PRODUCT CATALOG

FLAT-1® CYLINDERS

COMPACT DESIGN ENGINEERED TO REDUCE OVERALL LENGTH

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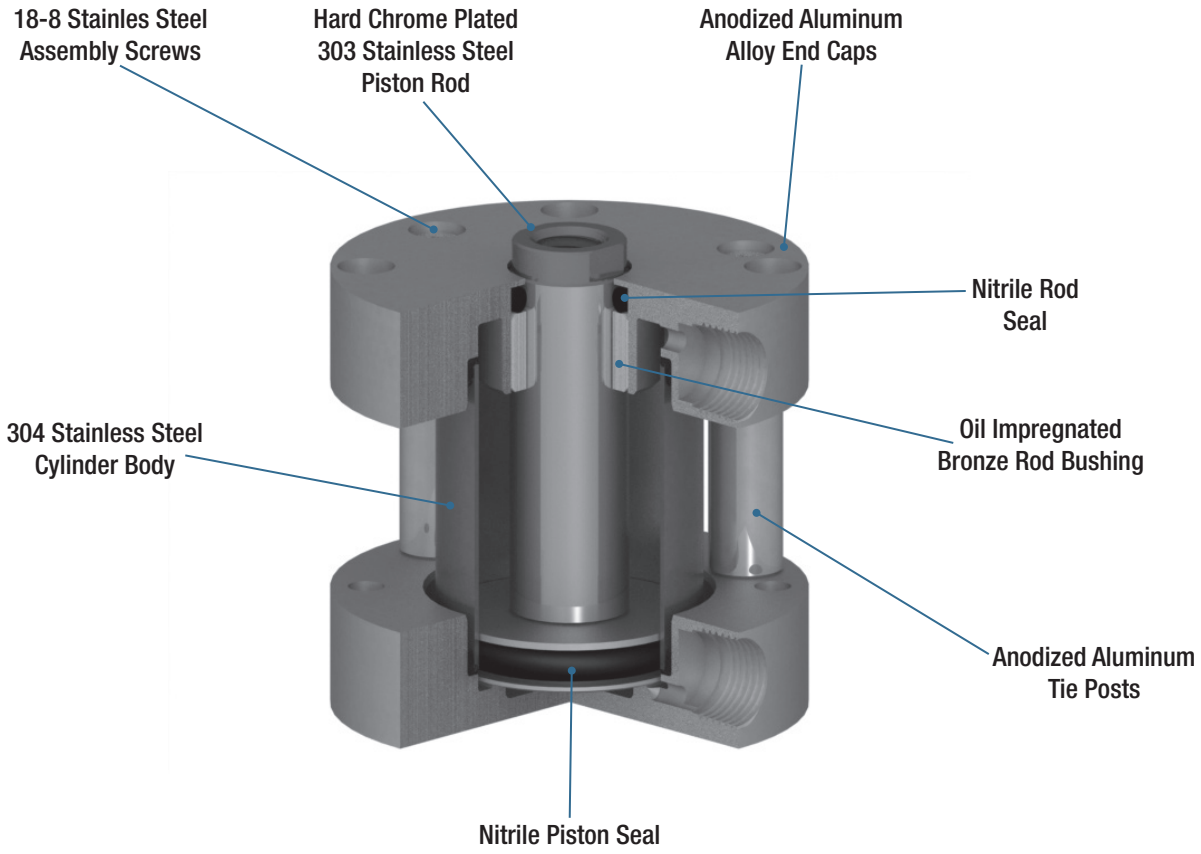
FLAT-1® CYLINDERS

Flat-1® cylinders have been redesigned to include a number of new features and new catalog standard options. New features include permanent grease lubrication, standard hard chrome plated piston rods, and an improved bumper design. New standard options are available in the catalog as well, including metallic rod scrapers, low pressure hydraulic designs, and a standard mounting hole interchange for another compact cylinder manufacturer. Optional body and bearing materials have also been added to provide the outstanding option breadth that Bimba is known for in a high quality, compact cylinder design.

PRODUCT FEATURES



FEATURES AND BENEFITS

- Compact design provides machine designers the ability to use Flat-1® cylinders in tight spaces
- Hard chrome plated piston rod is corrosion resistant and provides a hard, smooth sealing surface extending the life of the cylinder's rod seals
- Body materials are available in standard Stainless Steel and optional Aluminum or Plastic providing design engineers with increased flexibility.
- Single acting spring return cylinders include rod seals to provide for standard fail safe operation
- New switch track options accept either Reed or Hall Effect switches allowing for either AC or DC switch circuitry.
- 3,000 mile life ratings when low frictions seals are specified provides customers the confidence associated with a low maintenance design.
- Mechanically retained bumpers reduce the sound typically associated with high cycle pneumatic cylinder applications.
- New "F Series" mounting options provide drop in interchanges for a competitive manufacturer.
- The addition of NPT rod threads on double rod end models makes it easier for designers to connect air and fluid fittings to the rod ends.
- Optional rod bearing materials are available for applications requiring smoother cylinder rod travel than is provided by the standard oil impregnated bronze rod bushings.

APPROXIMATE POWER FACTORS (for all models except F02, 3, 4)	
9/16" (02) = 0.25	For example, a 3/4" bore model FO-041 will exert a force of approximately 0.4 times the air line pressure.
3/4" (04) = 0.4	
1-1/16" (09) = 0.9	
1-1/2" (17) = 1.7	
2" (31) = 3.1	
2-1/2" (50) = 5.0	
3" (70) = 7.0	
4" (125) = 12.5	

SUPERIOR PRODUCT BREADTH IN A COMPACT DESIGN

The compact Flat-1® offers mounting styles to fit most every application!

Pivot Mount

Front Trunnion Mount

Threaded Mounting Holes Both Ends

Clearance Holes Front

Nose Mount

F Series Counterbored Each End

F Series Threaded Both Ends

Basic Mount

Materials of Construction

End Caps: Anodized Aluminum Alloy

Cylinder Body: 304 Stainless Steel

Piston Rod: 303 Hard Chrome Plated Stainless Steel

Lubrication: Semi-Synthetic Grease

Seals: Buna-N Standard; High and Low Temperature (optional)

Engineering Specifications

Temperature*: -20° F to 200° F Standard
-40° F to 200° F (Low Temperature)
0° F to 400° F (High Temperature)

Pressure Rating: 200 PSI

** Cylinders operated for extended time at temperatures below 0° F or above 300° F may require special modifications.*

Maximum Stroke + Extra Extension Lengths

MODEL	BORE SIZES	MAXIMUM STROKE	MAXIMUM = STROKE + EE
FO & FOD	All bore sizes	16"	18"
FOS		4"	
FOR	9/16" (02) through 2-1/2" (50)		
FOR	3" (70) and 4" (125)	3"	

Please note the following:
It is recommended to support and guide the rod throughout the entire stroke.
All maximum lengths are based on tension (puling) loads. Compressive forces must be evaluated for column buckling.

Cylinder Weights

Approximate Cylinder Weights (oz.)

BORE	FO/FOS		FOD			FOR		NOSE MOUNT OPTION
	BASE (0" STROKE)	ADDER PER 1/8" OF STROKE	BASE	ADDER PER 1/8" OF STROKE	ADDER PER 1/8" OF STROKE FOR -H OPTION	BASE	ADDER PER 1/8" OF STROKE	ADDER TO BASE WEIGHT
9/16" (02)	1.2	0.08	1.3	0.15	0.1	1.3	0.08	0.1
3/4" (04)	1.9	0.1	2.1	0.2	0.15	2.0	0.1	0.2
1-1/16" (09)	0.28	0.01	4.72	0.34	0.29	5.40	0.11	4.33
1-1/2" (17)	0.43	0.02	8.30	0.58	0.51	8.65	0.23	6.65
2" (31)	0.68	0.03	9.44	0.81	0.68	13.10	0.29	6.94
2-1/2" (50)	1.25	0.04	21.31	0.84	0.71	24.15	0.33	7.54
3" (70)	1.64	0.05	27.64	1.10	0.93	31.14	0.41	7.98
4" (125)	55.7	1.0	71.8	1.3	1.1	61.8	1.0	5.9

Length Adders for Low Friction Seals (L) and Magnetic Piston (M)

BORE	LENGTH ADDER			
	LOW FRICTION SEALS (L)	MAGNETIC POSITION SENSING* (M)		
		FO/FOD	FOS	FOR
9/16" (02)	0.25	0.88	0.63	0.38
3/4" (04)	0.25	0.88	0.88	0.88
1-1/16" (09)	0.38	0.88	0.88	0.88
1-1/2" (17)	0.38	0.88	0.88	0.88
2" (31)	0.38	0.88	0.88	0.88
2-1/2" (50)	0.38	0.88	0.88	0.88
3" (70)	0.50	0.88	0.88	0.88
4" (125)	0.50	0.88	0.88	0.88

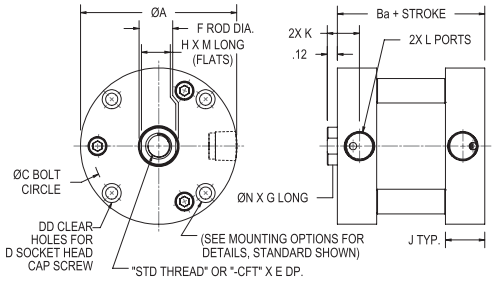
** If L and M are both selected, use the M length adder.*

Enclosed Spring Forces

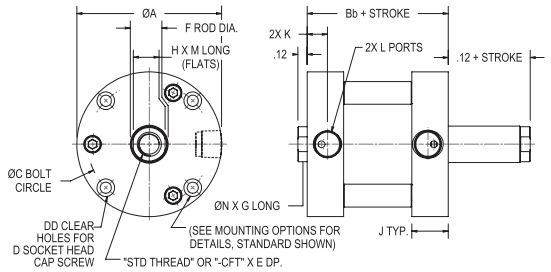
BORE	MAXIMUM FORCE (LB)	SPRING RATES (LB/IN)			
		0.12 TO 1" STROKE (LB/IN)	1.001 TO 2" STROKE (LB/IN)	2.001 TO 3" STROKE (LB/IN)	3.001 TO 4" STROKE (LB/IN)
9/16" (02)	5.90	4.00	1.75	1.24	0.88
3/4" (04)	10.40	6.00	2.70	1.86	1.35
1-1/16" (09)	10.80	6.50	2.70	1.91	1.35
1-1/2" (17)	12.90	6.00	2.30	1.66	1.15
2" (31)	17.50	11.00	2.60	2.10	1.30
2-1/2" (50)	26.00	9.50	5.00	3.28	2.50
3" (70)	35.00	16.00	5.00	3.81	2.50
4" (125)	50.00	22.00	5.50	4.40	2.75

BASIC MODEL DIMENSIONS (IN)

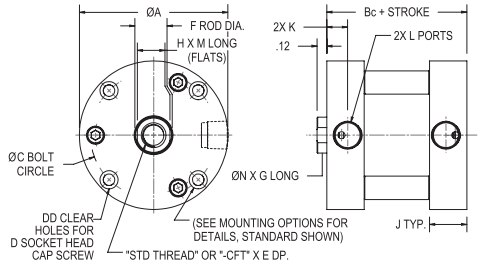
Model FO
(Double Acting Single End Rod)



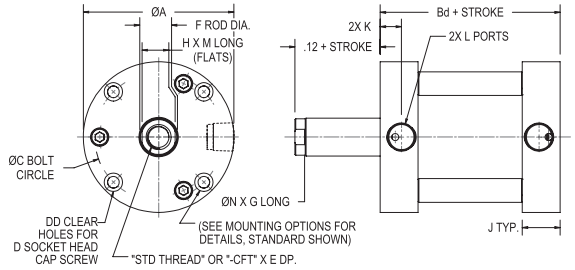
Model FOD
(Double Acting Double End Rod)



Model FOS
(Single Acting Rod Normally Retracted)



Model FOR
(Reverse Single Acting Rod Normally Extended)



BORE	A	Ba	Bb	Bc				Bd				C	D	DD	E*
				0-1"	1.001"-2"	2.001"-3"	3.001"-4"	0-1"	1.001"-2"	2.001"-3"	3.001"-4"				
9/16" (02)	1.11	0.56	0.69	0.81	1.38	1.96	2.52	1.06	1.62	2.14	2.70	0.88	#4	2	0.46
3/4" (04)	1.49	0.56	0.69	0.81	1.38	1.94	2.50	1.06	1.62	2.19	2.75	1.22	#6	4	0.46
1-1/16" (09)	1.99	0.88	0.94	0.88	1.50	2.13	2.75	1.38	2.00	2.63	3.25	1.69	#6	4	0.59
1-1/2" (17)	2.61	0.88	1.00	0.88	1.50	2.13	2.75	1.38	2.00	2.63	3.25	2.19	#10	4	0.59
2" (31)	3.11	0.94	1.06	0.94	1.56	2.19	2.81	1.44	2.06	2.69	3.31	2.69	#10	4	0.59
2-1/2" (50)	3.74	1.19	1.31	1.19	1.81	2.94	3.81	1.94	2.81	3.69	4.56	3.25	1/4	4	0.59
3" (70)	4.24	1.25	1.37	1.25	2.12	3.00	3.87	2.00	2.88	3.75	N/A	3.78	1/4	4	0.57
4" (125)	5.50	1.56	1.69	1.56	2.44	3.31	4.19	2.31	3.19	4.06	N/A	4.94	5/16	4	0.62

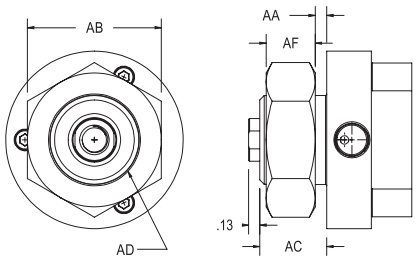
** FOD models with strokes less than or equal to 3/8 have reduced thread depths. Contact Bimba for details. Stroke threshold is 5/8 for 4" bore.*

BORE	F	G	H	J	K	L	M	N	STD THREAD	CFT
9/16" (02)	0.25	0.14	0.22	0.34	0.17	#10-32	0.13	0.24	#8-32 UNC-2B	N/A
3/4" (04)	0.31	0.14	0.25	0.34	0.17	#10-32	0.13	0.29	#10-32 UNF-2B	#10-24 UNC-2B
1-1/16" (09)	0.50	0.14	0.44	0.50	0.28	1/8 NPT	0.13	0.48	5/16-24 UNF-2B	5/16-18 UNC-2B
1-1/2" (17)	0.63	0.14	0.50	0.50	0.26	1/8 NPT	0.13	0.59	3/8-24 UNF-2B	3/8-16 UNC-2B
2" (31)	0.75	0.14	0.62	0.53	0.28	1/8 NPT	0.13	0.71	1/2-20 UNF-2B	1/2-13 UNC-2B
2-1/2" (50)	0.75	0.14	0.62	0.66	0.35	1/4 NPT	0.13	0.71	1/2-20 UNF-2B	1/2-13 UNC-2B
3" (70)	0.88	0.14	0.75	0.69	0.35	1/4 NPT	0.13	0.84	5/8-18 UNF-2B	5/8-11 UNC-2B
4" (125)	1.00	0.14	0.87	0.84	0.42	3/8" NPT	0.13	0.96	3/4-16 UNF-2B	3/4-10 UNC-2B

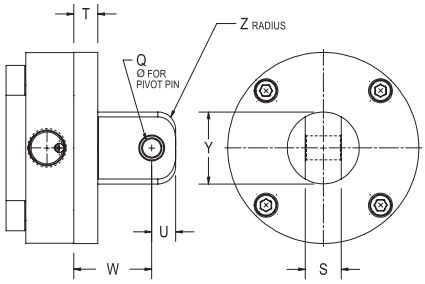
NOTE: Use caution when using a long screw that spans the length of the cylinder. If the endcap experiences flexing, we recommend the -4F or -4R mounting style.

MOUNTING OPTIONS AND DIMENSIONS (IN)

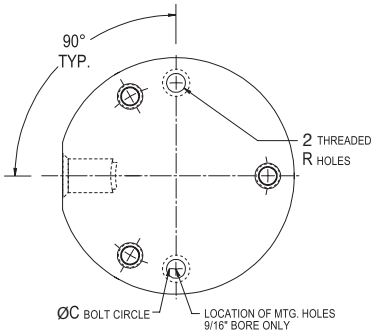
Nose Mount
(Option 5)
Available in FO, FOS, FOR models
and includes rod wiper



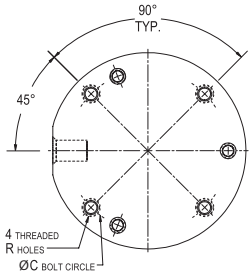
Pivot Mount
(Option 1, 1N)
Available in standard (as shown) or 90°
Includes bronze pivot bushing
Not available as an accessory



Threaded Mounting Holes for 9/16" bore (02)
(Option 3, 3F, 3R)
Available in front, rear, or both end caps
Option 3R shown



Threaded Mounting Holes for 3/4" bore (04) and larger

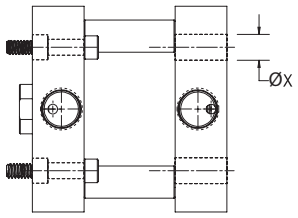


Mounting Option Dimensions

BORE	AA	AB	AC	AD	AF	C	M	N	P	Q	R	S	T	U	W	X	Y	Z
9/16" (02)	0.06	0.75	0.38	1/2-20 UNF-2A	0.31	0.88	N/A	N/A	N/A	0.19	#4-40 UNC-2B	0.38	0.19	0.25	0.75	0.19	0.63	0.19
3/4" (04)	0.06	0.75	0.38	5/8-18 UNF-2A	0.25	1.22	0.31	0.13	0.17	0.19	#6-32 UNC-2B	0.38	0.19	0.25	0.75	0.24	0.75	0.19
1-1/16" (09)	0.13	1.50	0.75	1-14 UNS-2A	0.55	1.69	0.50	0.25	0.25	0.19	#6-32 UNC-2B	0.38	0.25	0.25	0.81	0.25	0.75	0.19
1-1/2" (17)	0.13	1.88	0.75	1-1/4-12 UNF-2A	0.50	2.19	0.50	0.25	0.25	0.38	#10-24 UNC-2B	0.75	0.25	0.44	1.19	0.34	1.38	0.38
2" (31)	0.19	1.88	0.88	1-3/8-12 UNF-2A	0.50	2.69	0.50	0.25	0.25	0.38	#10-24 UNC-2B	0.75	0.31	0.44	1.25	0.34	1.38	0.38
2-1/2" (50)	0.25	1.88	1.00	1-3/8-12 UNF-2A	0.50	3.25	0.63	0.31	0.33	0.38	1/4-20 UNC-2B	0.75	0.38	0.44	1.31	0.41	1.38	0.38
3" (70)	0.25	1.88	1.00	1-3/8-12 UNF-2A	0.50	3.78	0.63	0.31	0.33	0.63	1/4-20 UNC-2B	1.00	0.38	0.56	1.69	0.41	1.88	0.38
4" (125)	0.19	2.63	1.13	1-3/4-12 UN-2A	0.88	4.94	0.75	0.38	0.42	0.63	5/16-18 UNC-2B	1.00	0.44	0.56	1.75	0.50	1.88	0.38

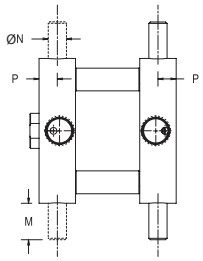
MOUNTING OPTIONS AND DIMENSIONS (IN)

Screw Clearance Holes (Option 4R or 4F) Available in front or rear end cap Option 4R shown



NOTE: Use caution when using a long screw that spans the length of the cylinder. If the endcap experiences flexing, we recommend the -4F or -4R mounting style.

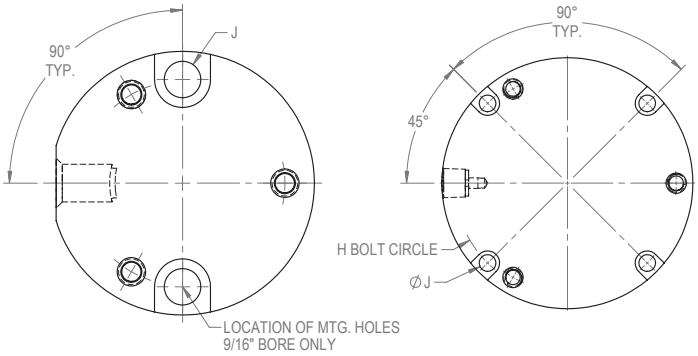
Trunnion Mount (Option 2, 2F, 2R) Available in front, rear, or both end caps Not available in 9/16" (02) bore



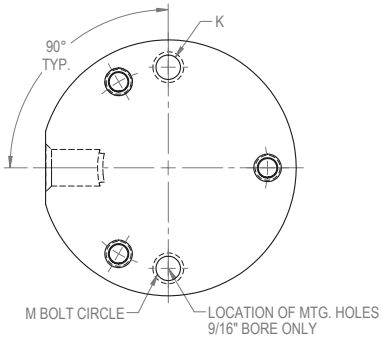
Mounting Option Dimensions

BORE	AA	AB	AC	AD	AF	C	M	N	P	Q	R	S	T	U	W	X	Y	Z
9/16" (02)	0.06	0.75	0.38	1/2-20 UNF-2A	0.31	0.88	N/A	N/A	N/A	0.19	#4-40 UNC-2B	0.38	0.19	0.25	0.75	0.19	0.63	0.19
3/4" (04)	0.06	0.75	0.38	5/8-18 UNF-2A	0.25	1.22	0.31	0.13	0.17	0.19	#6-32 UNC-2B	0.38	0.19	0.25	0.75	0.24	0.75	0.19
1-1/16" (09)	0.13	1.50	0.75	1-14 UNS-2A	0.55	1.69	0.50	0.25	0.25	0.19	#6-32 UNC-2B	0.38	0.25	0.25	0.81	0.25	0.75	0.19
1-1/2" (17)	0.13	1.88	0.75	1-1/4-12 UNF-2A	0.50	2.19	0.50	0.25	0.25	0.38	#10-24 UNC-2B	0.75	0.25	0.44	1.19	0.34	1.38	0.38
2" (31)	0.19	1.88	0.88	1-3/8-12 UNF-2A	0.50	2.69	0.50	0.25	0.25	0.38	#10-24 UNC-2B	0.75	0.31	0.44	1.25	0.34	1.38	0.38
2-1/2" (50)	0.25	1.88	1.00	1-3/8-12 UNF-2A	0.50	3.25	0.63	0.31	0.33	0.38	1/4-20 UNC-2B	0.75	0.38	0.44	1.31	0.41	1.38	0.38
3" (70)	0.25	1.88	1.00	1-3/8-12 UNF-2A	0.50	3.78	0.63	0.31	0.33	0.63	1/4-20 UNC-2B	1.00	0.38	0.56	1.69	0.41	1.88	0.38
4" (125)	0.19	2.63	1.13	1-3/4-12 UN-2A	0.88	4.94	0.75	0.38	0.42	0.63	5/16-18 UNC-2B	1.00	0.44	0.56	1.75	0.50	1.88	0.38

F Series Mounting Holes (Option -6)



F Series Mounting Holes (Option -7)

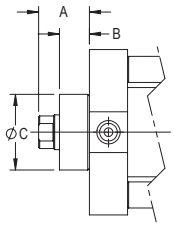


F Series Dimensions

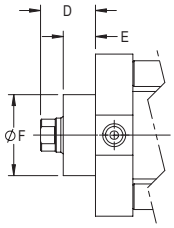
BORE	F Series Interchange					
	H	# OF HOLES FOR OPTION 6	J	# OF HOLES FOR OPTION 7	K	M
9/16" (02)	0.875	2	#6	2	#6-32	0.875
3/4" (04)	1.188	2	#6	2	#8-32	1.188
1-1/16" (09)	1.688	2	#10	2	#10-32	1.688
1-1/2" (17)	2.375	2	#10	N/A	N/A	N/A
2" (31)	2.810	2	1/4	N/A	N/A	N/A
2-1/2" (50)	3.250	4	1/4	N/A	N/A	N/A
3" (70)	3.812	4	1/4	N/A	N/A	N/A
4" (125)	5.000	4	1/4	N/A	N/A	N/A

CYLINDER OPTIONS AND DIMENSIONS (IN)

Rod Wiper (Option W)



Metallic Rod Scraper (Option Z)

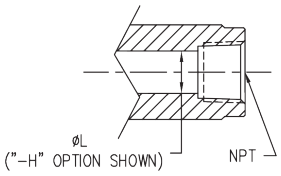


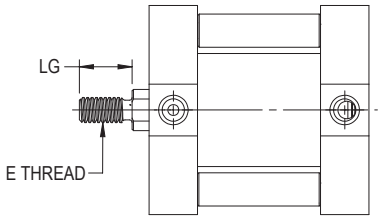
BORE	WIPER/SCRAPER					
	A	B	C	D	E	F
9/16" (02)	0.46	0.27	0.56	0.50	0.30	0.65
3/4" (04)	0.46	0.27	0.68	0.50	0.30	0.74
1-1/16" (09)	0.46	0.27	0.87	0.58	0.36	0.93
1-1/2" (17)	0.38	0.19	0.99	0.52	0.30	1.06
2" (31)	0.39	0.19	1.12	0.54	0.30	1.18
2-1/2" (50)	0.39	0.19	1.12	0.54	0.30	1.18
3" (70)	0.38	0.19	1.24	0.53	0.30	1.37
4" (125)	0.38	0.19	1.37	0.49	0.30	1.43

Maximum Torque Recommendations for Nose Mount Option

BORE	MAXIMUM TORQUE
9/16" (02)	1
3/4" (04)	28
1-1/16" (09)	100
1-1/2" (17)	120
2" (31)	130
2-1/2" (50)	130
3" (70)	130
4" (125)	150

Hollow Rod Diameter and Thread Dimensions for FOD Cylinders

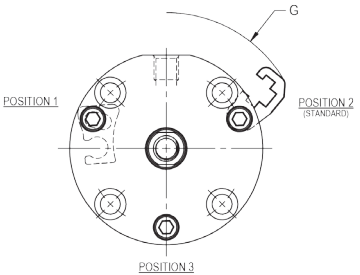




BORE	ROD THREAD												
	-H OPTION	HØ	-CFTH OPTION	HØ	-HMT OPTION	HØ	-CMTH OPTION	HØ	-HNPT OPTION	HØ	LG	E	
												MT	CMT
9/16" (02)	#8-32 UNC-2B	0.12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.38	#8-32 UNC	N/A
3/4" (04)	#10-32 UNF-2B	0.14	#10-24 UNC-2B	0.14	#10-32 UNF-2A	0.09	N/A	N/A	N/A	N/A	0.38	#10-32 UNF	#10-24-UNC
1-1/16" (09)	5/16-24 UNF-2B	0.22	5/16-18 UNC-2B	0.22	5/16-24 UNF-2A	0.16	5/16-18 UNC-2A	0.16	1/8 NPT	0.22	0.50	5/16-24 UNF-2A	5/16-18 UNC-2A
1-1/2" (17)	3/8-24 UNF-2B	0.28	3/8-16 UNC-2B	0.28	3/8-24 UNF-2A	0.19	3/8-16 UNC-2A	0.19	1/8 NPT	0.28	0.50	3/8-24 UNF-2A	3/8-16 UNC-2A
2" (31)	1/2-20 UNF-2B	0.38	1/2-13 UNC-2B	0.38	1/2-20 UNF-2A	0.25	1/2-13 UNC-2A	0.25	1/4 NPT	0.38	0.63	1/2-20 UNF-2A	1/2-13 UNC-2A
2-1/2" (50)	1/2-20 UNF-2B	0.38	1/2-13 UNC-2B	0.38	1/2-20 UNF-2A	0.25	1/2-13 UNC-2A	0.25	1/4 NPT	0.38	0.63	1/2-20 UNF-2A	1/2-13 UNC-2A
3" (70)	5/8-18 UNF-2B	0.44	5/8-11 UNC-2B	0.44	5/8-18 UNF-2A	0.31	5/8-18 UNF-2A	0.31	3/8 NPT	0.44	0.75	5/8-18 UNF-2A	5/8-18 UNF-2A
4" (125)	3/4-16 UNF-2B	0.50	3/4-10 UNC-2B	0.50	3/4-16 UNF-2A	0.38	3/4-10 UNC-2A	0.38	3/8 NPT	0.50	0.75	3/4-16 UNF	3/4-10 UNC

Position Sensing Switches and Dimensions

For options M (Hall Effect Switches) and U (4mm Diameter Magnetic Reed Switches), the default switch mounting post dimension is position 2. To locate the post in locations 1 or 3, please specify M1, M3, U1, U3 as required. To order more than one track, specify T1 and/or T3 for additional Hall Effect tracks or S1 and/or S3 for additional 4mm Magnetic Reed Switches.



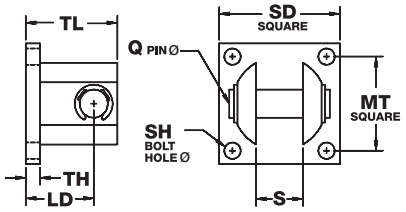
Option M post is shown in position 2; option U post is shown in position 1

BORE	G inch
9/16" (02)	0.29
3/4" (04)	0.25
1-1/16" (09)	0.07
1-1/2" (17)	0.02
2" (31)	0.03
2-1/2" (50)	0.02
3" (70)	0.03
4" (125)	0.00

ACCESSORY OPTIONS AND DIMENSIONS (IN)

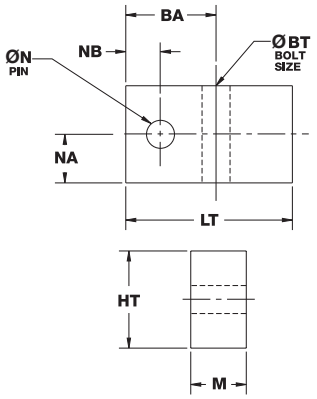
Anodized Aluminum Clevis Bracket complete with Stainless Steel Pin; Designed for use with Pivot Mounted Cylinder (Option 1 or 1N)

BORE	MODEL	LD	MT	Q	S	SH	SD	TH	TL
9/16" (02)	BC-1	0.56	0.75	0.19	0.39	#6	1.00	0.16	0.78
3/4" (04)	BC-1	0.56	0.75	0.19	0.39	#6	1.00	0.16	0.78
1-1/16" (09)	BC-1	0.56	0.75	0.19	0.39	#6	1.00	0.16	0.78
1-1/2" (17)	BC-2	0.94	1.38	0.38	0.76	#10	1.75	0.22	1.34
2" (31)	BC-2	0.94	1.38	0.38	0.76	#10	1.75	0.22	1.34
2-1/2" (50)	BC-2	0.94	1.38	0.38	0.76	#10	1.75	0.22	1.34
3" (70)	BC-3	1.25	2.00	0.63	1.02	0.25	2.50	0.25	1.81
4" (125)	BC-3	1.25	2.00	0.63	1.02	0.25	2.50	0.25	1.81



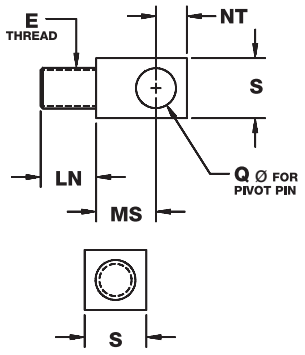
Anodized Aluminum Trunnion Bracket (includes bronze pivot bushings; 2 pieces)

BORE	MODEL	BA	BT	HT	LT	M	N	NA	NB
3/4" (04)	BT-1	0.56	#10	0.63	1.12	0.31	0.13	0.30	0.22
1-1/16" (09)	BT-2	0.81	0.25	0.88	1.50	0.50	0.25	0.38	0.31
1-1/2" (17)	BT-2	0.81	0.25	0.88	1.50	0.50	0.25	0.38	0.31
2" (31)	BT-2	0.81	0.25	0.88	1.50	0.50	0.25	0.38	0.31
2-1/2" (50)	BT-3	0.94	0.31	1.00	1.63	0.63	0.31	0.45	0.38
3" (70)	BT-3	0.94	0.31	1.00	1.63	0.63	0.31	0.45	0.38
4" (125)	BT-4	1.06	0.38	1.25	1.88	0.75	0.38	0.55	0.44



High Strength Zinc-Plated Rod Pivot (includes bronze pivot bushing and nut)

BORE	MODEL	E	LN	MS	NT	Q	S
9/16" (02)	RP-1/2	#8-32 UNC	0.38	0.47	0.25	0.19	0.38
3/4" (04)	RP-1	#10-32 UNF	0.38	0.47	0.25	0.19	0.38
1-1/16" (09)	RP-2	5/16-24 UNF	0.63	0.47	0.25	0.19	0.38
1-1/2" (17)	RP-3	3/8-24 UNF	0.63	0.72	0.44	0.38	0.75
2" (31)	RP-4	1/2-20 UNF	0.75	0.72	0.44	0.38	0.75
2-1/2" (50)	RP-4	1/2-20 UNF	0.75	0.72	0.44	0.38	0.75
3" (70)	RP-5	5/8-18 UNF	0.88	1.00	0.63	0.63	1.00
4" (125)	RP-6	3/4-16 UNF	0.88	1.00	0.63	0.63	1.00



HOW TO ORDER

The Model Number for all Flat-1 cylinders consists of three alphanumeric clusters. These designate type, bore size and stroke length, and mounting and special options. Please refer to the charts below for an example of Model Number FO-170.25-1V. This is a double acting, 1-1/2" bore, 1/4" stroke, pivot mount cylinder with high temperature option.

TYPE	
FO	Double Acting, Single End Rod
FOD	Double Acting, Double End Rod
FOR	Reverse Acting (Spring Extend)
FOS	Single Acting (Spring Return)

BORE SIZE	
02	9/16"
04	3/4"
09	1-1/16"
17	1-1/2"
31	2"
50	2-1/2"
70	3"
125	4"

STROKE LENGTH	
0.25	1/4"
0.375	3/8"
0.5	1/2"
ETC.	

FO-170.25-1 V

MOUNTING OPTIONS

(Enter in numeric order)

No number	Basic model (standard counterbored mounting holes)
1	Pivot mount
1N	Pivot mount 90° from standard
2	Trunnion mount, both ends[1]
2F	Front trunnion mount[1]
2R	Rear trunnion mount[1]
3	Threaded mounting holes, both ends
3F	Threaded mounting holes, front
3R	Threaded mounting holes, rear
4F	Screw clearance holes, front[2]
4R	Screw clearance holes, rear[2]
5	Nose mount[3]
6	F series interchange; counterbored each end
7	F series interchange; threaded, both ends[5]
7F	F series interchange; threaded holes, front[4 5]
7R	F series interchange; threaded holes, rear[4 5]

[1] Not available in 9/16" bore
[2] "Screw clearance" to allow bolt head to pass through; no counter bores (see page 9)
[3] Available in FO, FOR, and FOS models; includes wiper
[4] Opposite endcap will have the standard Bimba hole pattern (see page 9 for dimensions)
[5] Available in 02, 04, and 09 bores only

OPTIONS

(Enter in alphabetical order, except for EE which is last)

99	Oil pre-lube
AB	Thick walled aluminum body
B	Bumpers, both ends[1 2]
BF	Bumper, front only[1 2]
BR	Bumper, rear only[1 2]
CFT	Coarse female rod thread (fine thread standard) (see page 9)
CMT	Coarse male rod thread (see page 9)
D	Low pressure hydraulic design (250 PSI max, non-shock)
H	Hollow rod (FOD models only) (see page 9)
J	Failsafe operation; spring return (FOD models only)
K	Composite rod bushing
L	Low friction seals (see table page 6 for length adders)
M, M1, M3	Magnetic position sensing. Switch post designed for HC and HK style Hall Effect switches (see table page 6 and 9 for length adders and envelope dimensions)[2]
MT	Male rod thread (fine thread) (see page 9)
NPT	Female NPT thread, both ends (FOD models only)[4]
NPTF	Female NPT thread, front (FOD models only)[4]
NPTR	Female NPT thread, rear (FOD models only)[4]
NT	Non-threaded rod
PB	Composite body
Q	Low temperature operation (-40° F to 200° F)
S1, S3	Addtional 90° right angle, 4mm diameter switch post located in position #1 or #3
SR	Stainless steel rod (not compatible with option D or Z)
T1, T3	Additional Hall Effect switch mounting post located in postion #1 or #3
U, U1, U3	Magnetic position sensing. Switch post designed for 90° right angle, 4mm diamter magnetic reed switches (see table page 6 and 9 for length adders and envelope dimensions)[2]
V	High temperature option (0° F to 400° F)[2]
W	Rod wiper (see page 9) (-20° F to 200° F)
X	X-ring piston seal[3]
Z	Metallic rod scraper (see page 9) (Buna-N backup [-20° F to 200° F])
EE0.375	3/8" extra rod extension, etc.
EE1	1" extra rod extension, etc.

[1] There is no stroke reduction when the supply pressure is 80 PSI or greater. At 0 PSI, there will be a stroke reduction of approximately .040". Bumper compression is linear for 0 PSI to 80 PSI. FOS models have a rear bumper only. FOR models have a front bumper only.
[2] Bumpers and the piston magnet materials are rated only to 200° F. Magnetic position sensing and bumper operation is not reliable above 200° F and options B and M should only be specified with option V for chemical compatibility.
[3] Optional piston seal which may improve performance in certain short stroke applications where back pressure due to flow controls or reduced exhaust flow may exist.
[4] Must be ordered with Hollow Rod (H) option.

COMMON CYLINDER DESIGN MODIFICATIONS

This table shows common modifications to our standard design which have been provided to customers. Please contact your local distributor for information on pricing and delivery for these special options.

FEATURE	DEVIATION FROM STANDARD MODEL
Body or End Cap	Add customer logo
Clean Room Design	Design modifications
End Caps	Additional standard ports
End Caps	Reduced port size
End Caps	Rotated ports
End Caps	Omit Bimba logo
Lubrication	Customer-specified lubricants
Rod	Cross-drilled hole
Rod	Spherical rod end
Rod	Screwdriver slot in rod end
Rod	MT one end only (FOD models)
Rod	EE one end only (FOD models)
Rod	Special thread sizes
Rod	Special thread lengths/depths
Rod	Non-standard OD or ID
Rod	Case hardened
Seals	Non-standard materials
Seals	U-Cup style rod seal
Stroke Length	Longer than standard

HOW TO REPAIR

To order repair kits please provide the correct bore code in the kit part number blank for the desired size repair kit. Optional seals are designated by the suffix option. Repair kits include the standard bronze rod bushing, piston, rod, and body seals. For cylinders with optional composite bushings, please order those bushing as a separate repair part with part number (PF4-__). For cylinders where viton seals, wipers, or scrapers are required, complete end caps assemblies are provided to allow for easier repair.

SINGLE END ROD REPAIR KITS

BASIC REPAIR KITS
K-BIF-FO-__
K-BIF-FO-__-L
K-BIF-FO-__-Q
K-BIF-FO-__-V
K-BIF-FO-__-X
K-BIF-FO-__-V-L
K-BIF-FO-__-Q-L
K-BIF-FO-__-D
K-BIF-FO-__-D-V

NOSE MOUNT REPAIR KITS
K-BIF-FO-N-__
K-BIF-FO-N-__-L
K-BIF-FO-N-__-Q
K-BIF-FO-N-__-V
K-BIF-FO-__-X
K-BIF-FO-N__-V-L
K-BIF-FO-N__-Q-L
K-BIF-FO-N__-D
K-BIF-FO-N__-D-V

ROD WIPER REPAIR KITS
K-BIF-FO-W-__
K-BIF-FO-W-__-L
K-BIF-FO-W-__-Q
K-BIF-FO-W-__-V
K-BIF-FO-W-__-X
K-BIF-FO-W__-V-L
K-BIF-FO-W-__-Q-L
K-BIF-FO-W-__-D
K-BIF-FO-W-__-D-V

ROD SCRAPER REPAIR KITS
K-BIF-FO-Z-__
K-BIF-FO-Z-__-L
K-BIF-FO-Z-__-Q
K-BIF-FO-Z-__-V
K-BIF-FO-Z-__-X
K-BIF-FO-Z-__-V-L
K-BIF-FO-Z-__-Q-L
K-BIF-FO-Z-__-D
K-BIF-FO-Z-__-D-V

DOUBLE END ROD REPAIR KITS

BASIC REPAIR KITS
K-BIF-FOD-__
K-BIF-FOD-__-L
K-BIF-FOD-__-Q
K-BIF-FOD-__-V
K-BIF-FOD-__-X
K-BIF-FOD-__-V-L
K-BIF-FOD-__-Q-L
K-BIF-FOD-__-D
K-BIF-FOD-__-D-V

ROD WIPER REPAIR KITS
K-BIF-FOD-W-__
K-BIF-FOD-W-__-L
K-BIF-FOD-W-__-Q
K-BIF-FOD-W-__-V
K-BIF-FOD-W-__-X
K-BIF-FOD-W__-V-L
K-BIF-FOD-W-__-Q-L
K-BIF-FOD-W-__-D
K-BIF-FOD-W-__-D-V

ROD SCRAPER REPAIR KITS
K-BIF-FOD-Z-__
K-BIF-FOD-Z-__-L
K-BIF-FOD-Z-__-Q
K-BIF-FOD-Z-__-V
K-BIF-FOD-Z-__-X
K-BIF-FOD-Z-__-V-L
K-BIF-FOD-Z-__-Q-L
K-BIF-FOD-Z-__-D-V
K-BIF-FOD-Z-__-Q-L

OPTION LEGEND	
(L)	Low Friction Seals
(Q)	Low Temp Seals
(V)	High Temp Seals
(X)	X-Ring Seals
(D)	Low Pressure Hydraulic

NOTES

Your stocking distributor is:

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Email: cs@bimba.com www.bimba.com