

Bimba FLAT-1

BIMBA FLAT-1 FITS RIGHT IN!

BIMBA Flat-1 cylinders were designed with space savings in mind. Six models offer six ways to save space.

Flat-1 –

The original round cylinder.

Square Flat-1 –

For additional mounting variations.

Flat-II –

The dual piston rod, nonrotating cylinder.

Square Flat-II –

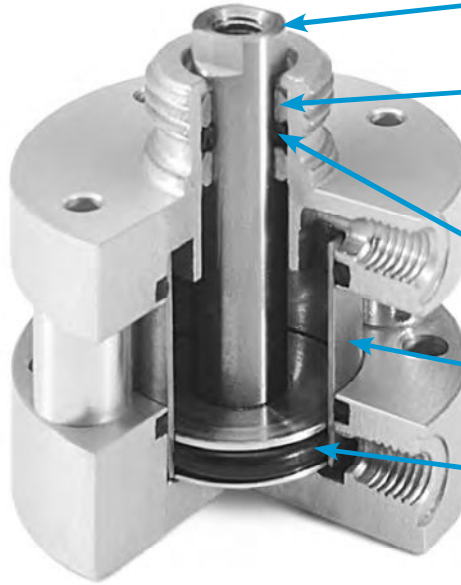
The dual piston rod, square nonrotating cylinder.

FO2, 3, 4 –

Force multiplying cylinders.

FOP –

For three positions.



- 303 stainless steel piston rod
- Oil impregnated bronze rod bushing
- Anodized aluminum alloy heads
- Buna N “O” ring rod seal
- 304 stainless cylinder body
- Buna N “O” ring piston seal

Space savings without sacrificing quality means better performance and longer cylinder life. Flat-1 offers these quality features:

- 304 stainless steel cylinder body with a mirror finish I.D. Stainless steel fights corrosion and scoring from dirt particles. The result is longer piston seal life.
- Oil impregnated bronze rod bushing is standard in all models.
- Ground and polished 303 stainless steel piston rod.
- High strength piston to rod connection.
- Precision machined, anodized aluminum alloy heads.

**Approximate Power Factors
(For all models except FO2, 3, 4)**

9/16" (02)	=	0.25
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

For example, a 3/4" bore model FO-041 will exert a force of approximately 0.4 times the air line pressure.

Bimba FLAT-1



- Body — 304 Stainless Steel
 - Heads — Anodized Aluminum Alloy
 - Piston Rod — Ground and Polished 303 Stainless Steel
 - Seals — Buna N (High temperature seals optional)
 - Rod Bushing — Oil Impregnated Bronze
 - Spring Forces — See page 2.10
 - Pressure Rating — 200 PSI Maximum (Air only)
 - Temperature Rating — From -20°F to +150°F (-25°C to +65°C)
- Buna N seals with a temperature range of -20°F to +150°F (-25°C to +65°C) are standard in all Bimba air cylinders. Fluoroelastomer seals rated for higher temperature applications are available. If cylinders are operated below 0°F (-18°C) for extended time periods, special modifications may be required. Special seal materials are available upon request.

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-170.125-1V. This is a double acting, 1-1/2" bore, 1/8" stroke, pivot mount cylinder with high temperature option.

TYPE	BORE SIZE	STROKE LENGTH
FO – Double Acting, Single End Rod FOD – Double Acting, Double End Rod FOR – Reverse Acting FOS – Single Acting	02 – 9/16" 31 – 2" 04 – 3/4" 50 – 2-1/2" 09 – 1-1/16" 70 – 3" 17 – 1-1/2" 125 – 4"	0.125 – 1/8" 0.25 – 1/4" 0.375 – 3/8" ETC.

FO-170.125-1 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
4	- Screw clearance holes, both ends ²
4F	- Screw clearance holes, front ²
4R	- Screw clearance holes, rear ²
5	- Nose mount ³

¹ Not available in 9/16" bore.
² "Screw clearance" to allow bolt head to pass through; no counter bores (see page 2.8).
³ Available in FO, FOR and FOS models; includes heavy-duty rear head and wiper.

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OPTIONS	
(Enter in alphabetical order, except for EE which is last)	
B	- Bumpers, both ends ¹
BF	- Bumper, front only ¹
BR	- Bumper, rear only ¹
CFT	- Coarse female thread (fine thread standard) (see page 2.7)
CMT	- Male rod end (coarse thread) (see page 2.10)
G	- Magnalube® G
H	- Hollow rod (double end models only) (see page 2.10)
HD	- Heavy duty rear head (see page 2.9) ³
J	- Failsafe operation (FOS models) ²
L	- Low friction seals (see table page 2.9 for length adders)
M, M1, M3, M4	- Magnetic position sensing (see table page 2.9 and 2.10 for length adders and envelope dimensions)
MT	- Male rod end (fine thread) (see page 2.10)
NT	- Non-threaded rod
P2, P3, P4	- Front port position #2, etc. (see page 2.6) ²
Q	- Low temperature operation (-40°F to 200°F)
S	- Stainless steel fasteners (125 PSI maximum pressure rating – air only)
T1, T3, T4	- Additional switch mounting post located in position #1, 3 or 4
V	- High temperature option (0°F to 400°F) ⁴
W	- Rod wiper (Buna N only) (see page 2.10)
X	- X-ring piston seal ⁵
Y	- Moly-coat (MoS ₂ I. D. coating)
EE0.375	- 3/8" extra rod extension, etc.
EE1	- 1" extra rod extension, etc.

¹ Stroke is reduced by approximately .03" per bumper under 60 psi air pressure or greater. Stroke is reduced by approximately .13" per bumper under 0 psi air pressure. Option B has bumper each end, option BR and model FOS have rear bumper only, option BF and model FOR have front bumper only.

² Not available in 9/16" bore.

³ Recommended for high cycle applications where cylinder is front face mounted; see page 2.9 for length adders.

⁴ If magnetic position sensing is specified with option V, standard Buna-N based magnet will be provided. Magnetic position sensing is not reliable above 200°F.

⁵ 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.

Bimba FLAT-I

Bimba FLAT-I

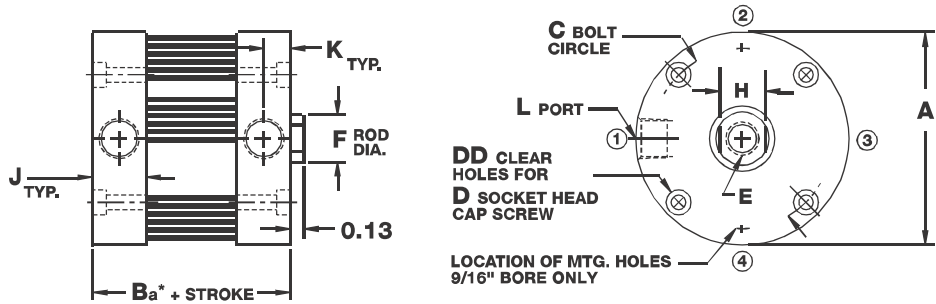
Bimba is a JIT manufacturer and we are able to provide FO, FOD, FOR, or FOS model cylinders in ANY 0.001" stroke length increment for all option styles within our standard three-day lead time. Longer stroke lengths are also available upon request at standard lead times. Please consult Technical Assistance at 800-44-BIMBA for help.

The tables represent our standard stroke lengths. Blue stroke lengths are BASIC FO, FOD, FOS, and FOR cylinders in stock available for Same Day Shipping.

Basic Models

Model FO

(Double Acting, Single End Rod)

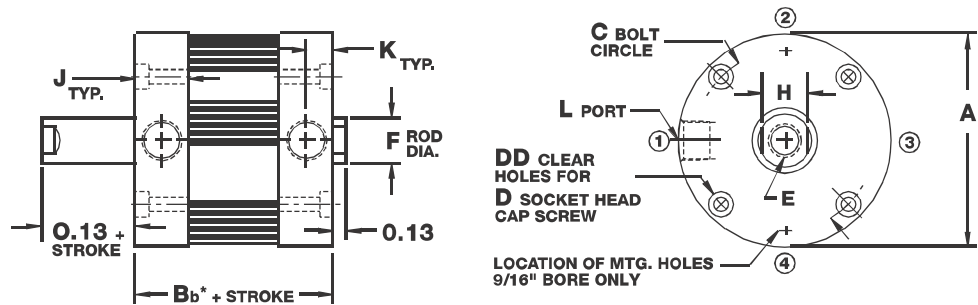


*Some options affect cylinder length; see page 2.9.

Nominal Bore Diameter	Bore Code	Standard Stroke Length Availability															
		1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
9/16"	02	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
3/4"	04	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
1-1/16"	09	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
1-1/2"	17	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
2"	31	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
2-1/2"	50	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
3"	70	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
4"	125	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"

Model FOD

(Double Acting, Double End Rod)



*Some options affect cylinder length; see page 2.9.

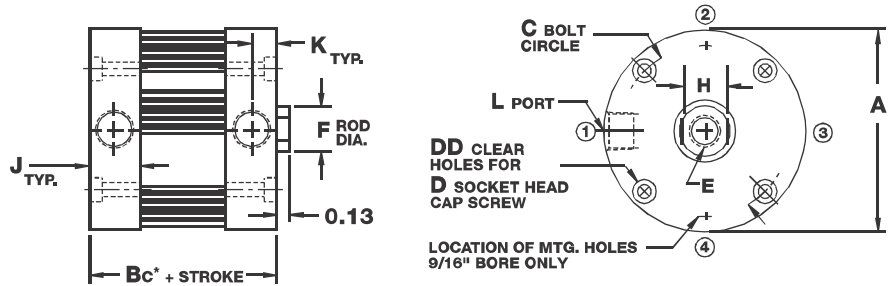
Nominal Bore Diameter	Bore Code	Standard Stroke Length Availability															
		1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
9/16"	02	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
3/4"	04	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
1-1/16"	09	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
1-1/2"	17	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
2"	31	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
2-1/2"	50	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
3"	70	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
4"	125	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"

Bimba FLAT-I

Basic Models

Model FOS

(Single Acting,
Spring Return,
Rod Normally Retracted)

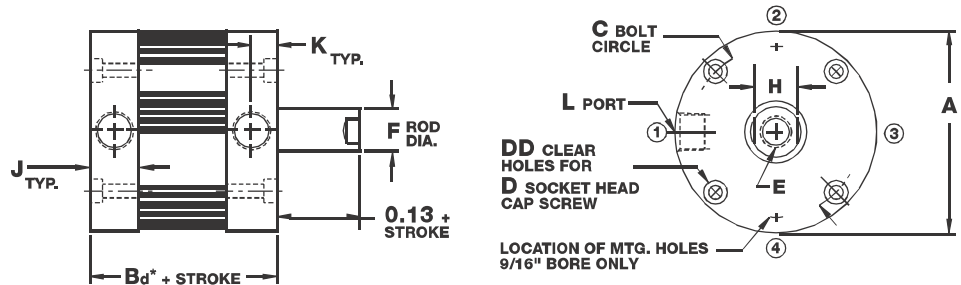


See page 2.10 for spring forces.
*Some options affect cylinder length; see page 2.9.

Nominal Bore Diameter	Bore Code	Standard Stroke Length Availability															
		1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
9/16"	02	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
3/4"	04	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
1-1/16"	09	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
1-1/2"	17	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
2"	31	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
2-1/2"	50	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
3"	70	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
4"	125	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"

Model FOR

(Reverse Acting,
Spring Return,
Rod Normally Extended)



See page 2.10 for spring forces.
*Some options affect cylinder length; see page 2.9.

Nominal Bore Diameter	Bore Code	Standard Stroke Length Availability															
		1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
9/16"	02	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
3/4"	04	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
1-1/16"	09	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
1-1/2"	17	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
2"	31	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	N/A	N/A
2-1/2"	50	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	N/A	N/A
3"	70	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	N/A	N/A
4"	125	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	N/A	N/A

Bimba FLAT-I

Dimensions (in)

(Basic Model)

Bore	A	Ba*	Bb*	Bc*				Bd*				C	DD
				0-1" Stk.	1.001-2" Stk.	2.001-3" Stk.	3.001-4" Stk.	0-1" Stk.	1.001-2" Stk.	2.001-3" Stk.	3.001-4" Stk.		
9/16" (02)	1.12	0.56	0.69	0.81	1.38	1.96	2.52	1.06	1.62	2.14	2.70	0.88	2
3/4" (04)	1.50	0.56	0.69	0.81	1.38	1.94	2.50	1.06	1.62	2.19	2.75	1.22	4
1-1/16" (09)	2.00	0.88	0.94	0.88	1.50	2.13	2.75	1.38	2.00	2.63	3.25	1.69	4
1-1/2" (17)	2.62	0.88	1.00	0.88	1.50	2.13	2.75	1.38	2.00	2.63	3.25	2.19	4
2" (31)	3.12	0.94	1.06	0.94	1.56	2.19	2.81	1.44	2.06	2.69	N/A	2.69	4
2-1/2" (50)	3.75	1.19	1.31	1.19	2.06	2.94	2.81	1.94	2.81	2.81	N/A	3.25	4
3" (70)	4.25	1.25	1.38	1.25	2.12	3.00	3.88	2.00	2.88	2.88	N/A	3.78	4
4" (125)	5.50	1.56	1.69	1.56	2.44	3.31	4.19	2.31	3.19	3.19	N/A	4.94	4

Bore	D	E Standard	E Coarse	E Depth	F	H	J	K	L
9/16" (02)	#4	#8-32 UNC	N/A	0.46	0.25	0.22	0.34	0.14	#10-32 UNF
3/4" (04)	#6	#10-32 UNF	#10-24 UNC	0.46	0.31	0.25	0.34	0.14	#10-32 UNF
1-1/16" (09)	#6	5/16-24 UNF	5/16-18 UNC	0.70	0.50	0.44	0.50	0.25	1/8 NPT
1-1/2" (17)	#10	3/8-24 UNF	3/8-16 UNC	0.70	0.63	0.50	0.50	0.25	1/8 NPT
2" (31)	#10	1/2-20 UNF	1/2-13 UNC	0.70	0.75	0.63	0.53	0.25	1/8 NPT
2-1/2" (50)	1/4	1/2-20 UNF	1/2-13 UNC	0.70	0.75	0.63	0.66	0.33	1/4 NPT
3" (70)	1/4	5/8-18 UNF	5/8-11 UNC	0.73	0.88	0.75	0.69	0.33	1/4 NPT
4" (125)	5/16	3/4-16 UNF	3/4-10 UNC	0.80	1.00	0.88	0.84	0.42	3/8 NPT

*See page 2.9 for length adders for options.

Weights

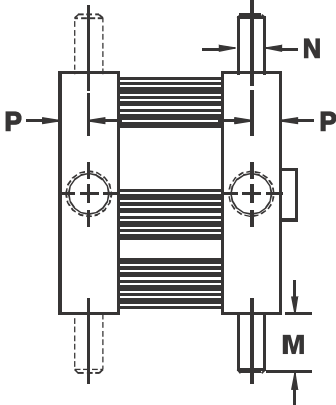
Bore	Approximate Cylinder Weights (oz.)							
	FO, FOS		FOD			FOR		Nose Mount option
	Base	Adder per 1/8" of stroke	Base	Adder per 1/8" of stroke	Adder per 1/8" of stroke for -H option	Base	Adder per 1/8" of stroke	Adder to base weight
9/16" (02)	1.2	0.08	1.3	0.15	0.1	1.3	0.08	0.1
3/4" (04)	1.9	0.1	2.1	0.2	0.15	2.0	0.1	0.2
1-1/16" (09)	4.9	0.3	5.8	0.4	0.3	5.3	0.3	1.1
1-1/2" (17)	9.6	0.4	11.2	0.6	0.5	10.5	0.4	1.8
2" (31)	13.0	0.5	15.2	0.7	0.6	14.0	0.5	2.7
2-1/2" (50)	22.4	0.6	28.0	0.8	0.7	25.0	0.6	3.1
3" (70)	28.9	0.8	38.0	1.1	0.9	32.5	0.8	3.5
4" (125)	55.7	1.0	71.8	1.3	1.1	61.8	1.0	5.9

Bimba FLAT-I

Mounting Options

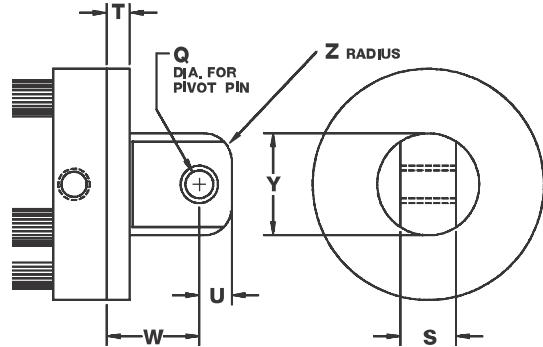
Trunnion Mount

(Option 2F, 2R, 2)
Available in front, rear, or both locations.
Not available in 9/16" bore.



Pivot Mount

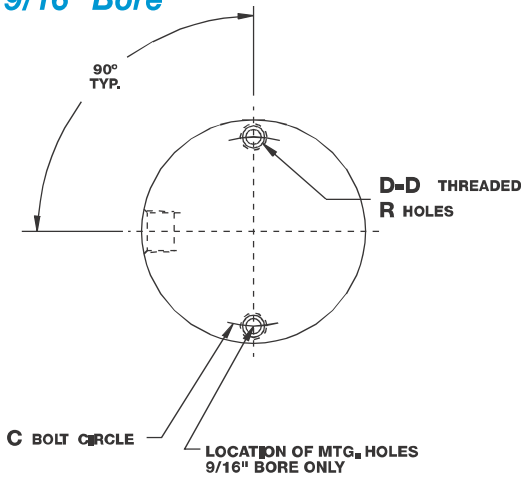
(Option 1, 1N)
Available in standard or 90°.
Complete with bronze pivot bushing.
Not available as an accessory.
Option 1 as shown.



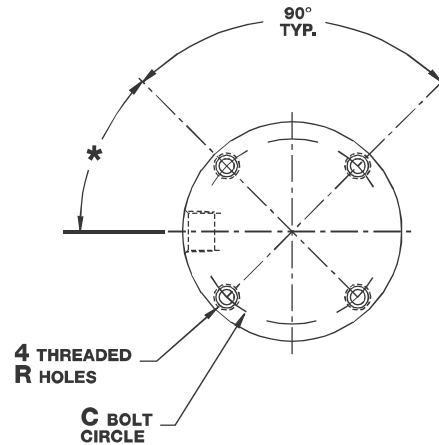
Threaded Mounting Holes

(Option 3F, 3R, 3)
Available in front, rear, or both locations.
(-3R shown)

9/16" Bore



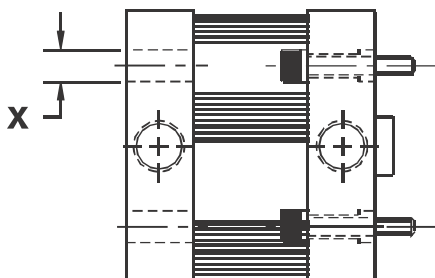
3/4" Bore and larger



*43°-3/4" Bore only 45°-all other bores

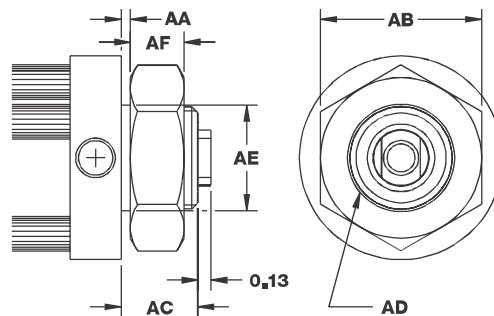
Screw Clearance Holes

(Option 4F, 4R, 4)
Available in front, rear, or both locations.
(-4R shown)



Nose Mount

(Option 5)
Available in FO, FOS, FOR models.



Bimba FLAT-I

Mounting Option Dimensions (in)

Bore	AA	AB	AC	AD	AE	AF	M	N	P	Q
9/16" (02)	.06	0.75 Hex	.38	1/2 – 20 UNF-2A	.50	.31	N/A	N/A	N/A	0.19
3/4" (04)	.06	0.75 Hex	.38	5/8 – 18 UNF-2A	.62	.25	0.31	0.12	0.17	0.19
1-1/16" (09)	.13	1.50 Hex	.75	1 – 14 UNS-2A	1.00	.55	0.50	0.25	0.25	0.19
1-1/2" (17)	.13	1.88 Hex	.75	1-1/4 – 12 UNF-2A	1.25	.52	0.50	0.25	0.25	0.38
2" (31)	.19	1.88 Hex	.88	1-3/8 – 12 UNF-2A	1.38	.52	0.50	0.25	0.25	0.38
2-1/2" (50)	.25	1.88 Hex	1.00	1-3/8 – 12 UNF-2A	1.38	.52	0.63	0.31	0.33	0.38
3" (70)	.25	1.88 Hex	1.00	1-3/8 – 12 UNF-2A	1.38	.52	0.63	0.31	0.33	0.63
4" (125)	.19	2.62 Hex	1.12	1-3/4 – 12 UN-2A	1.75	.88	0.75	0.38	0.42	0.63

Dimensions (in)

Bore	R	S	T	U	W	X	Y	Z
9/16" (02)	#4-40 UNC	0.38	0.19	0.25	0.75	0.17	0.63	0.19
3/4" (04)	#6-32 UNC	0.38	0.19	0.25	0.75	0.23	0.75	0.19
1-1/16" (09)	#6-32 UNC	0.38	0.25	0.25	0.81	0.25	0.75	0.19
1-1/2" (17)	#10-24 UNC	0.75	0.25	0.44	1.19	0.34	1.38	0.38
2" (31)	#10-24 UNC	0.75	0.31	0.44	1.25	0.34	1.38	0.38
2-1/2" (50)	1/4-20 UNC	0.75	0.38	0.44	1.31	0.41	1.38	0.38
3" (70)	1/4-20 UNC	1.00	0.38	0.56	1.69	0.41	1.88	0.38
4" (125)	5/16-18 UNC	1.00	0.44	0.56	1.75	0.50	1.88	0.38

Maximum Torque Recommendations for Nose Mount Option (ft-lb)

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

Length Adder Dimensions for Options

(Dimensional variations from standard as shown.)

Bore	Length Adder				
	Low Friction Seals (L)	Heavy Duty Rear Head* (HD)	Magnetic Position Sensing** (M)		
			FO, FOD	FOS	FOR
9/16" (02)	0.25	0.13	0.88	0.63	0.38
3/4" (04)	0.25	0.13	0.88	0.88	0.88
1-1/16" (09)	0.38	0.19	0.88	0.88	0.88
1-1/2" (17)	0.38	0.19	0.88	0.88	0.88
2" (31)	0.38	0.19	0.88	0.88	0.88
2-1/2" (50)	0.38	0.25	0.88	0.88	0.88
3" (70)	0.50	0.25	0.88	0.88	0.88
4" (125)	0.50	0.38	0.88	0.88	0.88

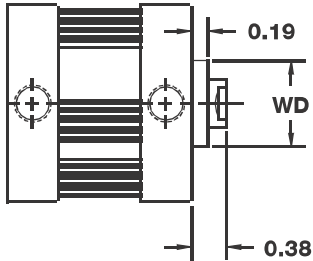
*Heavy duty rear head is recommended for applications where the cylinder is mounted on the front face or trunnion-mounted, and impact loading (20 or more cycles per minute) occurs between the piston and rear head. It increases the overall length of the cylinder as shown.

**A minimum stroke of 0.38 inches is required to sense extending end-of-stroke position. For low friction seals used in conjunction with magnetic position sensing, use M length adder only.

Bimba FLAT-1

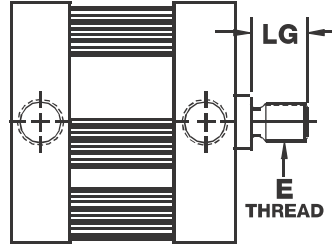
Options

Rod Wiper (Option W)



Bore	WD
9/16" (02)	0.56
3/4" (04)	0.69
1-1/16" (09)	0.88
1-1/2" (17)	1.00
2" (31)	1.13
2-1/2" (50)	1.13
3" (70)	1.25
4" (125)	1.38

Male Rod Ends (Option MT or CMT)



Bore	E		LG
	MT	CMT	
9/16" (02)	#8-32 UNC	N/A	0.38
3/4" (04)	#10-32 UNF	#10-24 UNC	0.38
1-1/16" (09)	5/16-24 UNF	5/16-18 UNC	0.50
1-1/2" (17)	3/8-24 UNF	3/8-16 UNC	0.50
2" (31), 2-1/2" (50)	1/2-20 UNF	1/2-13 UNC	0.63
3" (70)	5/8-18 UNF	5/8-11 UNC	0.75
4" (125)	3/4-16 UNF	3/4-10 UNC	0.75

FOD Hollow Rods (Option H)

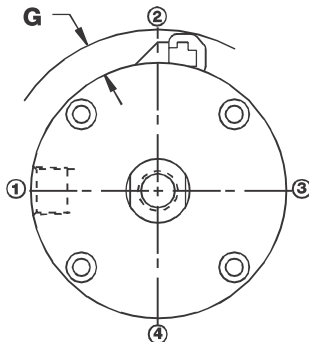
Bore	Hole Diameter	
	Female Rod Thread	Male Rod Thread
9/16" (02)	0.14	N/A
3/4" (04)	0.14	0.09
1-1/16" (09)	0.22	0.16
1-1/2" (17)	0.28	0.19
2" (31)	0.38	0.25
2-1/2" (50)	0.38	0.25
3" (70)	0.44	0.31
4" (125)	0.50	0.38

Enclosed Spring Forces

Bore	Maximum Force (lb)	Spring Rate			
		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)	5.25	4.25	1.75	1.24	0.88
3/4" (04)	10.00	6.00	2.50	1.76	1.25
1-1/16" (09)	11.50	6.00	2.50	1.76	1.25
1-1/2" (17)	13.00	5.50	2.25	1.60	1.13
2" (31)	13.00	5.50	2.25	1.60	1.13
2-1/2" (50)	25.00	6.50	2.75	1.93	1.38
3" (70)	25.00	6.50	2.75	1.93	1.38
4" (125)	25.00	6.50	2.75	1.93	1.38

MRS Switch Option Dimensions

For all ROUND Flat-1 Series Cylinder -M option, the default switch mounting post location is Position 2. To locate the post to other positions, please specify options M1, M3, or M4. For additional tracks, please specify options T1, T3, or T4 for the appropriate location.



Bore Designator	Bore	G inch (mm)
02	9/16" (14mm)	0.29 (7.4)
04	3/4" (19mm)	0.25 (6.4)
09	1-1/16" (27mm)	0.07 (1.8)
17	1-1/2" (38mm)	0.02 (.5)
31	2" (50mm)	0.03 (.8)
50	2-1/2" (63mm)	0.02 (.5)
70	3" (76mm)	0.03 (.8)
125	4" (101mm)	0.00 (0)

Bimba FLAT-I

Repair Kits

Single End Rod Kits

Basic Repair Kit (K-B-FO-__)*		
Part No.	Description	Quantity
PF-1	Rod Seal	1
PF-2	Piston Seal	1
PF-3	Tube Seal	2
PF-4	Bushing	2
Wiper Option Basic Repair Kit (K-B-FO-W-__)*		
Part No.	Description	Quantity
PF-1	Rod Seal	1
PF-2	Piston Seal	1
PF-3	Tube Seal	2
PF-4	Bushing	1
PF-5	Wiper Bushing	1
PF-6	Wiper	1

Double End Rod Kits

Basic Repair Kit (K-B-FOD-__)*		
Part No.	Description	Quantity
PF-1	Rod Seal	2
PF-2	Piston Seal	1
PF-3	Tube Seal	2
PF-4	Bushing	2
Wiper Option Basic Repair Kit (K-B-FOD-W-__)*		
Part No.	Description	Quantity
PF-1	Rod Seal	2
PF-2	Piston Seal	1
PF-3	Tube Seal	2
PF-5	Wiper Bushing	2
PF-6	Wiper	2

*Must specify bore size when ordered. Contact your local BIMBA Distributor for pricing on kits and other repair parts.

Single End Rod Kits for Nose Mount Option

Basic Repair Kit (K-B-FO-N)			
Part No.	Description	Quantity	
PF-1	Rod Seal	1	
PF-2	Piston Seal	1	
PF-3	Tube Seal	2	
PF-4	Bushing	2	
Wiper for Nose Mount Option			
D-63632	9/16" (02)	1	
D-63633	3/4" (04)	1	
D-63634	1-1/16" (09)	1	
D-63635	1-1/2" (17)	1	
D-63636	2" (31), 2-1/2" (50)	1	
D-63637	3" (70)	1	
D-63638	4" (125)	1	
Mounting Nuts for Nose Mount Option			
Bore	Part No.	Bore	Part No.
9/16" (02)	D-98	2" (31)	D-2540
3/4" (04)	D-62702	2-1/2" (50)	D-2540
1-1/16" (09)	D-1331	3" (70)	D-2540
1-1/2" (17)	D-508	4" (125)	D-62703

Flat-I/
Square Flat-1

Flat-II/
Square Flat-II

F02, F03, F04
(multiple power)

F0P
(multiple position)

Flat
Accessories

F1/F1E2

F1P/F1Q

Stopper/
Twist Clamp

Extruded
Flat Lift Table

Twin Bore

N/A

Diaphragm/
Miniature Cube

Bimba Square FLAT-1

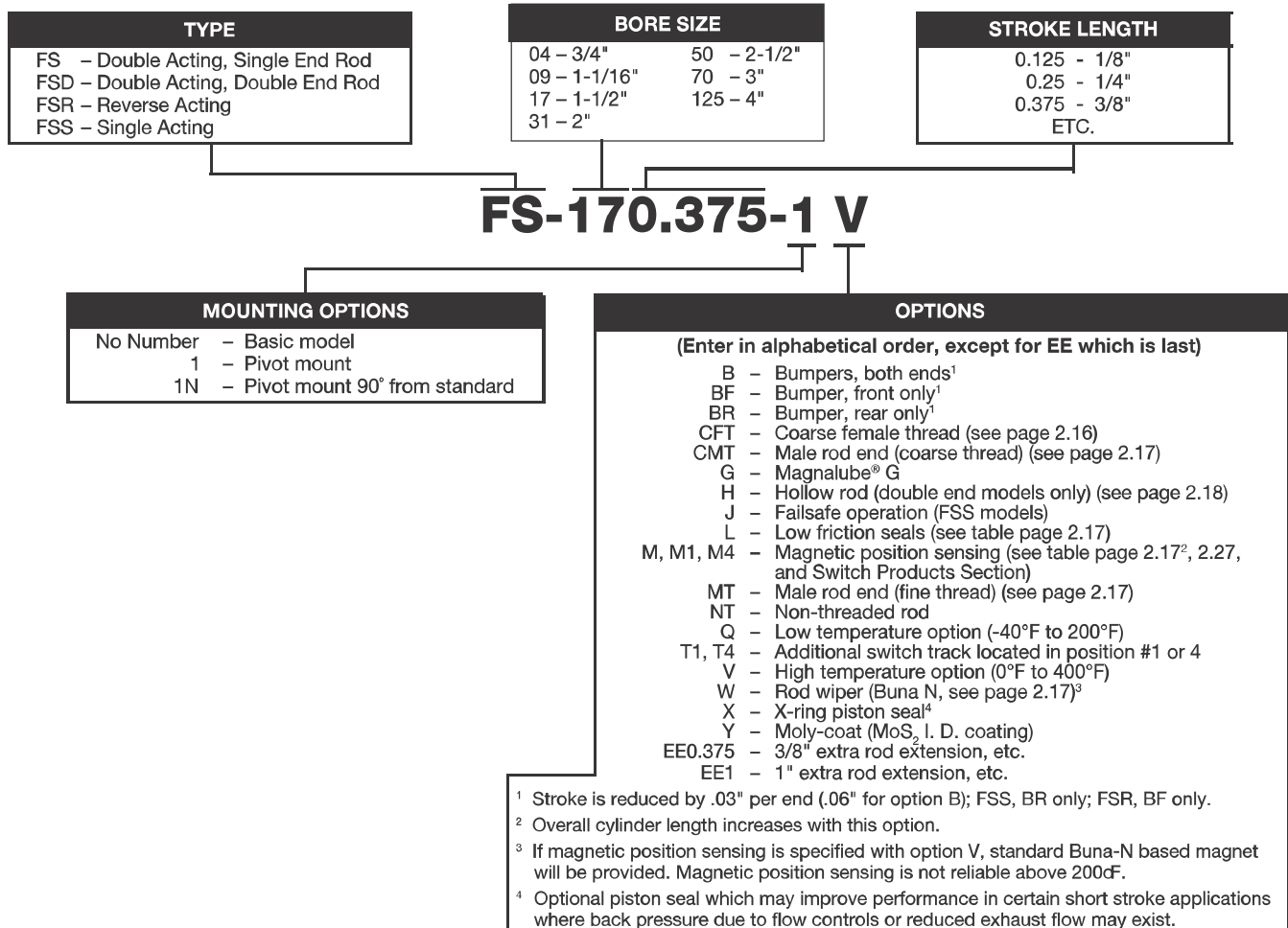
The convenient alternative for horizontal and side mounting, with provisions for both bottom flush or face mounting. The Square Flat-1 also minimizes the centerline distance when cylinders are mounted side-by-side.



- Body — 304 Stainless Steel
- Heads — Anodized Aluminum Alloy
- Piston Rod — Ground and Polished 303 Stainless Steel
- Seals — Buna N (High temperature seals optional)
- Rod Bushing — Oil Impregnated Bronze
- Tie Rods — 303 Stainless Steel
- Spring Forces — See page 2.18
- Pressure Rating — Bore Sizes 3/4"-2" 200 PSI Maximum (Air only)
Bore Sizes 2-1/2"-4" 150 PSI Maximum (Air only)
- Temperature Rating — From -20°F to +150°F (-25°C to +65°C)
Buna N seals with a temperature range of -20°F to +150°F (-25°C to +65°C) are standard in all Bimba air cylinders. Fluoroelastomer seals rated for higher temperature applications are available. If cylinders are operated below 0° (-18°C) for extended time periods, special modifications may be required. Special seal materials are available upon request.

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 options. Please refer to the charts below for an example of Model Number FS-170.375-1V. This is a double acting, 1-1/2" bore, 3/8" stroke, pivot mount cylinder with high temperature option.



Bimba Square FLAT-I

Flat-I/
Square Flat-1

Flat-II/
Square Flat-II

F02, F03, F04
(multiple power)

FOP
(multiple position)

Flat
Accessories

EF1/EF2

EP/EPQ

Stopper/
Twist Clamp

Extruded
Flat Lift Table

Twin Bore

NPA

Diaphragm/
Miniature Cube

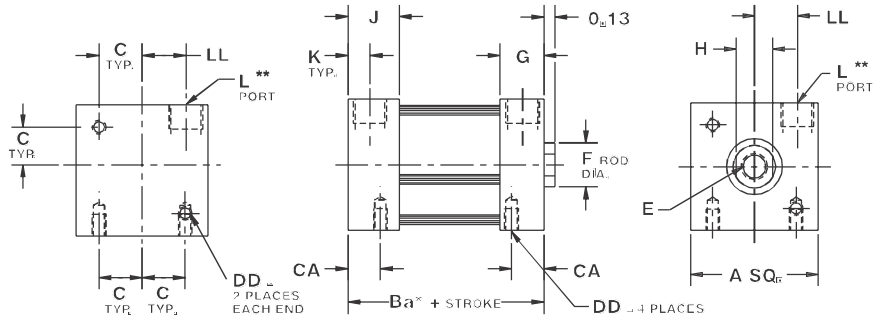
Bimba Square FLAT-I

Bimba is a JIT manufacturer and we are able to provide FS model cylinders in ANY 0.001" stroke length increment for all option styles within our standard three-day lead time. Longer stroke lengths are also available upon request at standard lead times. Please consult Technical Assistance at 800-44-BIMBA for help.

Basic Models

Model FS (Double Acting, Single End Rod)

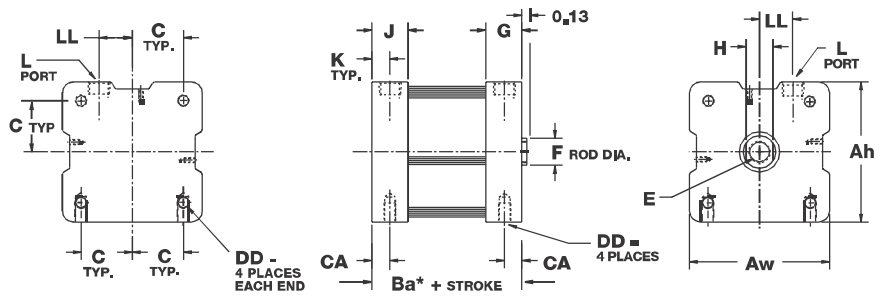
Bore sizes
3/4", 1-1/16",
1-1/2", 2"



*Some options affect cylinder length; see page 2.17.

**Port location is on the same side for M option only.

Bore sizes
2-1/2", 3", 4"



The table below represents our standard stroke lengths. Blue stroke lengths are BASIC FS cylinders in stock available for Same Day Shipping.

Nominal Bore Diameter	Bore Code	Standard Stroke Length Availability															
		Blue Stroke Lengths are BASIC, FS Stocked Cylinders Models Available for Same Day Shipping															
3/4"	04	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
1-1/16"	09	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
1-1/2"	17	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
2"	31	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
2-1/2"	50	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
3"	70	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
4"	125	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"

Bimba Square FLAT-I

Basic Models

Model FSD

(Double Acting, Double End Rod)

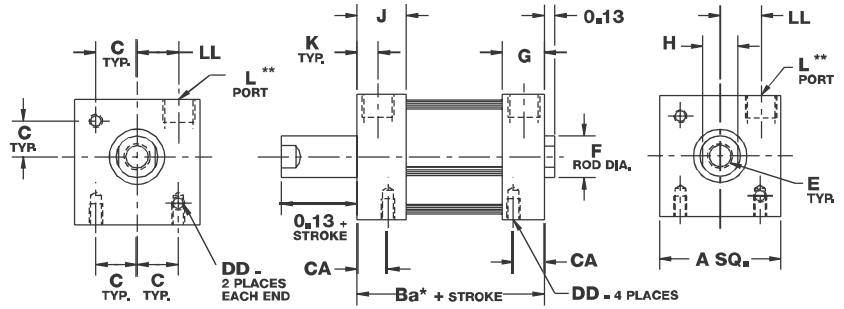
Standard Strokes

1/8", 1/4", 3/8", 1/2",
5/8", 3/4", 7/8", 1",
1-1/4", 1-1/2", 1-3/4",
2", 2-1/2", 3", 3-1/2", 4"

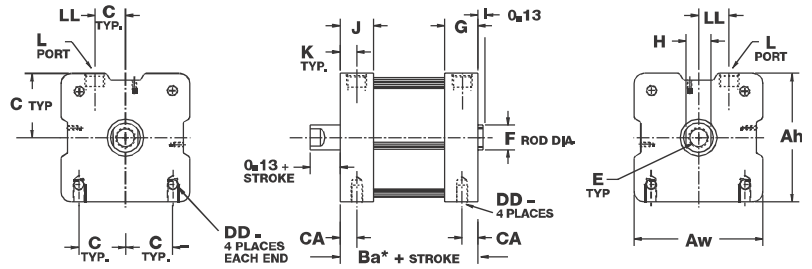
*Some options affect cylinder length; see page 2.17.

**Port location is on the same side for M option only.

Bore sizes
3/4", 1-1/16",
1-1/2", 2"



Bore sizes
2-1/2", 3", 4"



Model FSS

(Single Acting, Spring Return, Rod Normally Retracted)

Standard Strokes

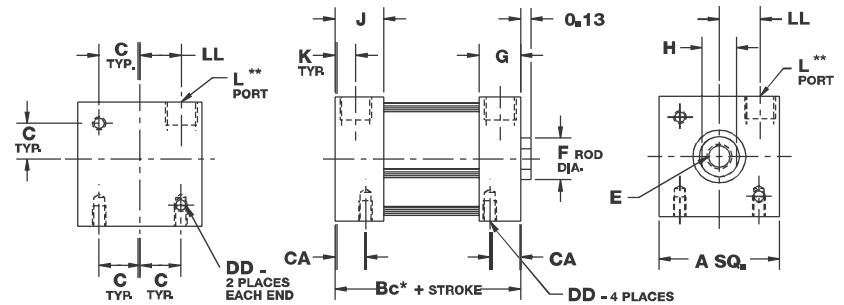
1/8", 1/4", 3/8", 1/2", 5/8",
3/4", 7/8", 1", 1-1/4",
1-1/2", 1-3/4", 2",
2-1/2", 3", 3-1/2", 4"

See page 2.18 for spring forces.

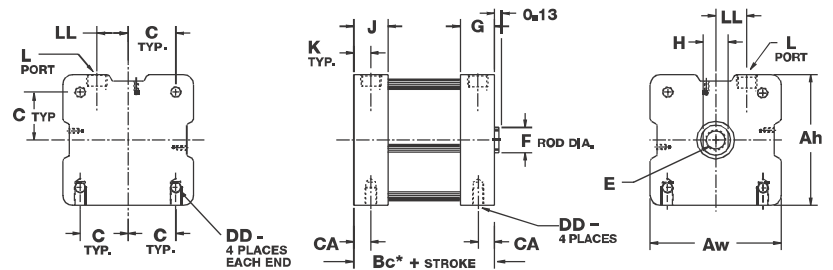
*Some options affect cylinder length; see page 2.17.

**Port location is on the same side for M option only.

Bore sizes
3/4", 1-1/16",
1-1/2", 2"



Bore sizes
2-1/2", 3", 4"



Flat-I/
Square Flat-I

Flat-II/
Square Flat-II

F02, F03, F04
(multiple power)

F0P
(multiple position)

Flat
Accessories

F1/F2
F1/F2

F3/F4
F3/F4

Stopper/
Twist Clamp

Extruded
Flat Lift Table

Twin Bore

NPA

Diaphragm/
Miniature Cube

Bimba Square FLAT-I

Basic Models

Model FSR

(Reverse Acting, Spring Return, Rod Normally Extended)

Standard Strokes

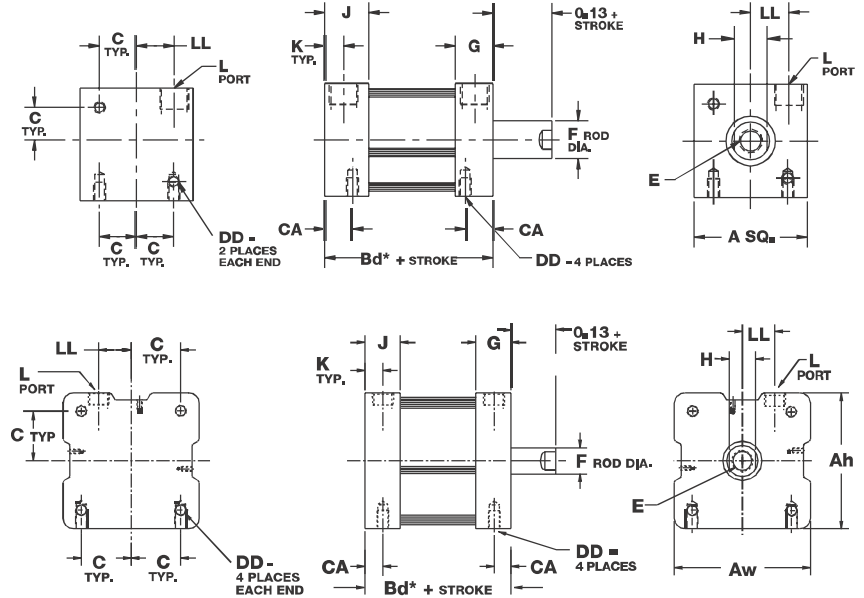
1/8", 1/4", 3/8", 1/2",
5/8", 3/4", 7/8", 1",
1-1/4", 1-1/2", 1-3/4", 2",
2-1/2", 3", 3-1/2", 4"
2"-4" Bores
3" stroke max

See page 2.18 for spring forces.

*Some options affect cylinder length; see page 2.17.

Bore sizes
3/4", 1-1/16",
1-1/2", 2"

Bore sizes
2-1/2", 3", 4"



Dimensions (in)

Bore	A	Aw	Ah	Ba*	Bc*				Bd*			
					0-1" Stk	1.001-2" Stk	2.001-3" Stk	3.001-4" Stk	0-1" Stk	1.001-2" Stk	2.001-3" Stk	3.001-4" Stk
3/4" (04)	1.25	N/A	N/A	0.75	1.00	1.56	2.13	2.69	1.25	1.81	2.38	2.94
1-1/16" (09)	1.50	N/A	N/A	1.25	1.25	1.88	2.50	3.13	1.75	2.38	3.00	3.63
1-1/2" (17)	2.00	N/A	N/A	1.25	1.25	1.88	2.50	3.13	1.75	2.38	3.00	3.63
2" (31)	2.5	N/A	N/A	1.31	1.31	1.94	2.56	3.19	1.81	2.44	3.06	N/A
2-1/2" (50)	N/A	3.28	3.25	1.66	1.66	2.54	3.41	4.29	2.39	3.27	3.29	N/A
3" (70)	N/A	3.78	3.75	1.71	1.71	2.58	3.46	4.33	2.44	3.31	3.33	N/A
4" (125)	N/A	5.04	5.00	2.00	2.00	2.88	3.75	4.63	2.75	3.62	3.63	N/A

Bore	C	CA	DD	E Standard	E Coarse	E Depth	F	G	H	J	K	L	LL
3/4" (04)	0.38	0.28	#6-32 UNC	#10-32 UNF	#10-24 UNC	0.46	0.31	0.42	0.25	0.42	0.14	#10-32	0.30
1-1/16" (09)	0.50	0.38	#8-32 UNC	5/16-24 UNF	5/16-18 UNC	0.70	0.50	0.58	0.44	0.50	0.25	1/8 NPT	0.50
1-1/2" (17)	0.69	0.31	#10-24 UNC	3/8-24 UNF	3/8-16 UNC	0.70	0.63	0.58	0.50	0.50	0.25	1/8 NPT	0.69
2" (31)	0.88	0.38	1/4-20 UNC	1/2-20 UNF	1/2-13 UNC	0.70	0.75	0.63	0.63	0.63	0.25	1/8 NPT	0.77
2-1/2" (50)	1.18	0.42	5/16-18	1/2-20 UNF	1/2-13 UNC	0.70	0.75	0.84	0.62	0.84	0.42	1/4 NPT	0.78
3" (70)	1.44	0.44	5/16-18	5/8-18 UNF	5/8-11 UNC	0.73	0.88	0.88	0.75	0.88	0.44	1/4 NPT	0.98
4" (125)	1.81	0.50	7/16-14	3/4-16 UNF	3/4-10 UNC	0.83	1.00	1.00	0.88	1.00	0.50	3/8 NPT	1.25

*See page 2.17 for length adders for options.

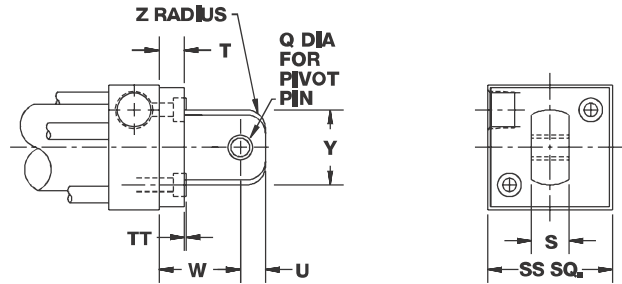
Bimba Square FLAT-I

Mounting Options

Pivot Mount

The pivot mount option is available as shown or rotated 90° to port and can be ordered as a separate mounting attachment.

See page 2.43 for dimensions.



Length Adder Dimensions for Options

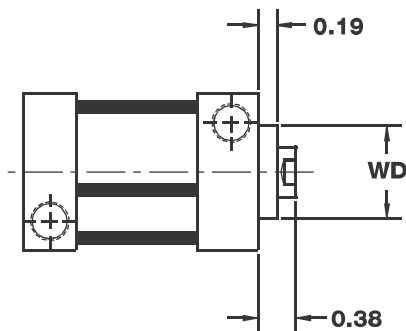
(Dimensional variations from standard as shown.)

Bore	Length Adder		
	Low Friction Seals (L)	Magnetic Position Sensing* (M)	Low Friction Seals and Magnetic Position Sensing
3/4" (04)	0.25	0.75	0.75
1-1/16" (09)	0.38	0.50	0.50
1-1/2" (17)	0.38	0.63	0.63
2" (31)	0.38	0.63	0.63
2-1/2" (50)	0.38	0.88	0.88
3" (70)	0.50	0.88	0.88
4" (125)	0.50	0.88	0.88

*A minimum stroke of 0.38" is required to sense extending end-of-stroke position. For port locations with Option-M, see page 2.26.

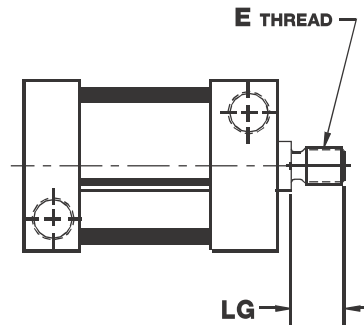
Options

Rod Wiper (Option W) (Buna N standard, not available in Viton)



Bore	WD
3/4" (04)	0.69
1-1/16" (09)	0.88
1-1/2" (17)	1.00
2" (31)	1.12
2-1/2" (50)	1.13
3" (70)	1.25
4" (125)	1.38

Male Rod Ends (Option MT or CMT)



Bore	E		LG
	MT	CMT	
3/4" (04)	#10-32 UNF	#10-24 UNC	0.38
1-1/16" (09)	5/16-24 UNF	5/16-18 UNC	0.50
1-1/2" (17)	3/8-24 UNF	3/8-16 UNC	0.50
2" (31)	1/2-20 UNF	1/2-13 UNC	0.62
2-1/2" (50)	1/2-20 UNF	1/2-13 UNC	0.63
3" (70)	5/8-18 UNF	5/8-11 UNC	0.75
4" (125)	3/4-16 UNF	3/4-10 UNC	0.75

Bimba Square FLAT-I

Options

Enclosed Spring Forces

Bore	Maximum Force (lb)	Spring Rate			
		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)
3/4" (04)	10	6	2.5	1.76	1.25
1-1/16" (09)	11.5	6	2.5	1.76	1.25
1-1/2" (17), 2" (31)	13	5.5	2.25	1.60	1.13
2-1/2" (50), 3" (70), 4" (125)	25	6.5	2.75	1.93	1.38

FSD Hollow Rods (Option H)

Bore	Hole Diameter	
	Female Rod Thread	Male Rod Thread
3/4" (04)	0.14	0.09
1-1/16" (09)	0.22	0.16
1-1/2" (17)	0.28	0.19
2" (31)	0.38	0.25
2-1/2" (50)	0.38	0.25
3" (70)	0.44	0.31
4" (125)	0.50	0.38

Repair Kits

Single End Rod Kits

Basic Repair Kit (K-B-FS-_)*		
Part No.	Description	Quantity
PF-1	Rod Seal	1
PF-2	Piston Seal	1
PF-41	Tube Seal	2
PF-4	Bushing	2

Double End Rod Kits

Basic Repair Kit (K-B-FSD-_)*		
Part No.	Description	Quantity
PF-1	Rod Seal	2
PF-2	Piston Seal	1
PF-41	Tube Seal	2
PF-4**	Bushing	3

*Must specify bore size when ordered. Contact your local Bimba Distributor for pricing on kits and other repair parts.

Wiper Option Basic Repair Kit (K-B-FS-W-_)*		
Part No.	Description	Quantity
PF-1	Rod Seal	1
PF-2	Piston Seal	1
PF-41	Tube Seal	2
PF-4	Bushing	1
PF-5	Wiper Bushing	1
PF-6	Wiper	1

Wiper Option Basic Repair Kit (K-B-FSD-W-_)*		
Part No.	Description	Quantity
PF-1	Rod Seal	2
PF-2	Piston Seal	1
PF-41	Tube Seal	2
PF-4**	Bushing	1
PF-5	Wiper Bushing	2
PF-6	Wiper	2

**Note: On FSD (Double Acting, Double End Rod) models, two bushings are provided on the head end with tie rod nuts. Opposite head end has one bushing.

Weights

Bore	Approximate Cylinder Weights (oz.)						
	FS, FSS		FSD			FSR	
	Base	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
3/4" (04)	2.2	0.1	2.4	0.2	0.15	2.2	0.1
1-1/16" (09)	5.1	0.2	5.7	0.4	0.3	5.5	0.2
1-1/2" (17)	10.1	0.3	10.5	0.6	0.5	10.4	0.3
2" (31)	14.2	0.4	16.0	0.8	0.6	15.0	0.4
2-1/2" (50)	28.6	0.4	34.2	0.6	0.5	31.2	0.4
3" (70)	40.2	0.6	49.3	0.9	0.7	43.8	0.6
4" (125)	71.6	0.6	87.7	0.9	0.7	77.7	0.6

Bimba FLAT-II

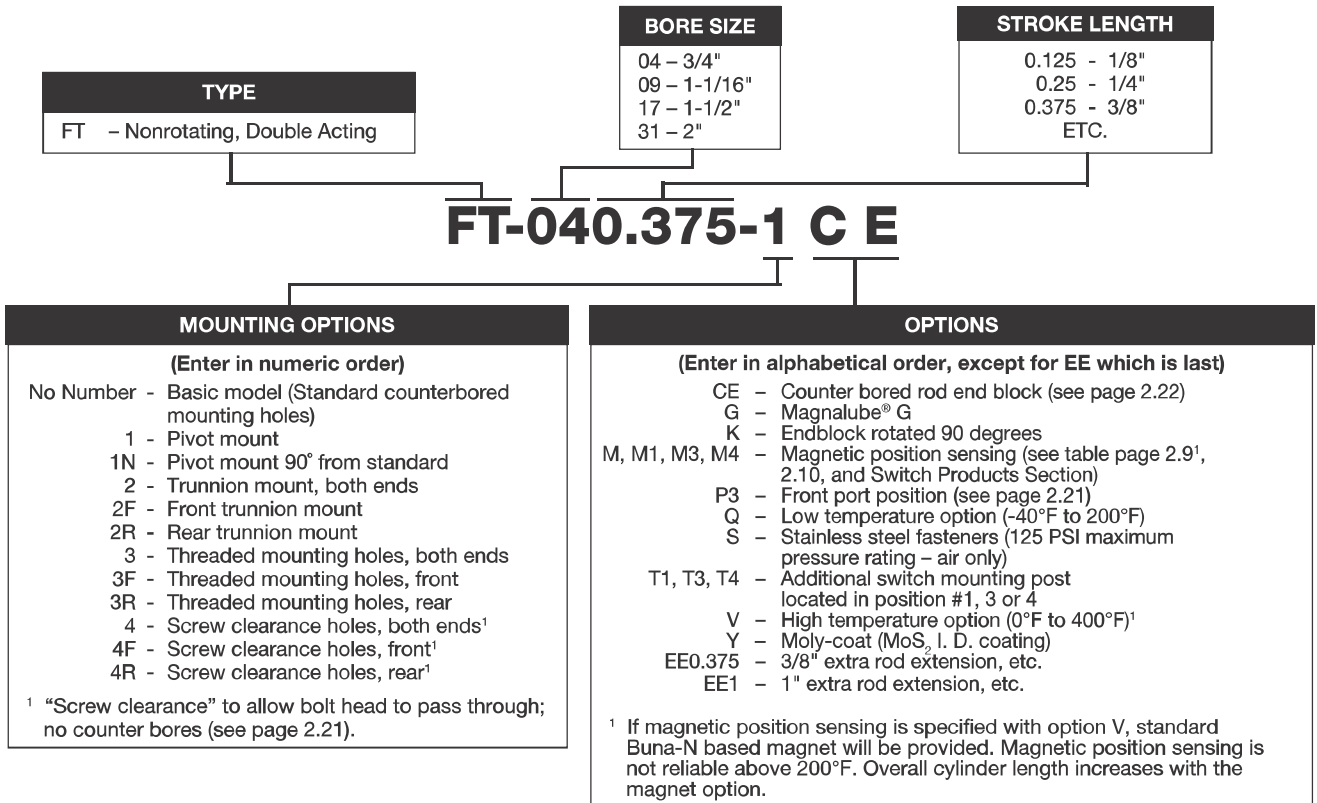


Flat-II nonrotating, double-acting cylinder provides the answer to applications where rotation cannot be tolerated and space is at a minimum. Nonrotation is achieved with dual piston rods and a rod end block that insures the rods work in tandem. Flat-II eliminates the need for external alignment devices, such as guides, rods and alignment posts or pins.

- Body — 304 Stainless Steel
- Heads — Anodized Aluminum Alloy
- Piston Rod — Ground and Polished 303 Stainless Steel
- Piston Seals — Buna N (High temperature seals optional)
- Rod Bushing — Oil Impregnated Bronze
- Rod Seals — Buna N O-ring (High temperature seals optional)
- Rod End Block — Anodized Aluminum Alloy
- Pressure Rating — 200 PSI Maximum (Air only)
- Temperature Rating — From -20°F to +150°F (-25°C to +65°C)
Buna N seals with a temperature range of -20°F to +150°F (-25°C to +65°C) are standard in all Bimba air cylinders. Fluoroelastomer seals rated for higher temperature applications are available. If cylinders are operated below 0°F (-18°C) for extended time periods, special modifications may be required. Special seal materials are available upon request.

How to Order

The Model Number for all Flat-II 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 FT-040.375-1CE. This is a nonrotating, double-acting, 3/4" bore, 3/8" stroke, pivot mount cylinder with counterbored mounting holes in the rod end block.



Bimba FLAT-II

Repair Kits

Basic Repair Kit (K-B-FT-__)*		
Part No.	Description	Quantity
PF-29	Rod Seal	2
PF-30	Piston Seal	2
PF-3	Tube Seal	2
PF-31	Bushing	4

**Must specify bore size when ordered.
Contact your local BIMBA Distributor for pricing on kits and other repair parts.*

Weights

Bore	Approximate Cylinder Weights (oz.)	
	Base	Adder per 1/8" of stroke
3/4" (04)	2.7	0.1
1-1/16" (09)	6.4	0.5
1-1/2" (17)	12.2	0.7
2" (31)	18.4	0.9

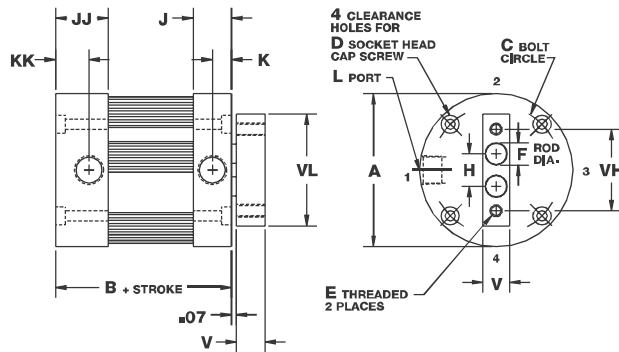
Bimba FLAT-II

Bimba is a JIT manufacturer and we are able to provide FT model cylinders in ANY 0.001" stroke length increment for all option styles within our standard three-day lead time. Longer stroke lengths are also available upon request at standard lead times. Please consult Technical Assistance at 800-44-BIMBA for help.

Basic Model

Model FT

(Nonrotating, double acting)



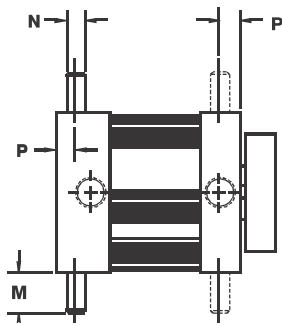
The table below represents our standard stroke lengths. **Blue** stroke lengths are BASIC FT cylinders in stock available for Same Day Shipping.

Nominal Bore Diameter	Bore Code	Standard Stroke Length Availability															
		1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
3/4"	04	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
1-1/16"	09	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
1-1/2"	17	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"
2"	31	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"	3-1/2"	4"

Mounting Options

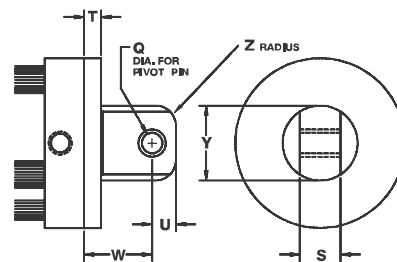
Trunnion Mount

(rear, front or both) (-2R shown)



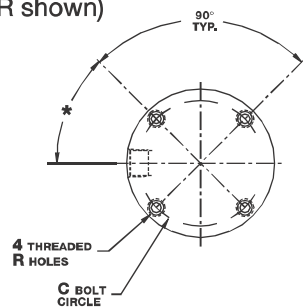
Pivot Mount

(complete with bronze bushing) (-1 shown)



Threaded Mounting Holes

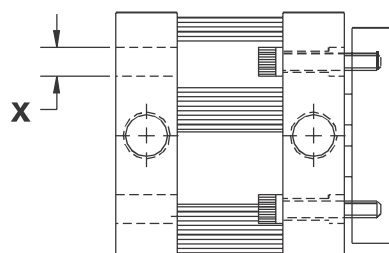
(available either or both ends) (-3R shown)



*43° 3/4" bore only. 45° all other bores.

Screw Clearance Holes

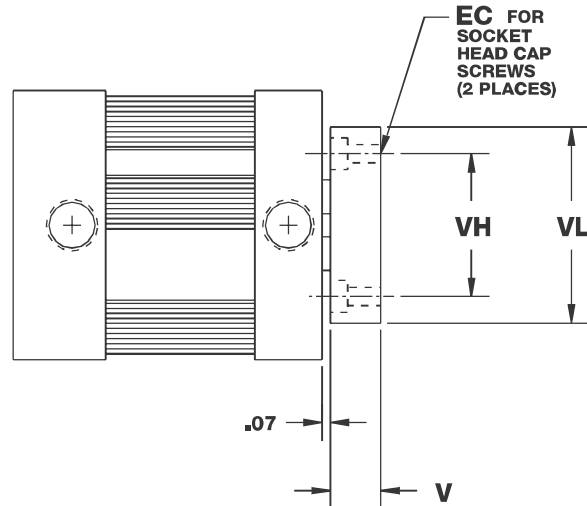
(available either or both ends) (-4R shown)



Bimba FLAT-II

Dimensions (in)

Counterbored Rod End Block



Bore	A	B*	C	D	E	EC	F	H
3/4" (04)	1.50	0.94	1.22	#6	#6-32 UNC	#6	0.19	0.332
1-1/16" (09)	2.00	1.31	1.69	#6	#8-32 UNC	#8	0.25	0.422
1-1/2" (17)	2.63	1.31	2.19	#10	1/4-20 UNC	1/4	0.38	0.562
2" (31)	3.13	1.38	2.69	#10	5/16-18 UNC	5/16	0.50	0.750

Bore	J	JJ	K	KK	L	M	N	P	Q	R
3/4" (04)	0.34	0.47	0.14	0.27	#10-32	0.31	0.13	0.17	0.19	#6-32 UNC
1-1/16" (09)	0.50	0.69	0.25	0.44	1/8 NPT	0.50	0.25	0.25	0.19	#6-32 UNC
1-1/2" (17)	0.50	0.69	0.25	0.44	1/8 NPT	0.50	0.25	0.25	0.38	#10-24 UNC
2" (31)	0.53	0.72	0.25	0.44	1/8 NPT	0.50	0.25	0.25	0.38	#10-24 UNC

Bore	S	T	U	V	VL	VH	W	X	Y	Z
3/4" (04)	0.38	0.19	0.25	0.38	1.25	0.88	0.75	0.23	0.75	0.19
1-1/16" (09)	0.38	0.25	0.25	0.38	1.44	1.06	0.81	0.25	0.75	0.19
1-1/2" (17)	0.75	0.25	0.44	0.50	2.00	1.50	1.19	0.34	1.38	0.38
2" (31)	0.75	0.31	0.44	0.63	2.50	1.88	1.25	0.34	1.38	0.38

*Magnetic Position Sensing Length Adder: 0.63.
A minimum stroke of 0.38" is required to sense extending end-of-stroke position.

Bimba FLAT-II

Nonrotation is achieved through the use of dual piston rods incorporated into the body of the Flat-II cylinder. The rods are securely attached to the piston by our unique spin-riveting process. A rod end block is used to insure the rods work in tandem—as a team. This end block also acts as a useful surface to easily accommodate any mounting attachments required to get the job done. For mounting convenience, the rod end block is provided with threaded mounting holes or optional counterbored holes.

As with any cylinder application, side loading should be avoided. The two smaller rods will have more deflection due to side load than the one standard rod in a comparable Flat-1 model.

The Flat-II is intended to work satisfactorily against pure torsional loads. The maximum torsional load per bore size is shown in the following table:

Bore	3/4" (04)	1-1/16" (09)	1-1/2" (17)	2" (31)
Torque (in.-lb)	0.3	1	5	10
K	5.21	26.61	238.85	1344.63

The amount of angular deflection, in degrees, can be approximated by the following formula:

$$\emptyset = \frac{TL^3}{K}$$

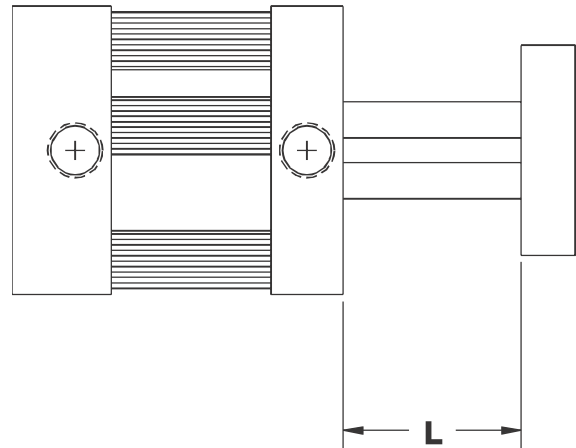
Where T = Torque (in.-lb.)
 L = Length (see sketch below)
 K = Per chart above
 \emptyset = Angular deflection

Note: To prevent rod distortion, the rod end block must be fastened securely.

Rotational Tolerance

<u>Bore</u>	<u>Maximum Rotation</u>
3/4" (04)	±1°
1-1/16" (09)	±3/4°
1-1/2" (17)	±1/2°
2" (31)	±1/2°

Deflection L Value



Bimba Square FLAT-II

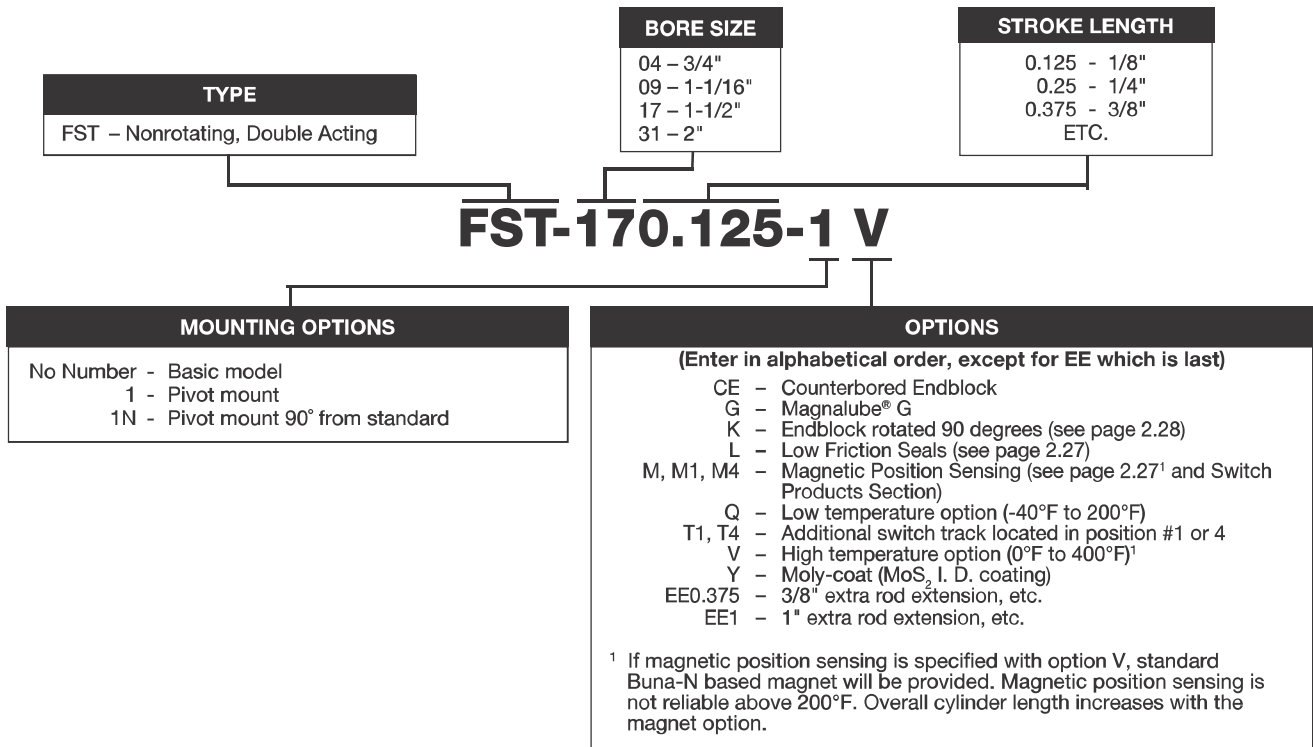
Square Flat-II nonrotating, double acting cylinder provides the answer to applications where rotation cannot be tolerated. Nonrotation is achieved with dual piston rods and a rod end block that insures the rods work in tandem. Square Flat-II eliminates the need for external alignment devices. It also provides a convenient alternative for horizontal and side mounting, with provisions for both bottom flush or face mounting. Centerline distances are minimized, facilitating side-by-side cylinder mounting.



- Body — 304 Stainless Steel
- Heads — Anodized Aluminum Alloy
- Piston Rod — Ground and Polished 303 Stainless Steel
- Piston Seals — Buna N (High temperature seals optional)
- Rod Bushing — Bronze
- Rod Seals — Buna N Block V (High temperature seals optional)
- Tie Rods — 303 Stainless Steel
- Rod End Block — Anodized Aluminum Alloy
- Pressure Rating — 200 PSI Maximum (Air only)
- Temperature Rating — From -20°F to +150°F (-25°C to +65°C)
Buna N seals with a temperature range of -20°F to +150°F (-25°C to +65°C) are standard in all Bimba air cylinders. Fluoroelastomer seals rated for higher temperature applications are available. If cylinders are operated below 0°F (-18°C) for extended time periods, special modifications may be required. Special seal materials are available upon request.

How to Order

The Model Number for all Square Flat-II cylinders consists of three alphanumeric clusters. These designate type, bore size and stroke length, mounting and special options. Please refer to the charts below for an example of Model Number FST-170.125-1V. This is a nonrotating, double acting, 1-1/2" bore, 1/8" stroke, pivot mount cylinder with high temperature seals.



Bimba Square FLAT-II

Flat-I/
Square Flat-1

Flat-II/
Square Flat-II

F02, F03, F04
(multiple power)

FOP
(multiple position)

Flat
Accessories

EF1/EF2

EP/EPQ

Stopper/
Twist Clamp

Extruded
Flat Lift Table

Twin Bore

NPA

Diaphragm/
Miniature Cube

Bimba Square FLAT-II

Basic Model

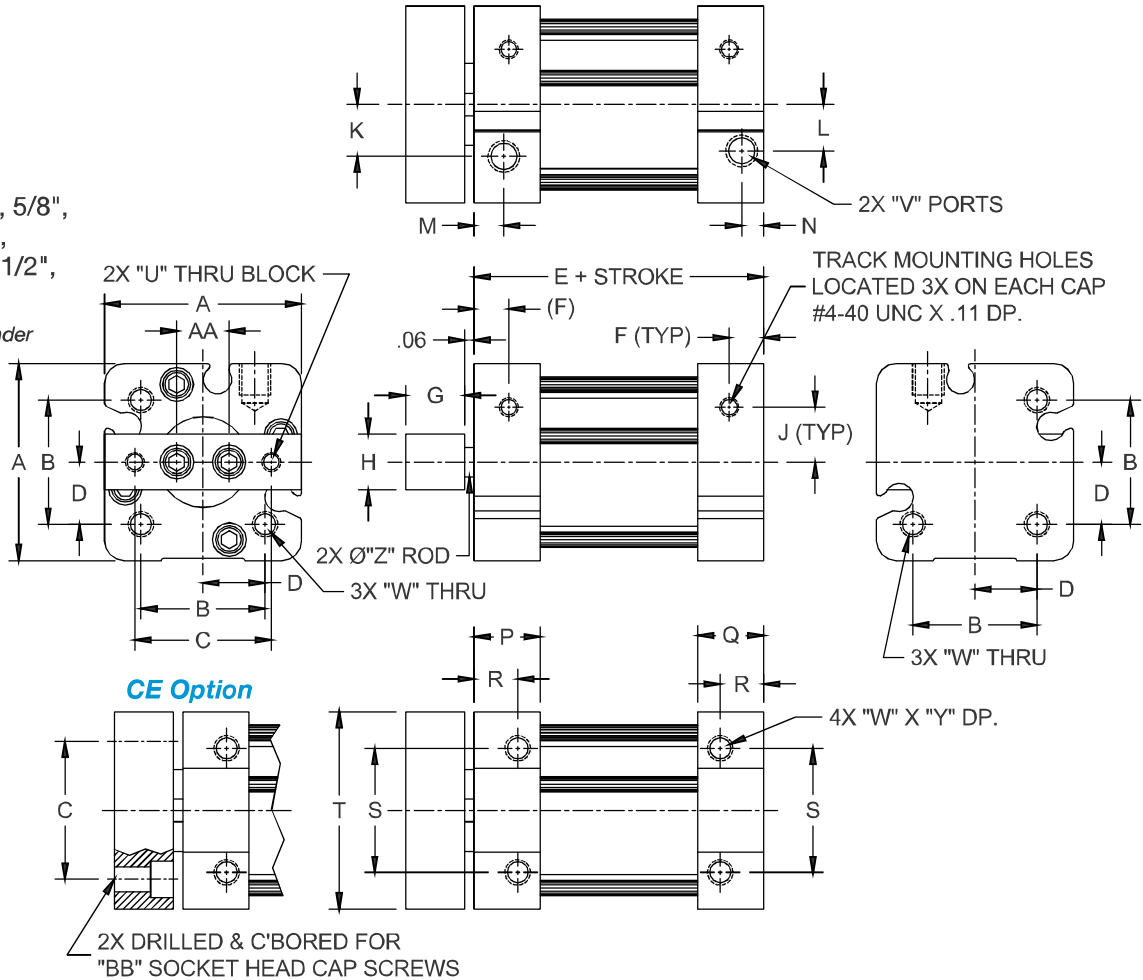
Model FST

(Nonrotating, double acting)

Standard Strokes

1/8", 1/4", 3/8", 1/2", 5/8",
3/4", 7/8", 1", 1-1/4",
1-1/2", 1-3/4", 2", 2-1/2",
3", 3-1/2", 4"

*Some options affect cylinder length; see page 2.27.



Dimensions (in)

Bore	A	B	C	D	E	F	G	H	I	K	L	M	N
3/4" (04)	1.25	0.750	0.875	0.375	0.75	0.22	0.38	0.38	0.35	0.33	0.30	0.19	0.14
1-1/16" (09)	1.50	1.000	1.062	0.500	1.25	0.22	0.38	0.38	0.34	0.45	0.45	0.25	0.24
1-1/2" (17)	2.00	1.375	1.500	0.688	1.25	0.22	0.50	0.50	0.20	0.61	0.61	0.25	0.24
2" (31)	2.50	1.750	1.875	0.875	1.31	0.22	0.63	0.63	0.19	0.76	0.76	0.25	0.25

Bore	P	Q	R	S	T	U	V	W	Y	Z	AA	BB
3/4" (04)	0.42	0.42	0.281	0.750	1.25	#6-32 UNC-2B	#10-32	#6-32 UNC-2B	0.22	0.188	0.33	#6
1-1/16" (09)	0.58	0.50	0.368	1.000	1.44	#8-32 UNC-2B	1/8 NPT	#8-32 UNC-2B	0.25	0.250	0.42	#8
1-1/2" (17)	0.58	0.50	0.310	1.375	2.00	1/4-20 UNC-2B	1/8 NPT	#10-24 UNC-2B	0.30	0.375	0.56	1/4
2" (31)	0.62	0.62	0.380	1.750	2.50	5/16-18 UNC-2B	1/8 NPT	1/4-20 UNC-2B	0.38	0.500	0.75	5/16

A minimum stroke of .38" is required to sense extending end-of-stroke position.
See page 2.27 for length adders for magnet option.

Bimba Square FLAT-II

Repair Kits

Basic Repair Kit (K-B-FST-___)*		
Part No.	Description	Quantity
PF-29-FST	Rod Seal	2
PF-30-FST	Piston Seal	1
PF-3-FST	Tube Seal	2

*Must specify bore size to order.

Weights

Bore	Approximate Cylinder Weights (oz.)	
	Base	Adder per 1/8" of stroke
3/4" (04)	2.7	0.1
1-1/16" (09)	6.4	0.5
1-1/2" (17)	12.2	0.7
2" (31)	18.4	0.9

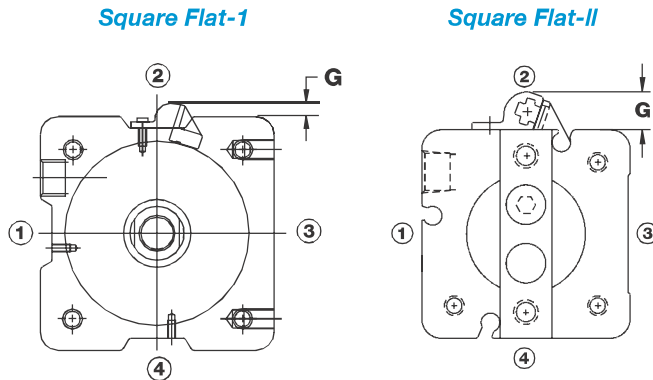
Length Adder Dimensions for Options

Bore	Length Adder		
	Low Friction Seals (L)	Magnetic Position Sensing* (M)	Low Friction Seals and Magnetic Position Sensing
3/4" (04)	0.25	0.75	0.75
1-1/16" (09)	0.25	0.50	0.50
1-1/2" (17)	0.25	0.63	0.63
2" (31)	0.25	0.63	0.63

*A minimum stroke of 0.38" is required to sense extending end-of-stroke position.

MRS Switch Option Dimensions

For all SQUARE Flat-1 Series Cylinder -M option, the default switch mounting post location is Position 2. To locate the post to other positions, please specify options M1 or M4. For additional tracks, please specify options T1 or T4 for the appropriate location.



Bore Designator	Bore	G inch (mm)
04*	3/4" (19mm)	0.365 (9.3)
09	1-1/16" (27mm)	0.365 (9.3)
17	1-1/2" (38mm)	0.365 (9.3)
31	2" (50mm)	0.365 (9.3)
50	2-1/2" (63mm)	0.270 (6.9)
70	3" (76mm)	0.300 (7.6)
125	4" (101mm)	0.160 (4.1)

*Note: Option combinations MT1 and M1T4 cannot be ordered in combination due to interference concerns.

Flat-1/
Square Flat-1

Flat-II/
Square Flat-II

F02, F03, F04
(multiple power)

F0P
(multiple position)

Flat
Accessories

E1/E2

EPP/EQ

Stopper/
Twist Clamp

Extruded
Flat Lift Table

Twin Bore

NPA

Diaphragm/
Miniature Cube

Bimba Square FLAT-II

Nonrotation is achieved through the use of dual piston rods incorporated into the body of the Flat-II cylinder. The rods are securely attached to the piston by our unique spin-riveting process. A rod end block is used to insure the rods work in tandem—as a team. This end block also acts as a useful surface to easily accommodate any mounting attachments required to get the job done. For mounting convenience, the rod end block is provided with threaded mounting holes or optional counterbored holes.

As with any cylinder application, side loading should be avoided (see option K below). The two smaller rods will have more deflection due to side load than the one standard rod in a comparable Flat-I model.

The Flat-II is intended to work satisfactorily against pure torsional loads. The maximum torsional load per bore size is shown in the following table:

Bore	3/4" (04)	1-1/16" (09)	1-1/2" (17)	2" (31)
Torque (in.-lb)	0.3	1	5	10
K	5.21	26.61	238.85	1344.63

The amount of angular deflection, in degrees, can be approximated by the following formula:

$$\emptyset = \frac{TL^3}{K}$$

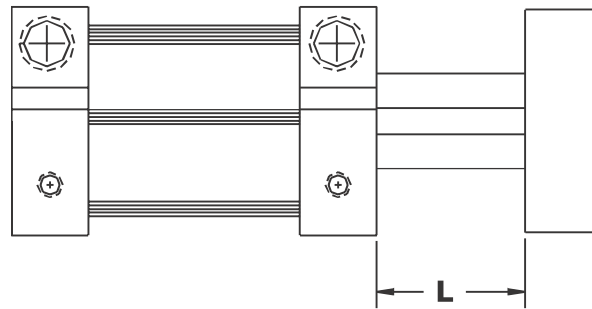
Where T = Torque (in.-lb.)
 L = Length (see sketch below)
 K = Per chart above
 \emptyset = Angular deflection

Note: To prevent rod distortion, the rod end block must be fastened securely.

Rotational Tolerance

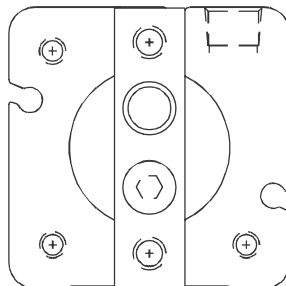
<u>Bore</u>	<u>Maximum Rotation</u>
3/4" (04)	±1°
1-1/16" (09)	±3/4°
1-1/2" (17)	±1/2°
2" (31)	±1/2°

Deflection L Value



$$L = .062 + \text{STROKE}$$

Option K - Endblock Rotated 90°



Bimba FO2 FO3 FO4



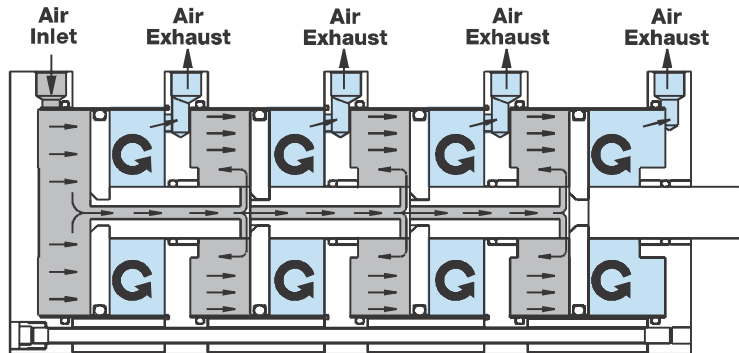
Space-Saving Cylinders That Multiply Force Output

The Bimba FO2, FO3, FO4 Series Flat-I are double-acting, single end rod cylinders that multiply the force output by supplying air to multiple pistons on extension. They save space and eliminate the need for a higher pressure system. Only one piston is powered on the return stroke, saving air volume and operating costs.

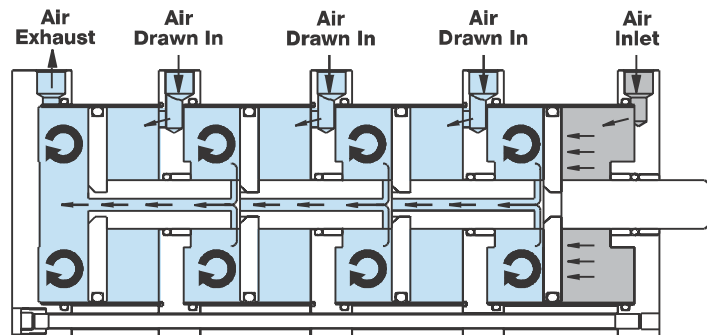
- Body — 304 Stainless Steel
- Heads — Anodized Aluminum Alloy
- Piston Rod — Ground and Polished 303 Stainless Steel
- Seals — Buna N (High temperature seals optional)
- Rod Bushing — Oil Impregnated Bronze
- Pressure Rating — 100 PSI Maximum (Air only)
- Temperature Rating — From -20°F to +150°F (-25°C to +65°C)
Buna N seals with a temperature range of -20°F to +150°F (-25°C to +65°C) are standard in all Bimba air cylinders. Fluoroelastomer seals rated for higher temperature applications are available. If cylinders are operated below 0°F (-18°C) for extended time periods, special modifications may be required. Special seal materials are available upon request.

How it Works

Extension-air supplied to multiple pistons



Retraction-air supplied to one piston only



Flat-I/
Square Flat-1

Flat-II/
Square Flat-II

FO2, FO3, FO4
(multiple power)

FOP
(multiple position)

Flat
Accessories

EF1/EF2

EPF/EPQ

Stopper/
Twist Clamp

Extruded
Flat Lift Table

Twin Bore

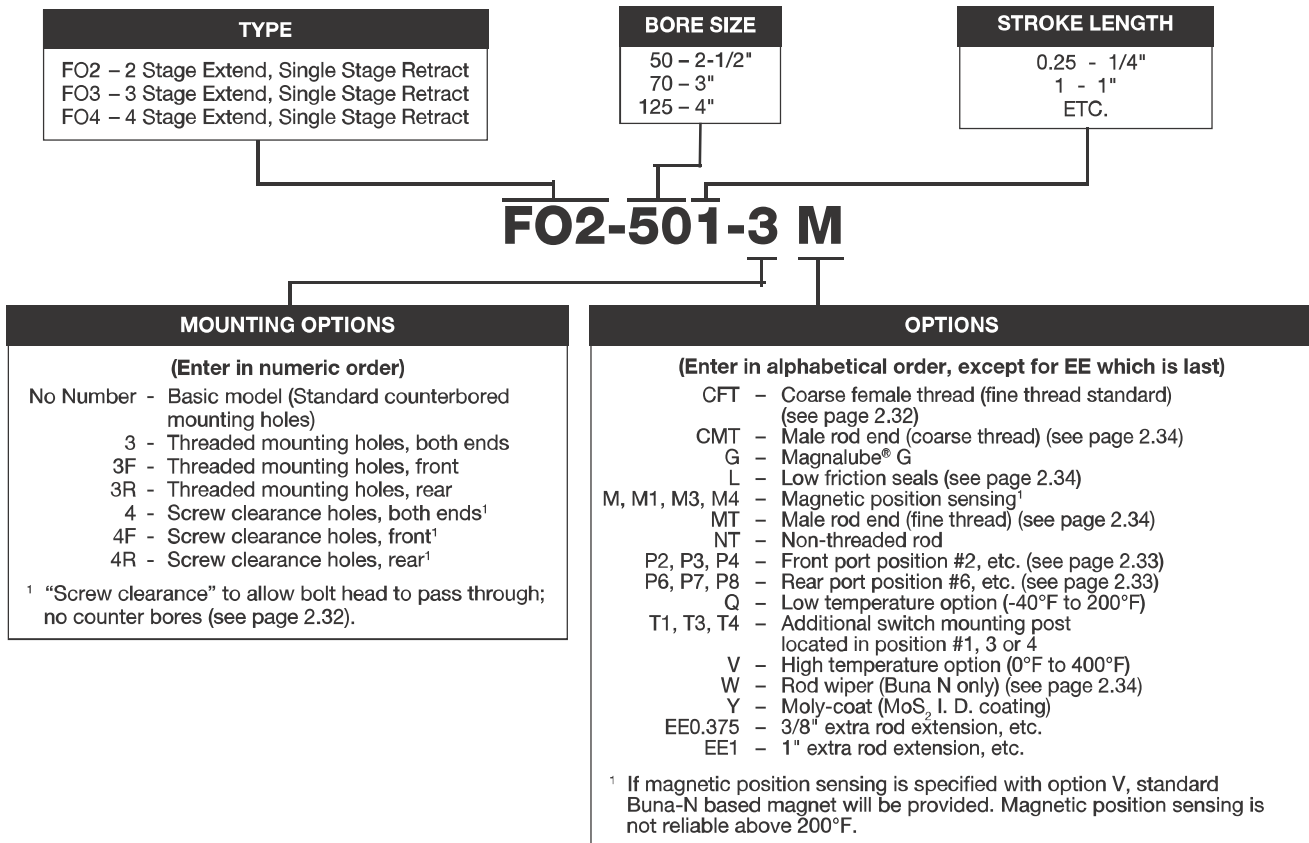
NPA

Diaphragm/
Miniature Cube

Bimba FO2 FO3 FO4

How to Order

The model number for all FO2, FO3 and FO4 Series Flat-I 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 our example of Model Number FO2-501-3M. This is a 2-1/2" bore FO2 Series Flat-I with 1" stroke, threaded mounting holes in both ends, with the magnetic position sensing option.



Approximate Power Factors					
Bore	Bore Model Designator	Power Factor Extension			Power Factor Retraction
		F02	F03	F04	
2-1/2" (50)	50	9.4	13.8	18.3	4.5
3" (70)	70	13.5	20.0	26.5	6.5
4" (125)	125	24.3	36.1	47.9	11.8

Multiply the air line pressure by the power factor to get the approximate force. For example, an FO2-501-3 operated at 80 PSI will exert a force of 752 lbs. on extension, and 360 lbs. on retraction.

Bimba F02 F03 F04

Flat-1/
Square Flat-1

Flat-II/
Square Flat-II

F02, F03, F04
(multiple power)

FOP
(multiple position)

Flat
Accessories

EF1/EF2

EP1/EP4

Stopper/
Twist Clamp

Extruded
Flat Lift Table

Twin Bore

NPA

Diaphragm/
Miniature Cube

Repair Kits

Basic Repair Kit (K-B-FO-__)*		
Part No.	Description	Quantity**
PF-1	Rod Seal	2, 3 or 4
PF-2	Piston Seal	2, 3 or 4
PF-3	Tube Seal	3, 4 or 5
PF-4	Bushing	3, 4 or 5

*Must specify model and bore size when ordered.
**Quantities listed correspond with F02, F03 or F04.

Wiper Option Repair Kit (K-B-FO-__-W)*		
Part No.	Description	Quantity**
PF-1	Rod Seal	2, 3 or 4
PF-2	Piston Seal	2, 3 or 4
PF-3	Tube Seal	3, 4 or 5
PF-4	Bushing	3, 4 or 5
PF-5	Wiper Bushing	1
PF-6	Wiper	1

Weights

Bore	Approximate Cylinder Weights (oz.)					
	Base			Adder per 1/8" of stroke		
	F02	F03	F04	F02	F03	F04
2-1/2" (50)	37.2	53.3	69.4	1.2	1.8	2.4
3" (70)	49.9	71.0	92.1	1.6	2.4	3.2
4" (125)	93.1	133.8	174.5	2.0	3.0	4.0

Bimba FO2 FO3 FO4

Dimensions (in)

Bore	A	B**			C	D	E Standard	E Coarse	E Depth	F	H
		FO2	FO3	FO4							
2-1/2" (50)	3.75	2.29	3.15	4.02	3.25	1/4	1/2-20 UNF	1/2-13 UNC	0.70	0.75	0.63
3" (70)	4.25	2.39	3.28	4.18	3.78	1/4	5/8-18 UNF	5/8-11 UNC	0.73	0.88	0.75
4" (125)	5.50	3.04	4.15	5.27	4.94	5/16	3/4-16 UNF	3/4-10 UNC	0.80	1.00	0.88

Bore	J	K	L	R	T	V	X	Z	AA	BB	CC
2-1/2" (50)	0.66	0.33	1/4 NPT	1/4-20 UNC	0.91	0.58	0.41	N/A	1.00	1.79	2.65
3" (70)	0.69	0.33	1/4 NPT	1/4-20 UNC	0.94	0.58	0.39	0.28	1.03	1.85	2.75
4" (125)	0.84	0.42	3/8 NPT	5/16-18 UNC	1.22	0.80	0.50	0.34	1.43	2.47	3.58

*See page 2.34 for length adders for options.

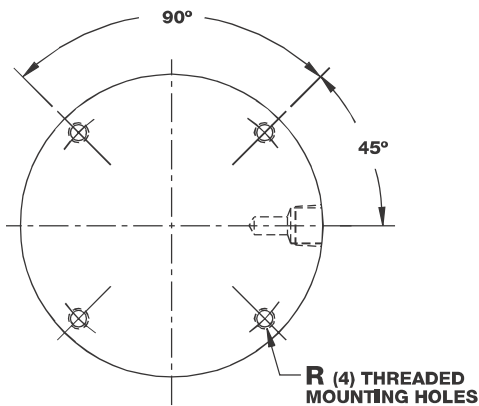
** For Strokes .125, .188, and .250

Bore	Type	Final Overall Cylinder Length*		
		Stroke		
		.125	.188	.250
2-1/2" (50)	FO2	2.65	2.71	2.77
	FO3	3.64	3.76	3.87
	FO4	4.63	4.81	4.97
3" (70)	FO2	2.75	2.81	2.88
	FO3	3.77	3.90	4.01
	FO4	4.79	4.98	5.15
4" (125)	FO2	3.38	3.44	3.53
	FO3	4.61	4.74	4.89
	FO4	5.85	6.04	6.24

Mounting Options

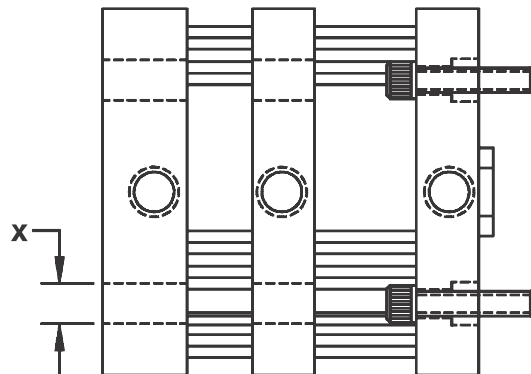
Threaded Mounting Holes

(available either or both ends)
(-3R shown)



Screw Clearance Holes

(available either or both ends)
(-4R shown) Screw clearance holes
standard on all center sections



Bimba F02 F03 F04

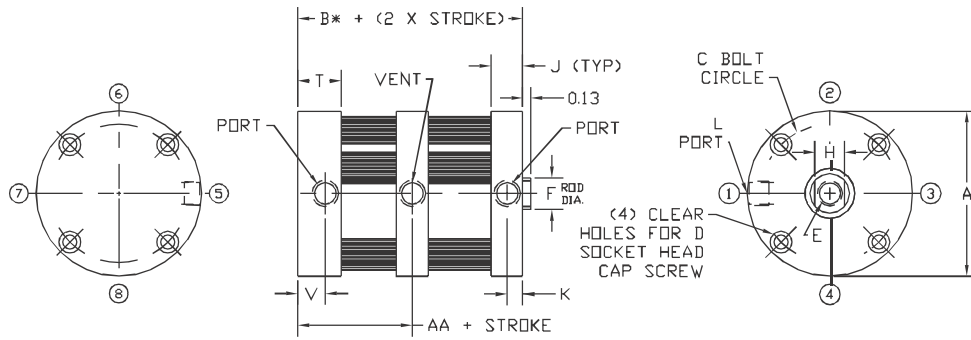
Basic Model

Standard Strokes

1/8", 1/4", 3/8", 1/2", 5/8", 3/4", 1", 1-1/4", 1-1/2", 1-3/4", 2", 2-1/2", 3", 3-1/2", 4"

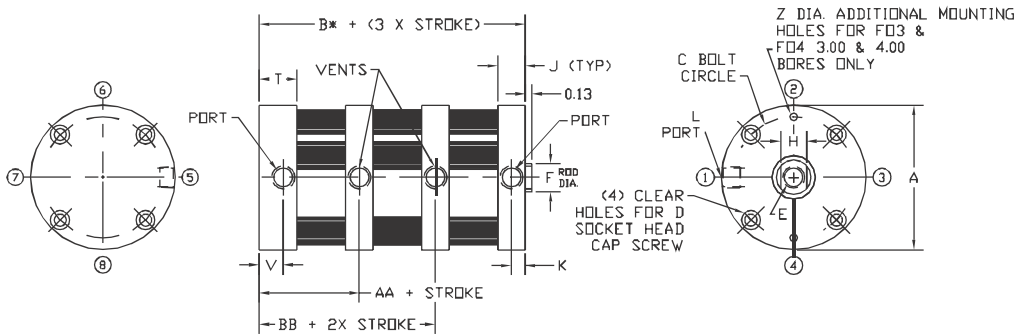
Special strokes available on request

Model F02



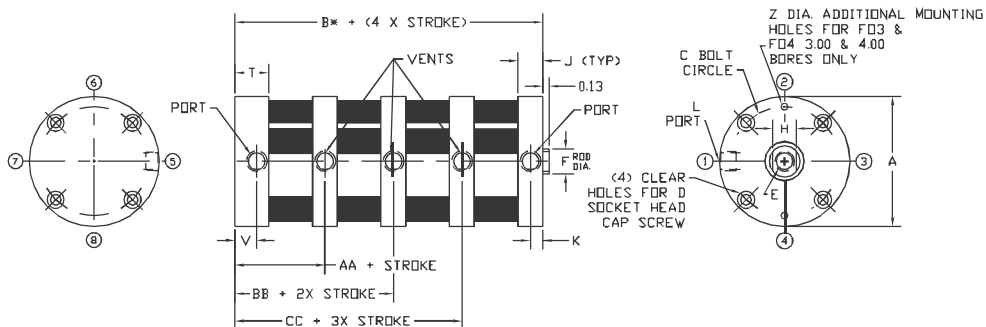
*Some options affect cylinder length, see page 2.34.

Model F03



*Some options affect cylinder length, see page 2.34.

Model F04



*Some options affect cylinder length, see page 2.34.

Flat-1/
Square Flat-1

Flat-1/
Square Flat-1

F02, F03, F04
(multiple power)

F0P
(multiple position)

Flat
Accessories

F1/F1E2

F1P/F1Q

Stopper/
Twist Clamp

Extruded
Flat Lift Table

Twin Bore

NPA

Diaphragm/
Miniature Cube

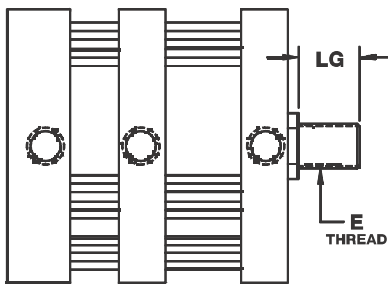
Bimba FO2 FO3 FO4

Options

Bore	Type	Length Adder		
		Low Friction Seal (L)	Magnetic Position Sensing (M)	Low Friction Seals & Magnetic Position Sensing (LM)
2-1/2" (50)	FO2	0.75	.88	1.25
	FO3	1.13		1.63
	FO4	1.50		2.00
3" (70)	FO2	1.00	.88	1.38
	FO3	1.50		1.88
	FO4	2.00		2.38
4" (125)	FO2	1.00	.88	1.38
	FO3	1.50		1.88
	FO4	2.00		2.38

Male Rod Ends (Option MT or CMT)

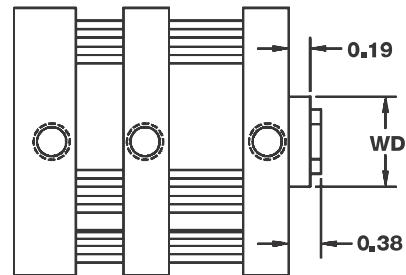
(Model FO2 shown)



Bore	E		LG
	MT	CMT	
2-1/2" (50)	1/2-20	1/2-13	0.63
3" (70)	5/8-18	5/8-11	0.75
4" (125)	3/4-16	3/4-10	0.75

Rod Wiper (Option W)

(Buna N standard, not available in high temperature option) (Model FO2 shown).



Bore	WD
2-1/2" (50)	1.13
3" (70)	1.25
4" (125)	1.38

Bimba FOP

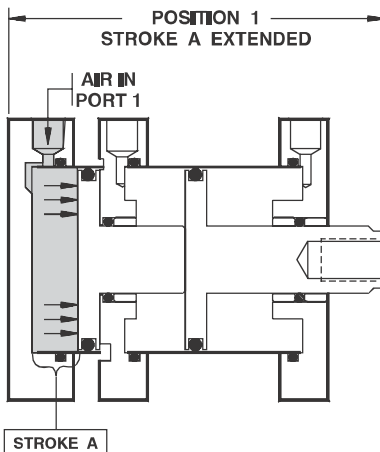


The Bimba Multiple Position FOP Flat-1 is a double-acting, single rod end cylinder that provides three positions with just one cylinder.*

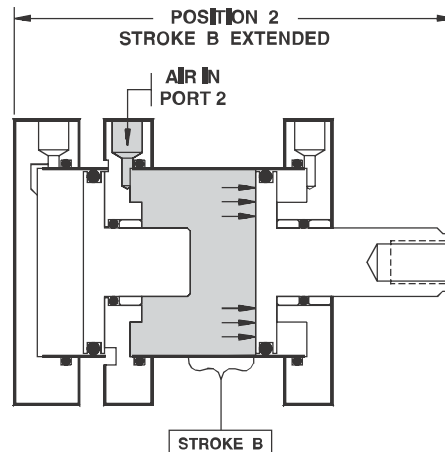
- Body — 304 Stainless Steel
 - Heads — Anodized Aluminum Alloy
 - Piston Rod — Ground and Polished 303 Stainless Steel
 - Seals — Buna N (High temperature seals optional)
 - Rod Bushing — Oil Impregnated Bronze
 - Pressure Rating — 200 PSI Maximum (Air only)
 - Temperature Rating — From -20°F to +150°F (-25°C to +65°C)
- Buna N seals with a temperature range of -20°F to +150°F (-25°C to +65°C) are standard in all Bimba air cylinders. Fluoroelastomer seals rated for higher temperature applications are available. If cylinders are operated at temperatures below 0°F (-18°C) for extended time periods, special modifications may be required. Special seal materials are available upon request.

*Other positions (4, 5, etc.) are available as specials. Contact your local Bimba distributor for more information.

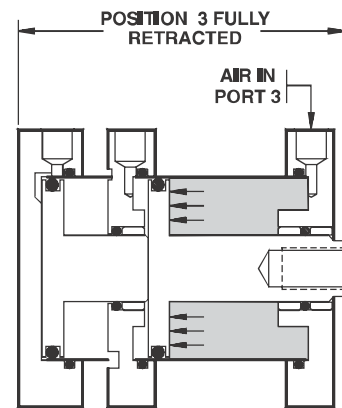
How it Works



Position 1
Air is supplied to Port 1, cylinder extends stroke length A.



Position 2
Air is supplied to Port 2, cylinder extends stroke length B.



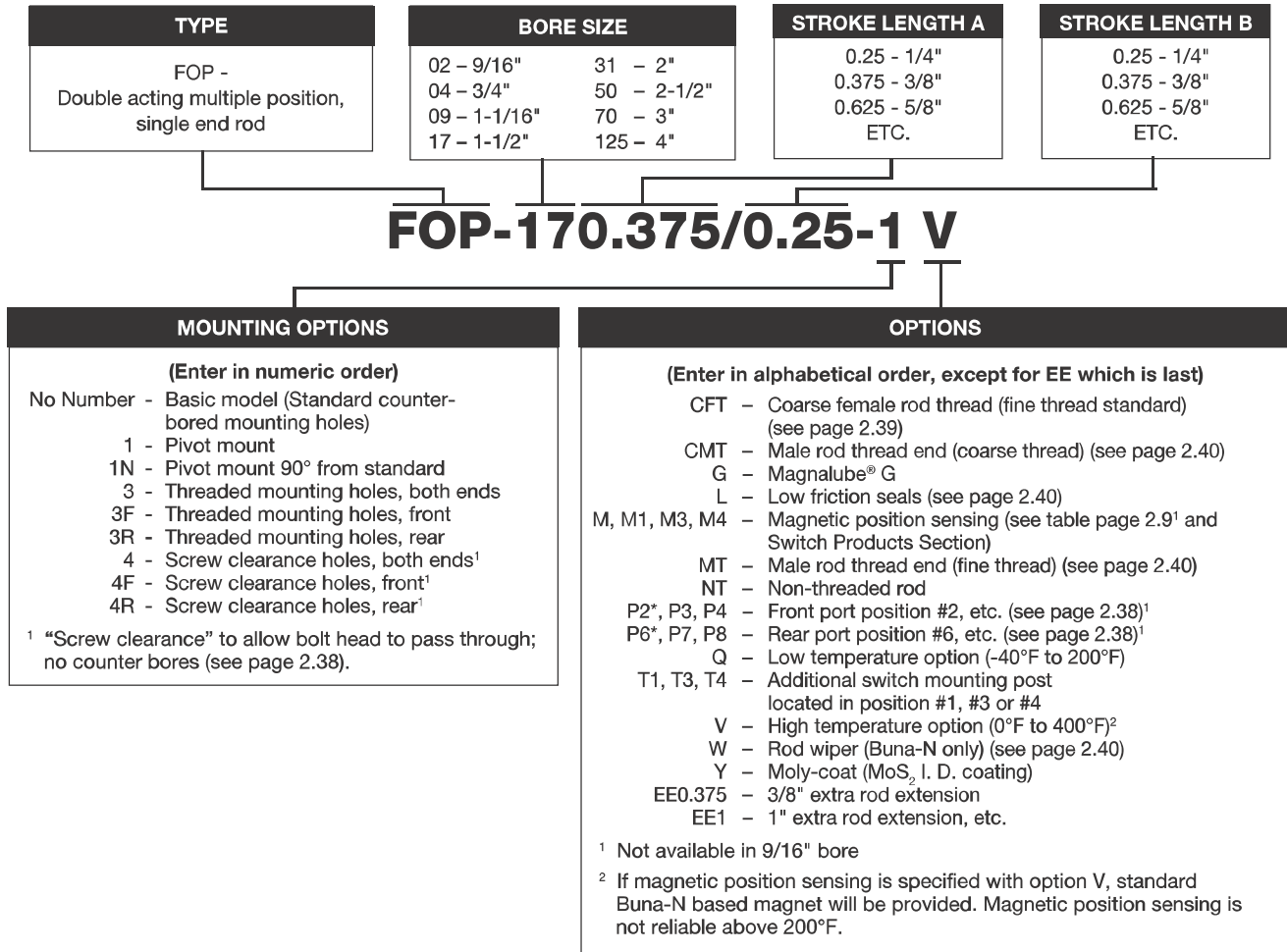
Position 3
Cylinder is fully retracted by supplying air to Port 3.

Note: For Magnetic Position Sensing option, magnet is mounted only on the piston of the Stroke B side.

Bimba FOP

How to Order

The model number for all Multiple Position FOP Flat-1 cylinders consists of three alphanumeric clusters. The first cluster designates type, the second cluster bore size and stroke lengths A and B, and the third cluster designates mounting and special options. Please refer to the charts below for an example of Model Number FOP-170.375/0.25-1V. This is a 1-1/2" bore multiple position FOP Flat-1 with a 3/8" stroke for position A, plus an **additional** stroke of 1/4" for position B, with a pivot mount on the rear head and high temperature seals.



Bimba FOP

Flat-I/
Square Flat-1

Flat-II/
Square Flat-II

F02, F03, F04
(multiple power)

FOP
(multiple position)

Flat
Accessories

EF1/EF2

EP/EPQ

Stopper/
Twist Clamp

Extruded
Flat Lift Table

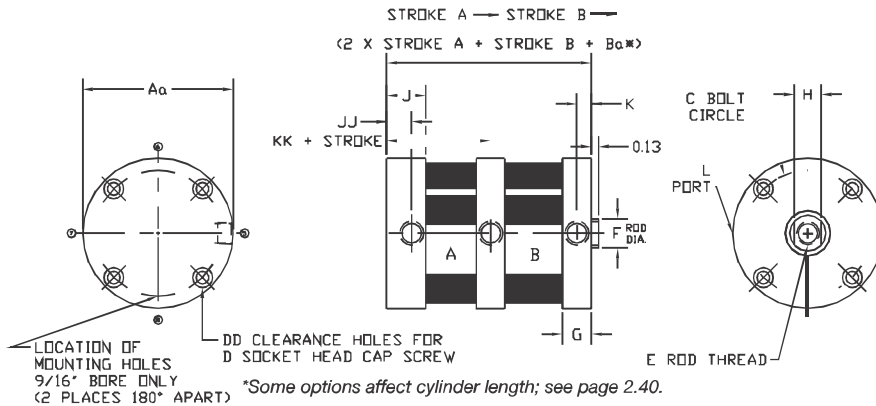
Twin Bore

NPA

Diaphragm/
Miniature Cube

Bimba FOP

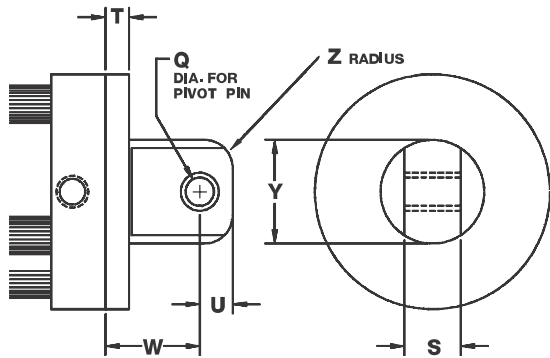
Basic Model



Mounting Options

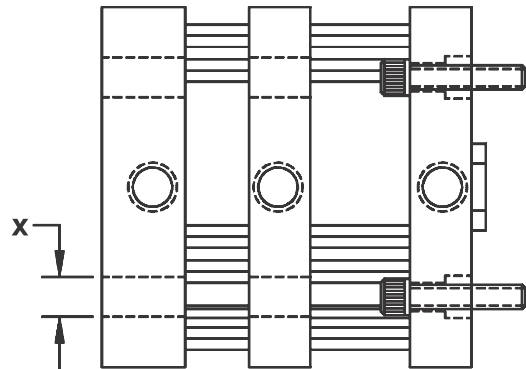
Pivot Mount

(-1 shown) Complete with bronze pivot bushing.
 (Not available as an accessory)



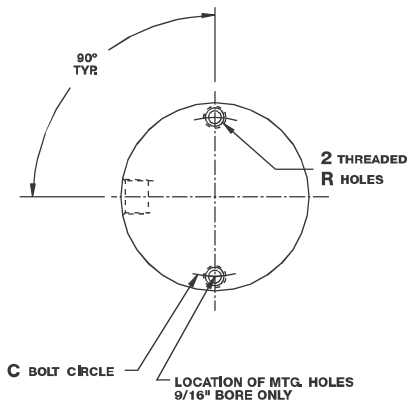
Screw Clearance Holes

(available either or both ends)
 (-4R shown) Screw clearance holes
 standard on all center sections

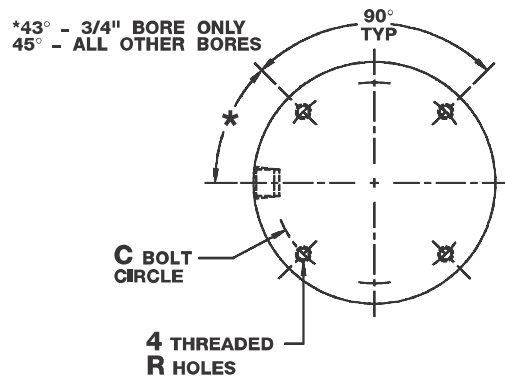


Threaded Mounting Holes

(available either or both ends)
 (3, -3F or -3R shown)
 9/16" Bore



3/4" Bore and larger



Bimba FOP

Dimensions (in)

Bore	Aa	Ba*	C	DD	D	E Standard	E Coarse	E Depth	F
9/16" (02)	1.13	1.14	0.88	2	#4	#8-32 UNC	N/A	0.46	0.25
3/4" (04)	1.50	1.14	1.22	4	#6	#10-32 UNF	#10-24 UNC	0.46	0.31
1-1/16" (09)	2.00	1.67	1.69	4	#6	5/16-24 UNF	5/16-18 UNC	0.70	0.50
1-1/2" (17)	2.63	1.70	2.19	4	#10	3/8-24 UNF	3/8-16 UNC	0.70	0.63
2" (31)	3.13	1.80	2.69	4	#10	1/2-20 UNF	1/2-13 UNC	0.70	0.75
2-1/2" (50)	3.75	2.25	3.25	4	1/4	1/2-20 UNF	1/2-13 UNC	0.70	0.75
3" (70)	4.25	2.34	3.78	4	1/4	5/8-18 UNF	5/8-11 UNC	0.73	0.88
4" (125)	5.50	3.00	4.94	4	5/16	3/4-16 UNF	3/4-10 UNC	0.80	1.00

Bore	G	H	J	JJ	K	KK	L
9/16" (02)	0.34	0.22	0.47	0.27	0.14	0.49	#10-32
3/4" (04)	0.34	0.25	0.47	0.27	0.14	0.49	#10-32
1-1/16" (09)	0.50	0.44	0.69	0.44	0.25	0.73	1/8 NPT
1-1/2" (17)	0.50	0.50	0.69	0.44	0.25	0.74	1/8 NPT
2" (31)	0.53	0.63	0.72	0.44	0.25	0.78	1/8 NPT
2-1/2" (50)	0.66	0.63	0.91	0.58	0.33	0.93	1/4 NPT
3" (70)	0.69	0.75	0.94	0.58	0.33	0.95	1/4 NPT
4" (125)	0.84	0.88	1.22	0.80	0.42	1.36	3/8 NPT

Bore	R	LG	WD	Q	S	T	U	W	X	Y	Z
9/16" (02)	#4-40 UNC	0.38	0.56	0.19	0.38	0.19	0.25	0.75	0.20	0.63	0.19
3/4" (04)	#6-32 UNC	0.38	0.69	0.19	0.38	0.19	0.25	0.75	0.23	0.75	0.19
1-1/16" (09)	#6-32 UNC	0.50	0.88	0.19	0.38	0.25	0.25	0.81	0.25	0.75	0.19
1-1/2" (17)	#10-24 UNC	0.50	1.00	0.38	0.75	0.25	0.44	1.19	0.34	1.38	0.38
2" (31)	#10-24-UNC	0.63	1.12	0.38	0.75	0.31	0.44	1.25	0.34	1.38	0.38
2-1/2" (50)	1/4-20 UNC	0.63	1.12	0.38	0.75	0.38	0.44	1.31	0.41	1.38	0.38
3" (70)	1/4-20 UNC	0.75	1.25	0.63	1.00	0.38	0.56	1.69	0.41	1.88	0.38
4" (125)	5/16-18 UNC	0.75	1.38	0.63	1.00	0.44	0.56	1.75	0.50	1.88	0.38

*See page 2.40 for length adders for options.

Flat-1/
Square Flat-1

Flat-1/
Square Flat-1

F02, F03, F04
(multiple power)

FOP
(multiple position)

Flat
Accessories

E1/E2

E1/E2
E1/E2

Stopper/
Twist Clamp

Extruded
Flat Lift Table

Twin Bore

N/A

Diaphragm/
Miniature Cube

Bimba FOP

Length Adder Dimensions for Options

(Dimensional variations from standard as shown.)

Bore	Length Adder		
	Low Friction Seals (L)	Magnetic Position Sensing* (M)	Low Friction Seals and Magnetic Position Sensing
9/16" (02), 3/4" (04)	0.50	0.88	1.12
1-1/16" (09), 1-1/2" (17), 2" (31), 2-1/2" (50)	0.75	0.88	1.25
3" (70), 4" (125)	1.00	0.88	1.38

*A minimum total stroke of 0.38" is required to sense extending end-of-stroke position.

Minimum Stroke

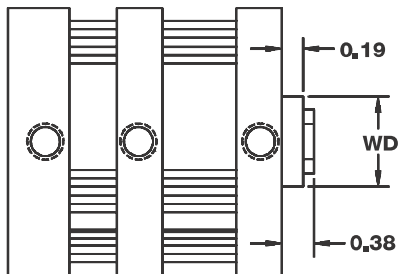
Model \ Bore	9/16" (02)	3/4" (04)	1-1/16" (09)	1-1/2" (17)	2" (31)	2-1/2" (50)	3" (70)	4" (125)
Base Model Stroke A	0.19	0.19	0.25	0.25	0.25	0.38	0.38	0.34

No minimum for stroke B.

No minimum for stroke A or B with low friction seal option.

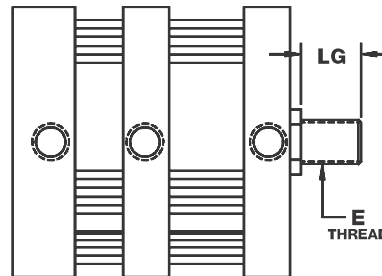
Rod Wiper (Option W)

(Buna N standard, not available in high temperature option)



Bore	WD
9/16" (02)	0.56
3/4" (04)	0.69
1-1/16" (09)	0.88
1-1/2" (17)	1.00
2" (31), 2-1/2" (50)	1.13
3" (70)	1.25
4" (125)	1.38

Male Rod Ends (Option MT or CMT)



Bore	E		LG
	MT	CMT	
9/16" (02)	#8-32	N/A	0.38
3/4" (04)	#10-32	#10-24	0.38
1-1/16" (09)	5/16-24	5/16-18	0.50
1-1/2" (17)	3/8-24	3/8-16	0.50
2" (31), 2-1/2" (50)	1/2-20	1/2-13	0.63
3" (70)	5/8-18	5/8-11	0.75
4" (125)	3/4-16	3/4-10	0.75

Bimba FOP

Repair Kits

Basic Repair Kit (K-B-FOP)*		
Part No.	Description	Quantity
PF-1	Rod Seal	2
PF-2	Piston Seal	2
PF-3	Tube Seal	3
PF-4	Bushing	3

Wiper Option Repair Kit (K-B-FOP-W)*		
Part No.	Description	Quantity
PF-1	Rod Seal	2
PF-2	Piston Seal	2
PF-3	Tube Seal	3
PF-4	Bushing	2
PF-5	Wiper Bushing	1
PF-6	Wiper	1

*Must specify bore size when ordered. Contact your local Bimba distributor for pricing on kits and other repair parts.

Weights

Bore	Approximate Cylinder Weights (oz.)	
	Base	Adder per 1/8" of stroke
9/16" (02)	3.3	0.16
3/4" (04)	4.5	0.2
1-1/16" (09)	9.9	0.6
1-1/2" (17)	18.7	0.8
2" (31)	24.5	1
2-1/2" (50)	41.3	1.2
3" (70)	52.9	1.6
4" (125)	102.7	2

Flat-1/
Square Flat-1

Flat-1/
Square Flat-1

F02, F03, F04
(multiple power)

FOP
(multiple position)

Flat
Accessories

E1/E2

E1/E2

Stopper/
Twist Clamp

Extruded
Flat Lift Table

Twin Bore

N/A

Diaphragm/
Miniature Cube

Bimba Flat-I Accessories

Selection Guide

(All Models)

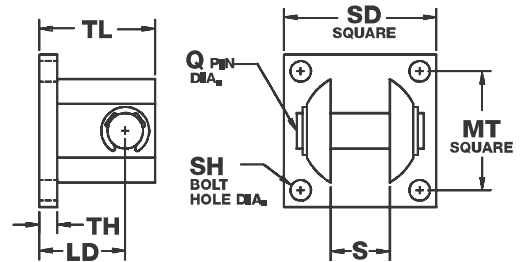
Accessory	Flat-1	Square Flat-1	Square Flat-II	Flat-II	FO2	FOP
Clevis Bracket	X	X	X	X	N/A	X
Trunnion Bracket	X	N/A	N/A	X	N/A	N/A
Rod Pivot	X	X	N/A	N/A	X	X
Pivot Attachment	N/A	X	X	N/A	N/A	N/A

Clevis Bracket

Anodized aluminum alloy, complete with stainless steel pin

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

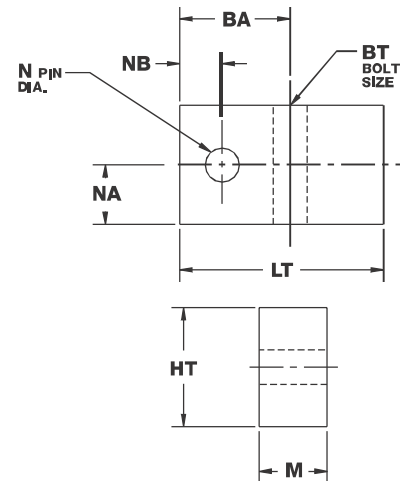
Bracket intended to mount with either rod pivot or pivot mount, not directly to the cylinder rear head.



Trunnion Bracket (pair)

Anodized aluminum alloy, complete with bronze pivot bushings

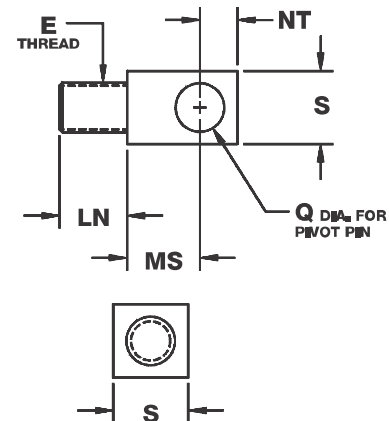
Model	Bore	BA	BT	HT	LT	M	N	NA	NB
BT-1	3/4" (04)	0.56	#10	0.63	1.12	0.31	0.13	0.30	0.22
BT-2	1-1/16" (09), 1-1/2" (17), 2" (31)	0.81	0.25	0.88	1.50	0.50	0.25	0.38	0.31
BT-3	2-1/2" (50), 3" (70)	0.94	0.31	1.00	1.63	0.63	0.31	0.45	0.38
BT-4	4" (125)	1.06	0.38	1.25	1.88	0.75	0.38	0.55	0.44



Rod Pivot

Zinc plated, high strength, heat treated alloy steel, complete with a bronze pivot bushing and nut

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

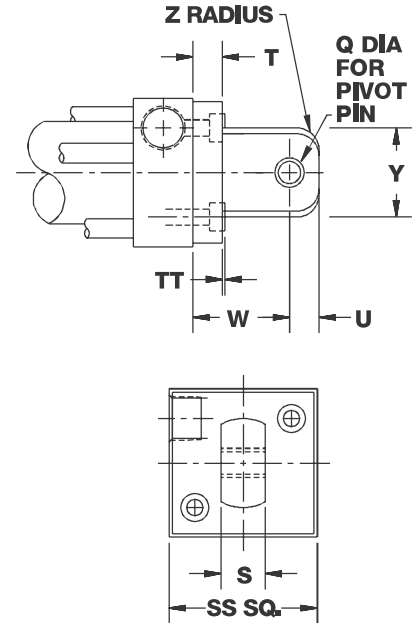


Bimba Flat-I Accessories

Pivot Attachment

Anodized aluminum alloy. Complete with mounting screws. Not necessary if ordered as part of complete Square Flat-1 cylinder (1 or 1N option).

Model	Bore	Q	S	SS	T	TT	U	W	Y	Z
PM-1	3/4" (04)	0.19	0.38	1.13	0.19	0.020	0.25	0.75	0.75	-
PM-2	1-1/16" (09)	0.19	0.38	1.25	0.25	0.020	0.25	0.81	0.75	-
PM-3	1-1/2" (17)	0.38	0.75	1.75	0.25	0.025	0.44	1.19	1.38	-
PM-4	2" (31)	0.38	0.75	2.25	0.31	0.080	0.44	1.38	1.38	-
PM-5	2-1/2" (50)	0.38	0.75	3.00	0.38	0.05	0.44	1.31	1.38	0.38
PM-6	3" (70)	0.63	1.00	3.50	0.38	0.05	0.56	1.69	1.88	0.38
PM-7	4" (125)	0.63	1.00	4.50	0.44	0.12	0.56	1.75	1.88	0.38



Price List

Description	Model	List Price
Rod Pivot	RP-1/2	
	RP-1	
	RP-2	
	RP-3	
	RP-4	
	RP-5	
Trunnion Bracket	BT-1	
	BT-2	
	BT-3	
	BT-4	
Clevis Bracket	BC-1	
	BC-2	
	BC-3	
Pivot Attachment	PM-1	
	PM-2	
	PM-3	
	PM-4	
	PM-5	
	PM-6	
	PM-7	
Wrench Kit (Fits wrench flats on all piston rods)	FWK	