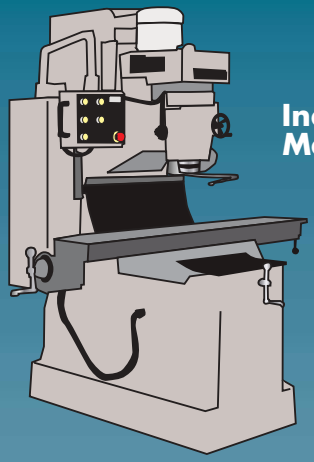
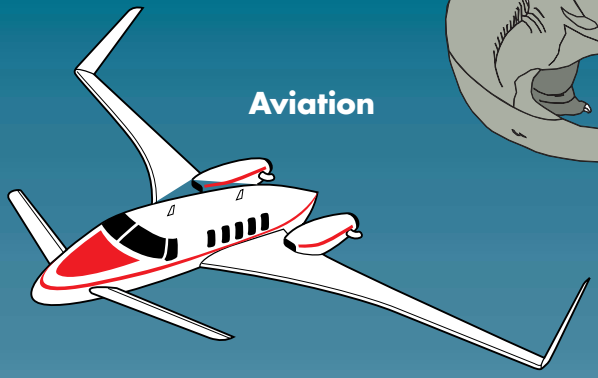
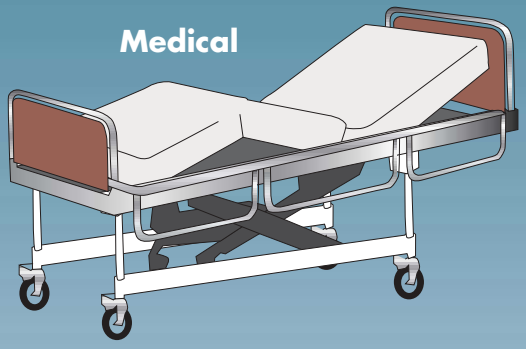
Compact Hydraulic Cylinders







For a Variety of Market Applications

- Hi Pressure - 5000 PSI
- Small Bore 1/2" and Larger
- Small Rod 1/4" and Larger
- Position Feedback Cylinders 1/2" and Larger
- 100% Tested

Custom Actuator Products, Inc.
Specialists in Compact Fluid Power

2500 Niagara Lane • Plymouth, MN 55447
Phone: (763) 525-0844 Fax: (763) 525-0845

"Smart" Mini Cylinders With .001" Repeatability

BORE SIZES FROM 3/4 TO 4". UP TO 5000 PSI Hydraulic or Pneumatic types

CAP "Smart" cylinders are ideal for situations where space constraints would otherwise limit design flexibility. Because of their small size, our cylinders fit nearly anywhere, allowing unlimited potential for their application.

The big difference in the CAP cylinder is our innovative use of mini linear resistance transducers (MLRTs) and linear resistance transducers (LRTs). These linear feedback devices do not control the rod position. They sense the position of the cylinder and send an analog output of its position through a miniature resistance element to the associated electronics. These compact transducers enable us to build the smallest position feedback cylinders available today.

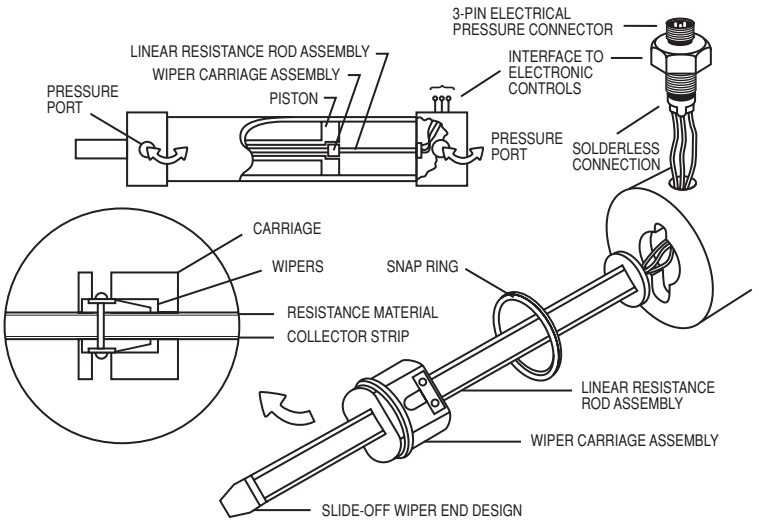
Our cylinders feature:

- 0.001" repeatability, depending on your system's electronic package.
- 500 million inches of travel life
- Pressures up to 5000 psi
- Temperature range to 185° F

We offer three basic types of control devices: a simple two-position controller which can sense the beginning and end of the stroke or any position in-between, a closed-loop signal tracking controller with a PID control loop, and a scaled analog output device to give a ratiometric output to a host controller. CAP is a leader in manufacturing small bore, high-pressure cylinders using the latest technologies to better serve companies like yours. Call today and find out how we can help with your design problems.

Typical Smart Cylinder Configuration

The CAP smart cylinder completely encloses the position sensing unit in the cylinder body. This provides a small profile and protects the sensor from external damage. Wire leads are sealed with a non-conducting material that withstands the internal fluid pressure. Several types of electronic interface connectors can be specified. The connector can be positioned at 90° or 180° from the fluid ports to fit your specific design requirements.



LRT/MLRT– INTERNAL CYLINDER POSITION FEEDBACK DEVICES

7500 LRT/7316 MLRT Ordering Information

Specify the following for a complete internal position feedback package:

- LRT model and stroke
- EPC model
- Cable interface

The CAP "Smart" Cylinder can be ordered in 3 Models:

- Small Bore/Small Rod Industrial
- NFPA
- Special

7500 LRT MODEL CODES

Order Number	Description
7500-XXX-A	LRT with no cap-end flange – non-slide-off wiper
7500-XXY-B1SW 7500-XXY-B2SW 7500-XXY-B3SW	Standard LRT – slide-off wiper – high pressure (See below for bore sizes)
7500-XXY-B1SWT 7500-XXY-B2SWT 7500-XXY-B3SWT	High Temperature LRT – slide-off wiper – high pressure (300°F)
7500-XXY-MSH	MSLRT unit that installs in identical cap-end cylinder envelope modification as the magnetostrictive model transducers. Includes slide-off wiper carriage.

7500 LRT SPECS

Fluids ..... Hydraulic or Pneumatic
Note: Cannot be water-based fluid

Repeatability ..... 001" Depending on Electronics

Life ..... 500 Million Inches of Wiper Travel

Non-linearity ..... 0.1% (48" Max.)
..... 1% (72" Max.)

Max. Stroke ..... 72" (call CAP for others)

Pressure Rating ..... 5000 psi

Temp ..... Std. 160° F
..... Hi-Temp 300° F

Min. Rod Size ..... 7/8" dia.

Piston Rod Drill ..... 1/2" dia.

Velocity ..... H=30" per sec.
..... P=50" per sec.

Signal Output ..... Ratiometric Analog Output

Signal Input ..... DC Voltage 5 Min. 50 Max.

NOTE: MUST HAVE HI-IMPEDENCE INTERFACE OF >500K TO LIMIT SENSOR CURRENT.

Bore Sizes for LRT Flange	B1: PH 1-1/2", 2", 2-1/2", HH 1-1/2" B2: PH 3-1/4", 4", 5", 6", HH 2", 2-1/2", 3-1/4", 4", 5" B3: HH 6" and greater

7316 MLRT MODEL CODES

7316-XXY-S1	MLRT-Mini LRT non-slide-off for small bore/small rod cylinders. Bore sizes from 3/4" to 1-1/2".
7316-XXY-S1SW 7316-XXY-S0SW	MLRT-Mini LRT with slide-off wiper carriage. MLRT-Mini LRT with slide-off wiper carriage for replacement in CAP Smart Cylinders

7316 MLRT SPECS

Fluids ..... Hydraulic or Pneumatic
Note: Cannot be water-based fluid

Repeatability ..... 001" Depending on Electronics

Life ..... 500 Million Inches of Wiper Travel

Non-linearity ..... 0.1% (18" Max.)

Max. Stroke ..... 18"

Pressure Rating ..... 5000 psi

Temp ..... Std. 160° F
..... Hi-Temp 300° F

Min. Rod Size ..... 5/16" dia.

Piston Rod Drill ..... 3/16" dia.

Velocity ..... H=30" per sec.
..... P=50" per sec.

Signal Output ..... Ratiometric Analog Output

Signal Input ..... DC Voltage 5 Min. 50 Max.

NOTE: MUST HAVE HI-IMPEDENCE INTERFACE OF 1 MEGAOHM TO LIMIT SENSOR CURRENT.

XXY	XX=Stroke in whole inches Y = Additional stroke in 1/8" increments

1/2" BORE CYLINDER

The Cylinder Model Code Will Appear As Follows:

AA 1/2 X 6 - 3 - 2 -4 M 3 6 - 2H

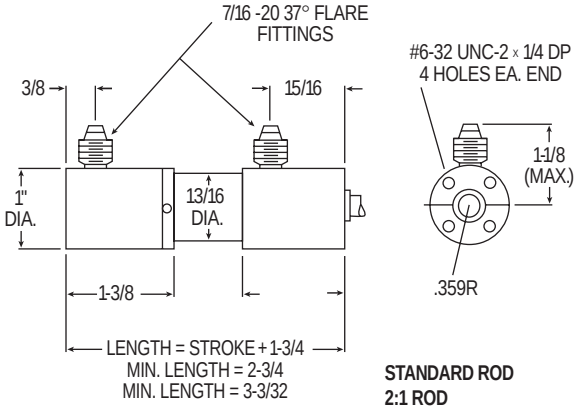
AA	1/2	X	6	-	3	-	2	-4	M	3	6	-	2H
STYLE	BORE		STROKE		MOUNTING		ROD	PORTS	ELECTRICAL CONNECTOR POSITION		MINI EPC RIGHT ANGLE CABLE DIRECTION		ATTACHMENTS

HYDRAULIC OR PNEUMATIC

OPTIONAL O-RING BACKED TEFLON ROD SEALS ARE AVAILABLE. USE CODE A OR B.

(BLANK IF NON-FEEDBACK)

END MOUNT – STYLE 1



STANDARD ROD
2:1 ROD

FOOT MOUNT (BOTH ENDS) – STYLE 3

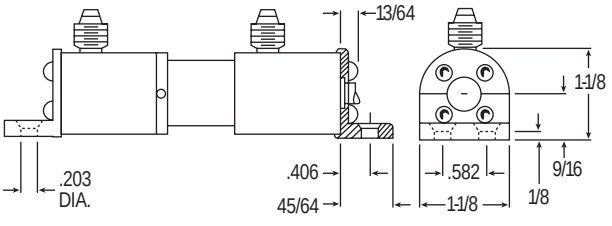
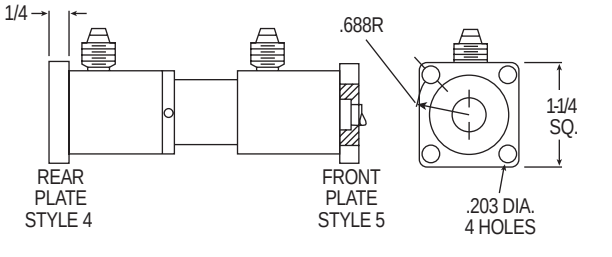
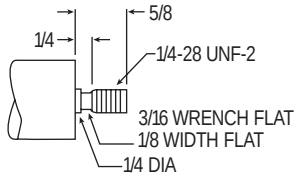


PLATE MOUNT (EITHER END) – STYLE 4 STYLE 5

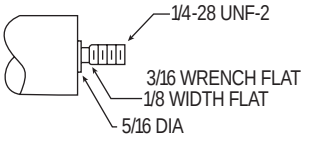


Specifications	STD. ROD	2:1 ROD
Diameter of bore, inches	0.500	0.500
Diameter of piston rod, inches	0.250	0.312
Effective area, rod side, sq. ins.	0.150	0.120
Effective area, piston side, sq. ins.	0.200	0.200

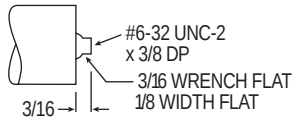
ROD ENDS



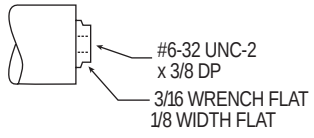
STYLE 1
STANDARD ROD-MALE



STYLE 2
2:1 ROD-MALE

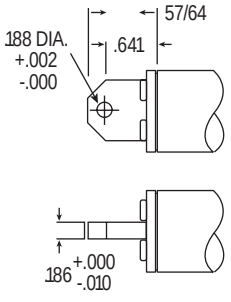


STYLE 3
STANDARD ROD-FEMALE

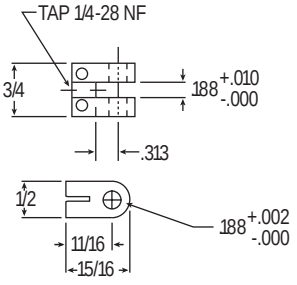


STYLE 4
2:1 ROD-FEMALE

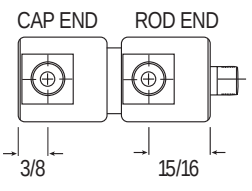
PIVOT MOUNT
STYLE 2



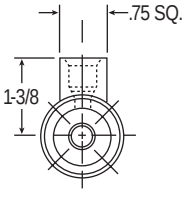
ROD CLEVIS
(ATTACHMENT 2)



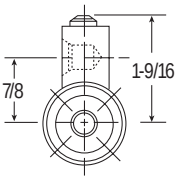
PORT STYLE BB



PORT LOCATION

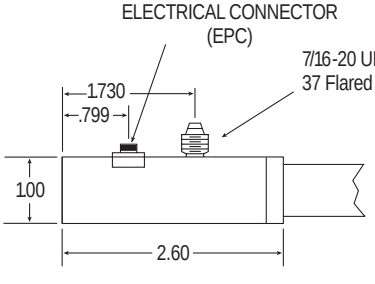


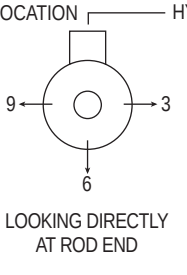
TOP ENTRY



SIDE ENTRY
(SPECIFY SIDE REQUIRED)

FOR POSITION FEEDBACK CYLINDERS
ADD 1.565 TO BODY LENGTH OF CYLINDER





NOTE
LOCATION DESIRED FOR EPC
3, 6, 9 or 12 O'CLOCK

3/4" BORE CYLINDER

The Cylinder Model Code Will Appear As Follows:

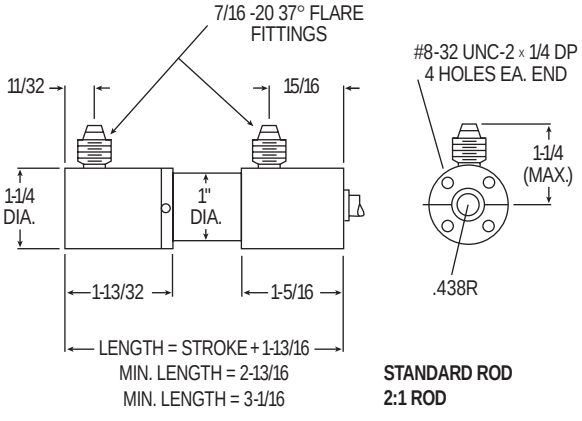
AA 3/4 X 6 - 3 - 2 -4 M 3 6 - 2H

STYLE	BORE	STROKE	MOUNTING	ROD	PORTS	ELECTRICAL CONNECTOR POSITION	MINI EPC RIGHT ANGLE CABLE DIRECTION (BLANK IF NON-FEEDBACK)	ATTACHMENTS

HYDRAULIC OR PNEUMATIC

OPTIONAL O-RING BACKED TEFLON ROD SEALS ARE AVAILABLE. USE CODE A OR B.

END MOUNT – STYLE 1



STANDARD ROD
2:1 ROD

FOOT MOUNT (BOTH ENDS) – STYLE 3

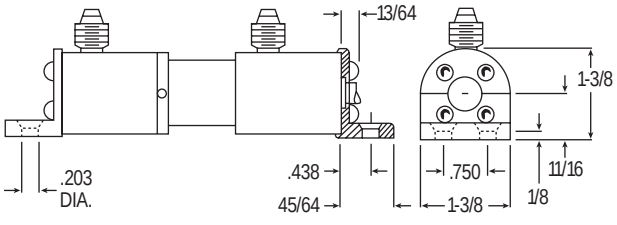
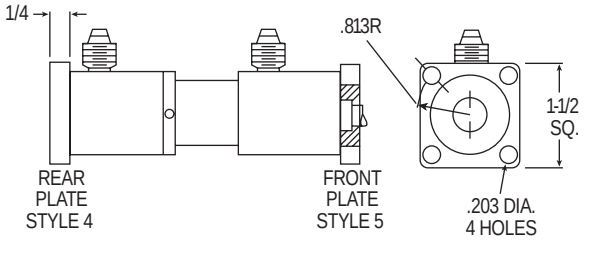
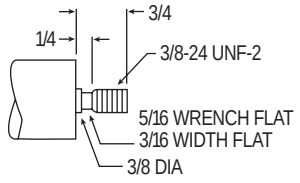


PLATE MOUNT (EITHER END) – STYLE 4 STYLE 5

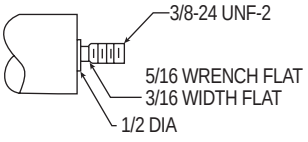


Specifications	STD. ROD	2:1 ROD
Diameter of bore, inches	0.750	0.750
Diameter of piston rod, inches	0.375	0.500
Effective area, rod side, sq. ins.	0.330	0.250
Effective area, piston side, sq. ins.	0.440	0.440

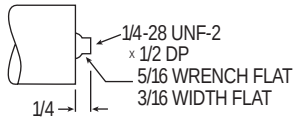
ROD ENDS



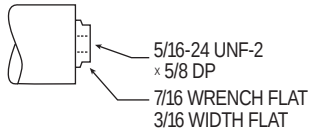
STYLE 1
STANDARD ROD-MALE



STYLE 2
2:1 ROD-MALE

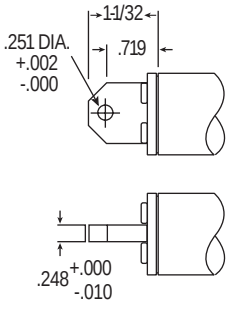


STYLE 3
STANDARD ROD-FEMALE

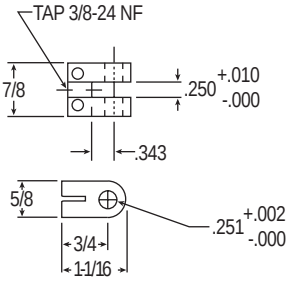


STYLE 4
2:1 ROD-FEMALE

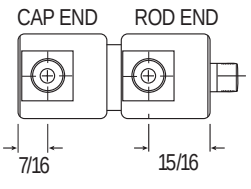
PIVOT MOUNT
STYLE 2



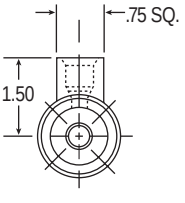
ROD CLEVIS
(ATTACHMENT 2)



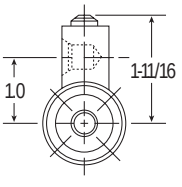
PORT STYLE BB



PORT LOCATION

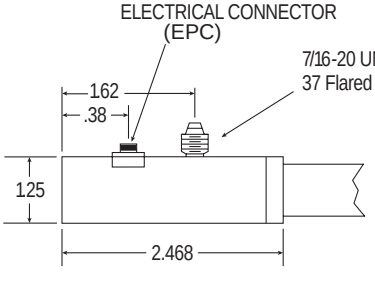


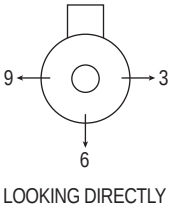
TOP ENTRY



SIDE ENTRY
(SPECIFY SIDE REQUIRED)

FOR POSITION FEEDBACK CYLINDERS
ADD 1.281 TO BODY LENGTH OF CYLINDER





NOTE
LOCATION DESIRED FOR EPC
3, 6, 9 or 12 O'CLOCK

1" BORE CYLINDER

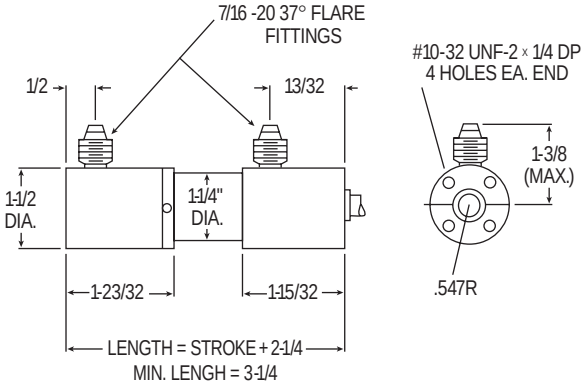
The Cylinder Model Code Will Appear As Follows:

AA 1 X 6 - 3 - 2 -4 M 3 6 - 2H — HYDRAULIC OR PNEUMATIC

STYLE | BORE | STROKE | MOUNTING | ROD | PORTS | ELECTRICAL CONNECTOR POSITION | MINI EPC RIGHT ANGLE CABLE DIRECTION (BLANK IF NON-FEEDBACK) | ATTACHMENTS

OPTIONAL O-RING BACKED TEFLON ROD SEALS ARE AVAILABLE. USE CODE A OR B.

END MOUNT – STYLE 1



FOOT MOUNT (BOTH ENDS) – STYLE 3

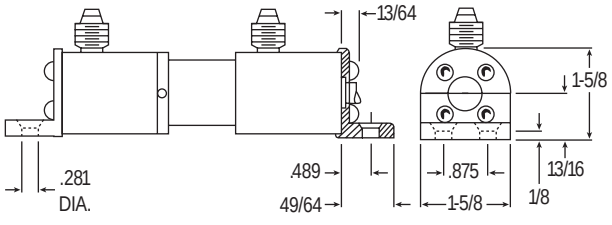
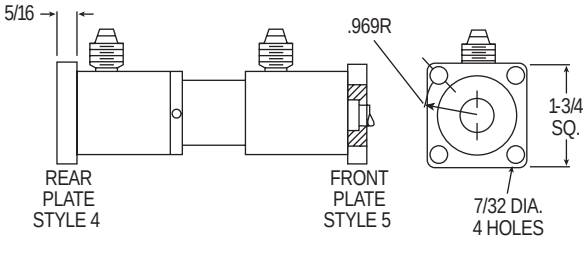
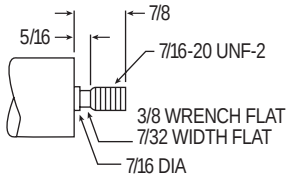


PLATE MOUNT (EITHER END) – STYLE 4 STYLE 5

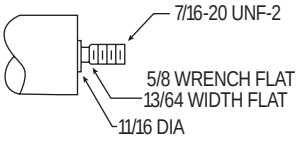


Specifications	STD. ROD	2:1 ROD
Diameter of bore, inches	1.250	1.250
Diameter of piston rod, inches	0.438	0.688
Effective area, rod side, sq. ins.	0.640	0.420
Effective area, piston side, sq. ins.	0.790	0.790

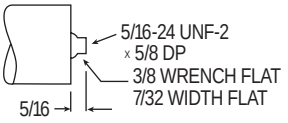
ROD ENDS



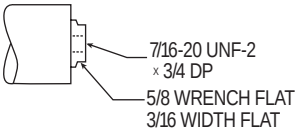
STYLE 1
STANDARD ROD-MALE



STYLE 2
2:1 ROD-MALE

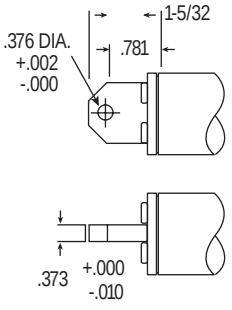


STYLE 3
STANDARD ROD-FEMALE

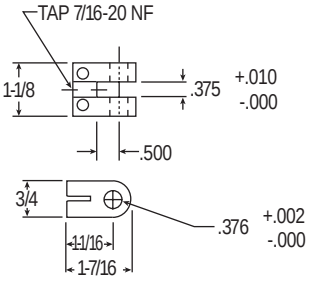


STYLE 4
2:1 ROD-FEMALE

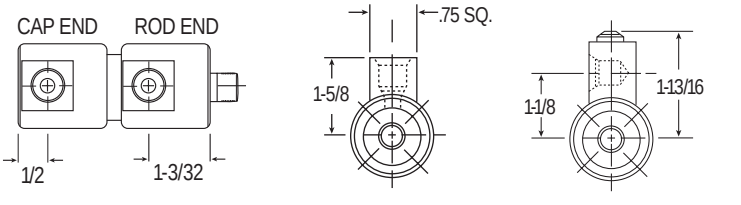
PIVOT MOUNT
STYLE 2



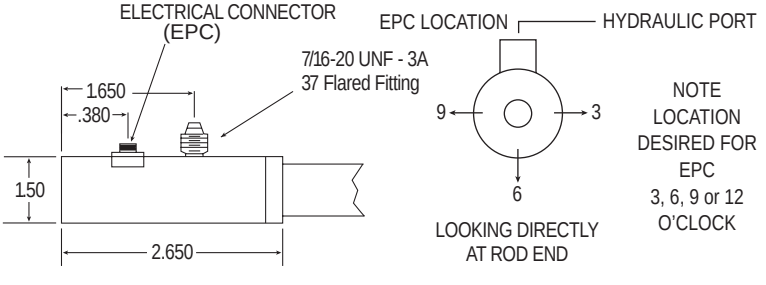
ROD CLEVIS
(ATTACHMENT 2)



PORT STYLE BB



FOR POSITION FEEDBACK CYLINDERS ADD 1.150 TO BODY LENGTH OF CYLINDER



1-1/4" BORE CYLINDER

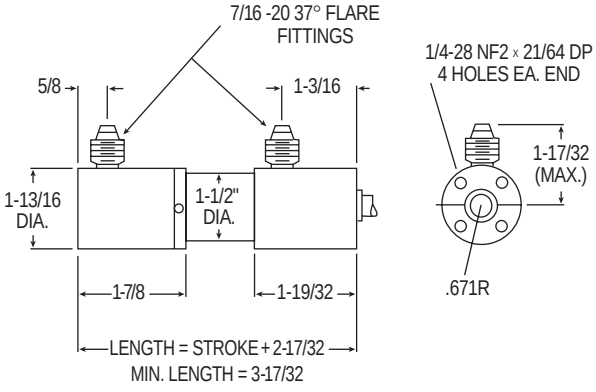
The Cylinder Model Code Will Appear As Follows:

AA 1-1/4 X 6 - 3 - 2 -4 M 3 6 - 2H — HYDRAULIC OR PNEUMATIC

STYLE | BORE | STROKE | MOUNTING | ROD | PORTS | ELECTRICAL CONNECTOR POSITION | MINI EPC RIGHT ANGLE CABLE DIRECTION (BLANK IF NON-FEEDBACK) | ATTACHMENTS

OPTIONAL O-RING BACKED TEFLON ROD SEALS ARE AVAILABLE. USE CODE A OR B.

END MOUNT – STYLE 1



FOOT MOUNT (BOTH ENDS) – STYLE 3

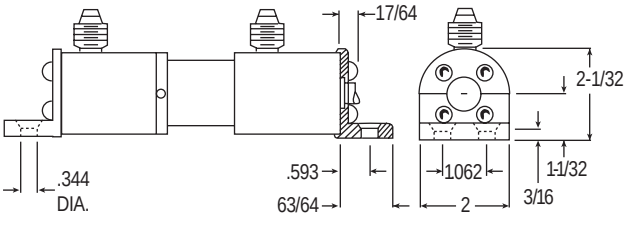
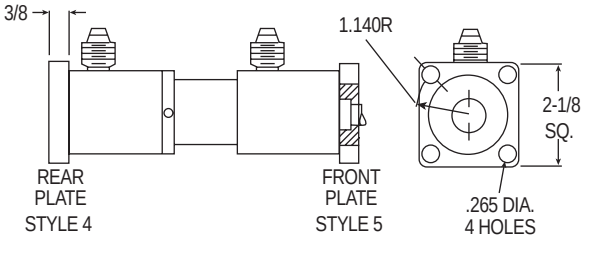
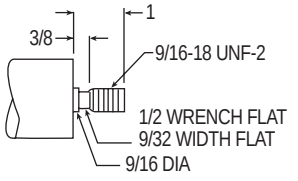


PLATE MOUNT (EITHER END) – STYLE 4 STYLE 5

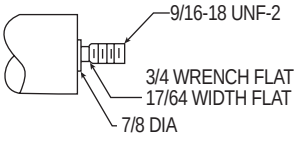


Specifications	STD. ROD	2:1 ROD
Diameter of bore, inches	1.250	1.250
Diameter of piston rod, inches	0.562	0.875
Effective area, rod side, sq. ins.	0.980	0.830
Effective area, piston side, sq. ins.	1.230	1.230

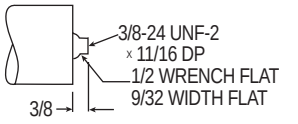
ROD ENDS



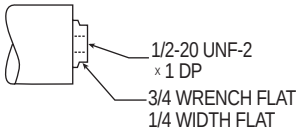
STYLE 1
STANDARD ROD-MALE



STYLE 2
2:1 ROD-MALE

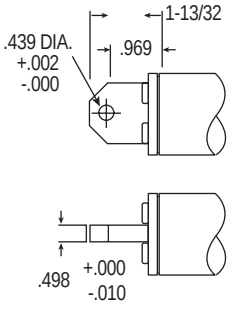


STYLE 3
STANDARD ROD-FEMALE

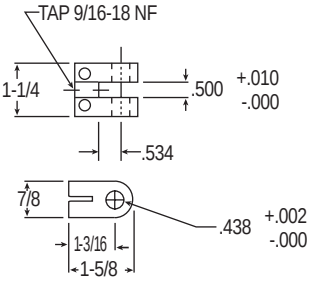


STYLE 4
2:1 ROD-FEMALE

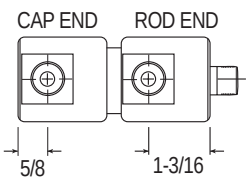
PIVOT MOUNT
STYLE 2



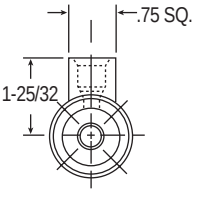
ROD CLEVIS
(ATTACHMENT 2)



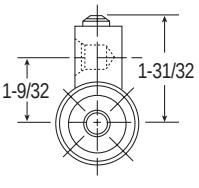
PORT STYLE BB



PORT LOCATION

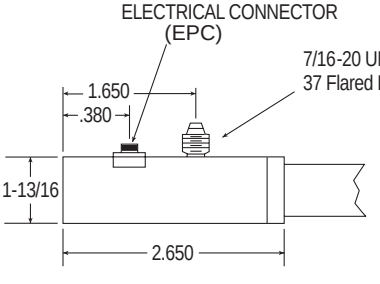


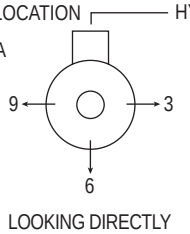
TOP ENTRY



SIDE ENTRY
(SPECIFY SIDE REQUIRED)

FOR POSITION FEEDBACK CYLINDERS
ADD 1.025 TO BODY LENGTH OF CYLINDER





NOTE
LOCATION DESIRED FOR EPC
3, 6, 9 or 12 O'CLOCK

1-1/2" BORE CYLINDER

The Cylinder Model Code Will Appear As Follows:

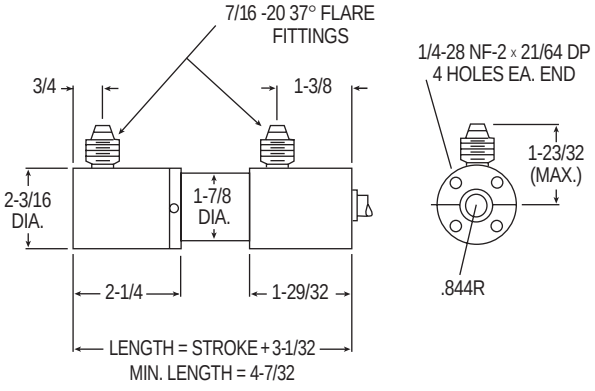
AA 1-1/2 X 6 - 3 - 2 -4 M 3 6 - 2H

STYLE | BORE | STROKE | MOUNTING | ROD | PORTS | ELECTRICAL CONNECTOR POSITION | MINI EPC RIGHT ANGLE CABLE DIRECTION (BLANK IF NON-FEEDBACK) | ATTACHMENTS

HYDRAULIC OR PNEUMATIC

OPTIONAL O-RING BACKED TEFLON ROD SEALS ARE AVAILABLE. USE CODE A OR B.

END MOUNT – STYLE 1



FOOT MOUNT (BOTH ENDS) – STYLE 3

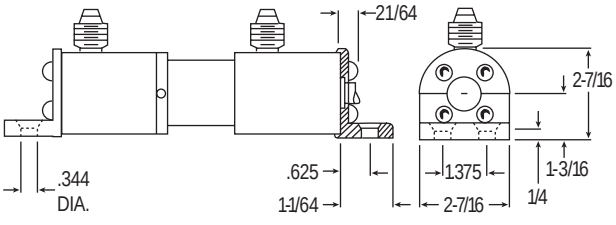
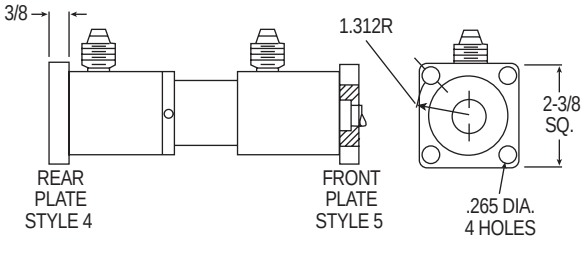
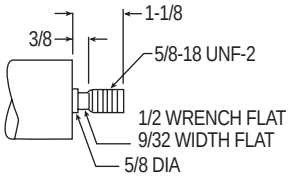


PLATE MOUNT (EITHER END) – STYLE 4 STYLE 5

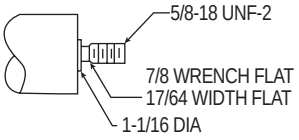


Specifications	STD. ROD	2:1 ROD
Diameter of bore, inches	1.500	1.500
Diameter of piston rod, inches	0.625	1.063
Effective area, rod side, sq. ins.	1.460	0.880
Effective area, piston side, sq. ins.	1.770	1.770

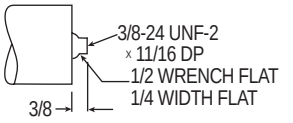
ROD ENDS



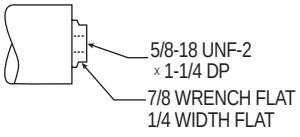
STYLE 1
STANDARD ROD-MALE



STYLE 2
2:1 ROD-MALE

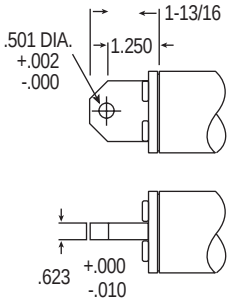


STYLE 3
STANDARD ROD-FEMALE

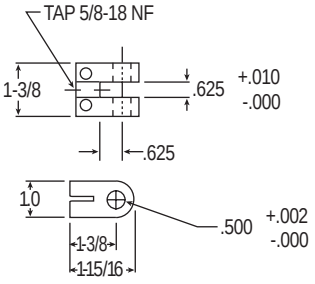


STYLE 4
2:1 ROD-FEMALE

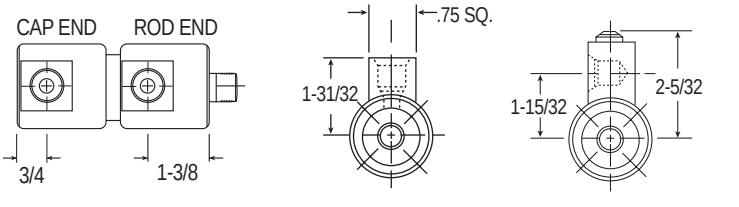
PIVOT MOUNT
STYLE 2



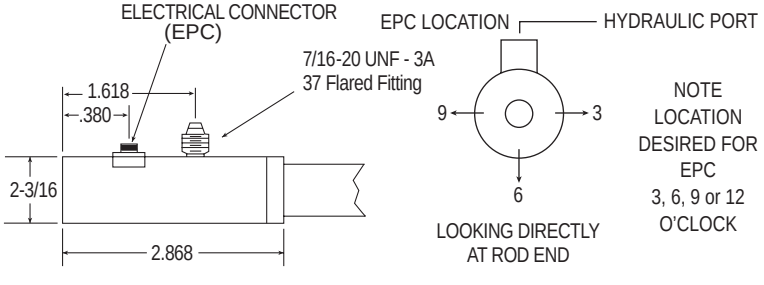
ROD CLEVIS
(ATTACHMENT 2)



PORT STYLE BB



FOR POSITION FEEDBACK CYLINDERS ADD 1.025 TO BODY LENGTH OF CYLINDER



2" BORE CYLINDER

The Cylinder Model Code Will Appear As Follows:

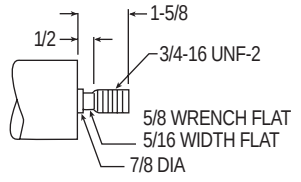
AA 2 X 6 - 3 - 2 -4 M 3 6 - 2H

STYLE	BORE		STROKE	MOUNTING	ROD	PORTS	ELECTRICAL CONNECTOR POSITION	MINI EPC RIGHT ANGLE CABLE DIRECTION (BLANK IF NON-FEEDBACK)	ATTACHMENTS

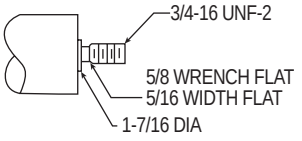
HYDRAULIC OR PNEUMATIC

OPTIONAL O-RING BACKED TEFLON ROD SEALS ARE AVAILABLE. USE CODE A OR B.

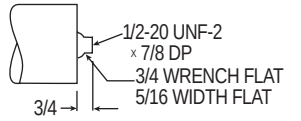
ROD ENDS



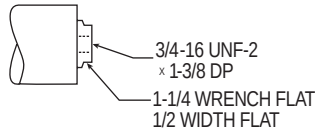
STYLE 1
STANDARD ROD-MALE



STYLE 2
2:1 ROD-MALE

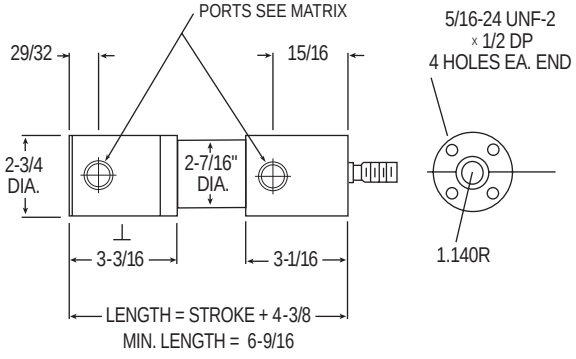


STYLE 3
STANDARD ROD-FEMALE

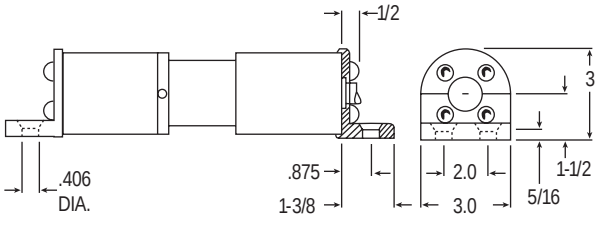


STYLE 4
2:1 ROD-FEMALE

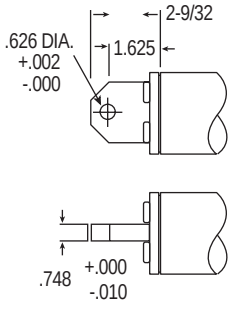
END MOUNT – STYLE 1



FOOT MOUNT (BOTH ENDS) – STYLE 3



PIVOT MOUNT
STYLE 2



ROD CLEVIS
(ATTACHMENT 2)

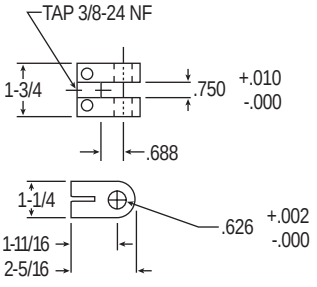
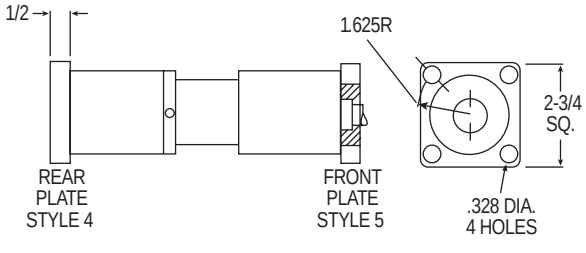


PLATE MOUNT (EITHER END) – STYLE 4 STYLE 5



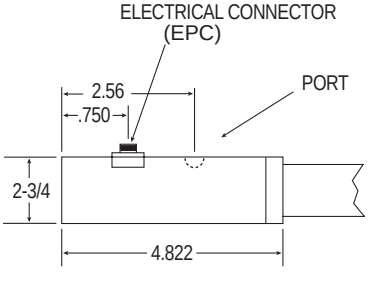
PORT STYLE

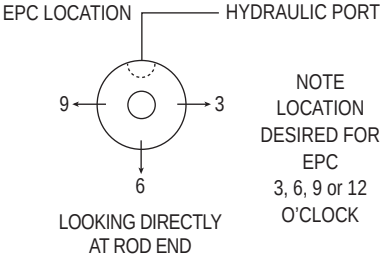
4J	7/16-20 straight thread female for 1/4 tubing
5J	1/2-20 straight thread female for 5/16 tubing
6J	9/16-18 straight thread female for 3/8 tubing
8J	3/4-16 straight thread female for 1/2 tubing, 2-1/2" and 3" Bores – Std. Rod.
10J	7/8-14 straight thread female for 5/8 tubing, 3" Bore – Std. Rod.
1P	1/8 female (NPSF)
2P	1/4 female (NPSF)
3P	3/8 female (NPSF)
4P	1/2 female (NPSF), 3" Bore – Std. Rod.

NOTE:
All "J's" are used with "O" ring type fittings.

All "P" types are not recommended where leak-free connections are required for high pressure service.

FOR POSITION FEEDBACK CYLINDERS ADD 1.281 TO BODY LENGTH OF CYLINDER





NOTE
LOCATION DESIRED FOR EPC
3, 6, 9 or 12 O'CLOCK

Specifications	STD. ROD	2:1 ROD
Diameter of bore, inches	2.000	2.000
Diameter of piston rod, inches	0.875	1.438
Effective area, rod side, sq. ins.	2.540	1.520
Effective area, piston side, sq. ins.	3.140	3.140

2-1/2" BORE CYLINDER

The Cylinder Model Code Will Appear As Follows:

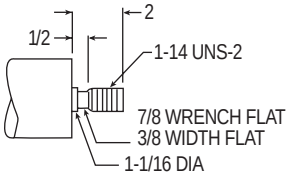
AA 2-1/2 X 6 - 3 - 2 -4 M 3 6 - 2H

STYLE	BORE	STROKE	MOUNTING	ROD	PORTS	ELECTRICAL CONNECTOR POSITION	MINI EPC RIGHT ANGLE CABLE DIRECTION	ATTACHMENTS
								HYDRAULIC OR PNEUMATIC

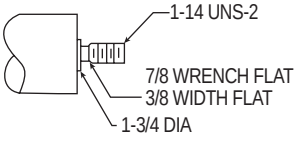
OPTIONAL O-RING BACKED TEFLON ROD SEALS ARE AVAILABLE. USE CODE A OR B.

(BLANK IF NON-FEEDBACK)

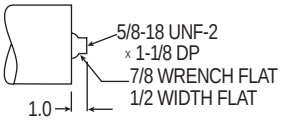
ROD ENDS



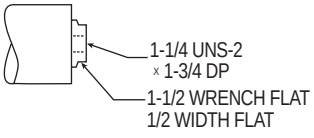
STYLE 1
STANDARD ROD-MALE



STYLE 2
2:1 ROD-MALE

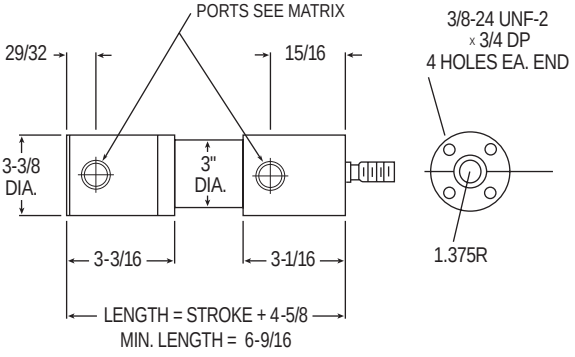


STYLE 3
STANDARD ROD-FEMALE

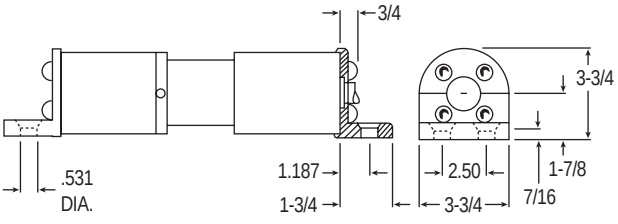


STYLE 4
2:1 ROD-FEMALE

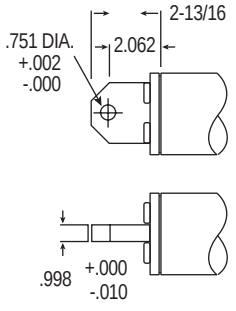
END MOUNT – STYLE 1



FOOT MOUNT (BOTH ENDS) – STYLE 3



PIVOT MOUNT
STYLE 2



ROD CLEVIS
(ATTACHMENT 2)

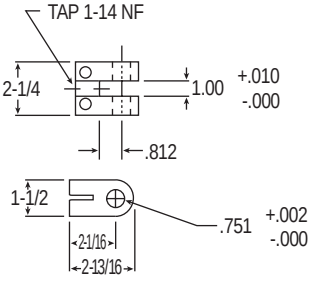
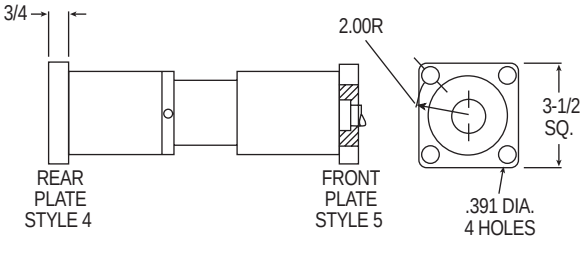


PLATE MOUNT (EITHER END) – STYLE 4 STYLE 5



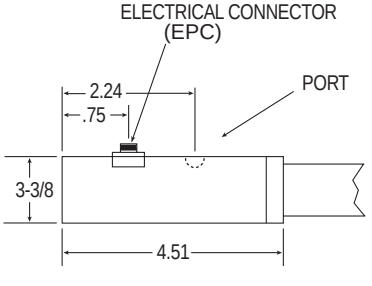
PORT STYLE

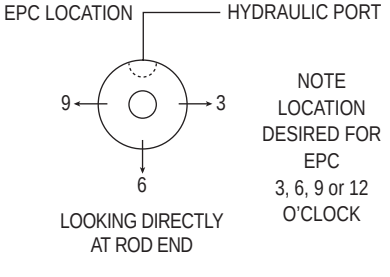
4J	7/16-20 straight thread female for 1/4 tubing
5J	1/2-20 straight thread female for 5/16 tubing
6J	9/16-18 straight thread female for 3/8 tubing
8J	3/4-16 straight thread female for 1/2 tubing, 2-1/2" and 3" Bores – Std. Rod.
10J	7/8-14 straight thread female for 5/8 tubing, 3" Bore – Std. Rod.
1P	1/8 female (NPSF)
2P	1/4 female (NPSF)
3P	3/8 female (NPSF)
4P	1/2 female (NPSF), 3" Bore – Std. Rod.

NOTE:
All "J's" are used with "O" ring type fittings.

All "P" types are not recommended where leak-free connections are required for high pressure service.

FOR POSITION FEEDBACK CYLINDERS ADD 1.281 TO BODY LENGTH OF CYLINDER





NOTE
LOCATION DESIRED FOR EPC
3, 6, 9 or 12 O'CLOCK

Specifications	STD. ROD	2:1 ROD
Diameter of bore, inches	2.500	2.500
Diameter of piston rod, inches	1.063	1.750
Effective area, rod side, sq. ins.	4.020	2.500
Effective area, piston side, sq. ins.	4.910	4.910

3" BORE CYLINDER

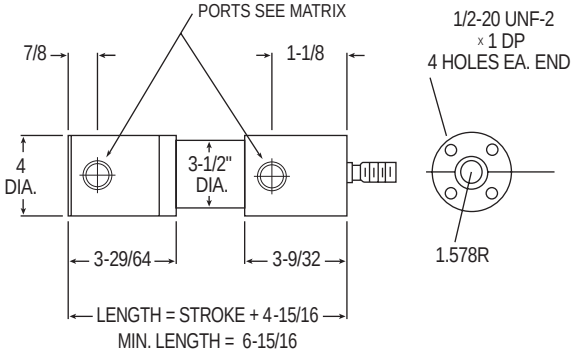
The Cylinder Model Code Will Appear As Follows:

AA 3 X 6 - 3 - 2 -4 M 3 6 - 2H — HYDRAULIC OR PNEUMATIC

STYLE | BORE | STROKE | MOUNTING | ROD | PORTS | ELECTRICAL CONNECTOR POSITION | MINI EPC RIGHT ANGLE CABLE DIRECTION (BLANK IF NON-FEEDBACK) | ATTACHMENTS

OPTIONAL O-RING BACKED TEFLON ROD SEALS ARE AVAILABLE. USE CODE A OR B.

END MOUNT – STYLE 1



FOOT MOUNT (BOTH ENDS) – STYLE 3

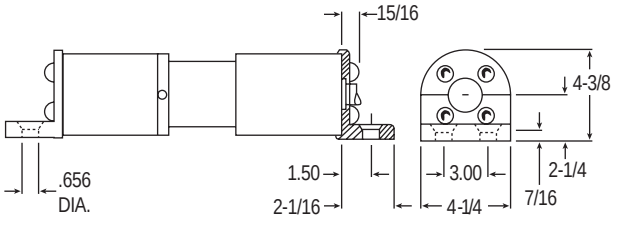
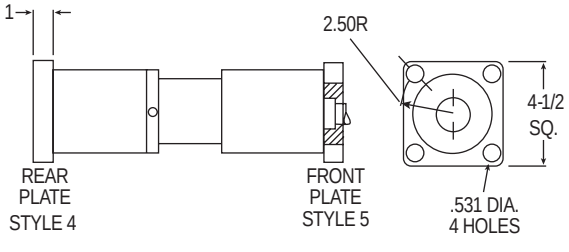
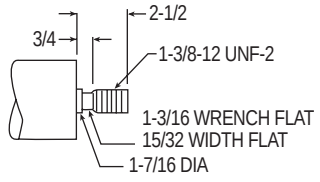


PLATE MOUNT (EITHER END) – STYLE 4 STYLE 5

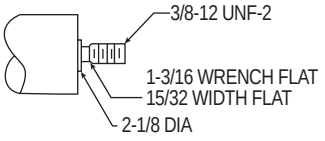


Specifications	STD. ROD	2:1 ROD
Diameter of bore, inches	3.000	3.000
Diameter of piston rod, inches	1.438	2.125
Effective area, rod side, sq. ins.	5.450	3.520
Effective area, piston side, sq. ins.	7.070	7.070

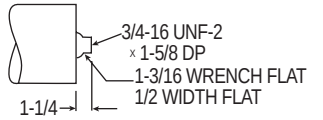
ROD ENDS



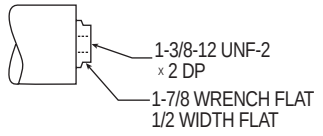
STYLE 1
STANDARD ROD-MALE



STYLE 2
2:1 ROD-MALE

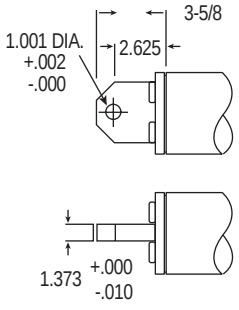


STYLE 3
STANDARD ROD-FEMALE

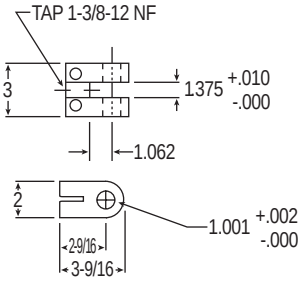


STYLE 4
2:1 ROD-FEMALE

PIVOT MOUNT
STYLE 2



ROD CLEVIS
(ATTACHMENT 2)



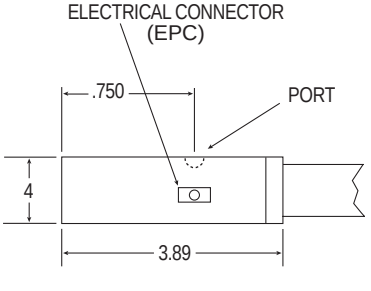
PORT STYLE

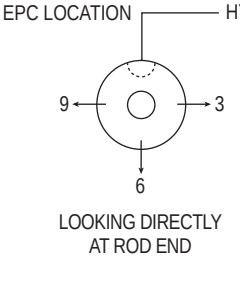
4J	7/16-20 straight thread female for 1/4 tubing
5J	1/2-20 straight thread female for 5/16 tubing
6J	9/16-18 straight thread female for 3/8 tubing
8J	3/4-16 straight thread female for 1/2 tubing, 2-1/2" and 3" Bores – Std. Rod.
10J	7/8-14 straight thread female for 5/8 tubing, 3" Bore – Std. Rod.
1P	1/8 female (NPSF)
2P	1/4 female (NPSF)
3P	3/8 female (NPSF)
4P	1/2 female (NPSF), 3" Bore – Std. Rod.

NOTE:
All "J's" are used with "O" ring type fittings.

All "P" types are not recommended where leak-free connections are required for high pressure service.

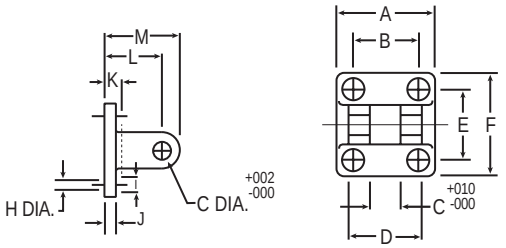
FOR POSITION FEEDBACK CYLINDERS ADD 1.281 TO BODY LENGTH OF CYLINDER

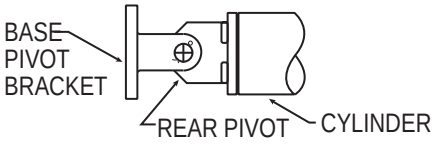




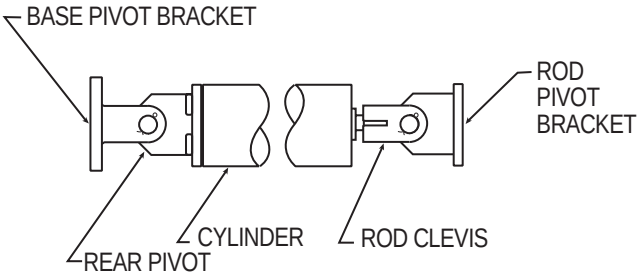
NOTE LOCATION DESIRED FOR EPC 3, 6 or 9 O'CLOCK

BASE PIVOT BRACKET
(ATTACHMENT 4)

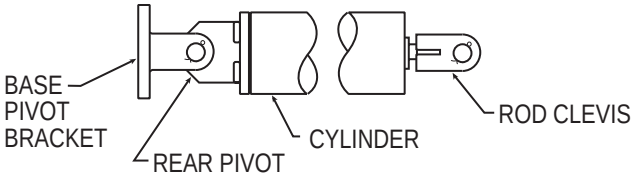




BASE PIVOT BRACKET
WITH ROD CLEVIS AND ROD PIVOT
(ATTACHMENT 7)



BASE PIVOT BRACKET WITH ROD CLEVIS
(ATTACHMENT 5)



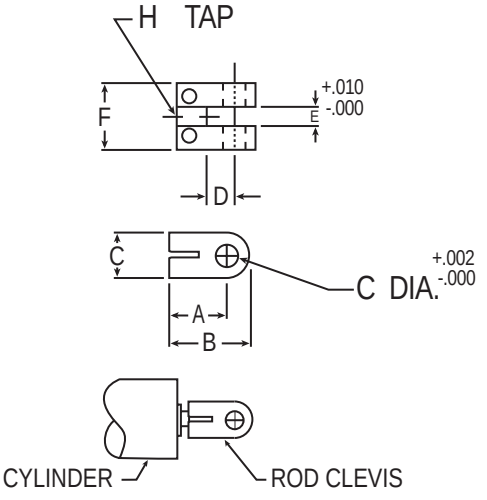
BASE PIVOT BRACKET

DIM.	CYLINDER BORE SIZE							
	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3
A	1-1/8	1-3/8	1-9/16	1-13/16	2-5/16	2-7/8	3-1/2	4-1/8
B	.625	.875	1.000	1.250	1.625	2.000	2.500	3.000
C	.188	.250	.375	.500	.625	.750	1.000	1.375
D	11/16	7/8	1-1/8	1-1/4	1-5/8	2-1/16	2-5/8	3-1/4
E	1.125	1.250	1.375	1.750	2.125	2.500	3.000	3.750
F	1-5/8	1-3/4	1-15/16	2-5/16	2-13/16	3-3/8	4	4-7/8
G	.188	.251	.376	.438	.501	.626	.751	1.001
H	.203	.203	.265	.265	.328	.391	.515	.656
I	21/64	21/64	25/64	26/64	31/64	19/32	49/64	31/32
J	1/8	1/8	1/8	1/8	7/32	1/4	3/8	3/8
K	11/32	11/32	7/16	7/16	9/16	15/16	1-13/64	1-1/4
L	.875	1.000	1.250	1.375	1.750	2.250	2.750	3.250
M	1-5/32	1-11/32	1-5/8	1-27/32	2-11/32	2-15/16	3-5/8	4-1/4
ORDER NO.	**704259**	**704260**	**704261**	**704262**	**704263**	**704264**	**704265**	**704266**

ROD CLEVIS

DIM.	CYLINDER BORE SIZE							
	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3
A	11/16	3/4	1-1/16	1-3/16	1-3/8	1-11/16	2-1/16	2-9/16
B	15/16	1-1/16	1-7/16	1-5/8	1-15/16	2-5/16	2-13/16	3-9/16
C	.188	.251	.376	.438	.501	.626	.751	1.001
D	.313	.343	.500	.534	.625	.688	.812	1.062
E	.188	.250	.375	.500	.625	.750	1.000	1.375
F	3/4	7/8	1-1/8	1-1/4	1-3/8	1-3/4	2-1/4	3
G	1/2	5/8	3/4	7/8	1	1-1/4	1-1/2	2
H	1/4-28 NF	3/8-24 NF	7/16-20 NF	9/16-18 NF	5/8-18 NF	3/4-16 NF	1-14 NF	1-3/8-12 NF
ORDER NO.	**704267**	**704268**	**704269**	**704270**	**704271**	**704272**	**704273**	**704274**

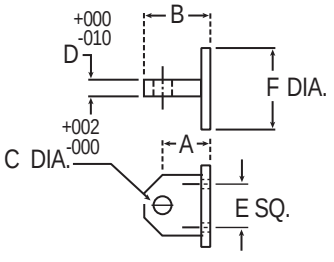
ROD CLEVIS
(ATTACHMENT 2)



PIVOT MOUNT

DIM.	CYLINDER BORE SIZE							
	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3
A	.641	.719	.781	.969	1.250	1.625	2.062	2.625
B	7/8	1-1/32	1-5/32	1-13/32	1-13/16	2-9/32	2-13/16	3-5/8
C	.188	.251	.376	.439	.501	.626	.751	1.001
D	.186	.248	.373	.498	.623	.748	.98	1.373
E	.508	.619	.774	.948	1.193	1.612	1.945	2.232
F	1	1-1/4	1-1/2	1-13/16	2-3/16	2-3/4	3-3/8	4
ORDER NO.	**358676**	**358677**	**358678**	**358679**	**358680**	**205135**	**205136**	**205137**

PIVOT MOUNT
(MOUNTING STYLE 2)



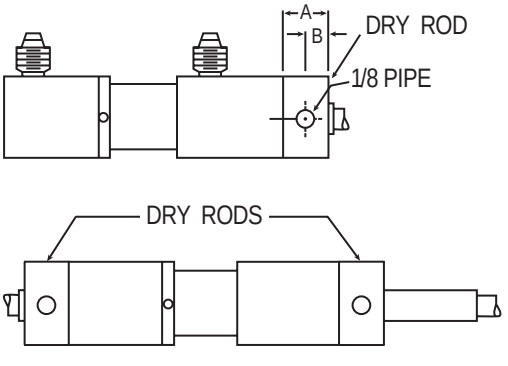
DRY ROD CYLINDER OPTION

Dry Rods are used to trap and drain off excess oil which may leak past cylinder seals due to severe cylinder duty, extreme environmental conditions or use of thin fluids.

	DIMENSIONAL INFORMATION								
DIM.	CYLINDER BORE SIZE								ROD
	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	
A	5/8	27/32	27/32	29/32	3/4	3/4	3/4	3/4	—
B	3/8	35/64	37/64	39/64	7/16	29/64	29/64	29/64	—
ORDER NO.	**704185**	**704186**	**704188**	**704190**	**704192**	**704194**	**704196**	**704198**	**Std.**
	—	**704187**	**704189**	**704191**	**704193**	**704195**	**704197**	**704199**	**2:1**

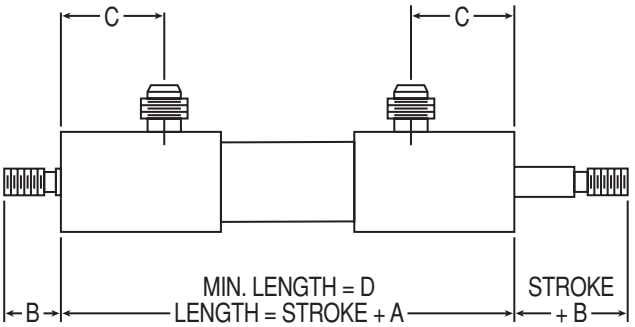
NOTE: Cylinders ordered with Dry Rod(s) are provided with dimension A of extra rod so the rod extension from the cylinder face is as shown in standard cylinder dimensional information.

DRY ROD CYLINDER OPTION



DOUBLE ROD END CYLINDER

DIMENSIONAL INFORMATION				
BORE	A	B	C	D
1/2	2-1/4	5/8	15/16	2-11/16
3/4	2-1/4	3/4	15/16	2-11/16
1	2-11/16	7/8	1-3/32	3
1-1/4	2-15/16	1	1-3/16	3-1/4
1-1/2	3-1/2	1-1/8	1-3/8	3-7/8
2	4-5/8	1-5/8	15/16	6-13/16
2-1/2	4-7/8	2	15/16	6-3/16
3	5-1/16	2-1/2	1-1/8	7-1/8



REPLACEMENT PARTS FOR CYLINDERS

SEAL KITS

STYLE "AA," "BB," & "CC" SEAL KITS WITH "V-LIP" ROD SEAL

	BUNA-N				EPR	
BORE			Double End Cycl.			
SIZE	Std. Rod	2:1 Rod	Std. Rod	2:1 Rod	Std. Rod	2:1 Rod
1/2"	632450	640210	632451	N.A.	N.A.	N.A.
3/4"	632452	632453	632454	632455	634249	
1"	632456	632457	632458	632459	635025	
1-1/4"	632460	632461	632462	632463		
1-1/2"	632464	632465	632466	632467	634250	
2"	630255	631874	631084	635751	636052	
2-1/2"	630253					
3"	630254		631993		634243	
4"	629590	632805	629886		630791	630619

STYLE "A," "B," & "C" SEAL KITS WITH TEFLON ROD SEAL

	BUNA-N				VITON		EPR	
BORE			Double End Cycl.					
SIZE	Std. Rod	2:1 Rod	Std. Rod	2:1 Rod	Std. Rod	2:1 Rod	Std. Rod	2:1 Rod
1/2"	626443	N.A.	626460	N.A.	626446	N.A.	626451	N.A.
3/4"	626481	626515	626501	628142	626483	626514	633626	633330
1"	626518	626552	626535	629681	626520	626551	626526	626548
1-1/4"	626555	626590	626570	627951	626558	626587		626581
1-1/2"	626592	626627	626612	626614	626594	626625	626596	
2"	626629	626664	626645	631760	626631	626662		
2-1/2"	626666	626701	626684	632702	626669	626699	626672	
3"	626703	626738	626720	632794	626706	626736	626717	
4"	626397	626398	628936	627790	627673	628625	627891	

SEAL KIT CONTENTS: All O-Rings, all Teflon seals or "V-Lip" seals, rod wiper(s), back-up ring(s), and installation instructions.

STUFFING BOXES

	STANDARD ROD		2:1 ROD	
BORE	Teflon Rod Seal	V-Lip Rod Seal	Teflon Rod Seal	V-Lip Rod Seal
1/2"	357441	359713	N.A.	365292
3/4"	357442	359717	357443	359823
1"	357444	359799	357445	359855
1-1/4"	357446	359794	357447	360202
1-1/2"	357448	359722	357449	360607

Stuffing boxes are made of bearing bronze unless otherwise specified.

ROD BUSHINGS

	STANDARD ROD		2:1 ROD	
BORE	Teflon Rod Seal	V-Lip Rod Seal	Teflon Rod Seal	V-Lip Rod Seal
2"	357450	359519	364273	364266
2-1/2"	357452	360414	357453	N.A.
3"	357454	359800	357455	N.A.
4"	358520	N.A.	359627	N.A.

"Smart" Cylinder With Integral Valve Pad

CYLINDER FEATURES:

- Internal LRT or MLRT position feedback device
- Stroke lengths in 1/8" increments
- NG3 Mini or NG6(DO3) Valve Pad
- NG3 Mini or NG6(DO3) Proportional Valve
- Bore sizes as small as 3/4"
- Pressures to 5000 psi
- 3-Pin quick disconnect position output port

Designed to operate with CAP Series 5030 Closed Loop Signal Tracking Control Unit

System Integration Information MM Series Cylinder

¾", 1", 1¼" BORE:

- Uses NG3 Mini Valve
- Internal MLRT Position Device
- Maximum Stroke 16"
- Use NH Series Cable

1½", 2", 2½" BORE:

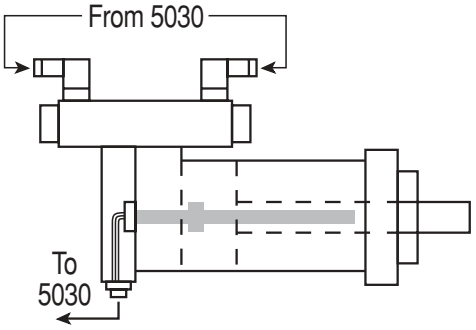
- Uses NG6(DO3) Proportional Valve
- Internal LRT Position Device
- Maximum Stroke 72"
- Use BH Series Cable

NH SERIES CABLES:

- Specify 6', 15', 20'
- 24 AWG PVC Insulated
- 3 Conductor

BH SERIES CABLES:

- Specify 6', 12', 20'
- 22 AWG PVC Insulated
- 3 Conductor



5030 Ordering Information

Model No.	Input Power	Input Signal	Output Signal	Hyd./Pneu.
5030	9 to 36Vdc	0 to 10Vdc	0 to 10Vdc	H
5031	115vac	0 to 10Vdc	0 to 10Vdc	H
5032	9 to 36Vdc	4 to 20mA	4 to 20mA	H
5033	115vac	4 to 20mA	4 to 20mA	H
5034	9 to 36Vdc	0 to 10Vdc	0 to 10Vdc	P
5035	115vac	0 to 10Vdc	0 to 10Vdc	P
5036	9 to 36Vdc	4 to 20mA	4 to 20mA	P
5037	115vac	4 to 20mA	4 to 20mA	P

CYLINDER ORDERING INFORMATION

HOW TO ORDER:
EXAMPLE MODEL CODE:

AA1 X 8—2—1— 4M—1 D — D.E.**

STANDARD STYLES

AA – Male Ports 1/2–1-1/2" Bore
BB – Female Ports 1/2–1-1/2" Bore
CC – Female Ports 2-3" Bore
MM – Valve Pad Option

AAA
– Heavy Duty Rod Seal.
– 1/2" Bore Only.
– Add .340" to rod end cap dimension

OPTIONAL O-RING BACKED TEFLON ROD SEALS ARE AVAILABLE for this option the single letter A, B, or C is used in the code.

BORE

STROKE

STANDARD MOUNTING OPTIONS

1 — Plain end mount, front and rear
2 — Rear pivot mount (not available on double end rod cylinders)
3 — Foot mount both ends
4 — Rear plate end mount
5 — Front plate end mount

STANDARD ROD STYLES

1 — Standard rod, male end
2 — 2:1 rod, male end
3 — Standard rod, female end
4 — 2:1 rod, female end

STANDARD CYLINDER ATTACHMENT OPTIONS

CODE	DESCRIPTION OF ATTACHMENTS
1	No Attachments
2	Rod Clevis w/Pins
4	Base Pivot Bracket w/Pin and Cotter Keys
5	Base Pivot Bracket, Rod Clevis and Pins
7	Base Pivot Bracket, Rod Clevis, Rod Pivot Bracket and Pins

CYLINDER TYPE

(Blank) — Std. Single Rod End
D.E. — Double Rod End

(Blank) — No Dry Rod
D — Dry Rod

PORT STYLE

2M	5/16-24 thread flared male	Specify with Style A only
4M	7/16-20 thread flared male for 1/4 tubing	Specify with Style A only
3J	3/8-24 straight thread female for 3/16 tubing	Specify with Style B only
4J	7/16-20 straight thread female for 1/4 tubing	Specify with Styles B & C only
5J	1/2-20 straight thread female for 5/16 tubing	Specify with Styles B & C only
6J	9/16-18 straight thread female for 3/8 tubing	Specify with Style C only
8J	3/4-16 straight thread female for 1/2 tubing	Specify with Style C only — 2-1/2" and 3" Bore — Std. Rod
10J	7/8-14 straight thread female for 5/8 tubing	Specify with Style C only — 3" Bore — Std. Rod
1P	1/8 female (NPSF)	Specify with Styles B & C only
2P	1/4 female (NPSF)	Specify with Styles B & C only
3P	3/8 female (NPSF)	Specify with Style C only
4P	1/2 female (NPSF)	Specify with Style C only — 3" Bore Std. Rod

NOTES: "M" is used with flare type fittings.
All "J's" are used with "O" ring type fittings.
All "P" types are not recommended where leak-free connections are required for high pressure service.

Buna N Seals are standard on all cylinders.

Modification options can be made by consulting the factory.

Modifications available are:

Rod Extension
Extra Rod Thread
Non-Standard Thread Sizes
Rotated Ports
Viton Seals
EPR Seals
Stainless Steel Rods
Stainless Steel Bodies
Non-Standard Mounting Styles
Aluminum Bodies
Electro-Nickel Plating

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