3

NFPA MX3



Mount Code X2

NFPA MX2



Mount Code X1

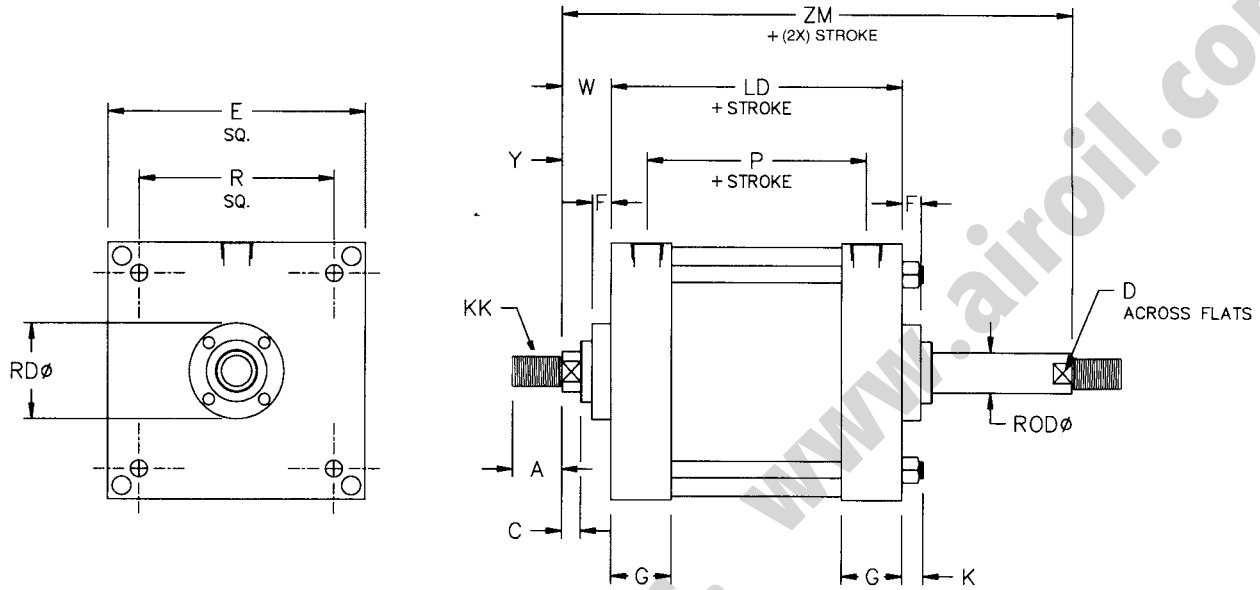
NFPA MX1

**Dimensions**

BORE	ROD	BB	DD	R	WF	ZJ
8"	1.375	2.310	5/8-18	6.440	1.630	6.750
	1.750	2.310	5/8-18	6.440	1.880	7.000
10"	1.750	2.690	3/4-16	8.060	1.880	8.250
	2.000	2.690	3/4-16	8.060	2.000	8.380
12"	2.500	2.690	3/4-16	8.060	2.250	8.630
	2.000	2.690	3/4-16	9.410	2.000	8.880
14"	2.500	2.690	3/4-16	9.410	2.250	9.130
	2.500	3.190	7/8-14	10.900	2.250	10.380



## Double Rod End



Order as "DA" Option    NFPA MDX0

### Dimensions

BORE	ROD	A	C	D	E	F	G	K	KK	LD	P	R	RD	W	Y	ZM
8"	1.375	1.630	0.630	1.130	8.500	0.63	2.000	0.630	1-14	5.630	3.250	6.440	3.130	1.630	2.810	8.880
	1.750	2.000	0.750	1.500	8.500	0.750	2.000	0.630	1 1/4-12	5.630	3.250	6.440	3.790	1.880	3.060	9.380
10"	1.750	2.000	0.750	1.500	10.630	0.750	2.250	0.750	1 1/4-12	6.630	4.130	8.060	5.500	1.880	3.130	10.380
	2.000	2.250	0.880	1.750	10.630	0.750	2.250	0.750	1 1/2-12	6.630	4.130	8.060	5.500	2.000	3.250	10.630
12"	2.500	3.000	1.000	2.060	10.630	0.750	2.250	0.750	1 7/8-12	6.630	4.130	8.060	5.500	2.250	3.500	11.130
	2.000	2.250	0.880	1.750	12.750	0.750	2.250	0.750	1 1/2-12	7.130	4.630	9.410	5.500	2.000	3.250	11.130
14"	2.500	3.000	1.000	2.060	12.750	0.750	2.250	0.750	1 7/8-12	7.130	4.630	9.410	5.500	2.250	3.500	11.630
	2.500	3.000	1.000	2.060	14.750	0.750	2.750	0.880	1 7/8-12	8.630	5.500	10.900	5.500	2.250	3.810	13.130



**Large Bore A Series  
NFPA Interchangeable**

**Stop Tube Data**

- Step 1 - Determine which mount below corresponds to your application.
- Step 2 - Determine the value of "L" from Table 1 below. Then find "L" dimension in Table 2 and read across to determine the required stop tube length.
- Step 3 - Add the stop tube length to the original "L" value from Step 2. This is the corrected "L". If the corrected "L" still falls within the same range as the original "L" then this is the required stop tube length. Otherwise, use this number in Table 2 to determine the second stop tube length.
- Step 4 - Add the second stop length to the original "L". If this value falls within the same range then the second stop tube length is the required length. Otherwise, repeat Step 4.

NOTE: Specify the effective stroke and the stop tube length when ordering.

Example:

- Step 1: 10" bore cylinder, 1 3/4 diameter rod, P1 mount, 82 inch stroke  
From catalog, XC = 10.375  
From table 1, "L"=XC=(2xStroke)
- Step 2: From Table 1, "L" = 10.375 + 164 = 174.375 inches  
From Table 2, when "L" = 174.375, stop tube length = 14 inches
- Step 3: Corrected "L" = 14 + 174.375 = 188.375 inches  
From Table 2, when "L" = 188.375, stop tube length = 15 inches
- Step 4: New corrected "L" = 15 + 174.375 = 189.375 inches  
From Table 2, when "L" = 189.375, stop tube length = 15 inches

The stop tube length from Step 3 and 4 are the same, therefore, 15 inches is the required stop tube length.

**Table 1**

MOUNT CODE	"L" (INCHES)
E3*	4 x (W + Stroke)
E4*	4 x (WF + Stroke)
P1 & U3	XC + (2 x Stroke)
S1*	4 x (WF + Stroke)
S2*	4 x (WF + Stroke)
S4*	4 x (WF + Stroke)
X3*	4 x (WF + Stroke)
X2*	4 x (WF + Stroke)
X1*	4 x (WF + Stroke)
T1	XG + Stroke
T2	XJ + (2 x Stroke)
T3	XI + Stroke

\* "L" given is for an unsupported rod end. If rod end is supported with a guide less than 1" in width, divide "L" by 4. If rod end is supported with a guide greater than 1" in width, divide "L" by 8.

For P1 mount, "L" assumes that the rod extends and the cylinder pivots with the rod. Multiply "L" by four so the rod extends and the cylinder does not pivot with the rod.

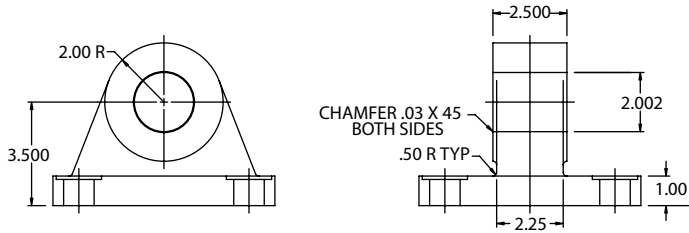
**Table 2**

"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
231-240	20
241-250	21
251-260	22
261-270	23
271-280	24
281-290	25
291-300	26
301-310	27

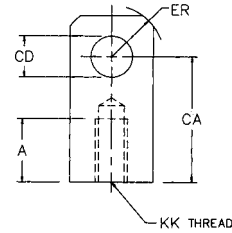


### Accessories

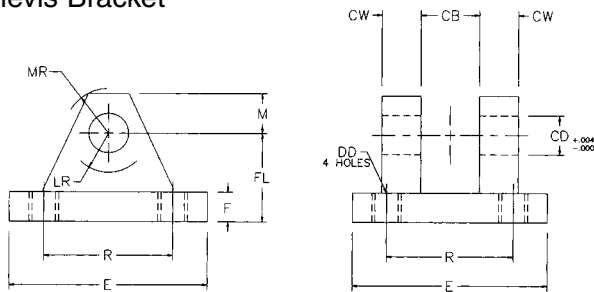
#### Eye Bracket \*



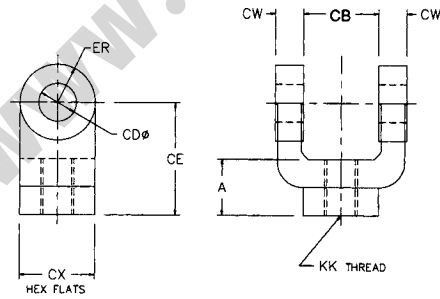
#### Rod Eye \*



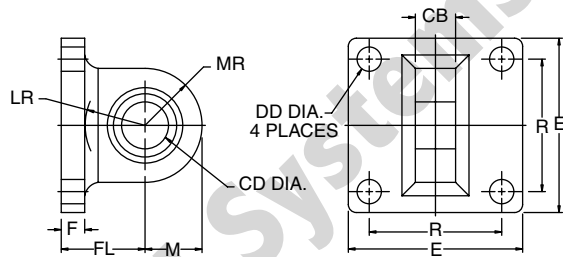
#### Clevis Bracket \*



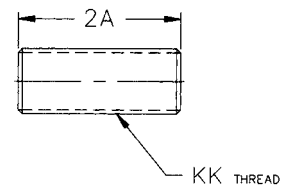
#### Rod Clevis \*



#### Spherical Eye Assembly \*



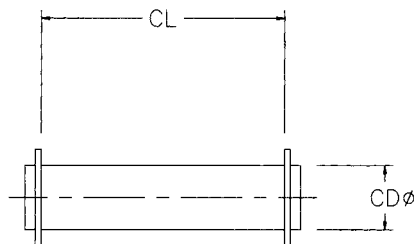
#### Rod Stud



NOTE: Assembly includes bracket and two spacers.

\* Order pivot pin separately

#### Pivot Pin



Included with mount codes P1 and U3





## Large Bore A Series NFPA Interchangeable

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### Accessories

#### Clevis Bracket

PART NO.	CB	CD	CW	DD	E	F	FL	LR	M	MR	R
A500-003	1.500	1.000	0.750	5/8-18	4.500	0.750	2.250	1.250	1.000	1.125	3.250
N29-1006	2.000	1.375	1.000	5/8-18	5.000	0.875	3.000	1.875	1.375	1.750	3.810
N29-1005	2.500	1.750	1.250	7/8-14	6.500	0.875	3.125	2.000	1.750	1.875	4.950
N29-1004	2.500	2.000	1.250	1-14	7.500	1.000	3.500	2.125	2.000	2.125	5.750
N29-1002	3.000	2.500	1.500	1 1/8-12	8.500	1.000	4.000	2.625	2.500	2.500	6.590

#### Eye Bracket

PART NO.	CB	CD	DD	E	F	FL	LR	M	MR	R
A500-103	1.500	1.000	0.656	4.500	0.750	2.250	1.500	1.000	1.250	3.250
A500-104	2.000	1.375	0.656	5.000	0.875	3.000	2.125	1.375	1.625	3.810
A500-105	2.500	1.750	0.906	6.500	0.875	3.125	2.250	1.750	2.125	4.950
A500-106	2.500	2.000	1.062	7.500	1.000	3.500	2.500	2.000	2.438	5.750
N30-1004	3.000	2.500	1.188	8.500	1.000	4.000	3.000	2.500	3.000	06.59

#### Rod Clevis

PART NO.	A	CB	CD	CE	CW	CX	ER	KK
A500-305	1.625	1.500	1.000	3.125	0.750	1.500	1.000	1-14
A500-306	2.000	2.000	1.375	4.125	1.000	2.000	1.375	1 1/4-12
A500-307	2.250	2.500	1.750	4.500	1.250	2.375	1.750	1 1/2-12
N27-1001	2.250	2.500	1.750	4.500	1.250	2.375	1.750	1 3/4-12
A500-308	3.000	2.500	2.000	5.500	1.250	2.938	2.000	1 7/8-12
A500-309	3.500	3.000	2.500	6.500	1.500	3.500	2.500	2 1/4-12

#### Rod Eye

PART NO.	A	CA	CB	CD	ER	KK
A500-204	1.625	2.813	1.500	1.000	1.188	1-14
A500-205	2.000	3.438	2.000	1.375	1.563	1 1/4-12
A500-206	2.250	4.000	2.500	1.750	2.000	1 1/2-12
N26-1004	2.250	4.000	2.500	1.750	2.000	1 3/4-12
N26-1003	3.000	5.000	2.500	2.000	2.500	1 7/8-12
N26-1002	3.500	5.813	3.000	2.500	2.813	2 1/4-12

#### Spherical Eye Bracket

PART NO.	CB	CD	DD	E	F	FL	LR	M	MR	R
N30-1005	1.000	1.000	0.656	4.500	0.750	2.250	1.500	1.375	1.375	3.250
N30-1006	1.375	1.375	0.656	5.000	0.875	3.000	2.125	2.000	2.000	3.810
N30-1003	1.500	1.750	0.906	6.500	0.875	3.125	2.250	2.125	2.125	4.940
N30-1007	1.750	2.000	1.032	7.500	1.000	3.500	2.500	2.375	2.375	5.750

#### Rod Stud

PART NO.	2A	KK
A500-T01	3.250	1-14
N82-1009	4.000	1 1/4-12
N82-1010	1.500	1 1/2-12
N82-1011	6.000	1 7/8-12

#### Pivot Pin

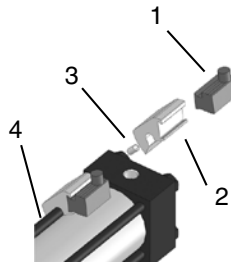
PART NO.	CD	CL
A500-403	1.000	3.125
A500-404	1.375	4.125
A500-405	1.750	5.125
A500-406	2.000	6.125
N131-1003	2.500	6.188



### Large Bore A Series World Switch Application Detail

#### Round Tube and Tie Rod Detail

1. World Switch
2. Tie Rod Bracket
3. Adjustment Screw
4. Cylinder Tie Rod



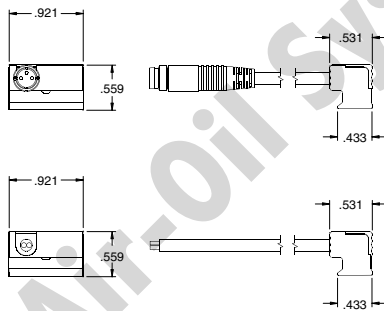
### Large Bore A Series World Switch Bracket

Cylinders	Bore	Part Number
A Series Tie Rod	8" Bore	SB6-W01
A Series Tie Rod	10" Bore	SB6-Y01

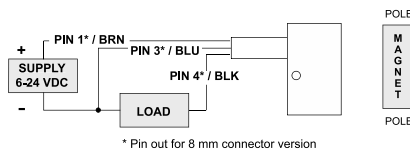
### Large Bore A Series World Switch Hall Effect Part Numbers

P/N	Switch Style	Switch Type	Function	Switching Voltage	Switching Current	Switching Power	Voltage Drop
SH6-031	3m Wire Version	Hall Effect for Reed Magnet & Light Sourcing	Normally Open Sourcing (PNP)	6 -24 VDC	0.3 Amps Max.	7.2 Watts Max.	0.5 Volts
SH6-021	8m Connector Pigtail	Hall Effect for Reed Magnet & Light Sourcing	Normally Open Sourcing (PNP)	6 -24 VDC	0.3 Amps Max.	7.2 Watts Max.	0.5 Volts
SH6-032	3m Wire Version	Hall Effect for Reed Magnet & Light Sourcing	Normally Open Sourcing (NPN)	6 -24 VDC	0.3 Amps Max.	7.2 Watts Max.	0.5 Volts
SH6-022	8m Connector Pigtail	Hall Effect for Reed Magnet & Light Sourcing	Normally Open Sourcing (NPN)	6 -24 VDC	0.3 Amps Max.	7.2 Watts Max.	0.5 Volts

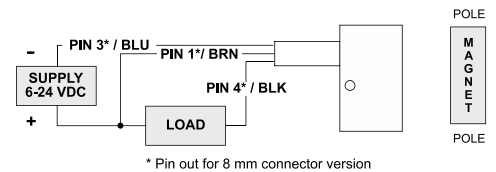
### Hall Effect Switch



#### PNP Sourcing



#### NPN Sinking





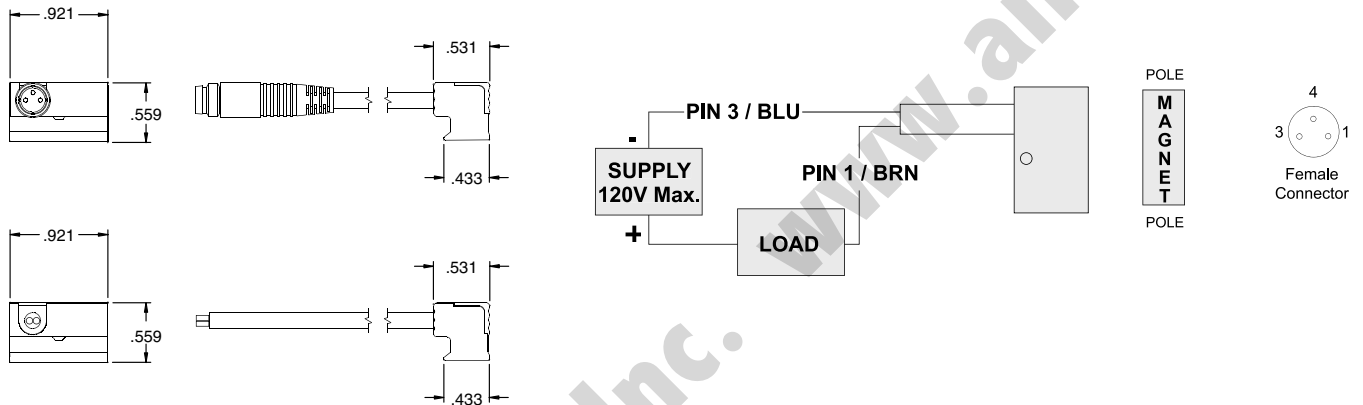
## Large Bore A Series NFPA Interchangeable

# NUMATICS®

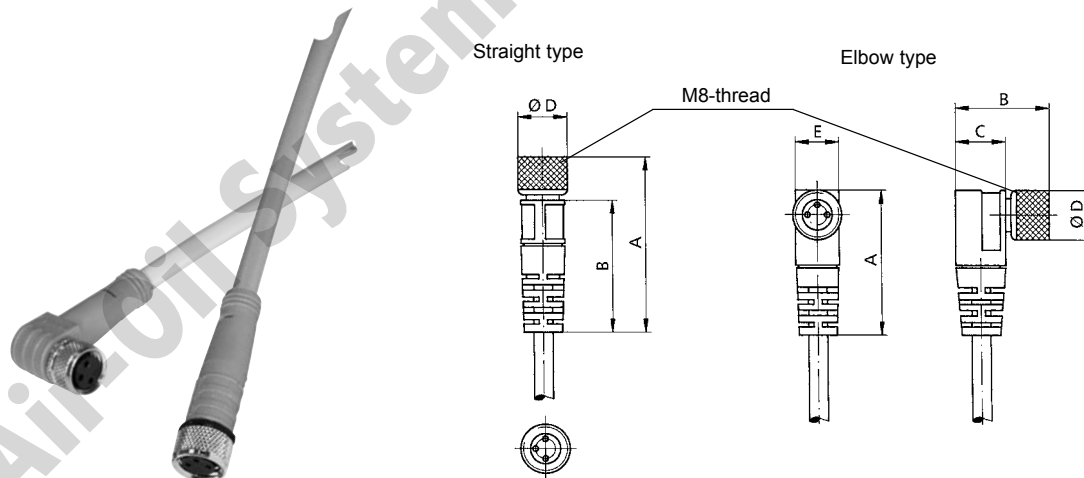
### Large Bore A Series World Switch Reed Switch Part Numbers

P/N	Switch Style	Switch Type	Function	Switching Voltage	Switching Current	Switching Power	Voltage Drop
SR6-002	3m Wire Version	Reed Switch, LED	SPST Normally Open	5 - 120V AC/DC	0.025 Amps Max. 0.001 Amps Min.	3 Watts Max.	3.5 Volts
SR6-004	3m Wire Version	Reed Switch, LED & MOV	SPST Normally Open	5 - 120V AC/DC	0.5 Amps Max. 0.005 Amps Min.	10 Watts Max.	3.0 Volts
SR6-021	8mm Pigtail	Reed Switch	SPST Normally Open	0 - 120V AC/DC	0.5 Amps Max.	10 Watts Max.	0 Volts
SR6-022	8mm Pigtail	Reed Switch, LED	SPST Normally Open	5 - 120V AC/DC	0.025 Amps Max. 0.001 Amps Min.	3 Watts Max.	3.5 Volts
SR6-024	8mm Pigtail	Reed Switch, LED & MOV	SPST Normally Open	5 - 120V AC/DC	0.5 Amps Max. 0.005 Amps Min.	10 Watts Max.	3.0 Volts

### Reed Switch - Normally Open Type SR6



### Cords M8-thread for Switches and Sensors with Connector



### Dimensions (mm)

Type		A	B	C	D	E	Weight (approx. kg)	Order Code
Straight with 5m-cable	(3x0.25 mm <sup>2</sup> )	32.3	24.4	—	9.0	—	0.143	SC6-001
Elbow with 5m-cable	(3x0.25 mm <sup>2</sup> )	26.3	17.1	9.2	9.0	8.0	0.145	SC6-002



### How to Order - A Series Piston Rod Assembly

**A92- K 1 N 0 - 01 A-AA**

Type  
A92 = A Series Piston Rod Assembly

Bore  
K = 1-1/2" U = 6"  
L = 2" W = 8"  
M = 2-1/2" X = 10"  
P = 3-1/4" Y = 12"  
R = 4" B = 14"  
T = 5"

Rod Code  
1 = Style # 1 Standard Rod Diameter  
2 = Style # 2 Standard Rod Diameter  
3 = Style # 3 Standard Rod Diameter  
4 = Special Standard Rod Diameter (must specify threads)  
5 = Special Oversize Rod Diameter (must specify threads)  
6 = Style # 1 Oversize Rod Diameter  
7 = Style # 2 Oversize Rod Diameter  
8 = Style # 3 Oversize Rod Diameter  
A = Style # 1 Second Oversize Rod Diameter  
B = Style # 2 Second Oversize Rod Diameter  
C = Style # 3 Second Oversize Rod Diameter  
U = Male Coupling Rod End Oversize Rod Diameter  
V = Male Coupling Rod End Oversize Rod Diameter

Cushion  
N = No Cushion  
B = Both Ends Cushioned  
H = Head End Cushioned  
C = Cap End Cushioned

Magnet  
0 = No Magnet  
2 = Reed Magnet (Is Included with Piston Rod Assembly)

Options (Does Not Include Seals)  
AA = No Option  
BH = Bumpered Head End  
CR = Cylindicator Ready "Stroke to Go"  
DA = Double Rod  
EB = Bumper Seals  
FA = No Wrench Flats, No Turn Down  
FB = Four Wrench Flats  
GA = High Temperature Rod Boot  
JN = Jam Nut  
KA = Stroke Adjust  
LB = Low Breakaway  
NA = Nickel Plated  
NN = Nylock Nut  
NS = Cylindicator Ready "No Stroke to Go"  
PP = PolyPak Piston  
RA = Save Air Stroke Adjuster  
RB = Rod Boot  
SA = Stainless Rod  
TI\*\* = "T" Seal Piston  
VA = Viton Seals  
1A\* = Rod Extension  
1B\* = Rear Rod Extension  
2A\* = Thread Extension  
2B\* = Rear Thread Extension  
3A = Rod Stud  
3B = Rear Rod Stud  
4A\* = Stop Tube  
4D\* = Double Piston Stop Tube

\* = must specify length  
\*\* For 10", 12", and 14" bores.  
Consult factory for additional options.

Fractional Inches of Stroke  
A = 0" E = 1/4" I = 1/2" M = 3/4"  
B = 1/16" F = 5/16" J = 9/16" N = 13/16"  
C = 1/8" G = 3/8" K = 5/8" O = 7/8"  
D = 3/16" H = 7/16" L = 11/16" P = 15/16"

Full Inches of Stroke  
00 = 0" Stroke  
01 = 1" Stroke  
02 = 2" Stroke  
03 = 3" Stroke  
04 = 4" Stroke  
05 = 5" Stroke  
99 = 99" Stroke

**Note:** Options listed are ones that apply to a piston rod assembly only.  
Model number is set up to use option code supplied with original cylinder or with any above.  
Note: Bumpers are not included with Piston Rod Assembly.

### Rod End Styles, Diameters and Threads

Diameter	Style #1 Standard Male	Style #2 Optional Male	Style #3 Optional Female
0.625	7/16-20	1/2-20	7/16-20
1.000	3/4-16	7/8-14	3/4-16
1.375	1-14	1 1/4-12	1-14
1.750	1 1/4-12	1 1/2-12	1 1/4-12
1.375	1-14	1 1/4-12	1-14
1.750	1 1/4-12	1 1/2-12	1 1/4-12
2.000	1 1/2-12	1 3/4-12	1 1/2-12
2.500	1 7/8-12	2 1/4-12	1 7/8-12

### Rod Diameters by Bore Size

Bore	Standard Dia.	Oversized Dia.
1-1/2"	0.625	1.000
2"	0.625	1.000
2-1/2"	0.625	1.000
3-1/4"	1.000	1.375
4"	1.000	1.375
5"	1.000	1.375
6"	1.375	1.750
8"	1.375	1.750
10"	1.750	2.000
12"	2.000	2.500
14"	2.500	N/A



## Large Bore A Series NFPA Interchangeable

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### How to Order - A Series Repair Kit

**A98 - K 1 N - AA**

#### Type

A98 = A Series Repair Kit

#### Bore

K = 1-1/2" U = 6"  
L = 2" W = 8"  
M = 2-1/2" X = 10"  
P = 3-1/4" Y = 12"  
R = 4" B = 14"  
T = 5"

#### Rod Size

0 = Standard Rod  
1 = Oversize Rod  
2 = Second Oversize Rod

#### Options

AA = No Option  
BK = Back to Back  
BZ = Bronze Bushing  
CR = Cylindicator Ready "Stroke to Go"  
CZ = Composite Bushing  
DA = Double Rod  
EB = Silencer Bumpers  
GA = High Temperature Rod Boot  
LB = Low Breakaway  
LT = Low Temp Seals  
MA = Metallic Rod Scraper  
MB = Rear Metallic Rod Scraper  
NA = Nickel Plated  
NS = Cylindicator Ready "No Stroke to Go"  
PA = Polypak Rod Seal  
PB = Rear Polypak Rod Seal  
PP = Polypak Piston Seals  
RA = Save Air Stroke Adjust  
TI\*\* = "T" Seal Piston  
VA = Viton Seals  
4D = Double Piston Stop Tube  
\*\* For 10", 12", and 14" bores.

#### Cushion

N = No Cushion  
B = Both Ends Cushioned  
H = Head End Cushioned  
C = Cap End Cushioned

**Note:** Options listed are ones that apply to a repair kit only.

Model number is set up to use option code supplied with original cylinder or with any above.

### How to Order - A Series Seal Kit

**A97 - K 1 N - AA**

#### Type

A97 = A Series Seal Kit

#### Bore

K = 1-1/2" U = 6"  
L = 2" W = 8"  
M = 2-1/2" X = 10"  
P = 3-1/4" Y = 12"  
R = 4" B = 14"  
T = 5"

#### Rod Size

0 = Standard Rod  
1 = Oversize Rod  
2 = Second Oversize Rod

#### Options

AA = No Option  
BK = Back to Back  
CR = Cylindicator Ready "Stroke to Go"  
DA = Double Rod  
EB = Silencer Bumpers  
LB = Low Breakaway  
LT = Low Temp Seals  
MA = Metallic Rod Scraper  
MB = Rear Metallic Rod Scraper  
NS = Cylindicator Ready "No Stroke to Go"  
PA = Polypak Rod Seal  
PB = Rear Polypak Rod Seal  
PP = Polypak Piston Seals  
RA = Save Air Stroke Adjust  
TI\*\* = "T" Seal Piston  
VA = Viton Seals  
4D = Double Piston Stop Tube  
\*\* For 10", 12", and 14" bores.

#### Cushion

N = No Cushion  
B = Both Ends Cushioned  
H = Head End Cushioned  
C = Cap End Cushioned

**Note:** Options listed are ones that apply to a seal kit only.

Model number is set up to use option code supplied with original cylinder or with any above.



## Piston Rod Assembly Kit Installation Instructions

1. Loosen 4 Tie Rod Nuts (Part #20) to remove Piston/Rod Assembly (Part #18 & #19).
2. Carefully remove seals. (Part #12, #14, & #15). Any damage to the seals may result in leakage.
3. Lubricate piston seal(s) and wearband (Part #12) with supplied Numatics' Lube. Examine seals before installing for any contamination. Contamination may cause leakage.
4. Install Piston Seal (Part #15). Make sure the piston seal is not twisted inside groove. Next install back-up rings if piston seal is a T-seal.
5. Install lubricated wearband onto piston. Sink piston/rod assembly into sinker tube.
6. Apply lube inside the cylinder tube (Part #17).
7. Sink piston/rod assembly into cylinder tube.
8. Press piston/rod assembly flush with the cylinder tube. Wipe off any lube from the face of the piston.
9. Examine all seals before reassembling cylinder for any contamination. Contamination may cause leakage.
10. Lightly grease Rod Seal (Part #3) of Loaded Bushing before installing. This will ease the installation of the rod bushing over the rod.
11. Reassemble cylinder. Loosely torque Tie Rod Nuts (Part #20) to allow head and cap to rotate slightly.
12. Before final torque, place cylinder on level surface. This will ensure that the cylinder head and cap are square. Torque Tie Rod Nuts (Part #20) in a crisscross pattern. Use torque tolerances chart for Tie Rod Nuts and Retainer Screws.
13. Stroke cylinder by hand. This will enable detection of any binding. If binding does occur, repeat steps 11-13.

See Seal Installation Guide on page 24 for additional (visual) instructions.

## Repair Kit and Seal Kit Removal/Installation Instructions

1. Loosen 2 or 4 Retainer Screws (Part #11) to remove Loaded Bushing (Part # 9)
2. Loosen 4 Tie Rod Nuts (Part #20) to remove Piston/Rod Assembly (Part #18 & #19)
3. Carefully remove old seals. (Part [#1, #2, #3 Seal kit only], #5, #6, #7, #12, #14, & #15) Any damage to the seal grooves may result in leakage.
4. Lubricate new seals with supplied Numatics' Lube. Examine seals before installing for any contamination. Contamination may cause leakage.
5. Install Piston Seal (Part #15). Make sure the piston seal is not twisted inside groove. Next install back-up rings (Part #14) if piston seal is a T-seal.
6. Install lubricated Wearband (Part #12) onto piston. Sink piston/rod assembly into sinker tube.
7. Apply lube inside the cylinder tube.
8. Sink piston/rod assembly into cylinder tube.
9. Press piston/rod assembly flush with the cylinder tube. Wipe off any lube from the face of the piston.
10. Place Tube End Seals (Part #6) into head and cap seal grooves. Examine seals after installing for any contamination. Contamination may cause leakage.
11. Install Rod Wiper (Part #1), Bushing O-ring (Part #2), and Rod Seal (Part #3) into bushing (Seal Kit only). Lightly grease Rod Seal and Bushing O-ring after installation. This will ease the installation of the rod bushing over the rod and into the head.
12. Reassemble cylinder except for loaded rod bushing (Part #9). First, loosely torque Tie Rod Nuts to allow head and cap to rotate slightly. Carefully place bushing over the rod until getting interference. With a twisting motion, slide the bushing down onto the rod and into the bushing pocket on the head.
13. Place Bushing Retainer (Part #10). Lightly tighten Retainer Screws (Part #11).
14. Before final torque, place cylinder on level surface to square head and cap. Torque Tie Rod Nuts in a crisscross pattern. Use the following charts for torque tolerances for Tie Rod Nuts and Retainer Screws.
15. Stroke cylinder by hand. This will enable detection of any binding. If binding does occur, repeat steps 12-14.

See Seal Installation Guide on page 24 for additional (visual) instructions.

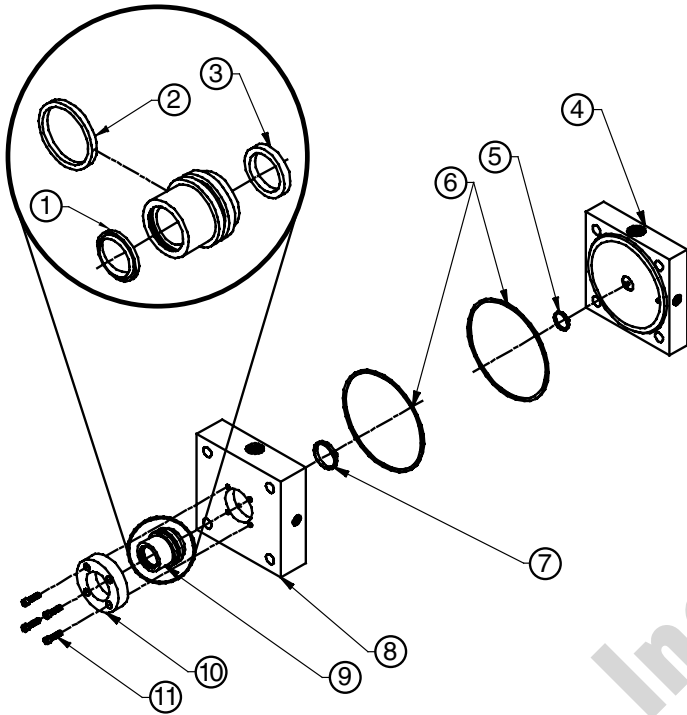


## Large Bore A Series NFPA Interchangeable

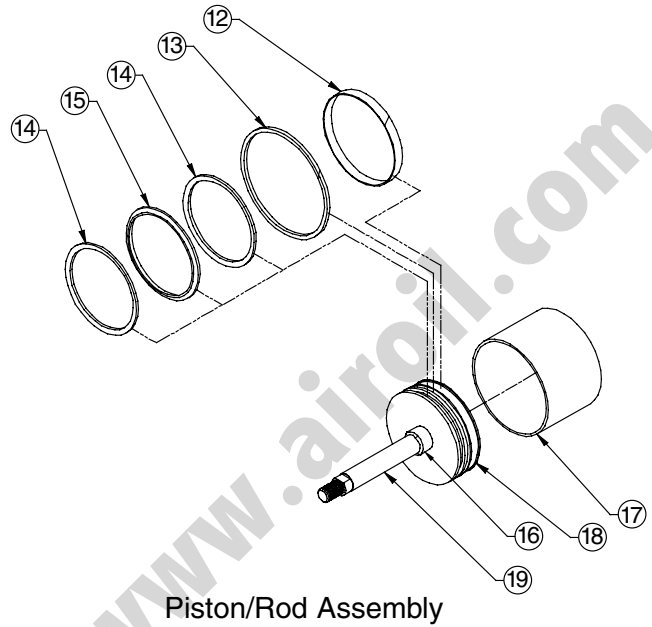
# NUMATICS®

### Diagrams

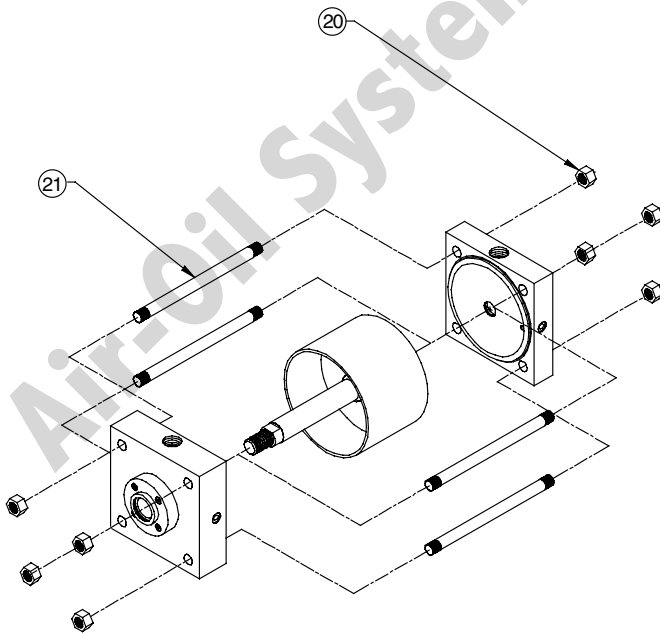
Pneumatic Service Temperatures:  
 Nitrile Seals: -10°F (-23°C) to 165°F (74°C)  
 Viton® Seals: 0°F (-17°C) to 400°F (204°C)



Head, Cap, and Bushing Assembly



Piston/Rod Assembly



Cylinder Assembly and Tie Rod Torque

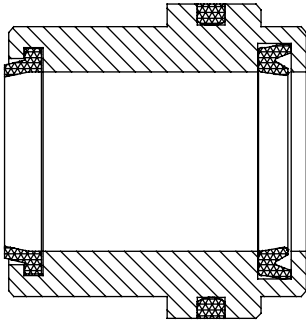
### A Series

Part #	Description	Parts included in:		
		Seal Kit	Repair Kit	Piston/Rod Assembly
1	Rod Wiper	X		
2	Bushing O-ring	X		
3	Rod Seal	X		
4	Cap			
5	Cap Cushion Seal	X	X	
6	Tube End Seals	X	X	
7	Head Cushion Seal	X	X	
8	Head			
9	Loaded Bushing Assembly		X	
10	Bushing Retainer			
11	Retainer Screws			
12	Wearband	X	X	
13	Magnet			X
14	Back-up Rings	X	X	
15	Piston Seal	X	X	
16	Cushion Spear			X
17	Tube			
18	Piston			X
19	Rod			X
20	Hex Nuts			
21	Tie Rods			

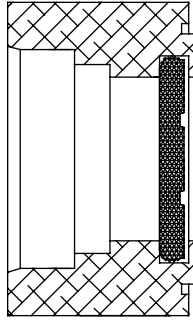




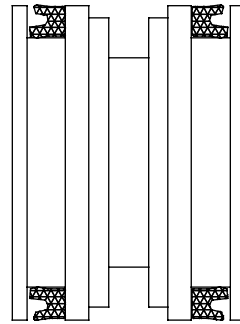
### Seal Installation Guide



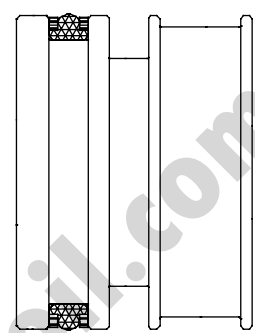
Loaded Bushing



Cushioned Head or Cap



Low Breakaway Piston



T-Seal Piston

#### Torque Tolerances (LBS-FT) Tie Rod Nut Part #20

Bore	Min.	Max.
1-1/2"	8	10
2"	15	20
2-1/2"	15	20
3-1/4"	23	30
4"	23	30
5"	50	60
6"	50	60
8"	80	90
10"	200	220
12"	200	220
14"	300	330

#### Retainer Screws Torque Tolerances (lbs-ft) Part #11

Size	Min.	Max.
#10-32	1	1.5
1/4-28	5	7
5/16-24	10	12

**Note:** Sinker Tubes are not included in kits. They can be ordered using the part numbers from the provided chart.

#### Sinker Tube Part Numbers

Bore	Part #
1-1/2"	A06-K91
2"	A06-L91
2-1/2"	A06-P91
3-1/4"	A06-M91
4"	A06-R91
5"	A06-T91
6"	A06-U91
8"	A06-W91
10"	A06-X91
12"	A06-Y91
14"	A06-B91

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