

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 -

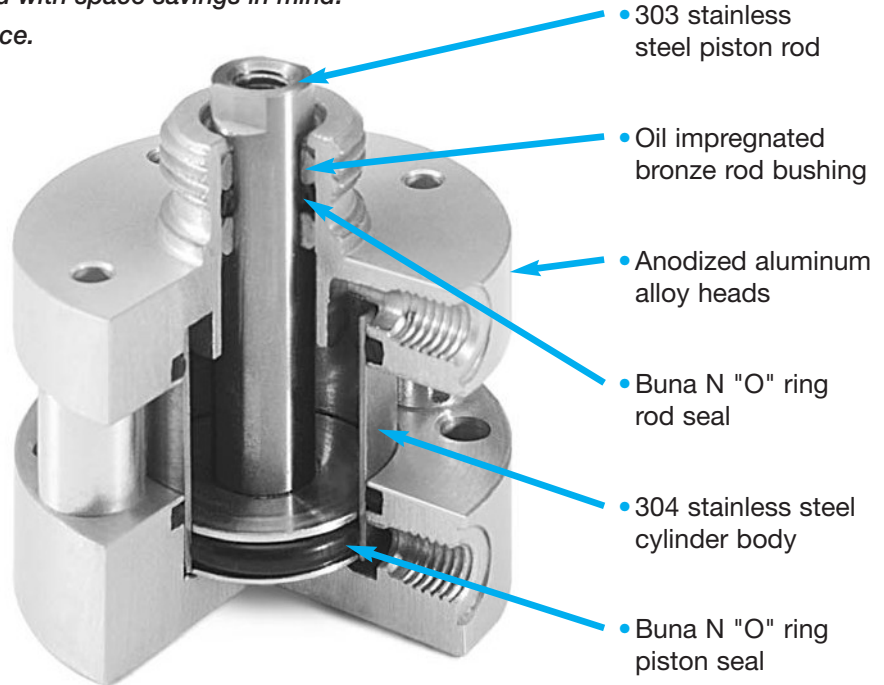
The dual piston rod, square nonrotating cylinder.

FO2, 3, 4 -

Force multiplying cylinders.

FOP -

For three positions.



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 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 2.9
- 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	02	- 9/16"	31	- 2"
FOD	- Double Acting, Double End Rod	04	- 3/4"	50	- 2-1/2"
FOR	- Reverse Acting	09	- 1-1/16"	70	- 3"
FOS	- Single Acting	17	- 1-1/2"	125	- 4"
					0.125 - 1/8"
					0.25 - 1/4"
					0.375 - 3/8"
					ETC.

FO-170.125-1V

MOUNTING OPTIONS	
(Enter in numeric order)	
No Number	- Basic model (Standard counter-bored 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 2.7).
³ Available in FO, FOR and FOS models; includes heavy-duty rear head and wiper.

OPTIONS	
(Enter in alphabetical order, except 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 2.6)
CMT	- Male rod end (coarse thread) (see page 2.9)
G	- Magnalube® G
H	- Hollow rod (double end models only) (see page 2.9)
HD	- Heavy duty rear head (see page 2.8)
J	- Failsafe operation (FOS models) ²
L	- Low friction seals (see table page 2.8)
M, M1, M3, M4	- Magnetic position sensing (see Related Products, page 8.8) ³
MT	- Male rod end (fine thread) (see page 2.9)
NT	- Non-threaded rod
P2, P3, P4	- Front port position #2, etc. (see page 2.5) 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)
W	- Rod wiper (Buna N only) (see page 2.9)
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 .03" per end (.06" for option B): FOS, BR only; FOR, BF only.
² Not available in 9/16" bore.
³ 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.

Flat-1 / Square Flat-1
 Flat-1 / Square Flat-1
 F02, F03, F04 (multiple power)
 F0P (multiple position)
 Flat Accessories
 EF1 / EF2
 Stopper / Twist Clamp
 Flat Lift Table
 Twin Bore
 NPA / LPA
 Diaphragm / Miniature Cube

Bimba FLAT-1

List Prices

Basic Model	Base Price by Bore Size							
	9/16"	3/4"	1-1/16"	1-1/2"	2"	2-1/2"	3"	4"
FO	\$36.30	\$37.50	\$48.60	\$57.90	\$66.60	\$84.60	\$104.30	\$153.50
FOS (0-1" Stroke)	38.90	41.40	53.60	62.10	71.30	90.60	111.60	165.10
FOS (1-1/8-4" Stroke)	42.60	44.00	56.90	66.70	76.00	98.30	119.30	172.80
FOR (0-1" Stroke)	46.70	48.10	61.10	73.50	82.90	102.80	124.40	184.20
FOR (1-1/8-4" Stroke)	47.70	49.40	62.40	78.20	87.60	110.50	132.00	191.70
Add per 1/8" of Stroke	0.25	0.25	0.35	0.45	0.70	0.85	0.90	1.10
FOD	52.60	54.10	68.00	83.70	96.20	119.10	143.40	203.30
Add per 1/8" of Stroke	0.30	0.30	0.40	0.70	0.85	0.95	1.05	1.35

Mounting Options	Adders by Bore Size							
	9/16"	3/4"	1-1/16"	1-1/2"	2"	2-1/2"	3"	4"
Pivot Mount (Options 1, 1N)	\$10.35	\$10.90	\$12.65	\$17.15	\$19.95	\$25.65	\$31.00	\$42.20
Trunnion Mount (Option 2, 2F, 2R)	N/A	9.05 per end	9.05 per end	9.05 per end	9.05 per end	10.30 per end	10.30 per end	10.90 per end
Threaded Mounting Holes (Options 3, 3F, 3R)	2.70 per end	2.85 per end	3.05 per end	3.75 per end	3.75 per end	4.40 per end	4.40 per end	5.35 per end
Screw Clearance Holes (Options 4, 4F, 4R)	2.25 per end	2.35 per end	2.35 per end	2.35 per end	2.35 per end	2.35 per end	2.35 per end	2.35 per end
Nose Mount (Option 5)	5.20	6.05	20.10	22.40	28.65	31.60	33.55	44.55

Options	Adders by Bore Size							
	9/16"	3/4"	1-1/16"	1-1/2"	2"	2-1/2"	3"	4"
B (both ends)	\$9.20	\$9.20	\$19.55	\$19.55	\$25.85	\$26.15	\$26.15	\$43.05
BF (front only)	5.80	5.80	13.80	13.80	20.10	20.10	20.10	32.15
BR (rear only)	3.45	3.45	5.80	5.80	5.80	6.05	6.05	10.90
EE (each 1/2" each end)	0.65	0.65	0.75	0.90	1.10	1.10	1.20	1.65
H	4.60	4.85	5.45	6.05	7.90	7.90	8.95	11.05
J (With Standard Seals)	N/A	.15	.20	.20	.25	.25	.25	.30
J (With High Temperature Seals)	N/A	.45	.70	.70	.85	.85	1.00	2.75
MT, CMT (each end)	3.60	3.80	4.25	4.60	6.40	6.40	7.55	9.05
V (With Standard Seals)								
Single Acting	1.80	1.85	3.20	5.25	7.05	10.15	14.00	19.10
Reverse Acting	2.35	2.65	4.25	6.50	8.35	11.35	15.65	20.85
Double Acting	3.50	3.75	5.45	8.75	11.55	15.70	23.00	28.80
Double End Rod	4.30	4.45	6.55	10.00	12.85	16.95	24.80	30.70
V (With Low Friction Seals)								
Single Acting	5.05	5.20	8.75	11.20	17.65	22.75	26.15	33.85
Reverse Acting	5.70	5.90	9.80	12.45	18.95	24.05	28.35	35.60
Double Acting	10.25	10.40	16.60	20.65	32.75	41.40	48.50	58.40
Double End Rod	10.75	11.05	17.60	21.85	34.15	42.65	50.20	60.05
W								
Single End	6.25	6.65	8.15	8.70	10.25	10.80	12.50	13.15
Double End	12.55	13.25	16.35	17.15	20.30	21.60	25.00	26.35
L	3.10	3.20	3.90	4.40	5.20	6.35	7.40	8.75
Magnetic Piston Sensing (Options M, M1, M3, M4)	5.65	5.65	5.65	8.35	13.95	20.85	25.10	27.70
S	1.90	1.90	1.90	2.25	2.25	3.00	3.00	6.25
Switch Mounting Post (Options T1, T3, T4) (Per post)	2.10	2.10	2.75	2.75	2.75	3.40	3.40	3.40
Y (Adder per 1/8" of stroke)	.35	.35	.35	.35	.35	.35	.35	.35
Q (Low Temp Seals)								
Single Acting	1.95	2.40	3.05	3.80	4.75	5.95	7.40	9.25
Reverse Acting	2.15	2.70	3.35	4.20	5.20	6.50	8.15	10.20
Double Acting	2.20	2.75	3.45	4.35	5.40	6.75	8.50	10.60
Double End Rod	2.75	3.45	4.35	5.40	6.75	8.50	10.60	13.30
Q (Low Temp w/L Option)								
Single Acting	4.10	5.20	6.45	8.10	10.15	12.70	15.85	19.85
Reverse Acting	4.60	5.80	7.20	8.95	11.20	14.00	17.50	21.85
Double Acting	4.75	5.95	7.40	9.30	11.65	14.60	18.20	22.80
Double End Rod	5.95	7.40	9.30	11.65	14.60	18.20	22.80	28.50

No charge options – CFT, G, HD, NT, P2, P3, P4.

Bimba FLAT-1

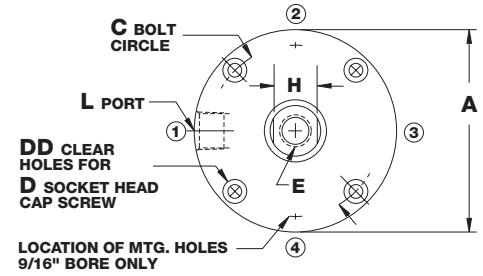
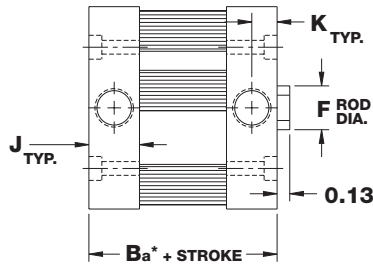
Basic Models

Model FO

(Double Acting,
Single 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"



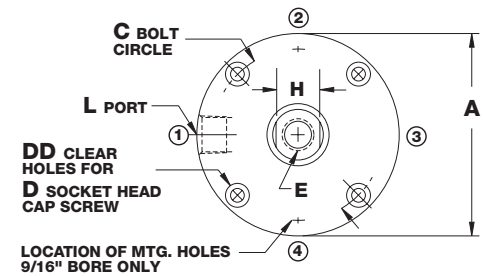
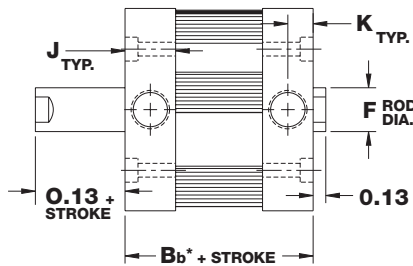
*Some options affect cylinder length; see page 2.8.

Model FOD

(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"



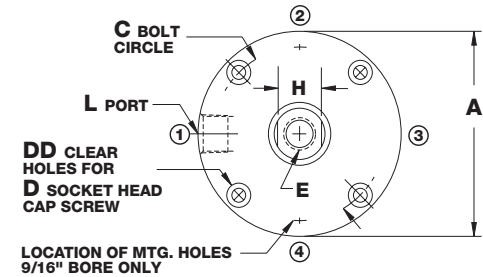
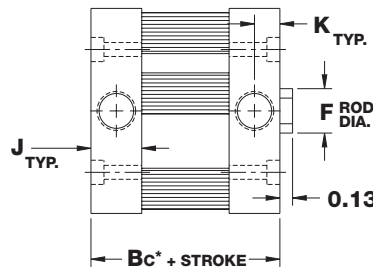
*Some options affect cylinder length; see page 2.8.

Model FOS

(Single Acting,
Spring Return,
Rod Normally Retracted)

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"



See page 2.9 for spring forces.

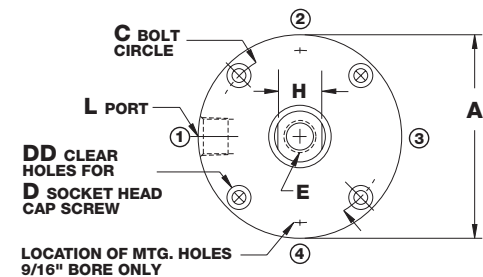
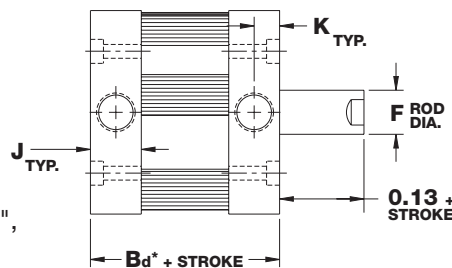
*Some options affect cylinder length; see page 2.8.

Model FOR

(Reverse Acting,
Spring Return,
Rod Normally Extended)

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"
2"-4" Bores
3" stroke max



See page 2.9 for spring forces.

*Some options affect cylinder length; see page 2.8.

Flat-1/
Square Flat-1

Flat-II/
Square Flat-II

F02, F03, F04
(multiple power)

F0P
(multiple position)

Flat
Accessories

EF1/EF2

Stopper/
Twist Clamp

Extruded
Flat Lift Table

Twin Bore

NPA/LPA

Diaphragm/
Miniature Cube

Bimba FLAT-1

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	3.81	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

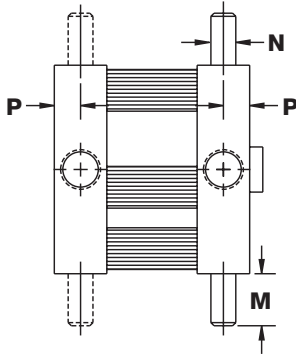
*See page 2.8 for length adders for options.

Bimba FLAT-1

Mounting Options

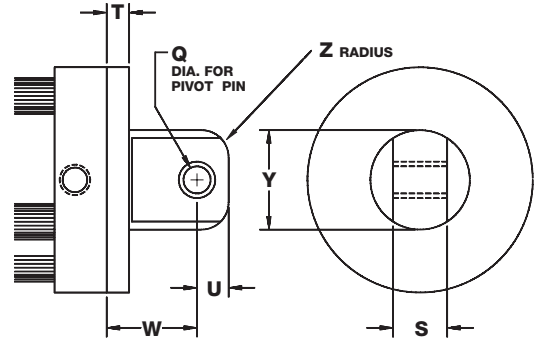
Trunnion Mount

(rear, front or both)
(-2F shown)
Not available in 9/16" bore.



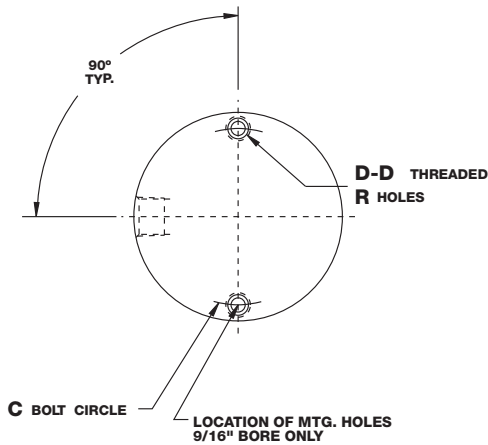
Pivot Mount

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

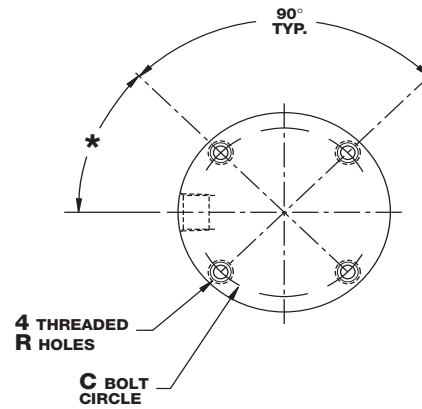


Threaded Mounting Holes

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



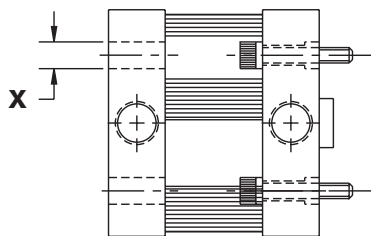
3/4" Bore and larger



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

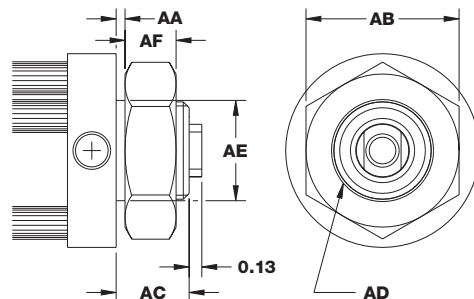
Screw Clearance Holes

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



Nose Mount

(available in FO, FOS, FOR)
(-5 shown)



Flat-1/
Square Flat-1

Flat-II/
Square Flat-II

FO2, FO3, FO4
(multiple power)

FOP
(multiple position)

Flat
Accessories

EF1/EF2

Stopper/
Twist Clamp

Extruded
Flat Lift Table

Twin Bore

NPA/LPA

Diaphragm/
Miniature Cube

Bimba FLAT-1

Dimensions (in.)

(Mounting Options)

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.)

(Mounting Options)

**Maximum Torque
Recommendations for
Nose Mount Option (ft.-lbs.)**

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

Bore	Maximum Torque
9/16" (02)	12
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

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

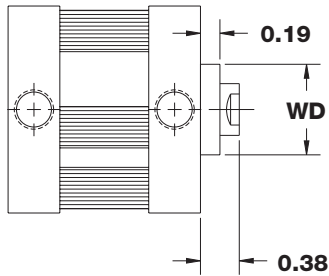
*Heavy duty rear head is recommended for applications where the cylinder is mounted on the front face or trunnion-mounted, and impact loading (20 or more cycles per minute) occurs between the piston and rear head. It increases the overall length of the cylinder as shown.

**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

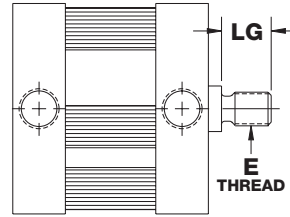
Options

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 (lbs.)	Spring Rate			
		0.12 to 1" Stroke (lbs./in.)	1.001 to 2" Stroke (lbs./in.)	2.001 to 3" Stroke (lbs./in.)	3.001 to 4" Stroke (lbs./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

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-1

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

Bimba Square FLAT-1

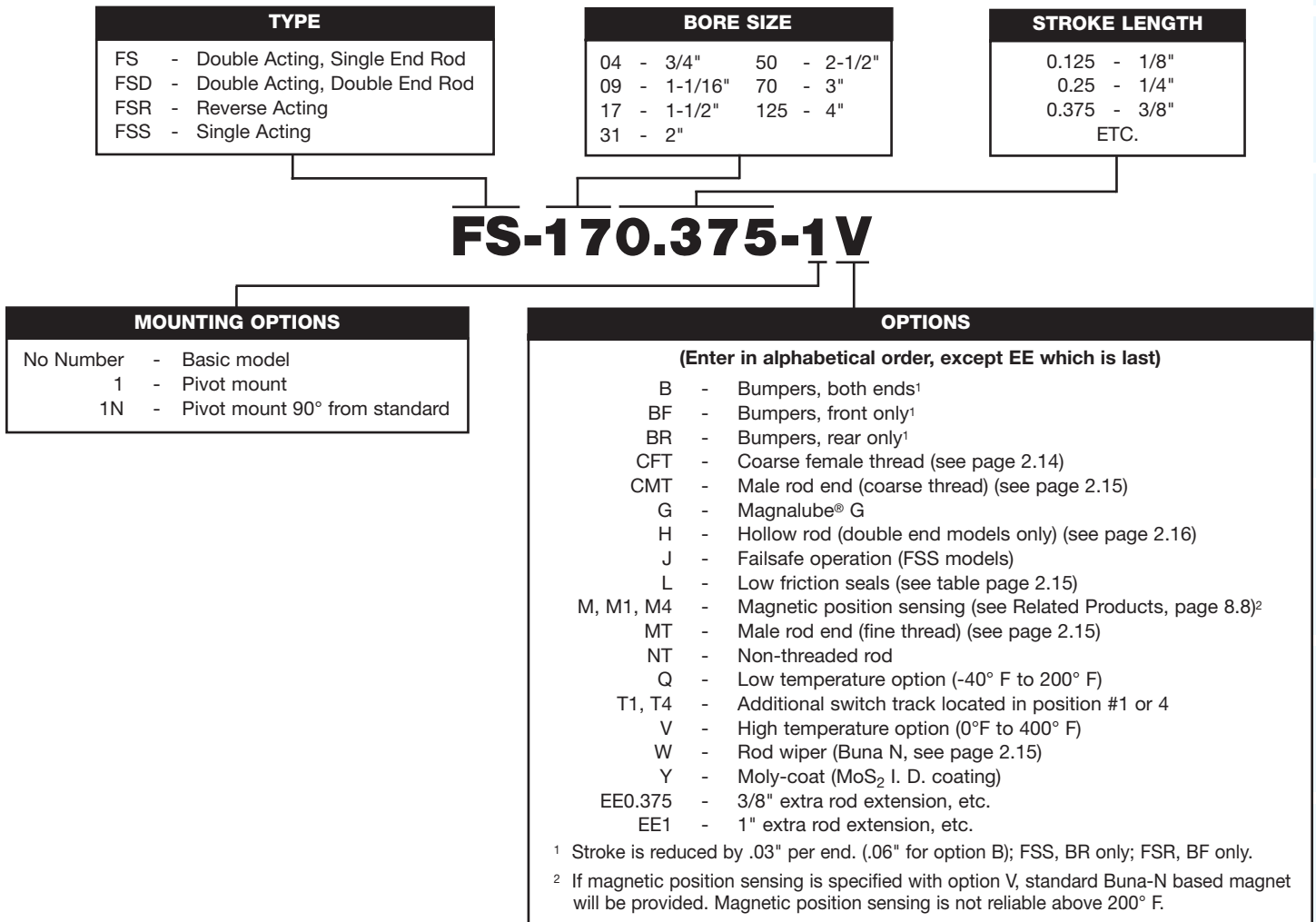
The convenient alternative for horizontal and side mounting, with provisions for both bottom flush or face mounting. The Square Flat-1 also minimizes the centerline distance when cylinders are mounted side-by-side.



- 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 2.16
- 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 Square 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.



Flat-1/
Square Flat-1

Flat-II/
Square Flat-II

F02, F03, F04
(multiple power)

F0P
(multiple position)

Flat
Accessories

EF1/EF2

Stopper/
Twist Clamp

Extruded
Flat Lift Table

Twin Bore

NPA/LPA

Diaphragm/
Miniature Cube

Bimba Square FLAT-1

List Prices

Basic Model	Base Price by Bore Size						
	3/4"	1-1/16"	1-1/2"	2"	2-1/2"	3"	4"
FS	\$43.90	\$52.40	\$65.30	\$75.20	\$104.50	\$121.60	\$221.00
FSS (0-1" Stroke)	46.20	56.40	70.00	85.30	112.10	132.00	236.30
FSS (1-1/8-4" Stroke)	51.20	63.40	83.70	98.50	118.60	139.10	243.30
FSR (0-1" Stroke)	50.40	62.40	77.80	88.10	122.20	146.00	256.50
FSR (1-1/8-4" Stroke)	56.60	69.10	85.20	98.60	128.80	153.00	263.60
Add per 1/8" of Stroke	0.25	0.35	0.45	0.70	0.75	0.85	1.05
FSD	63.30	72.20	87.80	104.30	146.80	171.00	282.50
Add per 1/8" of Stroke	0.30	0.40	0.70	0.85	0.90	1.00	1.30

Mounting Options	Base Price by Bore Size						
	3/4"	1-1/16"	1-1/2"	2"	2-1/2"	3"	4"
Pivot Mount (Options 1, 1N)	\$14.40	\$15.65	\$19.90	\$22.30	\$26.30	\$31.65	\$43.15

Options	Adders by Bore Size						
	3/4"	1-1/16"	1-1/2"	2"	2-1/2"	3"	4"
B (both ends)	\$9.20	\$19.55	\$19.55	\$25.85	\$26.15	\$26.15	\$43.05
BF (front only)	5.80	13.80	13.80	20.10	20.10	20.10	32.15
BR (rear only)	3.45	5.80	5.80	5.80	6.05	6.05	10.90
EE (each 1/2" each end)	0.65	0.75	0.90	1.10	1.05	1.15	1.50
H	4.85	5.45	6.35	7.90	7.40	8.85	10.35
J (With Standard Seals)	0.15	0.20	0.20	0.25	0.25	0.25	0.30
J (With High Temperature Seals)	0.45	0.70	0.70	0.85	0.85	1.00	2.75
MT, CMT (each end)	3.80	4.25	4.60	6.40	6.05	7.15	8.50
V (With Standard Seals)							
Single Acting	1.85	3.20	5.25	7.05	9.50	13.25	18.05
Reverse Acting	2.65	4.25	6.50	8.35	10.65	14.75	19.65
Double Acting	3.75	5.45	8.75	11.55	14.80	21.70	27.20
Double End Rod	4.45	6.55	10.00	12.85	15.95	23.35	29.00
V (With Low Friction Seals)							
Single Acting	5.20	8.75	11.20	17.65	21.45	24.55	31.95
Reverse Acting	5.90	9.80	12.45	18.95	22.70	26.70	33.55
Double Acting	10.40	16.60	20.65	32.75	39.05	45.80	55.05
Double End Rod	11.05	17.60	21.85	34.15	40.20	47.30	56.70
W							
Single End	6.65	8.15	8.55	10.25	10.25	11.75	12.45
Double End	13.25	16.30	17.15	20.40	20.35	23.55	24.90
L	3.20	3.90	4.40	5.20	6.00	7.05	8.20
Magnetic Piston Sensing (Options M, M1, M4)	5.65	5.65	8.30	13.95	19.65	23.70	26.20
Switch Mounting Post (Options T1, T4)	3.25	3.25	3.25	3.25	3.25	3.25	3.25
Y (Add per 1/8" of stroke)	0.35	0.35	0.35	0.35	0.35	0.35	0.35
Q (With Low Temp Seals)							
Single Acting	2.40	3.05	3.80	4.75	5.95	7.40	9.25
Reverse Acting	2.70	3.35	4.20	5.20	6.50	8.15	10.20
Double Acting	2.75	3.45	4.35	5.40	6.75	8.50	10.60
Double End Rod	3.45	4.35	5.40	6.75	8.50	10.60	13.30
Q (Low Temp w/L Option)							
Single Acting	5.20	6.45	8.10	10.15	12.70	15.85	19.85
Reverse Acting	5.80	7.20	8.95	11.20	14.00	17.50	21.85
Double Acting	5.95	7.40	9.30	11.65	14.60	18.20	22.80
Double End Rod	7.40	9.30	11.65	14.60	18.20	22.80	28.50

No charge options – CFT, G, NT.

Bimba Square FLAT-1

Basic Models

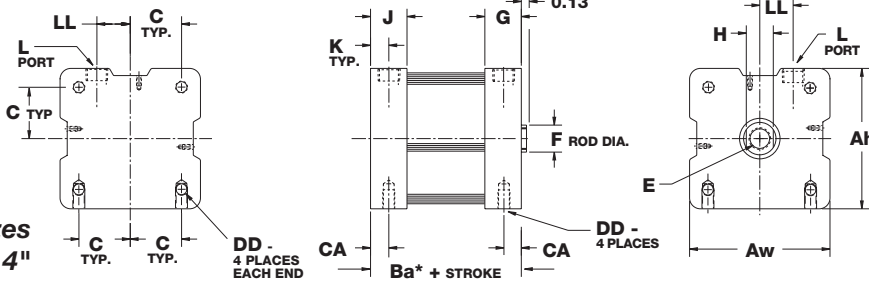
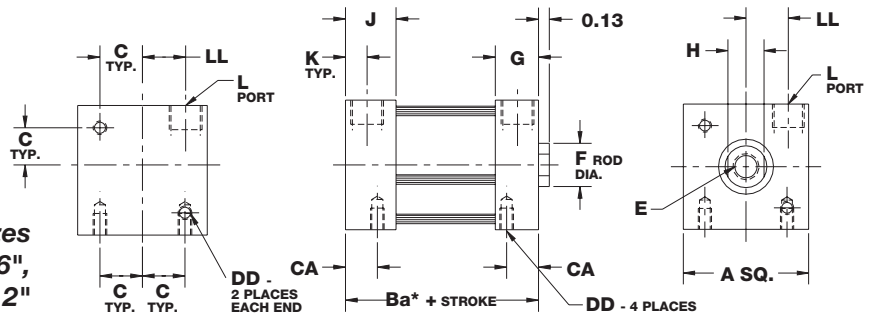
Model FS

(Double Acting, Single 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 2.15.

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



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

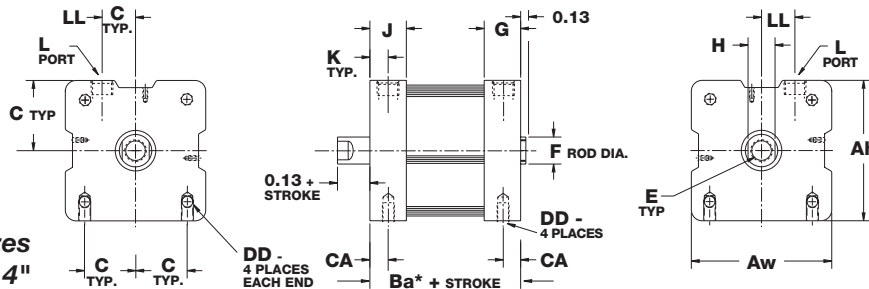
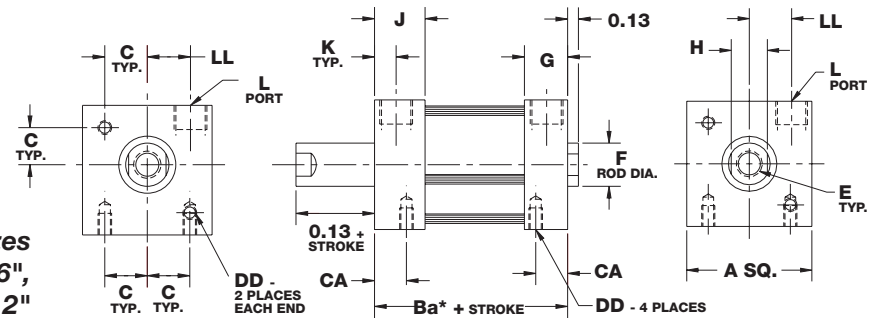
Model FSD

(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 2.15.

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



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

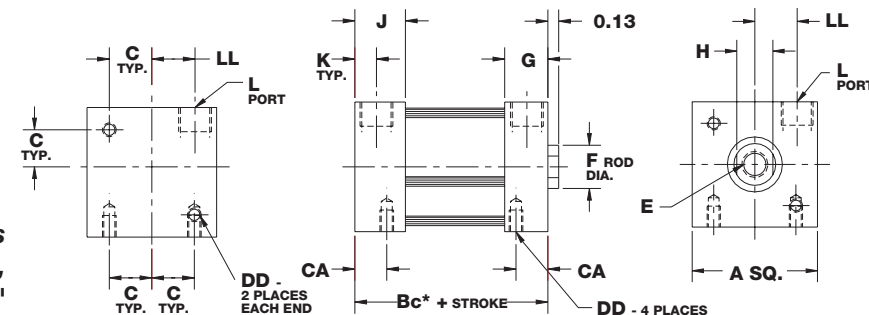
Model FSS

(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 2.16 for spring forces.

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



- Flat-1/
Square Flat-1
- Flat-II/
Square Flat-II
- F02, F03, F04
(multiple power)
- F0P
(multiple position)
- Flat
Accessories
- EF1/EF2
- Stopper/
Twist Clamp
- Extruded
Flat Lift Table
- Twin Bore
- NPA/LPA
- Diaphragm/
Miniature Cube

Bimba Square FLAT-1

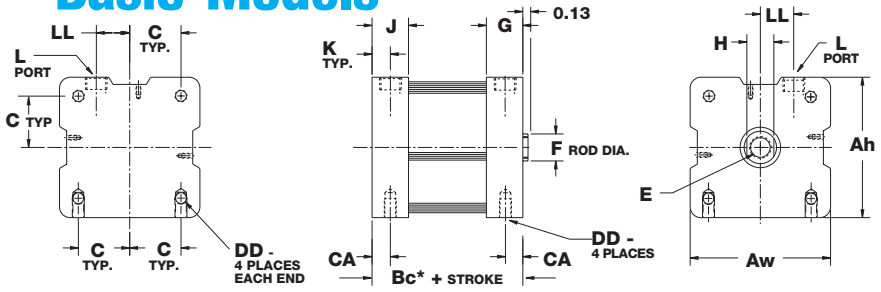
Basic Models

Model FSS

(Continued)

*Some options affect cylinder length; see page 2.15.

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



Model FSR

(Reverse Acting, Spring Return, Rod Normally Extended)

Standard strokes

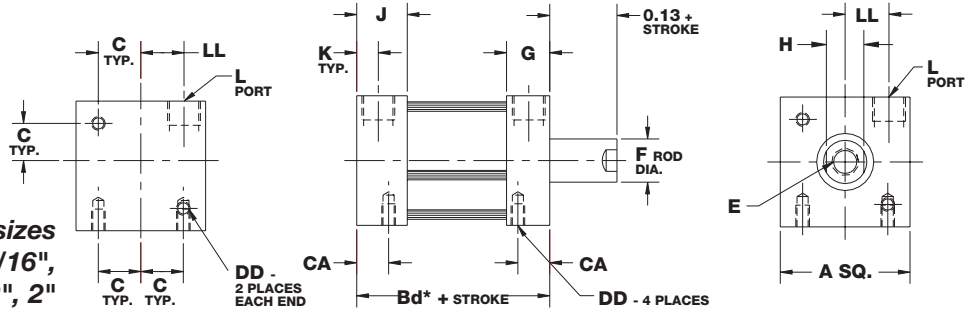
1/8", 1/4", 3/8", 1/2",
5/8", 3/4", 7/8", 1",
1-1/4", 1-1/2", 1-3/4", 2",
2-1/2", 3", 3-1/2", 4"

2"-4" Bores
3" stroke max

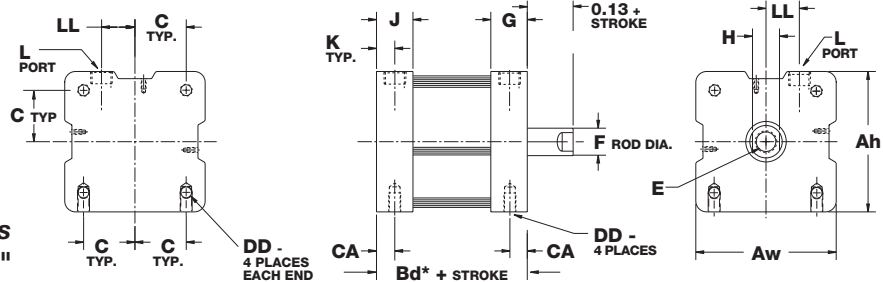
See page 2.16 for spring forces.

*Some options affect cylinder length; see page 2.15.

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

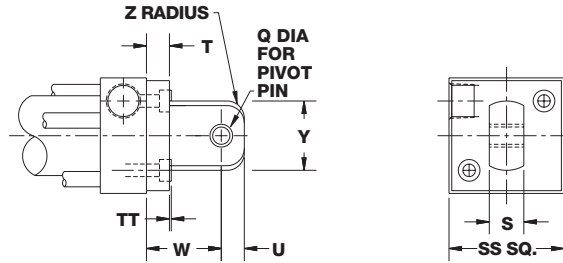
* See page 2.15 for length adders for options.

Bimba Square FLAT-1

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 2.41 for dimensions.

Options

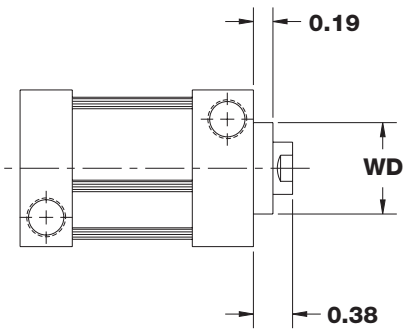
(Dimensional variations from standard as shown.)

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 2.24.

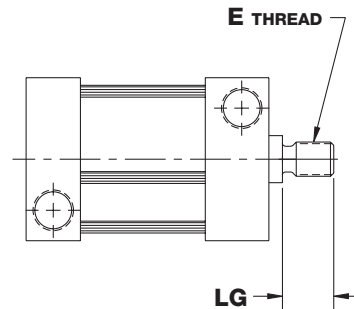
Rod Wiper (Option W)

(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-1

Options

Enclosed Spring Forces

Bore	Maximum Force (lbs.)	Spring Rate			
		0.12 to 1" Stroke (lbs./in.)	1.001 to 2" Stroke (lbs./in.)	2.001 to 3" Stroke (lbs./in.)	3.001 to 4" Stroke (lbs./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

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

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

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

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

**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

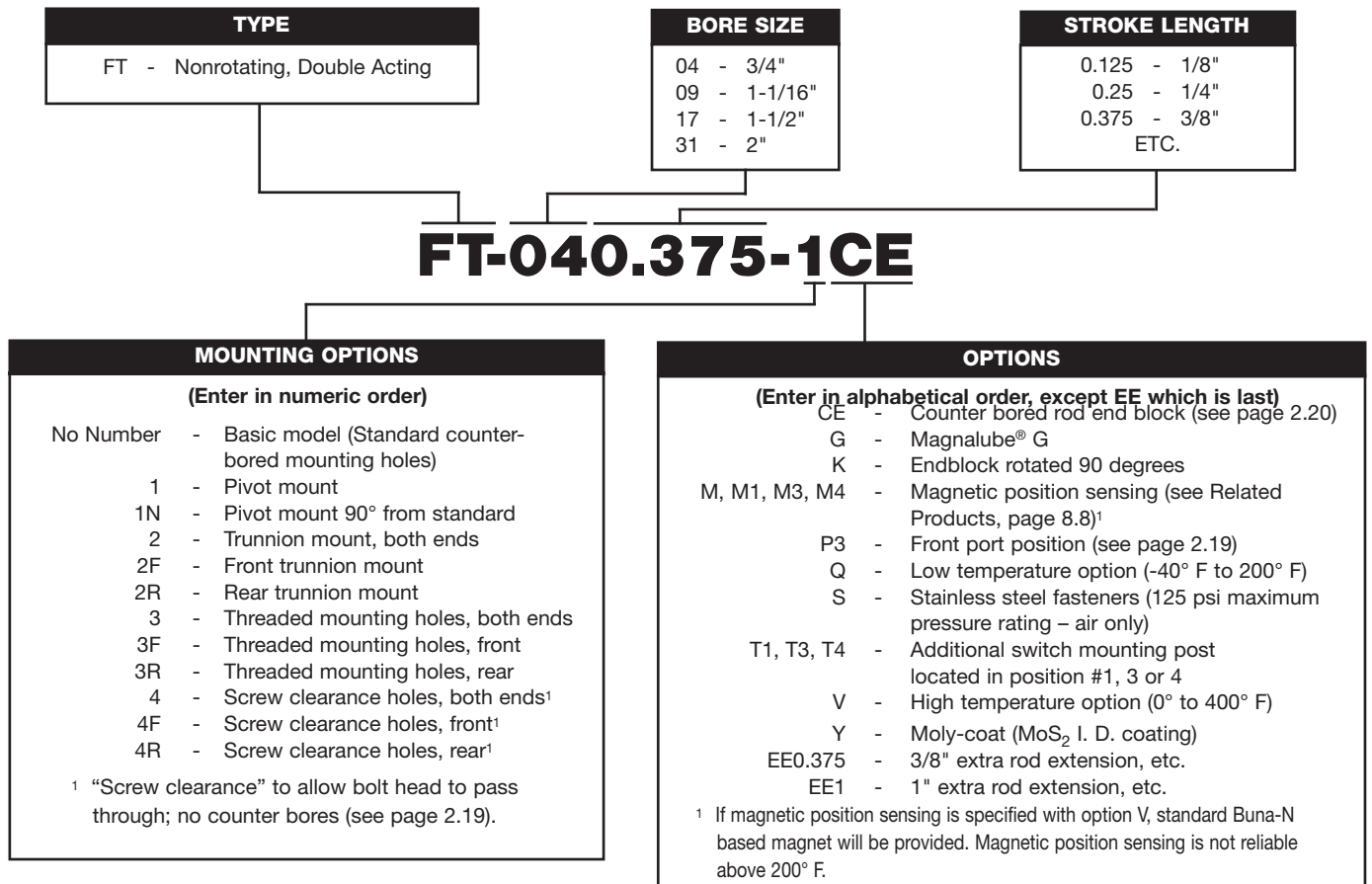


Flat-II nonrotating, double-acting cylinder provides the answer to applications where rotation cannot be tolerated and space is at a minimum. Nonrotation is achieved with dual piston rods and a rod end block that insures the rods work in tandem. Flat-II eliminates the need for external alignment devices,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



Bimba FLAT-11

Price List

Basic Model	Base Price by Bore Size			
	3/4"	1-1/16"	1-1/2"	2"
Base Model	\$56.00	\$73.40	\$87.00	\$100.50
Adder per 1/8" of stroke	0.30	0.40	0.65	0.75

Mounting Options	Adders by Bore Size			
	3/4"	1-1/16"	1-1/2"	2"
Pivot Mount (Options 1, 1N)	\$10.90	\$12.65	\$17.20	\$19.95
Trunnion Mount (Options 2, 2F, 2R)	9.05 per end	9.05 per end	9.05 per end	9.05 per end
Threaded Mounting Holes (Options 3, 3F, 3R)	2.85 per end	3.05 per end	3.75 per end	3.75 per end
Screw Clearance Holes (Options 4, 4F, 4R)	2.35 per end	2.35 per end	2.35 per end	2.35 per end

Options	Adders by Bore Size			
	3/4"	1-1/16"	1-1/2"	2"
EE (each 1/2" each end)	\$0.65	\$0.75	\$0.90	\$1.10
Magnetic Position Sensing (Options M, M1, M3, M4)	5.65	5.65	8.35	13.95
S	1.90	1.90	2.25	2.25
Switch Mounting Post (Options T1, T3, T4)	2.10	2.75	2.75	2.75
High Temperature Seals (Option V)	11.35	17.90	22.20	34.60
Y (Adder per 1/8" of stroke)	0.35	0.35	0.35	0.35
Q (low temp seals)	4.85	6.05	7.55	9.45

No charge options – CE, G, K, P3.

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-11

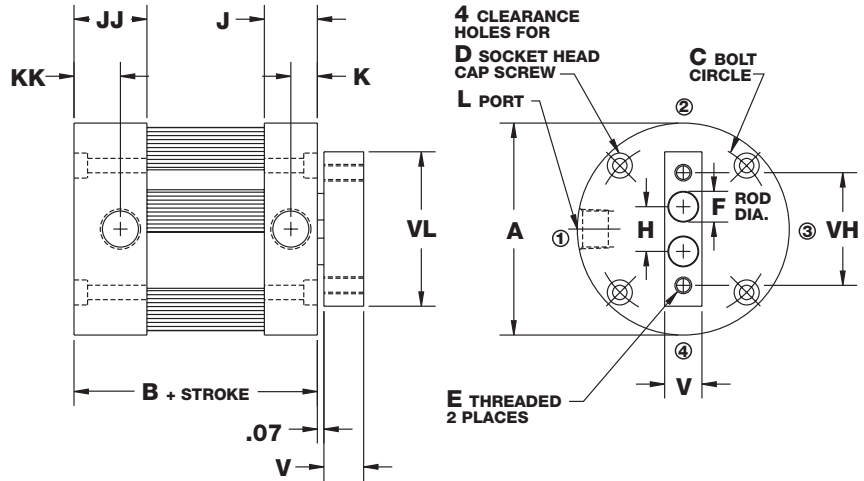
Basic Model

Model FT

(Nonrotating, double acting)

Standard strokes

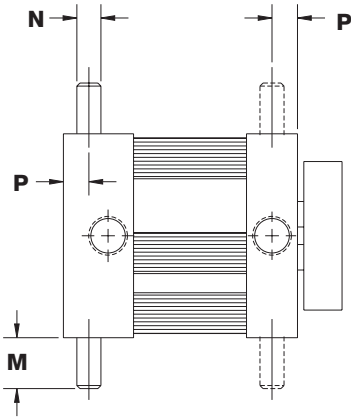
1/8", 1/4", 3/8", 1/2", 5/8",
3/4", 7/8", 1", 1-1/4", 1-1/2",
2", 2-1/2", 3", 3-1/2", 4"
Longer strokes available
upon request



Mounting Options

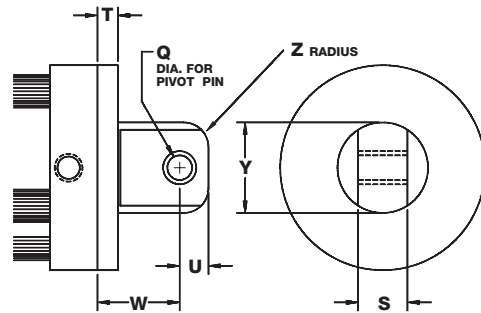
Trunnion Mount

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



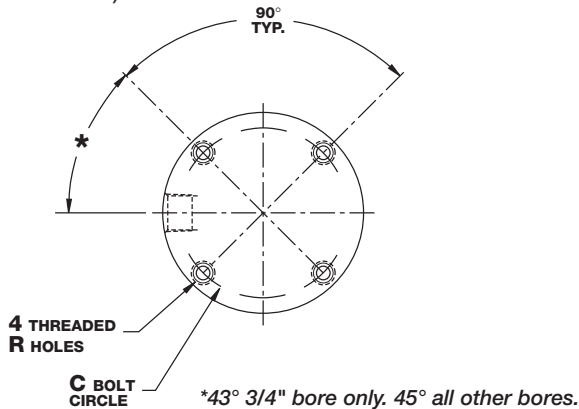
Pivot Mount

(complete with bronze bushing)
(-1 shown)



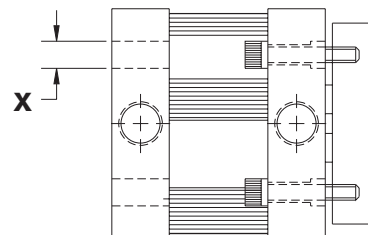
Threaded Mounting Holes

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



Screw Clearance Holes

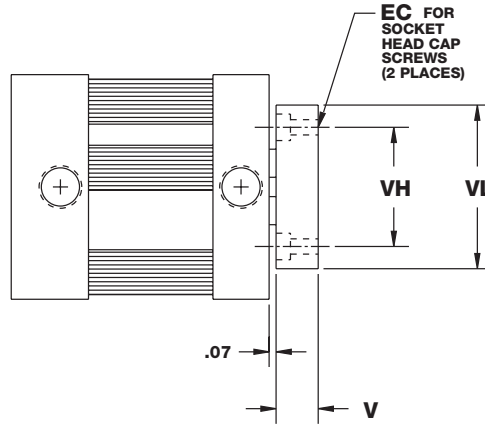
(available either or both ends)
(-4R shown)



Bimba FLAT-11

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-11

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:

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

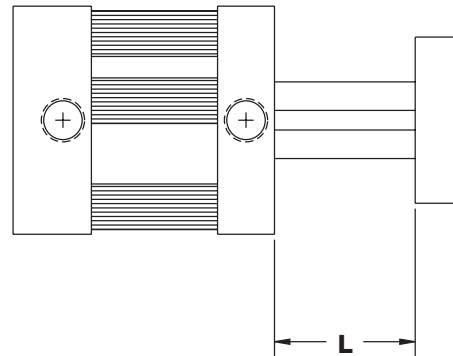
Where T = Torque (in.-lb.)
 L = Length (see sketch below)
 K = Per chart above
 \emptyset = Angular deflection

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

Rotational Tolerance

Bore	Maximum Rotation
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-11

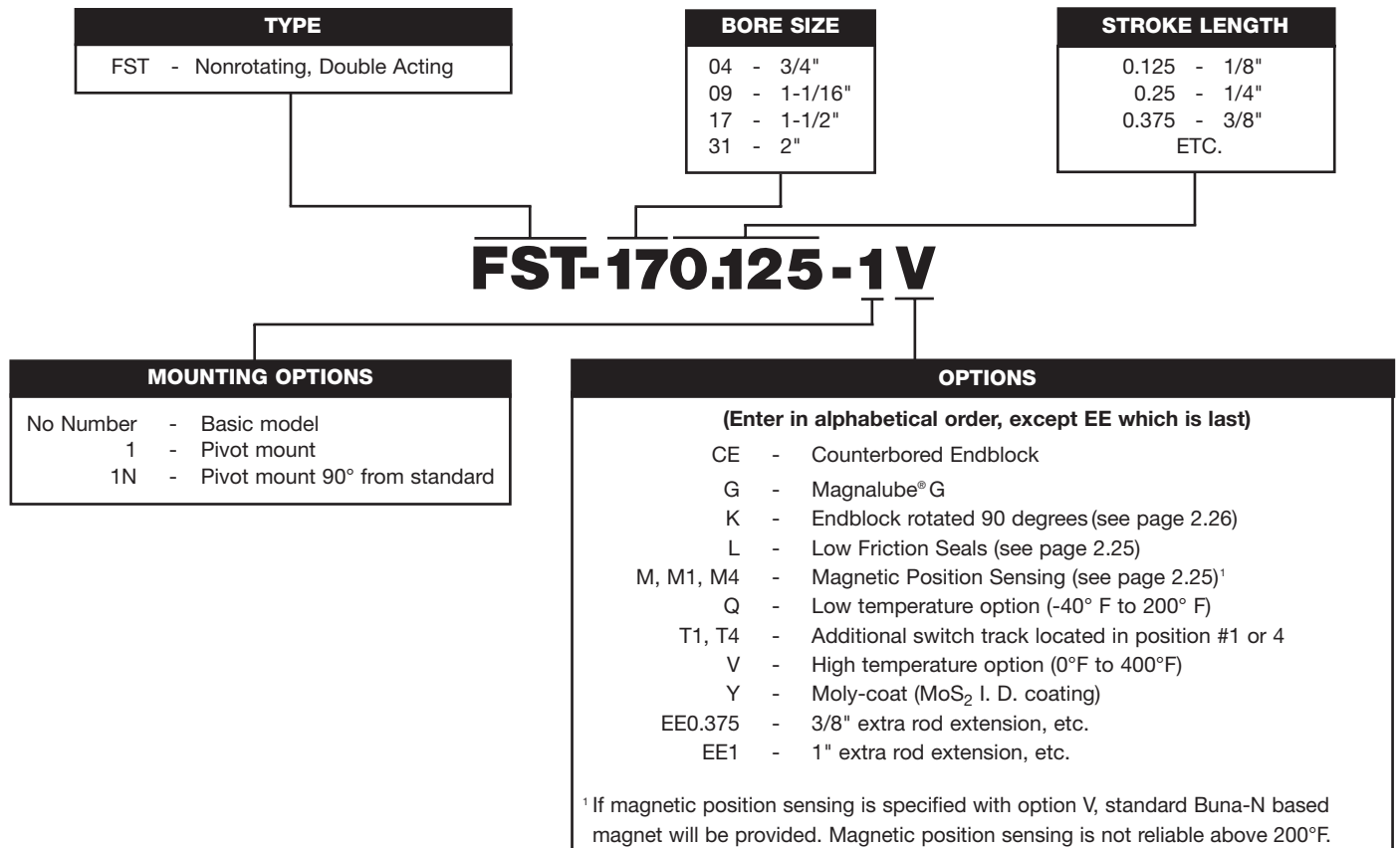
Square Flat-II nonrotating, double acting cylinder provides the answer to applications where rotation cannot be tolerated. Nonrotation is achieved with dual piston rods and a rod end block that insures the rods work in tandem. Square Flat-II eliminates the need for external alignment devices. It also 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-11

Price List

Basic Model	Base Price by Bore Size			
	3/4" (04)	1-1/16" (09)	1-1/2" (17)	2" (31)
Base Model	\$64.70	\$83.00	\$98.60	\$113.70
Adder per 1/8" of Stroke	0.30	0.40	0.65	0.75
Mounting Options	Adders by Bore Size			
	3/4" (04)	1-1/16" (09)	1-1/2" (17)	2" (31)
Pivot Mount (Options 1,1N)	\$14.40	\$15.65	\$19.90	\$22.30
Options	Adders by Bore Size			
	3/4" (04)	1-1/16" (09)	1-1/2" (17)	2" (31)
EE (each 1/2" each end)	\$0.65	\$0.75	\$0.90	\$1.10
V Option (Standard Seals)	4.45	6.55	10.00	12.85
V Option (Low Friction Seals)	11.35	17.90	22.20	34.60
L (Low Friction Seals)	3.20	3.90	4.40	5.20
Magnetic Position Sensing (Options M, M1, M3, M4)	5.65	5.65	8.35	13.95
Switch Mounting Post (Options T1, T4) (Per post)	3.25	3.25	3.25	3.25
Q Option (Standard Seals)	4.85	6.05	7.55	9.45
Q Option (Low Friction Seals)	10.35	12.90	16.30	20.35
Y (Adder per 1/8" of stroke)	0.35	0.35	0.35	0.35

No Charge Options - CE, G, K

Bimba Square FLAT-11

Basic Model

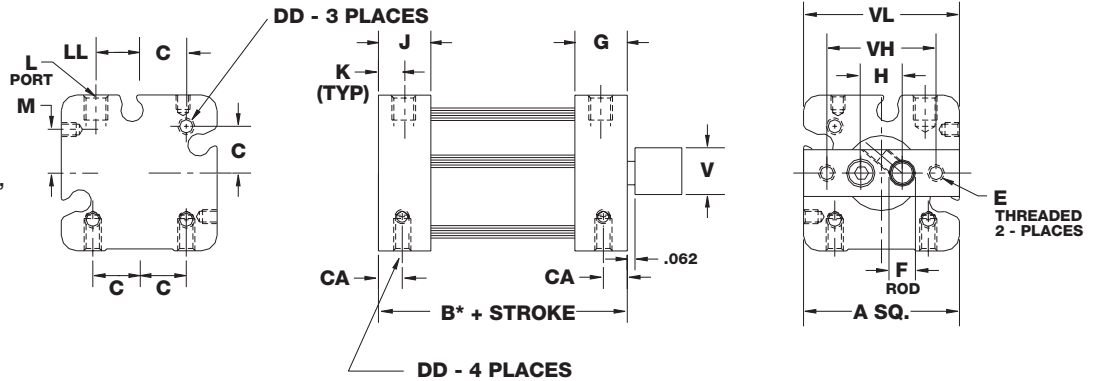
Model FST

(Nonrotating, double acting)

Standard strokes

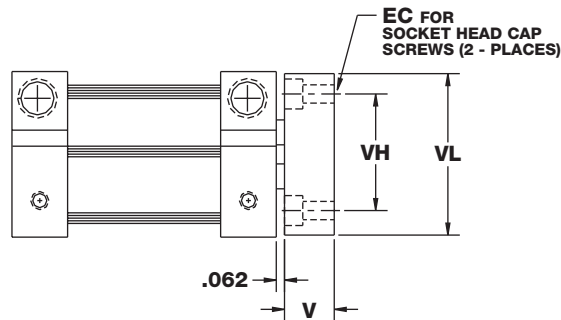
1/8", 1/4", 3/8", 1/2", 5/8",
3/4", 7/8", 1", 1-1/4",
1-1/2", 1-3/4", 2", 2-1/2",
3", 3-1/2", 4"

*Some options affect cylinder length; see page 2.25.



Dimensions (in.)

Counterbored Rod End Block



Bore	A	B	C	CA	DD	E	EC	F	G	H
3/4" (04)	1.25	0.75	0.38	0.28	#6-32 UNC	#6-32 UNC	#6	0.19	0.42	0.332
1-1/16" (09)	1.50	1.25	0.50	0.38	#8-32 UNC	#8-32 UNC	#8	0.25	0.58	0.422
1-1/2" (17)	2.00	1.25	0.69	0.31	#10-24 UNC	1/4-20 UNC	1/4	0.38	0.58	0.562
2" (31)	2.50	1.31	0.88	0.38	#1/4-20 UNC	5/16-18 UNC	5/16	0.50	0.62	0.750

Bore	J	K	L	LL	M	V	VH	VL
3/4" (04)	0.42	0.19	#10-32	0.35	0.349	0.38	0.88	1.25
1-1/16" (09)	0.50	0.25	1/8 NPT	0.45	0.321	0.38	1.06	1.44
1-1/2" (17)	0.50	0.25	1/8 NPT	0.60	0.200	0.50	1.50	2.00
2" (31)	0.62	0.25	1/8 NPT	0.76	0.186	0.63	1.88	2.50

A minimum stroke of .38" is required to sense extending end-of-stroke position.
See page 2.25 for length adders for magnet option.

Bimba Square FLAT-11

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

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

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.

Flat-1 /
Square Flat-1

Flat-11 /
Square Flat-11

F02, F03, F04
(multiple power)

F0P
(multiple position)

Flat
Accessories

EF1 / EF2

Stopper /
Twist Clamp

Extruded
Flat Lift Table

Twin Bore

NPA / LPA

Diaphragm /
Miniature Cube

Bimba Square FLAT-11

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-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:

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

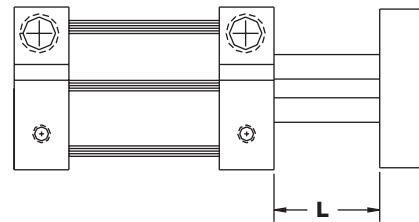
Where T = Torque (in.-lb.)
 L = Length (see sketch below)
 K = Per chart above
 \emptyset = Angular deflection

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

Rotational Tolerance

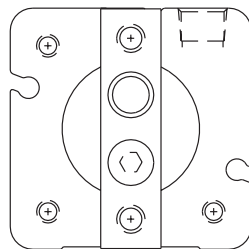
Bore	Maximum Rotation
3/4" (04)	±1°
1-1/16" (09)	±3/4°
1-1/2" (17)	±1/2°
2" (31)	±1/2°

Deflection L Value



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

Option K - Endblock Rotated 90°



Bimba F02 F03 F04



Space-Saving Cylinders That Multiply Force Output

The Bimba F02, F03, F04 Series Flat-1 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.

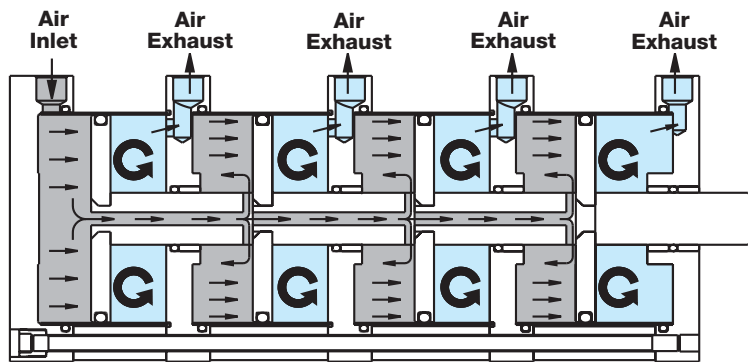
- Body — 304 Stainless Steel
- Heads — Anodized Aluminum Alloy
- Piston Rod — Ground and Polished 303 Stainless Steel
- Seals — Buna N (High temperature seals optional)
- Rod Bushing — Oil Impregnated Bronze
- Pressure Rating — 100 PSI Maximum (Air only)
- Temperature Rating — From -20°F to +150°F (-25°C 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.

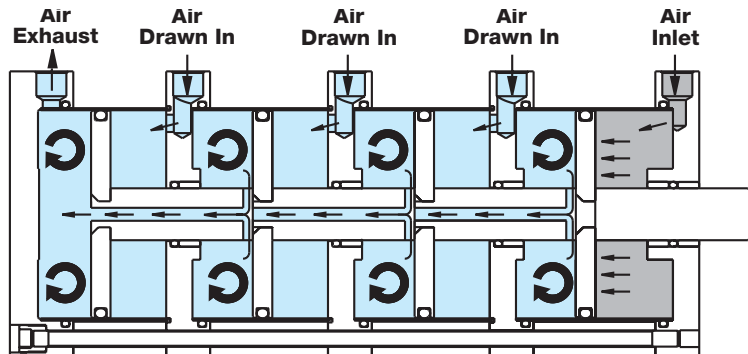
Fluoroelastomer seals rated for higher temperature applications are available. If cylinders are operated below 0°F (-18°C) for extended time periods, special modifications may be required. Special seal materials are available upon request.

How it Works

Extension-air supplied to multiple pistons



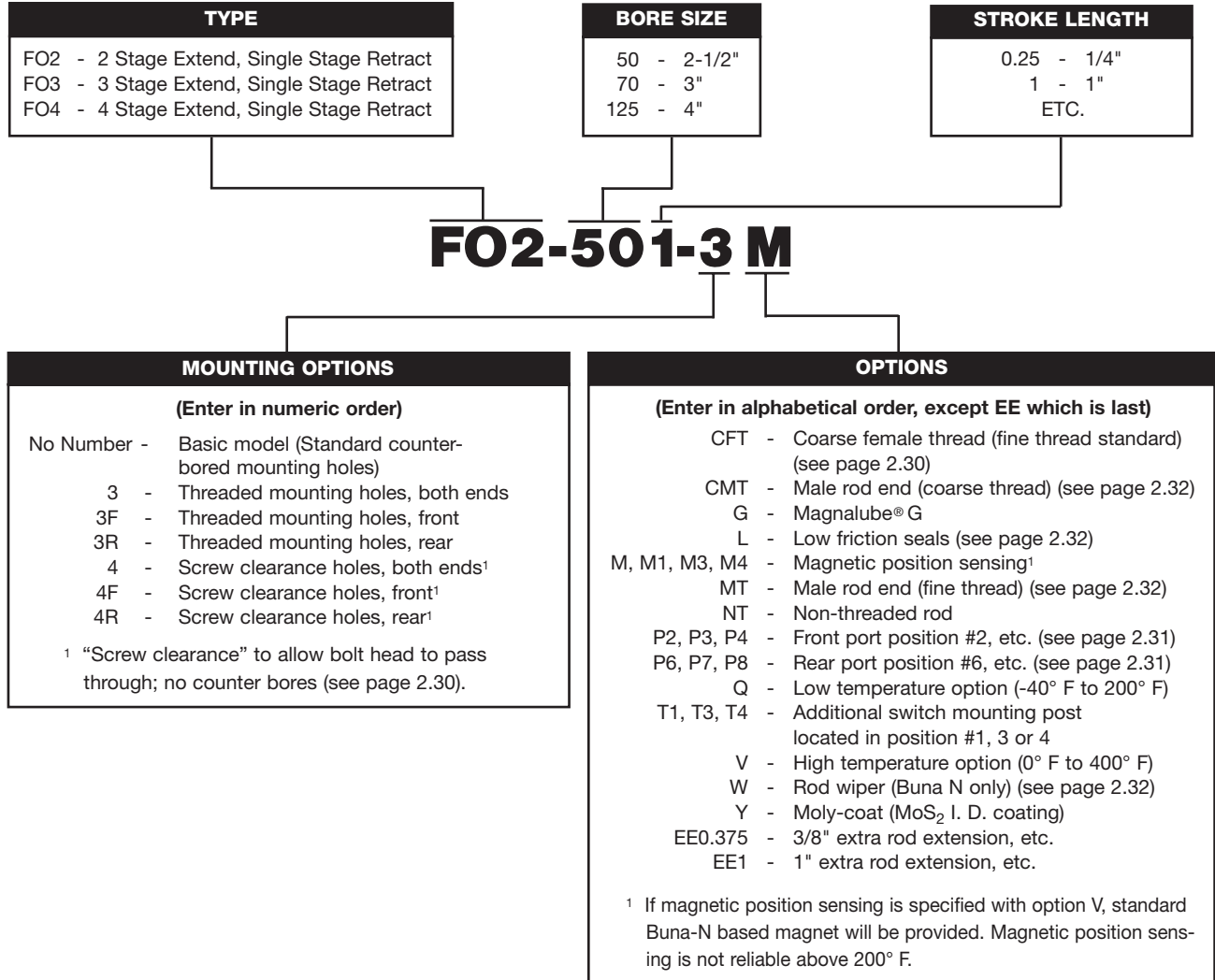
Retraction-air supplied to one piston only



Bimba FO2 FO3 FO4

How to Order

The model number for all FO2, FO3 and FO4 Series 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 our example of Model Number FO2-501-3M. This is a 2-1/2" bore FO2 Series Flat-1 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
		FO2	FO3	FO4	
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 FO2 FO3 FO4

List Prices

Basic Model	Base Price by Bore Size		
	2-1/2"	3"	4"
FO2	\$139.70	\$174.50	\$253.40
Adder per 1/8" of Stroke	2.40	3.10	3.70
FO3	200.90	239.30	318.60
Adder per 1/8" of Stroke	3.60	4.05	4.60
FO4	245.00	291.80	389.40
Adder per 1/8" of Stroke	4.45	4.90	5.45

Mounting Options	Base Price by Bore Size		
	2-1/2"	3"	4"
Threaded Mounting Holes (Options 3, 3F, 3R)	\$4.25 per end	\$4.25 per end	\$5.10 per end
Screw Clearance Holes (Options 4, 4F, 4R)	2.25 per end	2.25 per end	2.25 per end

No charge options - CFT, G, NT, P2, P3, P4, P6, P7, P8.

Options	Adders by Bore Size			
	2-1/2"	3"	4"	
EE (each 1/2" each end)	\$1.05	\$1.15	\$1.60	
L (Low Friction Seals)	FO2	12.25	14.25	16.60
	FO3	18.30	21.35	24.90
	FO4	24.40	28.45	33.20
Magnet Position Sensing (Options M, M1, M3, M4)	20.00	24.05	26.65	
MT, CMT (Male Rod)	6.15	7.25	8.70	
Switch Mounting Post (Options T1, T3, T4) (per post)	5.05	5.05	5.05	
Option V - High Temperature (Fluoroelastomer Seals)	FO2	19.60	28.65	36.00
	FO3	29.35	43.05	54.00
	FO4	39.10	57.35	72.05
Option V - High Temperature (with L Option)	FO2	51.70	60.70	73.05
	FO3	77.60	91.00	109.45
	FO4	103.45	121.35	145.95
W (Wiper)	10.40	11.95	12.65	
Y (Adder per 1/8" of stroke)	FO2	0.75	0.75	0.75
	FO3	1.05	1.05	1.05
	FO4	1.35	1.35	1.35
Option Q - Low Temperature	FO2	11.85	14.80	18.60
	FO3	20.80	25.90	32.50
	FO4	36.35	45.35	56.85
Option Q - Low Temperature (with Option L)	FO2	25.50	31.85	39.90
	FO3	44.65	55.70	69.85
	FO4	78.10	97.50	122.15

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 FO2, FO3 or FO4.

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		
	FO2	FO3	FO4	FO2	FO3	FO4
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 F02 F03 F04

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
2-1/2" (50)	0.66	0.33	1/4 NPT	1/4-20 UNC	0.91	0.58	0.41	N/A
3" (70)	0.69	0.33	1/4 NPT	1/4-20 UNC	0.94	0.58	0.39	0.28
4" (125)	0.84	0.42	3/8 NPT	5/16-18 UNC	1.22	0.80	0.50	0.34

*See page 2.32 for length adders for options.

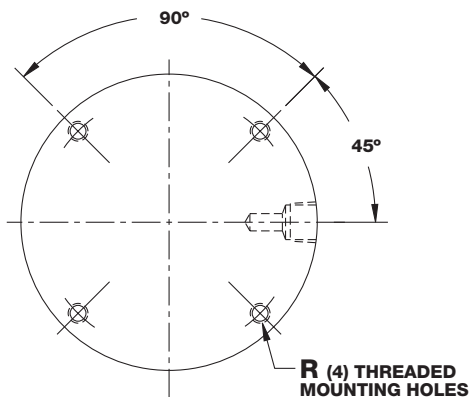
** For Strokes .125, .188, and .250

Bore	Type	"B"		
		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

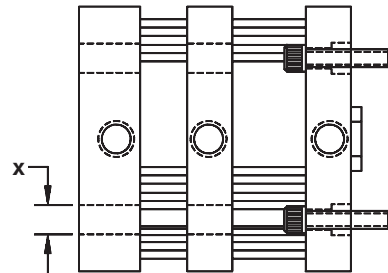
Threaded Mounting Holes

(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

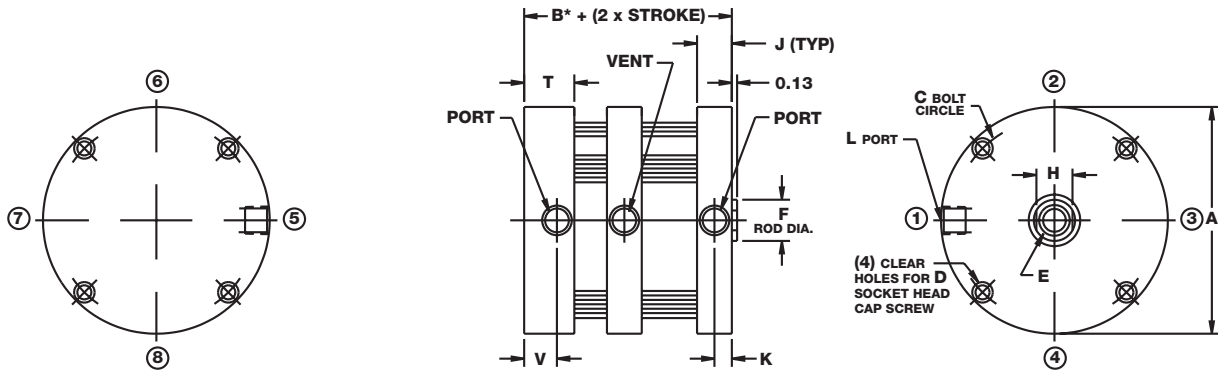
Basic Model

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"

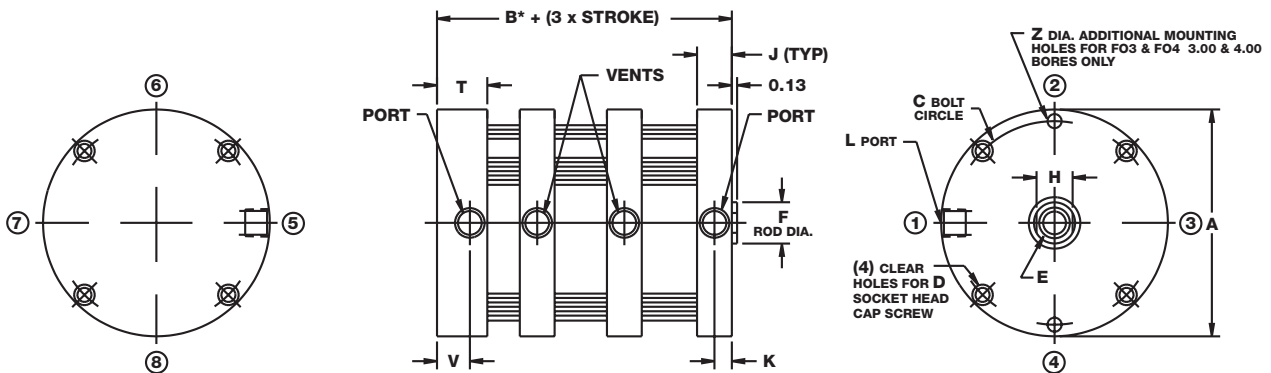
Special strokes available on request

Model F02



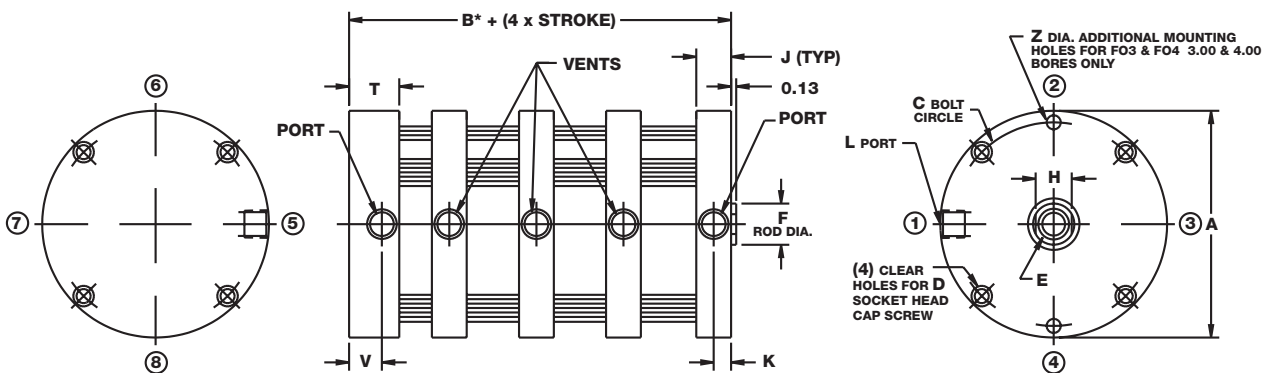
*Some options affect cylinder length, see page 2.32.

Model F03



*Some options affect cylinder length, see page 2.32.

Model F04



*Some options affect cylinder length, see page 2.32.

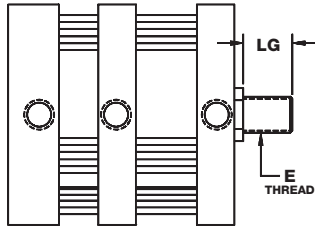
Bimba FO2 FO3 FO4

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)

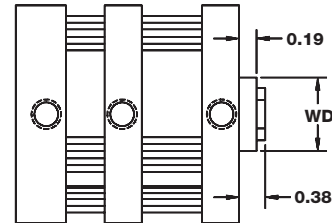
(Model FO2 shown)



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

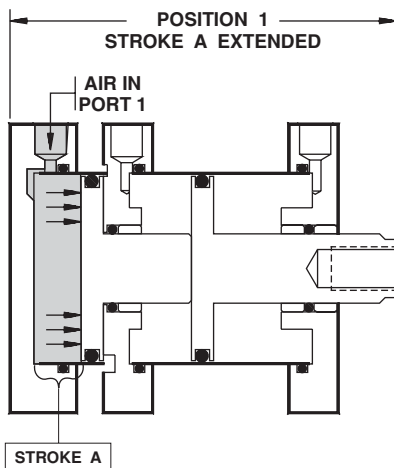


The Bimba Multiple Position FOP Flat-1 is a double-acting, single rod end cylinder that provides three positions with just one cylinder.*

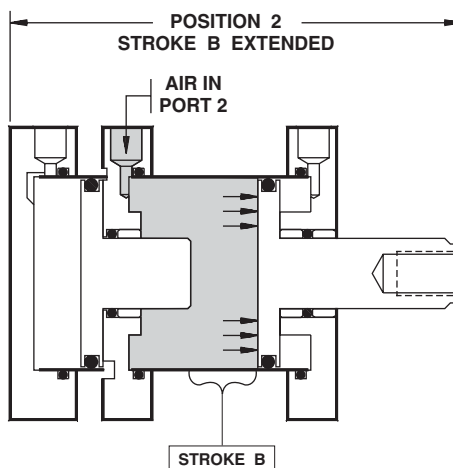
- Body — 304 Stainless Steel
- Heads—Anodized Aluminum Alloy
- Piston Rod — Ground and Polished 303 Stainless Steel
- Seals — Buna N (High temperature seals optional)
- Rod Bushing — Oil Impregnated Bronze
- Pressure Rating — 200 PSI Maximum (Air only)
- Temperature Rating — From -20°F to +150°F (-25°C 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 on request.

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

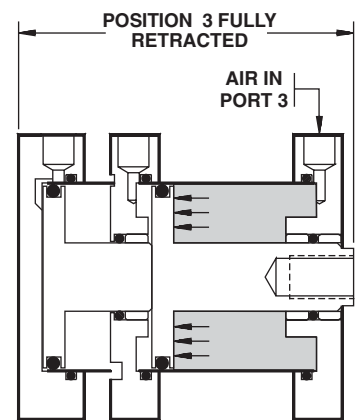
How it Works



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.

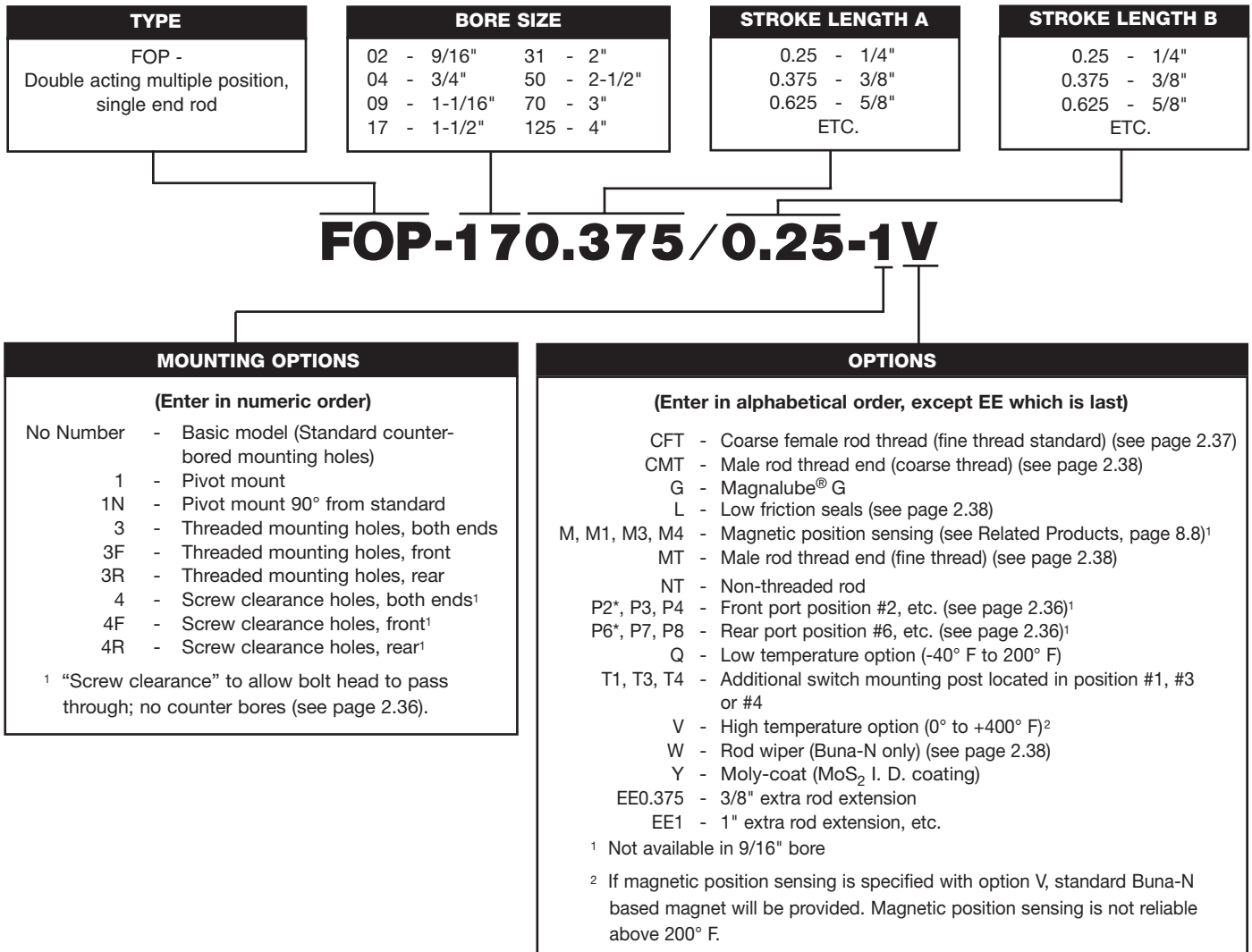


Position 3
Cylinder is fully retracted by supplying air to Port 3.

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

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.



List Prices

Basic Model	Base Price by Bore Size							
	9/16"	3/4"	1-1/16"	1-1/2"	2"	2-1/2"	3"	4"
Base Model	\$64.30	\$67.60	\$82.30	\$97.40	\$111.70	\$138.00	\$188.00	\$250.40
Total combined stroke adder (per 1/8")*	0.30	0.30	0.40	0.60	0.80	0.90	1.00	1.10

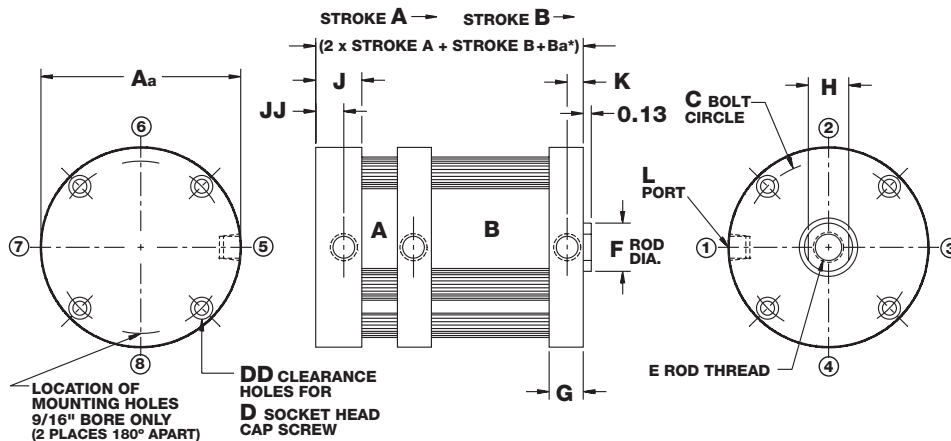
*Total combined stroke = (2 x Stroke A) + Stroke B.

Mounting Options	Adders by Bore Size							
	9/16"	3/4"	1-1/16"	1-1/2"	2"	2-1/2"	3"	4"
Pivot Mount (Options 1, 1N)	\$10.55	\$11.20	\$12.95	\$17.50	\$20.40	\$26.35	\$31.70	\$43.25
Threaded Mounting Holes (Options 3, 3F, 3R)	2.75 per end	3.00 per end	3.10 per end	3.80 per end	3.80 per end	4.50 per end	4.50 per end	5.45 per end
Screw Clearance Holes (Options 4, 4F, 4R)	2.30 per end	2.40 per end	2.40 per end	2.40 per end	2.40 per end	2.40 per end	2.40 per end	2.40 per end

Options	Adders by Bore Size							
	9/16"	3/4"	1-1/16"	1-1/2"	2"	2-1/2"	3"	4"
EE (each 1/2" each end)	\$0.65	\$0.65	\$0.75	\$0.90	\$1.10	\$1.10	\$1.20	\$1.65
MT, CMT Male Rod Thread	3.70	3.90	4.35	4.75	6.55	6.55	7.75	9.20
V Option (Standard Seals)	4.50	4.80	7.05	11.20	14.85	20.10	29.40	36.80
V Option (Low Friction Seals)	13.05	13.35	21.30	26.45	42.00	52.90	62.10	74.75
W Rod Wiper	6.45	6.75	8.40	8.85	10.45	11.15	12.80	13.45
L Low Friction Seals	5.95	6.20	7.70	8.70	10.20	12.55	14.55	17.05
Magnetic Piston Sensing (Options M, M1, M3, M4)	6.10	6.10	6.10	9.00	14.95	20.50	24.55	27.30
Switch Mounting Post (Options T1, T3, T4)	3.20	3.20	4.30	4.30	4.30	5.20	5.20	5.20
Y (Adder per 1/8" of total combined stroke)	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
Q Option (Standard Seals)	4.40	5.45	6.95	8.65	10.80	13.55	16.95	21.20
Q Option (Low Friction seals)	9.40	11.80	14.75	18.60	23.30	29.20	36.40	45.55

No charge options – CFT, G, NT, P2, P3, P4, P6, P7, P8.

Basic Model

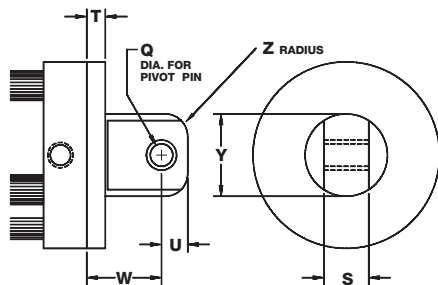


*Some options affect cylinder length; see page 2.38.

Mounting Options

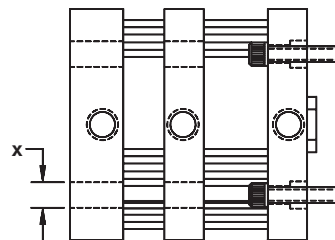
Pivot Mount

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



Screw Clearance Holes

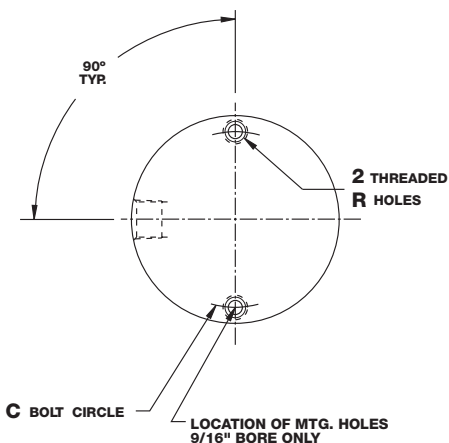
(available either or both ends)
 (-4R shown) Screw clearance holes standard on all center sections



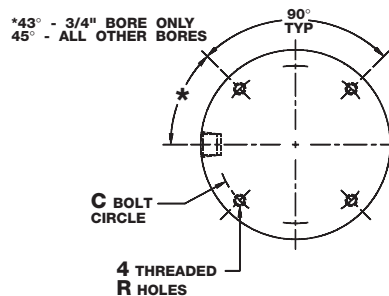
Threaded Mounting Holes

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

9/16" Bore



3/4" Bore and larger



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	L
9/16" (02)	0.34	0.22	0.47	0.27	0.14	#10-32
3/4" (04)	0.34	0.25	0.47	0.27	0.14	#10-32
1-1/16" (09)	0.50	0.44	0.69	0.44	0.25	1/8 NPT
1-1/2" (17)	0.50	0.50	0.69	0.44	0.25	1/8 NPT
2" (31)	0.53	0.63	0.72	0.44	0.25	1/8 NPT
2-1/2" (50)	0.66	0.63	0.91	0.58	0.33	1/4 NPT
3" (70)	0.69	0.75	0.94	0.58	0.33	1/4 NPT
4" (125)	0.84	0.88	1.22	0.80	0.42	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 2.38 for length adders for options.

Flat-I/
Square Flat-I

Flat-II/
Square Flat-II

F02, F03, F04
(multiple power)

FOP
(multiple position)

Flat
Accessories

EF1/EF2

Stopper/
Twist Clamp

Extruded
Flat Lift Table

Twin Bore

NPA/LPA

Diaphragm/
Miniature Cube

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 stroke of 0.38 is required to sense extending end-of-stroke position.

Minimum Stroke

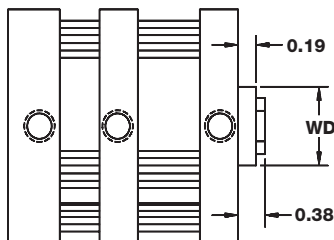
Model \ Bore	9/16" (02)	3/4" (04)	1-1/16" (09)	1-1/2" (17)	2" (31)	2-1/2" (50)	3" (70)	4" (125)
Base Model Stroke A	0.19	0.19	0.25	0.25	0.25	0.38	0.38	0.34

No minimum for stroke B.

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

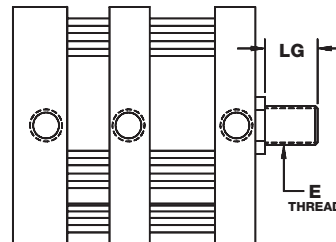
Rod Wiper (Option W)

(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

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

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

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

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-I /
Square Flat-I

Flat-II /
Square Flat-II

F02, F03, F04
(multiple power)

FOP
(multiple position)

Flat
Accessories

EF1 / EF2

Stopper /
Twist Clamp

Extruded
Flat Lift Table

Twin Bore

NPA / LPA

Diaphragm /
Miniature Cube

Bimba FLAT-1

Accessories

(All Models)

Selection Guide

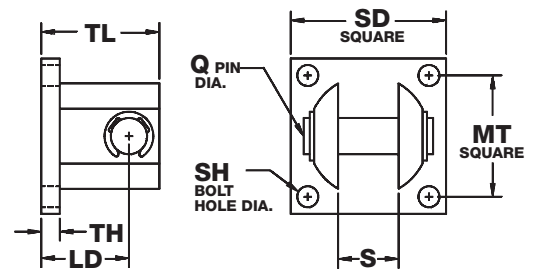
Accessory	Flat-1	Square Flat-1	Square Flat-II	Flat-II	FO2	FOP
Clevis Bracket	X	X	X	X	N/A	X
Trunnion Bracket	X	N/A	N/A	X	N/A	N/A
Rod Pivot	X	X	N/A	N/A	X	X
Pivot Attachment	N/A	X	X	N/A	N/A	N/A

Clevis Bracket

Anodized aluminum alloy, complete with chrome plated 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

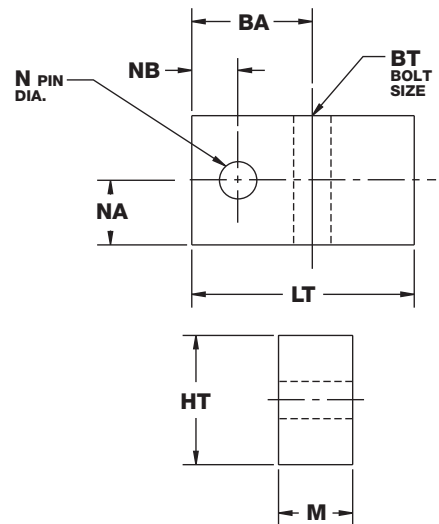
Bracket intended to mount with either rod pivot or pivot mount, not directly to the cylinder rear head.



Trunnion Bracket (pair)

Anodized aluminum alloy, complete with bronze pivot bushings

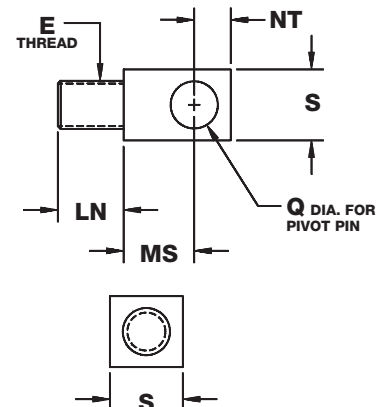
Model	Bore	BA	BT	HT	LT	M	N	NA	NB
BT-1	3/4" (04)	0.56	#10	0.63	1.12	0.31	0.13	0.30	0.22
BT-2	1-1/16" (09), 1-1/2" (17), 2" (31)	0.81	0.25	0.88	1.50	0.50	0.25	0.38	0.31
BT-3	2-1/2" (50), 3" (70)	0.94	0.31	1.00	1.63	0.63	0.31	0.45	0.38
BT-4	4" (125)	1.06	0.38	1.25	1.88	0.75	0.38	0.55	0.44



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



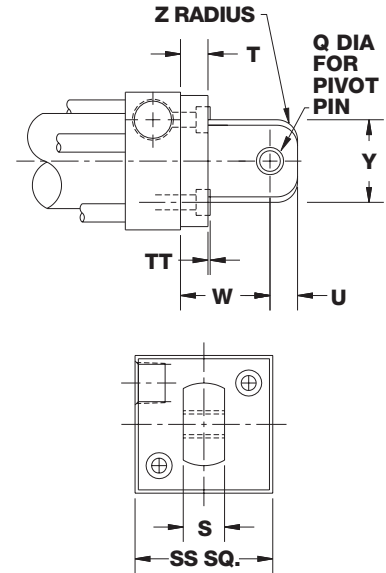
Bimba FLAT-1

Accessories

Pivot Attachment

Anodized aluminum alloy. Complete with two 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



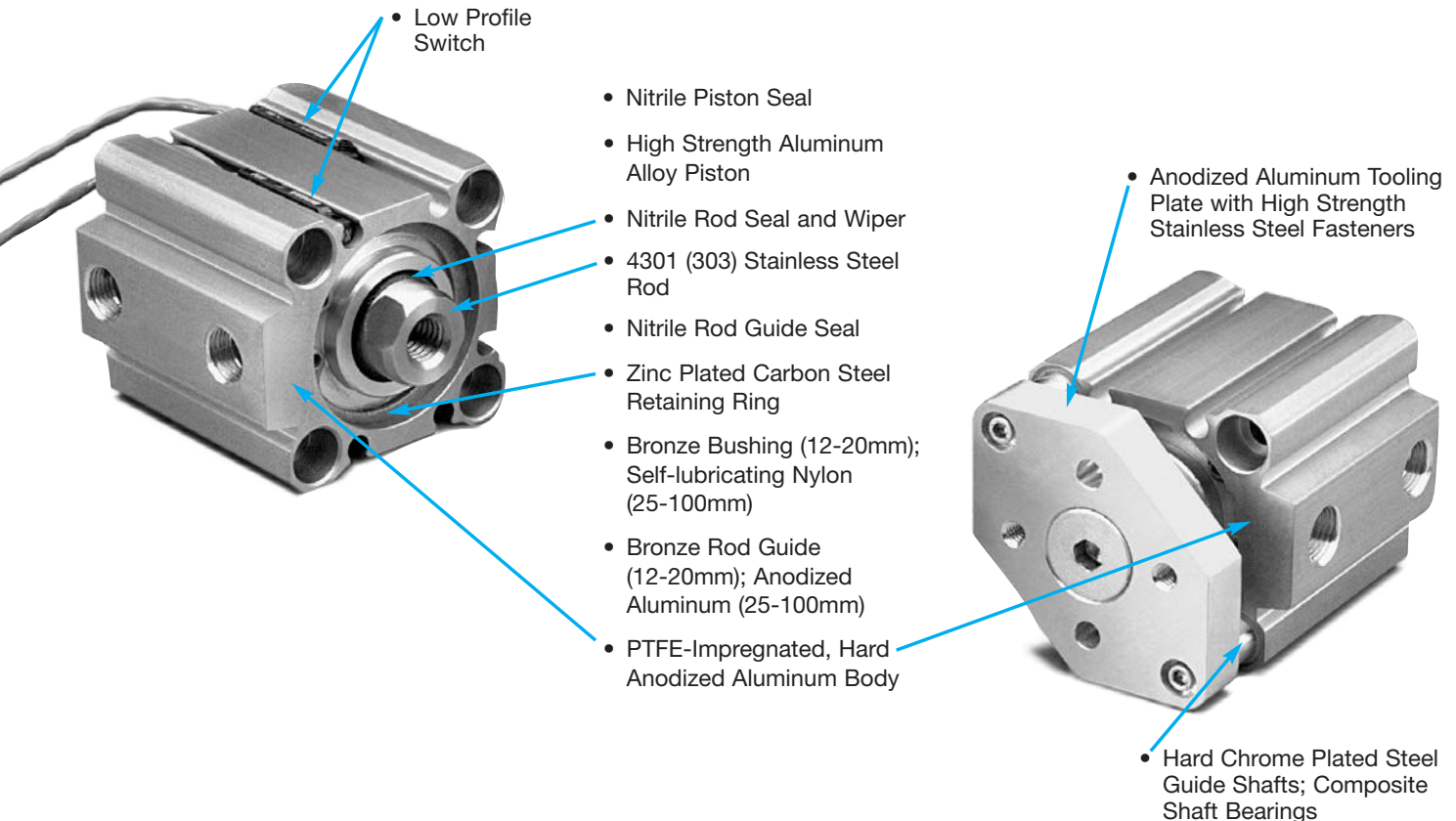
Price List

Description	Model	List Price
Rod Pivot	RP-1/2	\$10.25
	RP-1	11.00
	RP-2	11.00
	RP-3	11.50
	RP-4	11.50
	RP-5	13.50
	RP-6	14.00
Trunnion Bracket	BT-1	10.50
	BT-2	11.50
	BT-3	13.50
	BT-4	15.00
Clevis Bracket	BC-1	15.50
	BC-2	22.00
	BC-3	30.00
Pivot Attachment	PM-1	14.50
	PM-2	16.00
	PM-3	20.75
	PM-4	23.60
	PM-5	28.50
	PM-6	50.00
	PM-7	63.00
Wrench Kit (Fits wrench flats on all piston rods)	FWK	14.00

Bimba EF Cylinders

The Bimba EF Series is a compact, aluminum-extruded body air cylinder designed for international machine requirements.

The body is anodized in a special PTFE-impregnation process that provides superior wear characteristics. With its streamlined look, low cost and low-profile switch, it is an excellent choice for space-saving machine design.



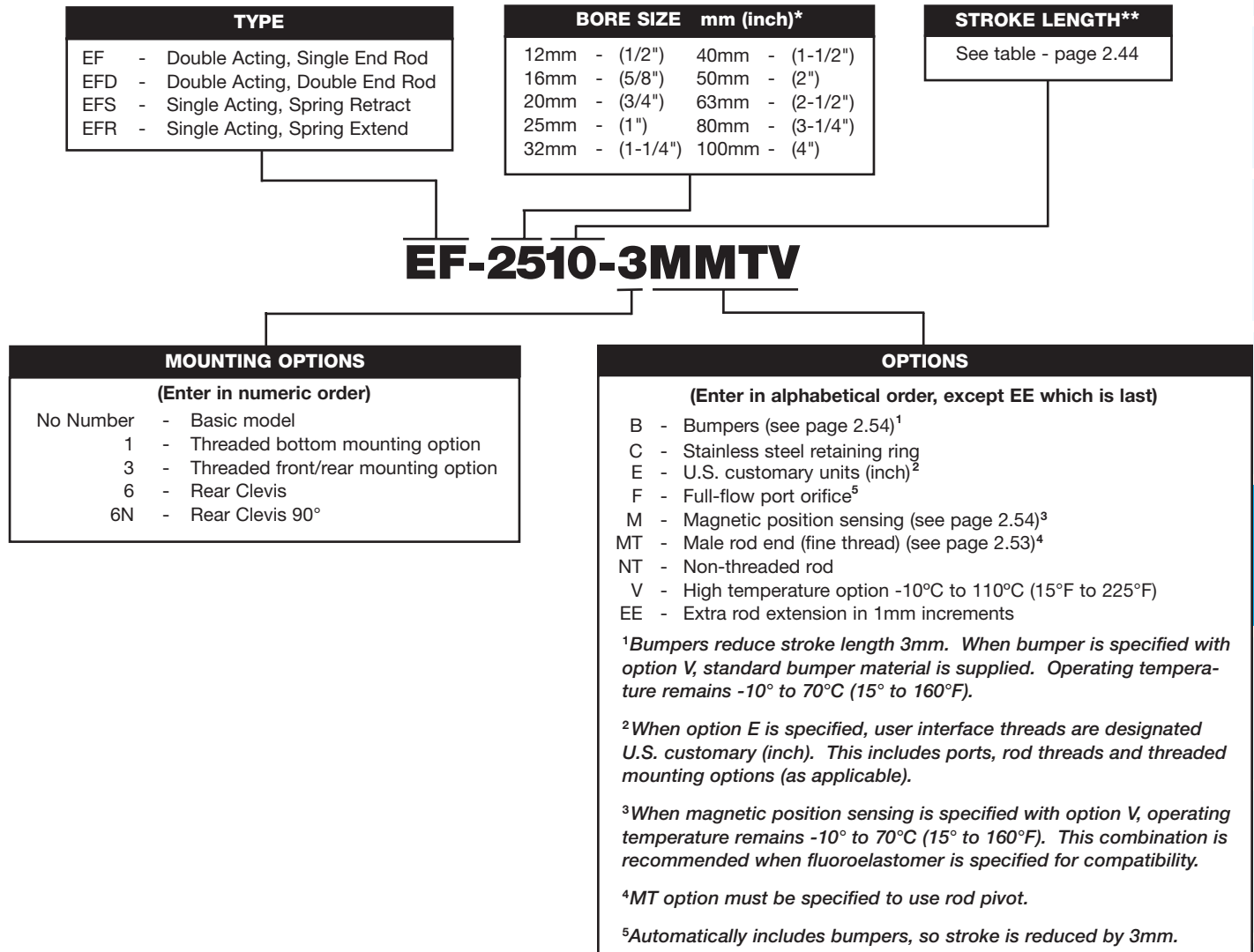
FEATURES AND ADVANTAGES

- PTFE-impregnated, hard anodized aluminum body provides superior wear resistance. Expected service life is 2500 kilometers.
- Very compact; dimensionally-interchangeable with similar compact extruded aluminum body cylinders.
- Very low profile, compact switch slides into groove within cylinder geometry.
- EF1 is available in four models: double acting, single or double rod end; and single acting, spring return or extend. EF2 is available in double acting, non-rotating.
- Both models are available in ten bore sizes, 12mm to 100mm.
- Wide variety of standard stroke lengths in 5mm increments; additional stroke lengths available.
- Standard cylinder is completely metric in design; with Option -E, threaded mounting options, rod threads and ports are in U.S. customary units (inch).
- Mounting options include threaded bottom mounting and threaded front/rear mounting option.
- Options include bumpers, ports and threaded mounting option and rod threads in U.S. customary units, magnetic position sensing, and high temperature seals.

Bimba EF1 Cylinders

How to Order

The Model Number for all EF1 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 EF-2510-3MMTV. This is a 25mm bore, double acting, single end rod cylinder, with metric threads and ports, 10mm of stroke, threaded front/rear mounting holes, magnetic position sensing, male rod end and high temperature option.



Please note that throughout all catalog charts, metric measurements are shown first and U.S. customary units (inches) are in parentheses.

*NOTE: Numbers in parentheses are the eq. bore size in inches. Listed for reference only. DO NOT use for model designation.

**When stroke length exceeds 30mm, a threaded mounting option should be considered. Mounting bolts that span the entire cylinder length may not be readily available.

Bimba EF1 Cylinders

Stroke Length Availability

Bore	Double Acting		Single Acting	
	Single Rod End	Double Rod End	Single Acting Spring Retract	Reverse Acting Spring Extend
	Standard Stroke Lengths (mm)		Standard Stroke Lengths (mm)	
12mm (1/2")	5, 10, 15, 20, 25, 30	5, 10, 15, 20, 25, 30	5, 10	5, 10
16mm (5/8")				
20mm (3/4")	5, 10, 15, 20, 25, 30, 35, 40, 45, 50	5, 10, 15, 20, 25, 30, 35, 40, 45, 50	5, 10	5, 10
25mm (1")				
32mm (1-1/4")	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100	5, 10, 15, 20, 25, 30, 35, 40, 45, 50	5, 10	5, 10
40mm (1-1/2")			5, 10, 15, 20	5, 10
50mm (2")	10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100	10, 15, 20, 25, 30, 35, 40, 45, 50	10, 15, 20	10, 20
63mm (2-1/2")			10, 15, 20, 25	20, 25
80mm (3-1/4")			10, 15, 20, 25	20, 25
100mm (4")			N/A	N/A

NOTE: Stroke lengths are available in 5mm increments up to the maximum standard stroke. Body length corresponds with that of the next standard stroke length. For example, a 40mm bore, 55mm stroke cylinder has the body length of a 75mm stroke cylinder. When a stroke exceeds 30mm, a threaded mounting option should be considered. Mounting bolts that span the entire cylinder length may not be readily available.

List Prices

Model Type	Bore Size									
	12mm	16mm	20mm	25mm	32mm	40mm	50mm	63mm	80mm	100mm
EF	\$23.00	\$25.25	\$31.00	\$35.75	\$43.50	\$51.75	\$62.00	\$73.50	\$93.00	\$140.00
Add per 5mm	1.10	1.10	1.10	1.15	1.15	1.20	1.50	1.65	1.95	2.35
EFS	21.75	25.75	27.50	34.00	36.75	44.50	53.75	67.50	85.50	N/A
EFR	24.50	27.00	31.25	36.00	43.75	52.00	63.50	74.25	94.00	N/A
Add per 5mm	0.40	1.15	1.30	1.35	1.45	1.60	2.25	2.50	2.85	N/A
EFD	31.00	34.25	41.75	48.00	58.75	69.75	83.75	99.25	125.50	189.00
Add per 5mm	1.90	1.90	1.90	1.95	1.95	2.10	2.55	2.85	3.20	4.00
Mounting Options										
1(threaded bottom)	\$3.65	\$3.80	\$4.95	\$5.15	\$5.85	\$6.00	\$6.55	\$6.85	\$7.30	\$7.60
3(thread front/rear)	5.55	5.80	7.65	7.95	9.00	8.95	10.00	10.60	11.15	11.65
6, 6N(rear clevis)	11.00	11.50	12.35	14.30	15.65	17.55	20.25	26.25	32.05	42.65
Options										
B	\$3.30	\$5.90	\$5.90	\$5.90	\$7.05	\$7.05	\$7.95	\$9.65	\$14.70	\$16.90
C(EF,EFS,EFR)	2.65	2.80	3.85	4.35	5.25	7.90	13.55	16.25	80.25	130.40
C(EFD)	5.30	5.55	7.60	8.70	10.45	15.80	27.15	32.40	160.45	260.75
F(includes B)	8.80	11.35	11.35	12.75	13.90	13.90	16.20	17.90	22.90	25.65
MT(per end)	1.40	1.40	1.40	2.25	2.25	2.50	2.90	3.40	6.85	10.20
M	4.80	5.90	7.70	7.70	9.60	9.60	11.25	13.70	17.55	20.50
V(EF)	10.95	12.00	12.35	14.95	16.70	23.80	26.20	34.00	41.65	52.60
V(EFS)	9.20	9.50	9.80	10.15	10.75	14.80	16.30	20.50	28.45	N/A
V(EFR)	10.95	12.00	12.35	14.95	16.70	23.80	26.20	34.00	41.65	N/A
V(EFD)	12.70	14.55	14.85	19.80	22.70	32.85	36.20	47.40	54.80	61.80
EE(per 1mm/end)	0.20	0.20	0.20	0.25	0.25	0.25	0.30	0.30	0.35	0.35

No charge options: E (U.S. customary units), NT

Invalid option combination: NT/MT

EFD models not available with option NT

All prices are F.O.B. Monee, Illinois and are subject to change without notice

Bimba EF1 Cylinders

Engineering Specifications

- Operating Medium:** Air
- Maximum Operating Pressure:** 10 bar (140 psi)
- Ambient and Fluid Temperature:** -10° to 70°C (15° to 160°F)
- Lubrication:** PTFE impregnated grease
- Standard Rod End:** Female
- Stroke Tolerance:** 12-50mm bore: ± .6mm (.025 inch)
63-100mm bore: ± .8mm (.030 inch)
- Cylinder Mounting (Standard):** Through hole with counterbores both ends
- Cylinder Mounting (Optional):** Front and Rear threaded
Side mount threaded
Rear Clevis
- Expected Service Life:** 2500 kilometers (1500 miles)*

*For filtered, lubricated air, no-load conditions; if unlubricated, life is approximately 1/3.

Maximum Side Loads kg-Force (lbs.)

Bore	Stroke Length					
	5mm	10mm	15mm	20mm	25mm	30mm
12mm (1/2")	0.27 (0.60)	0.22 (0.49)	0.19 (0.41)	0.16 (0.35)	0.14 (0.31)	0.12 (0.27)
16mm (5/8")	0.33 (0.73)	0.27 (0.59)	0.23 (0.50)	0.20 (0.43)	0.17 (0.38)	0.15 (0.34)
20mm (3/4")	0.34 (0.74)	0.27 (0.60)	0.23 (0.51)	0.20 (0.44)	0.18 (0.39)	0.16 (0.35)
25mm (1")	0.54 (1.18)	0.45 (0.99)	0.38 (0.85)	0.34 (0.74)	0.30 (0.66)	0.27 (0.59)
32mm (1-1/4")	1.28 (2.81)	1.08 (2.38)	0.94 (2.07)	0.83 (1.83)	0.74 (1.64)	0.67 (1.48)
40mm (1-1/2")	2.27 (4.99)	1.97 (4.34)	1.75 (3.84)	1.57 (3.44)	1.42 (3.12)	1.30 (2.85)
50mm (2")	N/A	2.40 (5.29)	2.13 (4.69)	1.92 (4.22)	1.74 (3.83)	1.60 (3.51)
63mm (2-1/2")	N/A	3.18 (6.99)	2.85 (6.27)	2.58 (5.69)	2.36 (5.20)	2.18 (4.80)
80mm (3-1/4")	N/A	5.94 (13.06)	5.41 (11.91)	4.97 (10.94)	4.60 (10.12)	4.28 (9.41)
100mm (4")	N/A	9.14 (20.10)	8.45 (18.58)	7.85 (17.28)	7.34 (16.14)	6.88 (15.15)

Bore	Stroke Length					
	35mm	40mm	45mm	50mm	75mm	100mm
12mm (1/2")	0.11 (0.25)	0.10 (0.23)	N/A	N/A	N/A	N/A
16mm (5/8")	0.14 (0.30)	0.13 (0.28)	N/A	N/A	N/A	N/A
20mm (3/4")	0.14 (0.32)	0.13 (0.29)	0.12 (0.27)	0.11 (0.25)	N/A	N/A
25mm (1")	0.24 (0.54)	0.22 (0.49)	0.21 (0.46)	0.19 (0.42)	N/A	N/A
32mm (1-1/4")	0.61 (1.35)	0.57 (1.25)	0.52 (1.15)	0.49 (1.07)	0.36 (0.80)	0.29 (0.64)
40mm (1-1/2")	1.19 (2.63)	1.11 (2.44)	1.03 (2.27)	0.97 (2.12)	0.73 (1.61)	0.59 (1.30)
50mm (2")	1.47 (3.24)	1.37 (3.01)	1.27 (2.80)	1.19 (2.63)	0.91 (2.00)	0.73 (1.61)
63mm (2-1/2")	2.02 (4.45)	1.88 (4.15)	1.76 (3.88)	1.66 (3.65)	1.28 (2.81)	1.04 (2.29)
80mm (3-1/4")	4.00 (8.79)	3.75 (8.25)	3.53 (7.78)	3.34 (7.35)	2.62 (5.77)	2.16 (4.75)
100mm (4")	6.48 (14.27)	6.13 (13.48)	5.81 (12.78)	5.52 (12.15)	4.43 (9.74)	3.69 (8.13)

Bimba EF1 Cylinders

Theoretical Cylinder Forces

FORCE = Power Factor x Input Pressure

Bore	Direction	Power Factor* (When input pressure in bar)	Power Factor** (When input pressure in psi)
12mm (1/2")	Extend	1.1	(0.2)
	Retract	0.8	(0.1)
16mm (5/8")	Extend	2.0	(0.3)
	Retract	1.5	(0.2)
20mm (3/4")	Extend	3.1	(0.5)
	Retract	2.4	(0.4)
25mm (1")	Extend	4.9	(0.8)
	Retract	3.8	(0.6)
32mm (1-1/4")	Extend	8.0	(1.2)
	Retract	6.0	(0.9)
40mm (1-1/2")	Extend	12.6	(1.9)
	Retract	10.6	(1.6)
50mm (2")	Extend	19.6	(3.0)
	Retract	16.5	(2.6)
63mm (2-1/2")	Extend	31.2	(4.8)
	Retract	28.0	(4.3)
80mm (3-1/4")	Extend	50.3	(7.8)
	Retract	45.4	(7.0)
100mm (4")	Extend	78.5	(12.2)
	Retract	71.5	(11.1)

*Power Factor x bar = kg.

**Power Factor x psi = Pounds

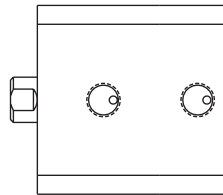
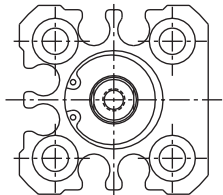
Bimba EF1 Cylinders

Enclosed Spring Forces

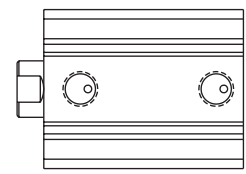
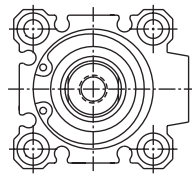
Action	Bore	Compressed Spring Force		Spring Rate	
		N	(lbs)	N/mm	(lbs/in)
Single Acting Spring Return	12mm (1/2")	12.8	(2.9)	0.8	(4.8)
	16mm (5/8")	16.0	(3.6)	1.0	(5.7)
	20mm (3/4")	18.1	(4.1)	1.2	(6.9)
	25mm (1")	21.4	(4.8)	1.1	(6.4)
	32mm (1-1/4")	22.2	(5.0)	0.8	(4.3)
	40mm (1-1/2")	33.1	(7.4)	0.9	(5.1)
	50mm (2")	53.8	(12.1)	1.2	(6.7)
	63mm (2-1/2")	89.0	(20.0)	2.1	(11.8)
	80mm (3-1/4")	106.8	(24.0)	2.3	(13.2)
	100mm (4")	N/A	(N/A)	N/A	(N/A)
Reverse Acting Spring Extend	12mm; 5mm stroke	10.9	(2.5)	1.6	(9.1)
	12mm; 10mm stroke	11.0	(2.5)	0.8	(4.6)
	16mm; 5mm stroke	20.7	(4.7)	3.4	(19.5)
	16mm; 10mm stroke	20.9	(4.7)	1.8	(10.3)
	20mm	27.3	(6.1)	2.3	(12.9)
	25mm	29.1	(6.5)	2.0	(11.2)
	32mm	26.6	(6.0)	0.9	(5.1)
	40mm	30.1	(6.8)	1.2	(7.1)
	50mm	81.9	(18.4)	2.9	(16.7)
	63mm; 20mm stroke	95.3	(21.4)	3.0	(16.7)
	63mm; 25mm stroke	95.3	(21.4)	2.4	(13.3)
	80mm; 20mm stroke	110.8	(24.9)	3.2	(17.8)
	80mm; 25mm stroke	110.9	(24.9)	2.5	(14.2)
	100mm	N/A	(N/A)	N/A	(N/A)

Body Styles

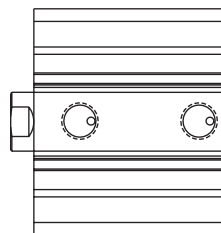
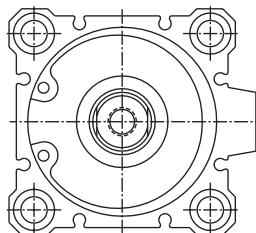
12mm Bore



16mm to 32mm Bore



40mm to 100mm Bore



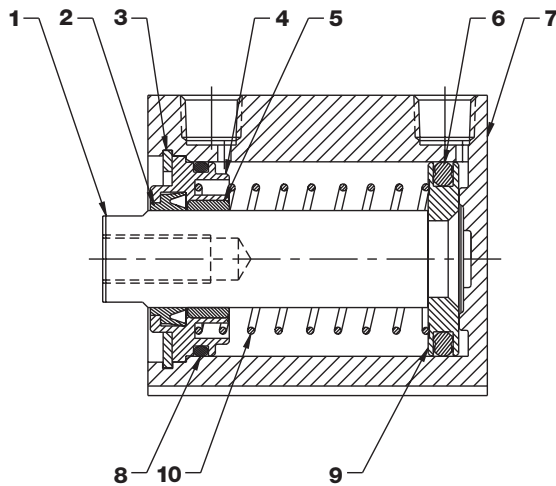
Bimba EF 1 Cylinders

Components

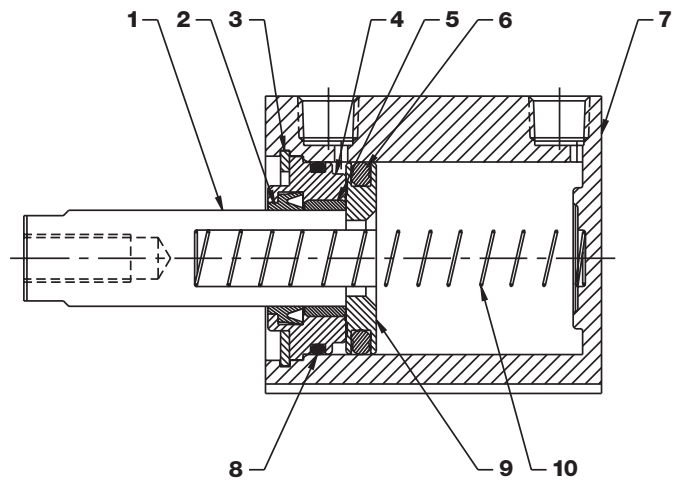
Part List

Part #	Description	Material
1	Rod	4301 (303) Stainless Steel
2	Rod Seal/Wiper	Nitrile (Standard) or Fluoroelastomer (High Temperature Option)
3	Retaining Ring	Zinc Plated Carbon Steel or Stainless Steel (optional)
4	Rod Guide	12-20mm: Bronze / 25-100mm: Anodized Aluminum
5	Bushing	12-20mm: Bronze / 25-100mm: Self Lubricating Nylon
6	Piston Seal	Nitrile (Standard) or Fluoroelastomer (High Temperature Option)
7	Cylinder Body	Polytetrafluoroethylene (PTFE) Impregnated Hard Anodized Aluminum
8	Rod Guide Seal	Nitrile (Standard) or Fluoroelastomer (High Temperature Option)
9	Piston	High Strength Aluminum Alloy
10	Spring	Corrosion Protected Music Wire

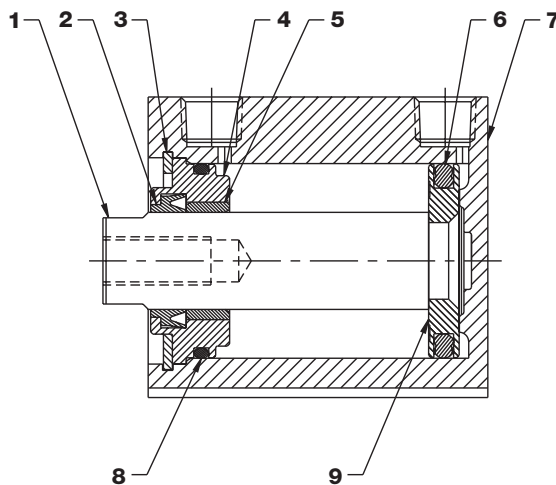
Single Acting/Spring Retract



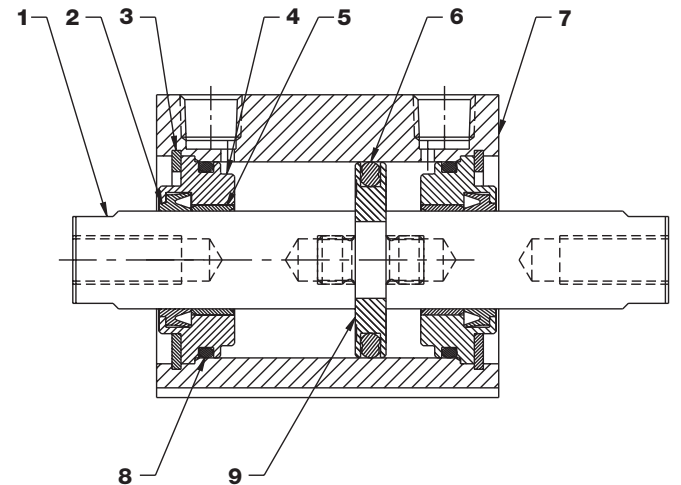
Single Acting/Spring Extend



Double Acting/Single Rod



Double Acting/Double Rod



Bimba EF1 Cylinders

Dimensions

Shown in millimeters (inches)

Double Acting/Single Rod

Bore	A	B	C	D	E	F	H
12mm (1/2")	3.8 (0.15)	17.0 (0.67)	8.9 (0.35)	M5 x 0.8 (#10-32)	6.0 (0.24)	3.5 (0.14)	15.5 (0.61)
16mm (5/8")	4.6 (0.18)	18.5 (0.73)	9.4 (0.37)	M5 x 0.8 (#10-32)	8.0 (0.31)	3.5 (0.14)	20.0 (0.79)
20mm (3/4")	4.8 (0.19)	19.5 (0.77)	9.4 (0.37)	M5 x 0.8 (#10-32)	10.0 (0.39)	4.5 (0.18)	25.5 (1.00)
25mm (1")	5.1 (0.20)	22.5 (0.89)	10.9 (0.43)	M5 x 0.8 (#10-32)	12.0 (0.47)	5.0 (0.20)	28.0 (1.10)
32mm (1-1/4")	7.1 (0.28)	23.0 (0.91)	10.4 (0.41)	G - 1/8 (NPT 1/8)	16.0 (0.63)	7.0 (0.28)	34.0 (1.34)
40mm (1-1/2")	7.4 (0.29)	29.5 (1.16)	13.2 (0.52)	G - 1/8 (NPT 1/8)	16.0 (0.63)	7.0 (0.28)	40.0 (1.57)
50mm (2")	9.4 (0.37)	30.5 (1.20)	13.7 (0.54)	G - 1/4 (NPT 1/4)	20.0 (0.79)	8.0 (0.31)	50.0 (1.97)
63mm (2-1/2")	9.7 (0.38)	36.0 (1.42)	15.7 (0.62)	G - 1/4 (NPT 1/4)	20.0 (0.79)	8.0 (0.31)	60.0 (2.36)
80mm (3-1/4")	11.7 (0.46)	43.5 (1.71)	17.8 (0.70)	G - 3/8 (NPT 3/8)	25.0 (0.98)	10.0 (0.39)	77.0 (3.03)
100mm (4")	12.2 (0.48)	53.0 (2.09)	24.4 (0.96)	G - 3/8 (NPT 3/8)	30.0 (1.18)	12.0 (0.47)	94.0 (3.70)

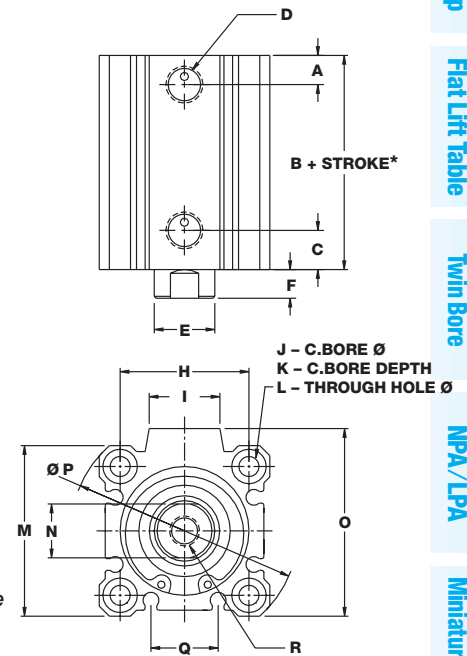
Bore	I	J	K	L	M	N	O
12mm (1/2")	N/A	6.1 (0.24)	3.5 (0.14)	3.5 (0.14)	25.0 (0.98)	5.0 (0.19)	25.0 (0.98)
16mm (5/8")	8.7 (0.34)	6.5 (0.26)	3.5 (0.14)	3.5 (0.14)	29.0 (1.14)	6.0 (0.25)	29.0 (1.14)
20mm (3/4")	9.5 (0.37)	9.0 (0.35)	7.0 (0.28)	5.5 (0.22)	36.0 (1.42)	8.0 (0.31)	36.0 (1.42)
25mm (1")	10.3 (0.41)	9.0 (0.35)	7.0 (0.28)	5.5 (0.22)	40.0 (1.57)	10.0 (0.38)	40.0 (1.57)
32mm (1-1/4")	18.5 (0.73)	9.0 (0.35)	7.0 (0.28)	5.5 (0.22)	45.0 (1.77)	14.0 (0.56)	49.5 (1.95)
40mm (1-1/2")	17.3 (0.68)	9.0 (0.35)	7.0 (0.28)	5.5 (0.22)	52.0 (2.05)	14.0 (0.56)	57.0 (2.24)
50mm (2")	20.0 (0.79)	11.1 (0.44)	8.0 (0.31)	6.9 (0.27)	64.0 (2.52)	17.0 (0.69)	71.0 (2.80)
63mm (2-1/2")	20.0 (0.79)	14.1 (0.56)	10.5 (0.41)	8.8 (0.35)	77.0 (3.03)	17.0 (0.69)	84.0 (3.31)
80mm (3-1/4")	26.0 (1.02)	17.5 (0.69)	13.5 (0.53)	11.0 (0.43)	98.0 (3.86)	22.0 (0.88)	104.0 (4.09)
100mm (4")	26.0 (1.02)	17.5 (0.69)	13.5 (0.53)	11.0 (0.43)	117.0 (4.61)	27.0 (1.06)	123.5 (4.86)

Bore	P	Q	R
12mm (1/2")	32.0 (1.26)	5.3 (0.21)	M3 x 0.5 6H (#8-32 UNC-2B)
16mm (5/8")	38.0 (1.50)	7.8 (0.31)	M4 x 0.7 6H (#8-32 UNC-2B)
20mm (3/4")	47.0 (1.85)	10.5 (0.41)	M5 x 0.8 6H (#10-32 UNF-2B)
25mm (1")	52.0 (2.05)	11.5 (0.45)	M6 x 1.0 6H (1/4-28 UNF-2B)
32mm (1-1/4")	60.0 (2.36)	17.7 (0.70)	M8 x 1.25 6H (5/16-24 UNF-2B)
40mm (1-1/2")	69.0 (2.72)	24.5 (0.96)	M8 x 1.25 6H (3/8-24 UNF-2B)
50mm (2")	86.0 (3.39)	29.3 (1.16)	M10 x 1.5 6H (1/2-20 UNF-2B)
63mm (2-1/2")	103.0 (4.06)	29.1 (1.15)	M10 x 1.5 6H (1/2-20 UNF-2B)
80mm (3-1/4")	132.0 (5.20)	28.1 (1.11)	M16 x 2.0 6H (5/8-18 UNF-2B)
100mm (4")	156.0 (6.14)	32.3 (1.27)	M20 x 2.5 6H (3/4-16 UNF-2B)

*See page 2.54 for overall body length with MRS option.

Stroke lengths are available in 5mm increments up to the maximum standard stroke. Body length corresponds with that of the next standard stroke length. For example, a 40mm bore, 55mm stroke cylinder has the body length of a 75mm stroke cylinder. When a stroke exceeds 30mm, a threaded mounting option should be considered. Mounting bolts that span the entire cylinder length may not be readily available.

When option E is specified, user interface threads are designated U.S. customary (inch). This includes ports, rod threads and threaded mounting options (as applicable).



Bimba EF1 Cylinders

Dimensions

Shown in millimeters (inches)

Double Acting/Double Rod

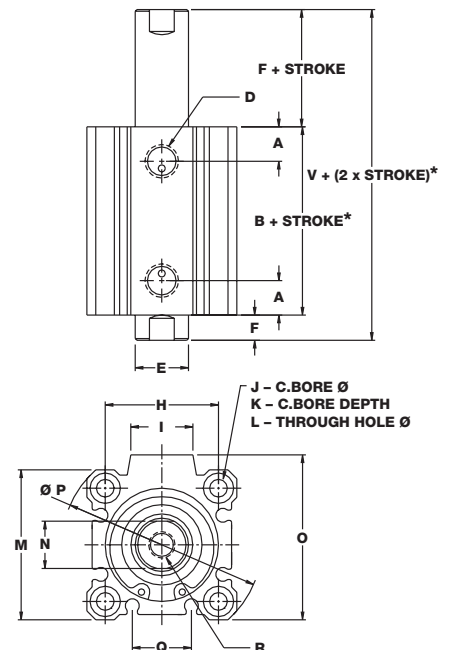
Bore	A	B	D	E	F	H	I
12mm (1/2")	10.6 (0.42)	25.2 (0.99)	M5 x 0.8 (#10-32)	6.0 (0.24)	3.5 (0.14)	15.5 (0.61)	N/A
16mm (5/8")	10.7 (0.42)	26.0 (1.03)	M5 x 0.8 (#10-32)	8.0 (0.31)	3.5 (0.14)	20.0 (0.79)	8.7 (0.34)
20mm (3/4")	10.1 (0.40)	26.0 (1.03)	M5 x 0.8 (#10-32)	10.0 (0.39)	4.5 (0.18)	25.5 (1.00)	9.5 (0.37)
25mm (1")	11.2 (0.44)	29.0 (1.14)	M5 x 0.8 (#10-32)	12.0 (0.47)	5.0 (0.20)	28.0 (1.10)	10.3 (0.41)
32mm (1-1/4")	8.9 (0.35)	30.5 (1.20)	G - 1/8 (NPT 1/8)	16.0 (0.63)	7.0 (0.28)	34.0 (1.34)	18.5 (0.73)
40mm (1-1/2")	13.1 (0.52)	40.0 (1.58)	G - 1/8 (NPT 1/8)	16.0 (0.63)	7.0 (0.28)	40.0 (1.57)	17.3 (0.68)
50mm (2")	12.2 (0.48)	40.5 (1.60)	G - 1/4 (NPT 1/4)	20.0 (0.79)	8.0 (0.31)	50.0 (1.97)	20.0 (0.79)
63mm (2-1/2")	12.8 (0.50)	42.0 (1.66)	G - 1/4 (NPT 1/4)	20.0 (0.79)	8.0 (0.31)	60.0 (2.36)	20.0 (0.79)
80mm (3-1/4")	14.4 (0.57)	51.0 (2.01)	G - 3/8 (NPT 3/8)	25.0 (0.98)	10.0 (0.39)	77.0 (3.03)	26.0 (1.02)
100mm (4")	18.3 (0.72)	60.5 (2.32)	G - 3/8 (NPT 3/8)	30.0 (1.18)	12.0 (0.47)	94.0 (3.70)	26.0 (1.02)

Bore	J	K	L	M	N	O	P
12mm (1/2")	6.1 (0.24)	3.5 (0.14)	3.5 (0.14)	25.0 (0.98)	5.0 (0.19)	25.0 (0.98)	32.0 (1.26)
16mm (5/8")	6.5 (0.26)	3.5 (0.14)	3.5 (0.14)	29.0 (1.14)	6.0 (0.25)	29.0 (1.14)	38.0 (1.50)
20mm (3/4")	9.0 (0.35)	7.0 (0.28)	5.5 (0.22)	36.0 (1.42)	8.0 (0.31)	36.0 (1.42)	47.0 (1.85)
25mm (1")	9.0 (0.35)	7.0 (0.28)	5.5 (0.22)	40.0 (1.57)	10.0 (0.38)	40.0 (1.57)	52.0 (2.05)
32mm (1-1/4")	9.0 (0.35)	7.0 (0.28)	5.5 (0.22)	45.0 (1.77)	14.0 (0.56)	49.5 (1.95)	60.0 (2.36)
40mm (1-1/2")	9.0 (0.35)	7.0 (0.28)	5.5 (0.22)	52.0 (2.05)	14.0 (0.56)	57.0 (2.24)	69.0 (2.72)
50mm (2")	11.1 (0.44)	8.0 (0.31)	6.9 (0.27)	64.0 (2.52)	17.0 (0.69)	71.0 (2.80)	86.0 (3.39)
63mm (2-1/2")	14.1 (0.56)	10.5 (0.41)	8.8 (0.35)	77.0 (3.03)	17.0 (0.69)	84.0 (3.31)	103.0 (4.06)
80mm (3-1/4")	17.5 (0.69)	13.5 (0.53)	11.0 (0.43)	98.0 (3.86)	22.0 (0.88)	104.0 (4.09)	132.0 (5.20)
100mm (4")	17.5 (0.69)	13.5 (0.53)	11.0 (0.43)	117.0 (4.61)	27.0 (1.06)	123.5 (4.86)	156.0 (6.14)

Bore	Q	R	V
12mm (1/2")	5.3 (0.21)	M3 x 0.5 6H (#8-32 UNC-2B)	32.4 (1.27)
16mm (5/8")	7.8 (0.31)	M4 x 0.7 6H (#8-32 UNC-2B)	33.2 (1.31)
20mm (3/4")	10.5 (0.41)	M5 x 0.8 6H (#10-32 UNF-2B)	35.2 (1.39)
25mm (1")	11.5 (0.45)	M6 x 1.0 6H (1/4-28 UNF-2B)	39.2 (1.54)
32mm (1-1/4")	17.7 (0.70)	M8 x 1.25 6H (5/16-24 UNF-2B)	44.7 (1.76)
40mm (1-1/2")	24.5 (0.96)	M8 x 1.25 6H (3/8-24 UNF-2B)	54.2 (2.14)
50mm (2")	29.3 (1.16)	M10 x 1.5 6H (1/2-20 UNF-2B)	56.3 (2.22)
63mm (2-1/2")	29.1 (1.15)	M10 x 1.5 6H (1/2-20 UNF-2B)	57.8 (2.28)
80mm (3-1/4")	28.1 (1.11)	M16 x 2.0 6H (5/8-18 UNF-2B)	70.8 (2.79)
100mm (4")	32.3 (1.27)	M20 x 2.5 6H (3/4-16 UNF-2B)	84.3 (3.26)

*See page 2.54 for overall body length with MRS option.

When option E is specified, user interface threads are designated U.S. customary (inch). This includes ports, rod threads and threaded mounting options (as applicable).



Bimba EF1 Cylinders

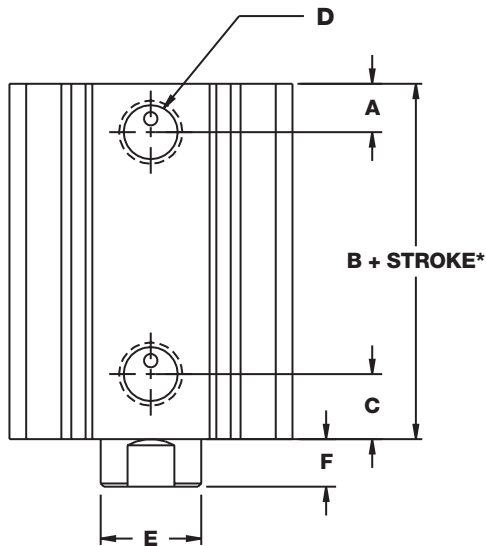
Dimensions

Shown in millimeters (inches)

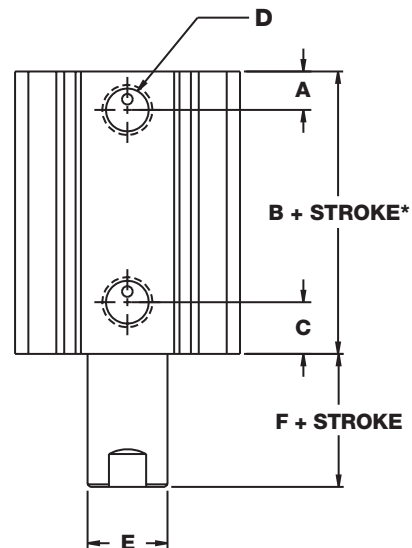
Spring Retract/Spring Extend

Bore	A	B	C	D	E	F
12mm (1/2")	3.8 (0.15)	17.0 (0.67)	8.9 (0.35)	M5 x 0.8 (#10-32)	6.0 (0.24)	3.5 (0.14)
16mm (5/8")	4.6 (0.18)	18.5 (0.73)	9.4 (0.37)	M5 x 0.8 (#10-32)	8.0 (0.31)	3.5 (0.14)
20mm (3/4")	4.8 (0.19)	19.5 (0.77)	9.4 (0.37)	M5 x 0.8 (#10-32)	10.0 (0.39)	4.5 (0.18)
25mm (1")	5.1 (0.20)	22.5 (0.89)	10.9 (0.43)	M5 x 0.8 (#10-32)	12.0 (0.47)	5.0 (0.20)
32mm (1-1/4")	7.1 (0.28)	23.0 (0.91)	10.4 (0.41)	G - 1/8 (NPT 1/8)	16.0 (0.63)	7.0 (0.28)
40mm (1-1/2")	7.4 (0.29)	29.5 (1.16)	13.2 (0.52)	G - 1/8 (NPT 1/8)	16.0 (0.63)	7.0 (0.28)
50mm (2")	9.4 (0.37)	30.5 (1.20)	13.7 (0.54)	G - 1/4 (NPT 1/4)	20.0 (0.79)	8.0 (0.31)
63mm (2-1/2")	9.7 (0.38)	36.0 (1.42)	15.7 (0.62)	G - 1/4 (NPT 1/4)	20.0 (0.79)	8.0 (0.31)
80mm (3-1/4")	11.7 (0.46)	43.5 (1.71)	17.8 (0.70)	G - 3/8 (NPT 3/8)	25.0 (0.98)	10.0 (0.39)

Spring Retract (Model EFS)



Spring Extend (Model EFR)



*See page 2.54 for overall body length with MRS option.

When option E is specified, user interface threads are designated U.S. customary (inch). This includes ports, rod threads and threaded mounting options (as applicable).

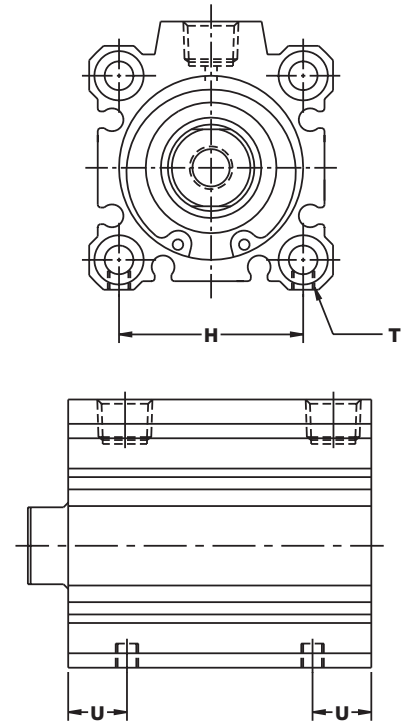
Bimba EF 1 Cylinders

Mounting Options

Threaded Bottom Mount (-1) (EF1 models only)

Bore	H	T	U
12mm (1/2")	15.5 (0.61)	M4 x 0.7 6H (8-32 UNC-2B)	6.6 (0.26)
16mm (5/8")	20.0 (0.79)	M4 x 0.7 6H (8-32 UNC-2B)	6.6 (0.26)
20mm (3/4")	25.5 (1.00)	M6 x 1.0 6H (1/4-20 UNC-2B)	11.2 (0.44)
25mm (1")	28.0 (1.10)	M6 x 1.0 6H (1/4-20 UNC-2B)	11.2 (0.44)
32mm (1-1/4")	34.0 (1.34)	M6 x 1.0 6H (1/4-20 UNC-2B)	11.2 (0.44)
40mm (1-1/2")	40.0 (1.57)	M6 x 1.0 6H (1/4-20 UNC-2B)	11.2 (0.44)
50mm (2")	50.0 (1.97)	M8 x 1.25 6H (5/16-18 UNC-2B)	13.0 (0.51)
63mm (2-1/2")	60.0 (2.36)	M10 x 1.5 6H (7/16-14 UNC-2B)	16.8 (0.66)
80mm (3-1/4")	77.0 (3.03)	M12 x 1.75 6H (1/2-13 UNC-2B)	20.8 (0.82)
100mm (4")	94.0 (3.70)	M12 x 1.75 6H (1/2-13 UNC-2B)	20.8 (0.82)

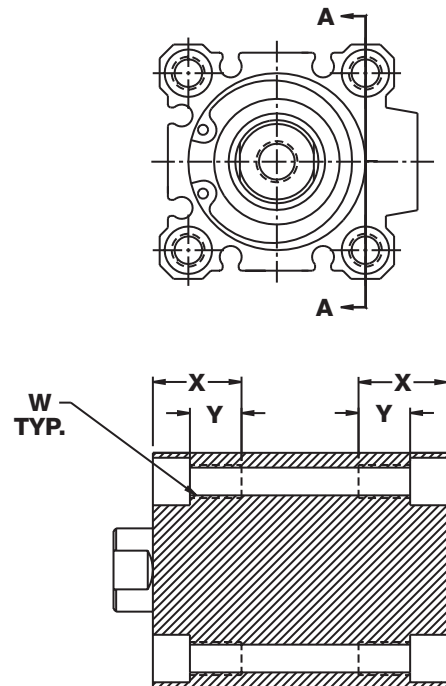
Note: On the following models, only the front set of threaded bottom mounting holes is provided; EF-205, EF-2010, EF-255, EF-325, EF-8010.



Threaded Front/Rear Mount (-3)

Bore	W	X	Y
12mm (1/2")	M4 X 0.7 (8-32 UNC)	10.5 (0.41)	7.0 (0.28)
16mm (5/8")	M4 X 0.7 (8-32 UNC)	10.5 (0.41)	7.0 (0.28)
20mm (3/4")	M6 X 1.0 (1/4-20 UNC)	17.0 (0.67)	10.0 (0.39)
25mm (1")	M6 X 1.0 (1/4-20 UNC)	17.0 (0.67)	10.0 (0.39)
32mm (1-1/4")	M6 X 1.0 (1/4-20 UNC)	17.0 (0.67)	10.0 (0.39)
40mm (1-1/2")	M6 X 1.0 (1/4-20 UNC)	17.0 (0.67)	10.0 (0.39)
50mm (2")	M8 X 1.25 (5/16-18 UNC)	22.0 (0.87)	14.0 (0.55)
63mm (2-1/2")	M10 X 1.5 (7/16-14 UNC)	28.5 (1.12)	18.0 (0.71)
80mm (3-1/4")	M12 X 1.75 (1/2-13 UNC)	35.6 (1.40)	22.0 (0.87)
100mm (4")	M12 X 1.75 (1/2-13 UNC)	35.6 (1.40)	22.0 (0.87)

Note: On EFT models, there are two threaded holes per end, not four.



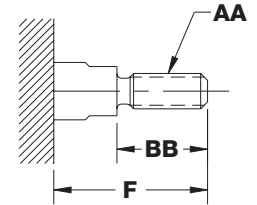
SECTION "A-A"

Bimba EF1 Cylinders

Options

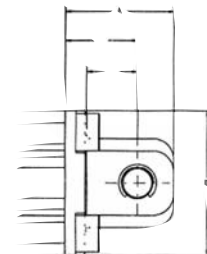
Male Rod End (MT)

Bore	Standard			With Option E		
	AA	BB	F	AA	BB	F
12mm (1/2")	M5 X 0.80	10.5 (0.41)	14.0 (0.55)	#8-32 UNC	8.0 (0.31)	11.5 (0.45)
16mm (5/8")	M6 X 1.00	12.0 (0.47)	15.5 (0.61)	#8-32 UNC	8.0 (0.31)	11.5 (0.45)
20mm (3/4")	M8 X 1.25	14.0 (0.55)	18.5 (0.73)	#10-32 UNF	8.0 (0.31)	12.5 (0.49)
25mm (1")	M10 X 1.25	17.5 (0.69)	22.5 (0.89)	1/4-28 UNF	9.5 (0.37)	14.5 (0.57)
32mm (1-1/4")	M14 X 1.5	23.5 (0.93)	28.5 (1.12)	5/16-24 UNF	12.7 (0.50)	19.7 (0.78)
40mm (1-1/2")	M14 X 1.5	23.5 (0.93)	28.5 (1.12)	3/8-24 UNF	16.0 (0.63)	23.0 (0.91)
50mm (2")	M18 X 1.5	28.5 (1.12)	33.5 (1.32)	1/2-20 UNF	19.5 (0.77)	27.5 (1.08)
63mm (2-1/2")	M18 X 1.5	28.5 (1.12)	33.5 (1.32)	1/2-20 UNF	19.5 (0.77)	27.5 (1.08)
80mm (3-1/4")	M22 X 1.5	35.5 (1.40)	43.5 (1.71)	5/8-18 UNF	25.5 (1.00)	35.5 (1.40)
100mm (4")	M26 X 1.5	35.5 (1.40)	43.5 (1.71)	3/4-16 UNF	28.5 (1.12)	40.5 (1.59)

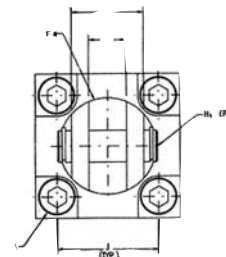


Rear Clevis Mount (6, 6N)

Stroke	A	B	C	D	E	F
12m	20 (0.79)	14 (0.55)	7 (0.28)	25 (0.98)	10 (0.39)	5 (0.21)
16m	21 (0.83)	15 (0.59)	10 (0.39)	29 (1.14)	12 (0.47)	7 (0.27)
20m	27 (1.06)	18 (0.71)	12 (0.47)	36 (1.41)	16 (0.62)	8 (0.33)
25m	30 (1.18)	20 (0.79)	14 (0.55)	40 (1.57)	20 (0.78)	10 (0.41)
32m	30 (1.18)	20 (0.79)	14 (0.55)	45 (1.77)	36 (1.41)	18 (0.72)
40m	32 (1.26)	22 (0.87)	14 (0.55)	52 (2.04)	36 (1.41)	18 (0.72)
50m	42 (1.65)	28 (1.10)	20 (0.79)	64 (2.52)	44 (1.72)	22 (0.87)
63m	44 (1.73)	30 (1.18)	20 (0.79)	77 (3.03)	44 (1.72)	22 (0.87)
80m	56 (2.21)	38 (1.50)	27 (1.06)	98 (3.85)	56 (2.20)	28 (1.11)
100m	67 (2.64)	45 (1.77)	31 (1.22)	117 (4.60)	64 (2.51)	32 (1.27)



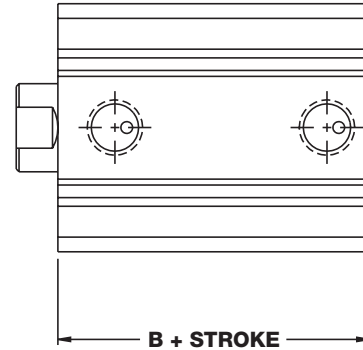
Bore	G	HØ (PIN)	I	J
12mm	13 (0.51)	5 (0.197)	M4x0.7 (#8-32 UNC)	15.5 (0.61)
16mm	15 (0.58)	5 (0.197)	M4x0.7 (#8-32 UNC)	20 (0.79)
20mm	21 (0.82)	8 (0.315)	M6x1.0 (1/4-20 UNC)	25.5 (1.00)
25mm	22 (0.85)	10 (0.394)	M6x1.0 (1/4-20 UNC)	28 (1.10)
32mm	39 (1.53)	10 (0.394)	M6x1.0 (1/4-20 UNC)	34 (1.34)
40mm	39 (1.53)	10 (0.394)	M6x1.0 (1/4-20 UNC)	40 (1.58)
50mm	49 (1.91)	14 (0.551)	M8x1.25 (5/16-18 UNC)	50 (1.97)
63mm	49 (1.91)	14 (0.551)	M10x1.5 (7/16-14 UNC)	60 (2.36)
80mm	62 (2.44)	18 (0.709)	M12x1.75 (1/2-13 UNC)	77 (3.03)
100mm	72 (2.84)	22 (0.866)	M12x1.75 (1/2-13 UNC)	94 (3.70)



Bimba EF1 Cylinders

Magnetic Position Sensing (M) (Body Lengths With MRS Option)

Bore	B	
	Double Acting Single Rod	Double Acting Double Rod
12mm (1/2")	27.0 (1.06)	32.4 (1.28)
16mm (5/8")	28.5 (1.12)	36.0 (1.42)
20mm (3/4")	29.5 (1.16)	36.0 (1.42)
25mm (1")	32.5 (1.28)	39.0 (1.54)
32mm (1-1/4")	33.0 (1.30)	40.5 (1.59)
40mm (1-1/2")	39.5 (1.56)	50.0 (1.97)
50mm (2")	40.5 (1.59)	50.5 (1.99)
63mm (2-1/2")	46.0 (1.81)	52.0 (2.05)
80mm (3-1/4")	53.5 (2.11)	61.0 (2.40)
100mm (4")	63.0 (2.48)	70.5 (2.78)



Bumpers (Stroke reduction by model for all bores)

Model	Stroke Reduction mm (inches)
Double Acting Single Rod End Double Acting Double Rod End	3.0 (.12)
Single Acting Spring Retract Reverse Acting Spring Extend	1.5 (.06)

Cylinder Weights

Bore	Approximate Base Weight of Cylinder gf (oz.)	Weight Added Per 5mm of Stroke gf (oz.)
12mm (1/2")	21.8 (0.77)	5.6 (0.20)
16mm (5/8")	38.7 (1.36)	8.0 (0.28)
20mm (3/4")	46.4 (1.64)	11.5 (0.41)
25mm (1")	73.1 (2.58)	14.6 (0.52)
32mm (1-1/4")	113.3 (4.00)	20.9 (0.74)
40mm (1-1/2")	181.4 (6.40)	21.3 (0.75)
50mm (2")	294.0 (10.37)	33.6 (1.19)
63mm (2-1/2")	484.5 (17.09)	40.7 (1.44)
80mm (3-1/4")	885.2 (31.23)	62.6 (2.21)
100mm (4")	1885.9 (66.52)	110.1 (3.89)

Bimba EF1 Cylinders

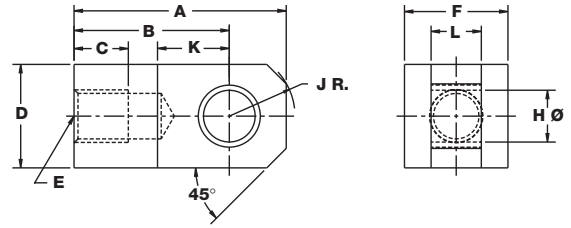
Accessories

Rod Pivot List Prices

Model Number	Bore	List Price
RP(M,E)K-12	12mm (1/2")	\$23.35
RP(M,E)K-16	16mm (5/8")	24.75
RP(M,E)K-20	20mm (3/4")	28.15
RP(M,E)K-25	25mm (1")	29.90
RP(M,E)K-32	32mm (1-1/4")	31.80
RP(M,E)K-40	40mm (1-1/2")	31.80
RP(M,E)K-50	50mm (2")	33.30
	63mm (2-1/2")	
RP(M,E)K-80	80mm (3-1/4")	34.10
RP(M,E)K-100	100mm (4")	35.55

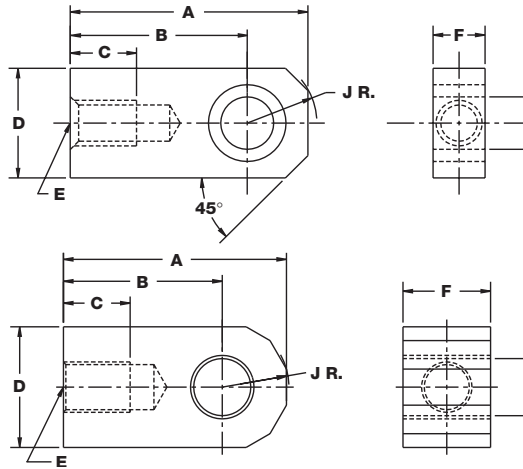
Note: To use Rod Pivot, cylinder must be specified with male thread option (MT).

For inch series Rod Pivot Kits, change the third digit from an M to an E.
For example: RPMK-32 is a metric size / RPEK-32 is a U.S. customary size.



Metric Small Bore Rod Pivot (for 12mm to 63mm bore cylinders)

RPMK-12, RPMK-16, RPMK-20, RPMK-25, RPMK-32, RPMK-40, RPMK-50



U.S. Customary Small Bore Rod Pivot (for 12mm to 63mm bore cylinders)

RPEK-12, RPEK-16, RPEK-20, RPEK-25, RPEK-32, RPEK-40, RPEK-50

Metric and U.S. Customary Large Bore Rod Pivot (for 80mm and 100mm bore cylinders)

RPMK-80, RPEK-80, RPMK-100, RPEK-100

Rod Pivot Dimensions

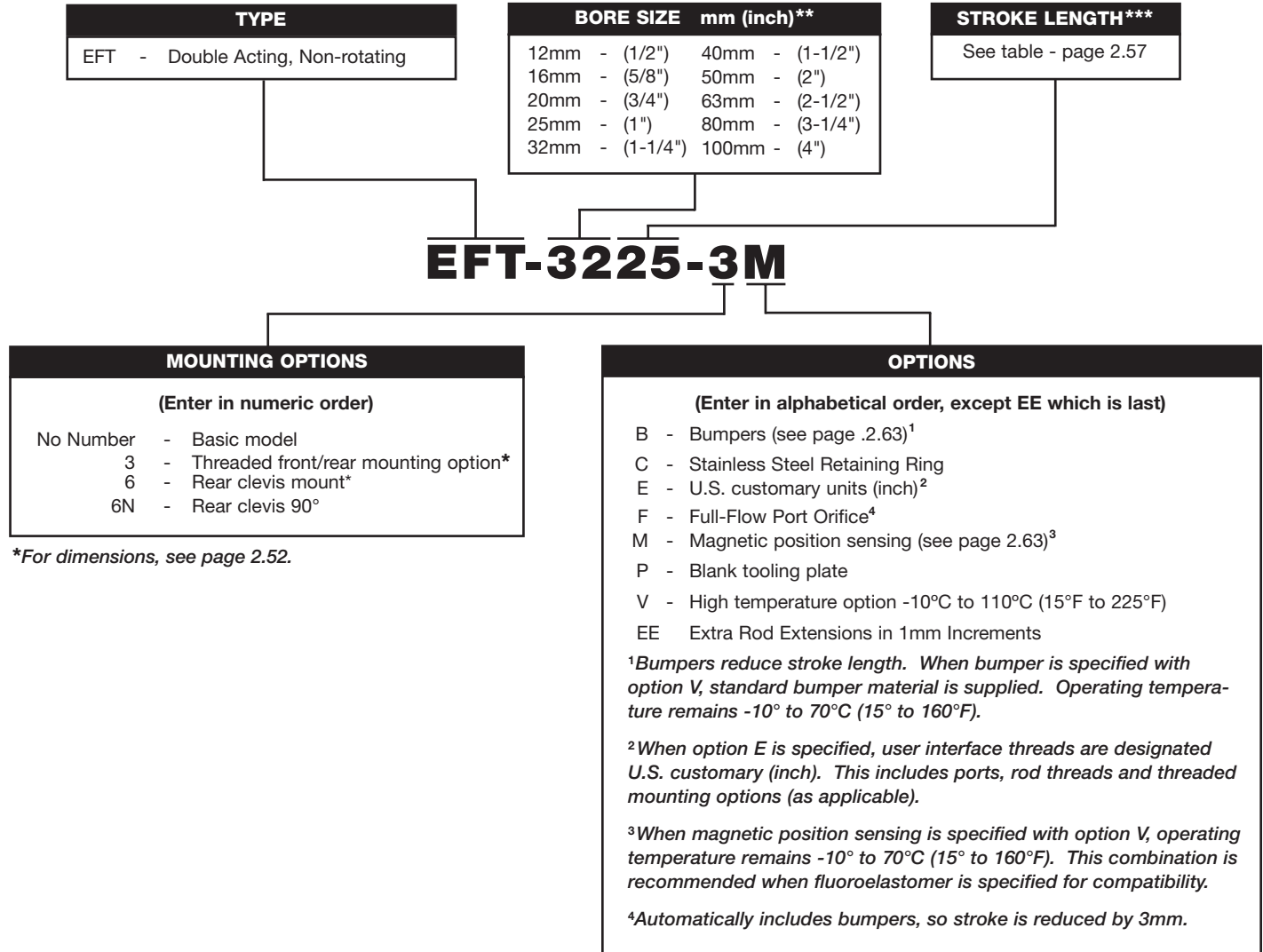
Model Number	Bore	A	B	C	D	E
RP(M,E)K-12	12mm (1/2")	21.5 (0.85)	16.0 (0.63)	6.0 (0.24)	10.0 (0.39)	M5 x 0.8 (# 8-32 UNC)
RP(M,E)K-16	16mm (5/8")	32.0 (1.26)	25.0 (0.99)	8.0 (0.24)	12.0 (0.47)	M6 x 1.0 (# 8-32 UNC)
RP(M,E)K-20	20mm (3/4")	34.0 (1.34)	25.0 (0.99)	8.5 (0.24)	16.0 (0.63)	M8 x 1.25 (# 10-32 UNF)
RP(M,E)K-25	25mm (1")	41.0 (1.62)	30.0 (1.19)	10.5 (0.32)	20.0 (0.79)	M10 x 1.25 (1/4-28 UNF)
RP(M,E)K-32	32mm (1-1/4")	40.5 (1.60)	30.0 (1.19)	14.0 (0.35)	22.0 (0.87)	M14 x 1.5 (5/16-24 UNF)
RP(M,E)K-40	40mm (1-1/2")	40.5 (1.60)	30.0 (1.19)	14.0 (0.43)	22.0 (0.87)	M14 x 1.5 (3/8-24 UNF)
RP(M,E)K-50	50mm (2")	53.8 (2.12)	40.0 (1.58)	18.0 (0.71)	28.0 (1.10)	M18 x 1.5 (1/2-20 UNF)
	63mm (2-1/2")					
RP(M,E)K-80	80mm (3-1/4")	70.2 (2.77)	50.0 (1.97)	21.0 (0.83)	38.0 (1.50)	M22 x 1.5 (5/8-18 UNF)
RP(M,E)K-100	100mm (4")	77.9 (3.07)	55.0 (2.17)	21.0 (0.83)	44.0 (1.73)	M26 x 1.5 (3/4-16 UNF)

Model Number	Bore Size	F	H	J	K	L
RP(M,E)K-12	12mm (1/2")	4.7 (0.19)	5.0 (0.190)	6.3 (0.25)	6.9 N/A	4.7 N/A
RP(M,E)K-16	16mm (5/8")	12.0 (0.25)	5.0 (0.190)	7.9 (0.31)	13.9 N/A	6.2 N/A
RP(M,E)K-20	20mm (3/4")	16.0 (0.31)	8.0 (0.314)	10.3 (0.41)	11.4 N/A	7.7 N/A
RP(M,E)K-25	25mm (1")	20.0 (0.38)	10.0 (0.394)	12.7 (0.50)	13.9 N/A	9.7 N/A
RP(M,E)K-32	32mm (1-1/4")	22.0 (0.70)	10.0 (0.394)	12.0 (0.47)	13.9 N/A	17.6 N/A
RP(M,E)K-40	40mm (1-1/2")	22.0 (0.70)	10.0 (0.394)	12.0 (0.47)	13.9 N/A	17.6 N/A
RP(M,E)K-50	50mm (2")	28.0 (0.85)	14.0 (0.501)	16.0 (0.63)	19.9 N/A	21.6 N/A
	63mm (2-1/2")					
RP(M,E)K-80	80mm (3-1/4")	27.6 (1.09)	18.04 (0.753)	21.0 (0.83)	N/A	N/A
RP(M,E)K-100	100mm (4")	31.6 (1.25)	22.04 (0.878)	24.0 (0.94)	N/A	N/A

Bimba EF2 Cylinders

How to Order

The Model Number for the EF2 cylinder 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 EFT-3225-3M. This is a 32mm bore, double acting, guided cylinder with metric threads and ports, 25mm stroke, threaded front/rear mounting holes, and magnetic position sensing.



*For dimensions, see page 2.52.

Please note that throughout all catalog charts, metric measurements are shown first and U.S. customary units (inches) are in parentheses.

**NOTE: Numbers in parentheses are the eq. bore size in inches. Listed for reference only. DO NOT use for model designation.

***When stroke length exceeds 30mm, a threaded mounting option should be considered. Mounting bolts that span the entire cylinder length may not be readily available.

Bimba EF2 Cylinders

Stroke Length Availability

Bore	Double Acting Standard Stroke Lengths (mm)
12mm (1/2")	5, 10, 15, 20, 25, 30
16mm (5/8")	
20mm (3/4")	5, 10, 15, 20, 25, 30, 35, 40, 45, 50
25mm (1")	
32mm (1-1/4")	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100
40mm (1-1/2")	
50mm (2")	10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100
63mm (2-1/2")	
80mm (3-1/4")	
100mm (4")	

NOTE: Stroke lengths are available in 5mm increments up to the maximum standard stroke. Body length corresponds with that of the next standard stroke length. For example, a 40mm bore, 55mm stroke cylinder has the body length of a 75mm stroke cylinder. When a stroke exceeds 30mm, a threaded mounting option should be considered. Mounting bolts that span the entire cylinder length may not be readily available.

List Prices

Model Type	Bore Size									
	12mm	16mm	20mm	25mm	32mm	40mm	50mm	63mm	80mm	100mm
EFT	\$41.00	\$46.00	\$52.50	\$59.25	\$74.25	\$86.00	\$99.75	\$114.00	\$134.25	\$183.25
Add per 5mm	2.00	2.00	2.00	2.25	2.25	2.25	2.75	3.25	3.50	4.25
Mounting Options										
3	\$5.65	\$5.90	\$7.80	\$8.10	\$9.15	\$9.35	\$10.20	\$10.80	\$11.35	\$11.90
6, 6N	11.20	11.70	12.55	14.55	15.95	17.85	20.65	26.75	32.65	43.50
Options										
B	\$3.40	\$6.00	\$6.00	\$6.00	\$7.15	\$7.15	\$8.10	\$9.80	\$14.95	\$17.25
C	2.70	2.90	3.90	4.40	5.35	8.05	13.85	16.55	108.75	186.15
F (includes B)	8.95	11.55	11.55	13.00	14.15	14.15	16.50	18.25	23.35	26.15
M	4.90	6.00	7.85	7.85	9.75	9.75	11.45	14.00	17.85	20.95
V	11.15	12.25	12.55	15.20	17.00	24.25	26.70	34.65	42.45	53.65
EE (per 1mm)	.35	.35	.35	.50	.50	.50	.65	.65	.85	.85

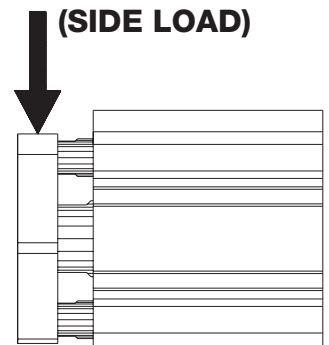
No charge options: E (U.S. Customary Units), P.

Bimba EF2 Cylinders

Maximum Side Loads kg-Force (lbs.)

Bore	Stroke Length							
	5mm	10mm	15mm	20mm	25mm	30mm	35mm	
12mm (1/2")	1.79 (3.94)	1.47 (3.24)	1.25 (2.75)	1.08 (2.39)	0.96 (2.11)	0.86 (1.89)		N/A
16mm (5/8")	2.60 (5.72)	2.16 (4.76)	1.85 (4.08)	1.62 (3.57)	1.44 (3.17)	1.30 (2.86)		N/A
20mm (3/4")	5.09 (11.23)	4.36 (9.62)	3.82 (8.42)	3.39 (7.48)	3.06 (6.74)	2.78 (6.13)	2.55 (5.62)	
25mm (1")	5.22 (11.50)	4.48 (9.88)	3.93 (8.66)	3.50 (7.71)	3.15 (6.94)	2.86 (6.32)	2.63 (5.80)	
32mm (1-1/4")	5.54 (12.22)	4.80 (10.59)	4.24 (9.35)	3.80 (8.37)	3.44 (7.58)	3.14 (6.91)	2.89 (6.36)	
40mm (1-1/2")	6.53 (14.40)	5.69 (12.55)	5.04 (11.12)	4.53 (9.98)	4.11 (9.06)	3.76 (8.28)	3.47 (7.64)	
50mm (2")	N/A	8.94 (19.71)	8.03 (17.71)	7.30 (16.09)	6.68 (14.74)	6.17 (13.60)	5.73 (12.62)	
63mm (2-1/2")	N/A	14.49 (31.95)	13.16 (29.01)	12.06 (26.58)	11.12 (24.51)	10.32 (22.76)	9.63 (21.23)	
80mm (3-1/4")	N/A	23.59 (52.02)	21.70 (47.85)	20.09 (44.30)	18.71 (41.24)	17.50 (38.58)	16.43 (36.23)	
100mm (4")	N/A	26.22 (57.80)	24.24 (53.45)	22.55 (49.71)	21.07 (46.46)	19.78 (43.61)	18.64 (41.08)	

Bore	Stroke Length				
	40mm	45mm	50mm	75mm	100mm
12mm (1/2")	N/A	N/A	N/A	N/A	N/A
16mm (5/8")	N/A	N/A	N/A	N/A	N/A
20mm (3/4")	2.35 (5.19)	2.19 (4.82)	2.04 (4.50)	N/A	N/A
25mm (1")	2.43 (5.35)	2.26 (4.98)	2.11 (4.64)	N/A	N/A
32mm (1-1/4")	2.68 (5.90)	2.49 (5.48)	2.33 (5.13)	1.76 (3.89)	1.42 (3.13)
40mm (1-1/2")	3.22 (7.09)	3.00 (6.60)	2.80 (6.18)	2.13 (4.70)	1.72 (3.79)
50mm (2")	5.34 (11.78)	5.01 (11.03)	4.71 (10.39)	3.64 (8.02)	2.96 (6.53)
63mm (2-1/2")	9.03 (19.90)	8.49 (18.72)	8.02 (17.67)	6.27 (13.82)	5.15 (11.35)
80mm (3-1/4")	15.49 (34.16)	14.66 (32.32)	13.91 (30.66)	11.07 (24.40)	9.19 (20.27)
100mm (4")	17.61 (38.83)	16.70 (36.82)	15.88 (35.00)	12.74 (28.08)	10.63 (23.44)



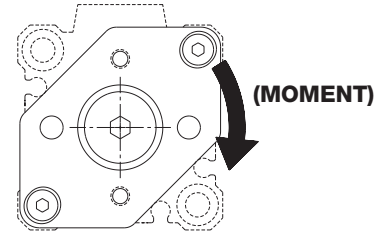
Maximum Moments N-m (in.-lbs.)

Bore	Stroke Length							
	5mm	10mm	15mm	20mm	25mm	30mm	35mm	
12mm (1/2")	0.08 (0.72)	0.07 (0.59)	0.06 (0.50)	0.05 (0.44)	0.04 (0.39)	0.04 (0.35)		N/A
16mm (5/8")	0.16 (1.39)	0.13 (1.16)	0.11 (1.00)	0.10 (0.87)	0.09 (0.78)	0.08 (0.70)		N/A
20mm (3/4")	0.42 (3.72)	0.36 (3.20)	0.32 (2.81)	0.28 (2.50)	0.25 (2.25)	0.23 (2.05)	0.21 (1.88)	
25mm (1")	0.45 (4.02)	0.39 (3.46)	0.34 (3.04)	0.31 (2.71)	0.28 (2.45)	0.25 (2.23)	0.23 (2.05)	
32mm (1-1/4")	0.50 (4.45)	0.44 (3.88)	0.39 (3.44)	0.35 (3.09)	0.32 (2.81)	0.29 (2.57)	0.27 (2.37)	
40mm (1-1/2")	0.59 (5.24)	0.52 (4.57)	0.46 (4.05)	0.41 (3.64)	0.37 (3.31)	0.34 (3.03)	0.32 (2.79)	
50mm (2")	N/A	1.13 (10.04)	1.02 (9.06)	0.93 (8.26)	0.86 (7.59)	0.79 (7.02)	0.74 (6.53)	
63mm (2-1/2")	N/A	2.35 (20.84)	2.15 (18.99)	1.97 (17.44)	1.82 (16.13)	1.69 (15.00)	1.58 (14.01)	
80mm (3-1/4")	N/A	4.72 (41.75)	4.35 (38.51)	4.04 (35.75)	3.77 (33.35)	3.53 (31.25)	3.32 (29.41)	
100mm (4")	N/A	5.57 (49.33)	5.16 (45.63)	4.79 (42.44)	4.48 (39.67)	4.21 (37.24)	3.96 (35.09)	

Bimba EF2 Cylinders

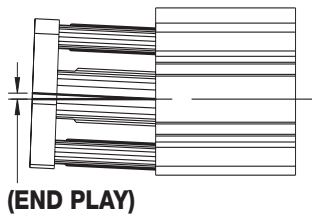
Maximum Moments N-m (in.-lbs.)

Bore	Stroke Length				
	40mm	45mm	50mm	75mm	100mm
12mm (1/2")	N/A	N/A	N/A	N/A	N/A
16mm (5/8")	N/A	N/A	N/A	N/A	N/A
20mm (3/4")	0.20 (1.74)	0.18 (1.62)	0.17 (1.51)	N/A	N/A
25mm (1")	0.21 (1.89)	0.20 (1.76)	0.19 (1.64)	N/A	N/A
32mm (1-1/4")	0.25 (2.20)	0.23 (2.05)	0.22 (1.92)	0.16 (1.46)	0.13 (1.18)
40mm (1-1/2")	0.29 (2.59)	0.27 (2.41)	0.26 (2.26)	0.19 (1.72)	0.16 (1.39)
50mm (2")	0.69 (6.11)	0.65 (5.73)	0.61 (5.40)	0.47 (4.19)	0.39 (3.42)
63mm (2-1/2")	1.49 (13.15)	1.40 (12.39)	1.32 (11.71)	1.04 (9.19)	0.85 (7.57)
80mm (3-1/4")	3.14 (27.77)	2.97 (26.30)	2.82 (24.98)	2.26 (19.96)	1.88 (16.63)
100mm (4")	3.75 (33.17)	3.55 (31.45)	3.38 (29.90)	2.71 (24.00)	2.26 (20.04)



Tooling Plate End Play mm (in.)

Bore	Stroke Length						
	5mm	10mm	15mm	20mm	25mm	30mm	35mm
12mm (1/2")	0.17 (.007)	0.21 (.008)	0.25 (.010)	0.29 (.012)	0.34 (.013)	0.38 (.015)	N/A
16mm (5/8")	0.18 (.007)	0.23 (.009)	0.27 (.011)	0.32 (.012)	0.36 (.014)	0.41 (.016)	N/A
20mm (3/4")	0.15 (.006)	0.18 (.007)	0.20 (.008)	0.23 (.009)	0.26 (.010)	0.29 (.011)	0.32 (.013)
25mm (1")	0.16 (.006)	0.19 (.007)	0.22 (.008)	0.24 (.010)	0.27 (.011)	0.30 (.012)	0.33 (.013)
32mm (1-1/4")	0.17 (.007)	0.20 (.008)	0.23 (.009)	0.26 (.010)	0.28 (.011)	0.31 (.012)	0.34 (.013)
40mm (1-1/2")	0.17 (.007)	0.20 (.008)	0.23 (.009)	0.26 (.010)	0.28 (.011)	0.31 (.012)	0.34 (.013)
50mm (2")	N/A	0.26 (.010)	0.30 (.012)	0.33 (.013)	0.36 (.014)	0.40 (.016)	0.43 (.017)
63mm (2-1/2")	N/A	0.18 (.007)	0.20 (.008)	0.22 (.009)	0.24 (.010)	0.26 (.010)	0.28 (.011)
80mm (3-1/4")	N/A	0.20 (.008)	0.23 (.009)	0.25 (.010)	0.27 (.011)	0.29 (.011)	0.31 (.012)
100mm (4")	N/A	0.21 (.008)	0.23 (.009)	0.26 (.010)	0.28 (.011)	0.30 (.012)	0.32 (.013)



Bore	Stroke Length				
	40mm	45mm	50mm	75mm	100mm
12mm (1/2")	N/A	N/A	N/A	N/A	N/A
16mm (5/8")	N/A	N/A	N/A	N/A	N/A
20mm (3/4")	0.35 (.014)	0.38 (.015)	0.40 (.016)	N/A	N/A
25mm (1")	0.36 (.014)	0.39 (.015)	0.42 (.016)	N/A	N/A
32mm (1-1/4")	0.37 (.015)	0.40 (.016)	0.43 (.017)	0.57 (.022)	0.71 (.028)
40mm (1-1/2")	0.37 (.015)	0.40 (.016)	0.43 (.017)	0.57 (.022)	0.71 (.028)
50mm (2")	0.46 (.018)	0.50 (.020)	0.53 (.021)	0.70 (.027)	0.86 (.034)
63mm (2-1/2")	0.30 (.012)	0.32 (.013)	0.35 (.014)	0.45 (.018)	0.55 (.022)
80mm (3-1/4")	0.33 (.013)	0.36 (.014)	0.38 (.015)	0.49 (.019)	0.60 (.023)
100mm (4")	0.34 (.014)	0.36 (.014)	0.39 (.015)	0.50 (.020)	0.61 (.024)

Flat-1 / Square Flat-1
 Flat-II / Square Flat-II
 F02, F03, F04
 F0P
 Flat Accessories
 EF1 / EF2
 Stopper / Twist Clamp
 Extruded Flat Lift Table
 Twin Bore
 NPA / LPA
 Diaphragm / Miniature Cube

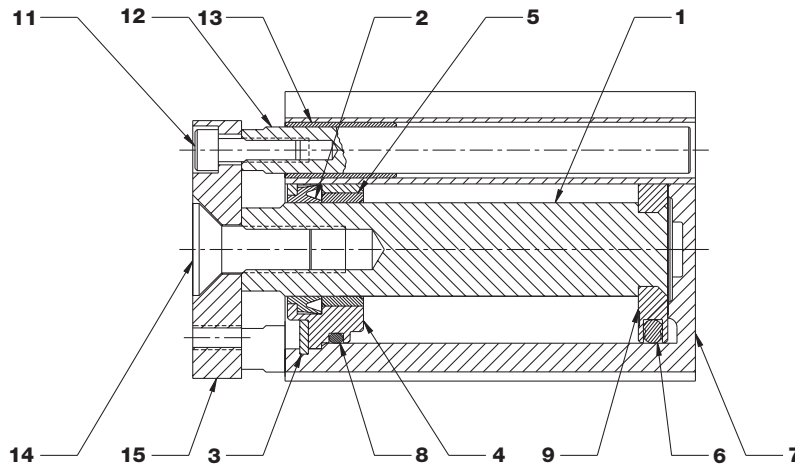
Bimba EF2 Cylinders

Components

Shown in millimeters (inches)

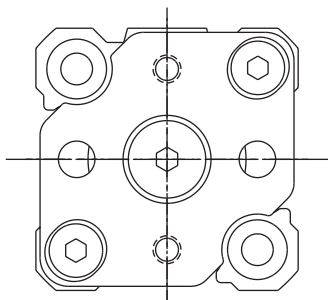
Part List

Part #	Description	Material
1	Rod	4301 (303) Stainless Steel
2	Rod Seal/Wiper	Nitrile (Standard) or Fluoroelastomer (High Temperature Option)
3	Retaining Ring	Zinc Plated Carbon Steel or Stainless Steel (Optional)
4	Rod Guide	12-20mm: Bronze / 25-100mm: Anodized Aluminum
5	Bushing	12-20mm: Bronze / 25-100mm: Self Lubricating Nylon
6	Piston Seal	Nitrile (Standard) or Fluoroelastomer (High Temperature Option)
7	Cylinder Body	Polytetrafluoroethylene (PTFE) Impregnated Hard Anodized Aluminum
8	Rod Guide Seal	Nitrile (Standard) or Fluoroelastomer (High Temperature Option)
9	Piston	High Strength Aluminum Alloy
11	Cap Screw	Stainless Steel
12	Guide Rod	Chrome Plated Stainless Steel
13	Guide Bushing	Delrin
14	Flat Screw	Stainless Steel
15	Plate	Clear Coat Anodized Aluminum

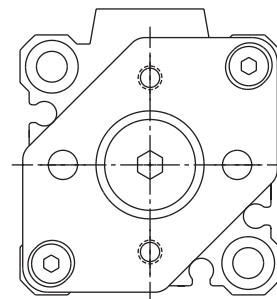


Tooling Plate Styles

12mm to 16mm Bore



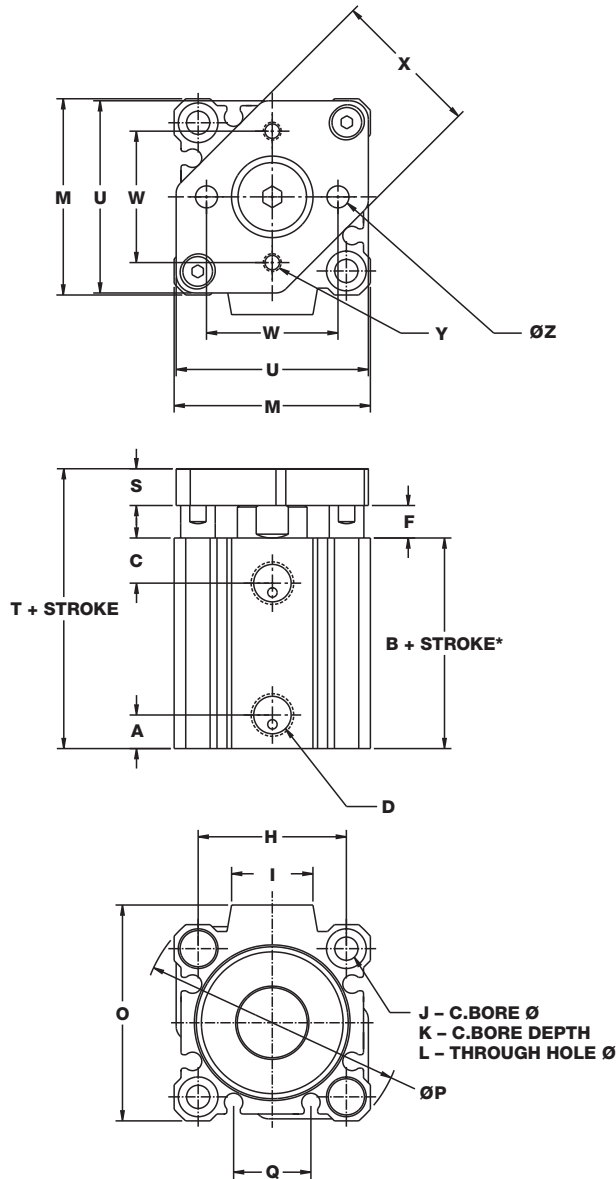
20mm to 100mm Bore



Bimba EF2 Cylinders

Dimensions

Shown in millimeters (inches)



Double Acting/Non-Rotating

Bore	A	B	C	D	F	H	I	J
12mm (1/2")	3.8 (0.15)	17.0 (0.67)	8.9 (0.35)	M5 x 0.8 (#10-32)	3.5 (0.14)	15.5 (0.61)	N/A	6.1 (0.24)
16mm (5/8")	4.5 (0.18)	18.5 (0.73)	9.4 (0.37)	M5 x 0.8 (#10-32)	3.5 (0.14)	20.0 (0.79)	8.7 (0.34)	6.5 (0.26)
20mm (3/4")	4.8 (0.19)	19.5 (0.77)	9.4 (0.37)	M5 x 0.8 (#10-32)	4.5 (0.18)	25.5 (1.00)	9.5 (0.38)	9.0 (0.36)
25mm (1")	5.1 (0.20)	22.5 (0.89)	10.9 (0.43)	M5 x 0.8 (#10-32)	5.0 (0.20)	28.0 (1.10)	10.3 (0.41)	9.0 (0.36)
32mm (1-1/4")	7.0 (0.28)	23.0 (0.91)	10.4 (0.41)	G - 1/8 (NPT 1/8)	7.0 (0.28)	34.0 (1.34)	18.6 (0.73)	9.0 (0.36)
40mm (1-1/2")	7.4 (0.29)	29.5 (1.16)	13.2 (0.52)	G - 1/8 (NPT 1/8)	7.0 (0.28)	40.0 (1.58)	17.3 (0.68)	9.0 (0.36)
50mm (2")	9.4 (0.37)	30.5 (1.20)	13.7 (0.54)	G - 1/4 (NPT 1/4)	8.0 (0.32)	50.0 (1.97)	20.0 (0.79)	11.1 (0.44)
63mm (2-1/2")	9.7 (0.38)	36.0 (1.42)	15.7 (0.62)	G - 1/4 (NPT 1/4)	8.0 (0.32)	60.0 (2.36)	20.0 (0.79)	14.1 (0.56)
80mm (3-1/4")	11.6 (0.46)	43.5 (1.71)	17.8 (0.70)	G - 3/8 (NPT 3/8)	10.0 (0.39)	77.0 (3.03)	26.0 (1.02)	17.5 (0.69)
100mm (4")	12.2 (0.48)	53.0 (2.09)	24.4 (0.96)	G - 3/8 (NPT 3/8)	12.0 (0.47)	94.0 (3.70)	26.0 (1.02)	17.5 (0.69)

Bimba EF2 Cylinders

Dimensions

Shown in millimeters (inches)

Bore	K	L	M	O	P	Q	S	T
12mm (1/2")	3.5 (0.14)	3.5 (0.14)	25.0 (0.98)	25.0 (0.98)	32.0 (1.26)	5.3 (0.21)	6.0 (0.24)	26.5 (1.04)
16mm (5/8")	3.5 (0.14)	3.5 (0.14)	29.0 (1.14)	29.0 (1.14)	38.0 (1.50)	7.8 (0.31)	6.0 (0.24)	28.0 (1.10)
20mm (3/4")	7.0 (0.28)	5.5 (0.22)	36.0 (1.42)	36.0 (1.42)	47.0 (1.85)	10.5 (0.41)	6.9 (0.27)	30.8 (1.21)
25mm (1")	7.0 (0.28)	5.5 (0.22)	40.0 (1.58)	40.0 (1.58)	52.0 (2.05)	11.5 (0.45)	8.3 (0.33)	35.8 (1.41)
32mm (1-1/4")	7.0 (0.28)	5.5 (0.22)	45.0 (1.77)	49.5 (1.95)	60.0 (2.36)	17.7 (0.70)	8.3 (0.33)	38.3 (1.52)
40mm (1-1/2")	7.0 (0.28)	5.5 (0.22)	52.0 (2.05)	57.0 (2.24)	69.0 (2.72)	24.5 (0.96)	8.3 (0.33)	44.8 (1.76)
50mm (2")	8.0 (0.31)	6.9 (0.27)	64.0 (2.52)	71.0 (2.80)	86.0 (3.39)	29.3 (1.16)	12.1 (0.48)	50.6 (1.99)
63mm (2-1/2")	10.5 (0.41)	8.8 (0.35)	77.0 (3.03)	84.0 (3.31)	103.0 (4.06)	29.1 (1.15)	12.5 (0.49)	56.5 (2.22)
80mm (3-1/4")	13.5 (0.53)	11.0 (0.43)	98.0 (3.86)	104.0 (4.09)	132.0 (5.20)	28.1 (1.11)	14.0 (0.55)	67.5 (2.66)
100mm (4")	13.5 (0.53)	11.0 (0.43)	117.0 (4.61)	123.5 (4.86)	156.0 (6.14)	32.3 (1.27)	14.0 (0.55)	79.0 (3.11)

Bore	U	W	X	Y		Z	
				Standard	With Option E	Standard	With Option E
12mm (1/2")	24.3 (0.96)	14.0 (0.55)	20.8 (0.82)	M3 x 0.5 6H	#4-40 UNC-2B	4.1 (0.16)	3.6 (0.14)
16mm (5/8")	28.0 (1.10)	20.0 (0.79)	25.0 (0.98)	M3 x 0.5 6H	#4-40 UNC-2B	4.1 (0.16)	3.6 (0.14)
20mm (3/4")	35.0 (1.38)	27.0 (1.06)	26.5 (1.04)	M4 x 0.7 6H	#6-32 UNC-2B	5.2 (0.20)	4.3 (0.17)
25mm (1")	39.0 (1.54)	27.0 (1.06)	30.0 (1.18)	M4 x 0.7 6H	#6-32 UNC-2B	5.2 (0.20)	4.3 (0.17)
32mm (1-1/4")	44.0 (1.73)	30.0 (1.18)	34.3 (1.35)	M4 x 0.7 6H	#8-32 UNC-2B	5.2 (0.20)	4.7 (0.18)
40mm (1-1/2")	51.0 (2.01)	30.0 (1.18)	38.0 (1.50)	M4 x 0.7 6H	#8-32 UNC-2B	5.2 (0.20)	4.7 (0.18)
50mm (2")	63.0 (2.48)	42.8 (1.69)	48.0 (1.89)	M5 x 0.8 6H	#10-32 UNF-2B	6.4 (0.25)	5.6 (0.22)
63mm (2-1/2")	75.8 (2.98)	42.8 (1.69)	53.7 (2.11)	M5 x 0.8 6H	#10-32 UNF-2B	6.4 (0.25)	5.6 (0.22)
80mm (3-1/4")	97.0 (3.82)	50.8 (2.00)	74.8 (2.94)	M6 x 1.0 6H	#1/4-20 UNC-2B	7.1 (0.28)	7.2 (0.29)
100mm (4")	115.5 (4.55)	50.8 (2.00)	93.3 (3.67)	M6 x 1.0 6H	#1/4-20 UNC-2B	7.1 (0.28)	7.2 (0.29)

*See page 2.63 for overall body length with MRS option.

When option E is specified, user interface threads are designated U.S. customary (inch). This includes ports, rod threads and threaded mounting options (as applicable).

Bimba EF2 Cylinders

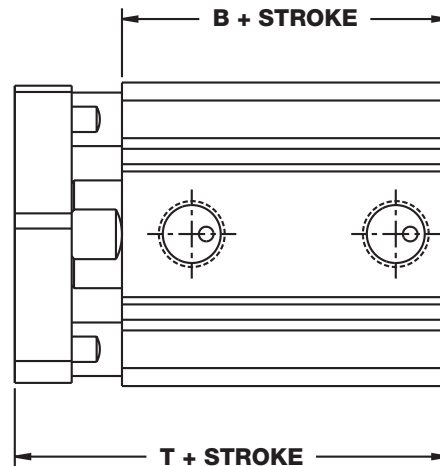
Weights

Bore	Base Weight of Cylinder gram-force (oz.)	Weight Added Per 5mm of Stroke gram-force (oz.)
12mm (1/2")	32.3 (1.14)	6.1 (0.22)
16mm (5/8")	53.4 (1.89)	8.6 (0.30)
20mm (3/4")	74.4 (2.62)	13.3 (0.47)
25mm (1")	114.6 (4.04)	16.3 (0.58)
32mm (1-1/4")	166.9 (5.89)	22.6 (0.80)
40mm (1-1/2")	250.7 (8.84)	23.0 (0.81)
50mm (2")	440.4 (15.53)	35.8 (1.26)
63mm (2-1/2")	697.3 (24.60)	45.2 (1.59)
80mm (3-1/4")	1309.6 (46.20)	70.0 (2.47)
100mm (4")	2464.6 (86.94)	117.5 (4.15)

Options

Magnetic Position Sensing (M)
(Body Lengths With MRS Option)

Bore	B	T
12mm (1/2")	27.0 (1.06)	36.7 (1.44)
16mm (5/8")	28.5 (1.12)	38.2 (1.51)
20mm (3/4")	29.5 (1.16)	41.0 (1.61)
25mm (1")	32.5 (1.28)	46.0 (1.81)
32mm (1-1/4")	33.2 (1.31)	48.7 (1.92)
40mm (1-1/2")	39.5 (1.56)	55.0 (2.17)
50mm (2")	40.5 (1.60)	60.6 (2.39)
63mm (2-1/2")	46.0 (1.81)	66.3 (2.61)
80mm (3-1/4")	53.5 (2.11)	77.4 (3.05)
100mm (4")	63.0 (2.48)	88.9 (3.50)



Bumpers

(Stroke reduction by model for all bores)

Model	Stroke Reduction mm (inches)
Double Acting, Non-Rotating	3.0 (.12)

Bimba Stopper Cylinders



A Bimba EF1 Cylinder was modified for a conveyor stopping application. Featuring a heavy-duty mounting, the cylinder's rod/bearing design was developed to withstand side impact loading.

How to Order and List Prices

Model/Price	Dimensions (inch)
<p>Model Number: EFL—Double-acting load-bearing conveyor-stop cylinder EFLR—Double-acting failsafe, spring extended</p> <p>Part Number: EFL or EFLR-32 □ -E(options) Note: Part number must include option -E; available only in inch series.</p> <p>Stroke Length: 15, 20, 25mm</p> <p>List Price: EFL \$130.00 + \$1.70/5mm stroke EFLR \$143.05 + \$1.70/5mm stroke</p> <p>Options: EE (Extra rod extension up to 25mm) \$.16/mm M (MRS position sensing) \$9.95 V (High Temp, to 225° F) \$17.35</p>	

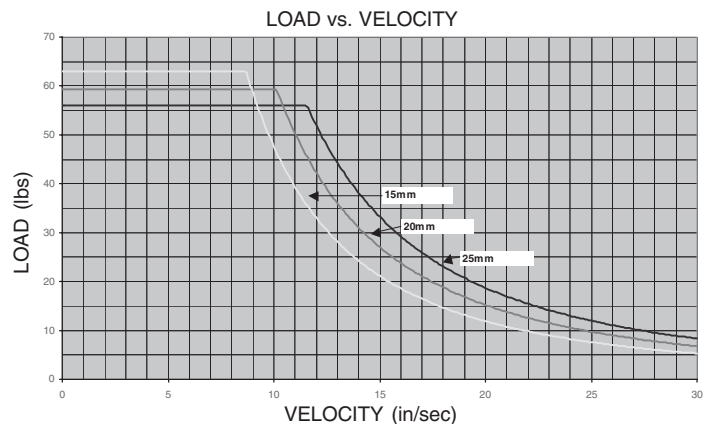
Engineering Specifications

- Maximum Operating Pressure: 140 psi
- Operating Temperature: 15° to 160° F (15° - 225° with -V option)
- Lubrication: PTFE Grease
- Cylinder Body: Aluminum; Hard-Coat with PTFE
- Piston Rod: 303 Stainless Steel
- Mounting Flange: Anodized Aluminum
- Seals: Nitrile (fluoroelastomer optional)
- Rod Bearing: Sintered Iron
- Spring Pre-final Loads: 2-8 lbs.

Impact Limitations

Maximum Side Load

Stroke (mm)	Side Load (lb.)
15	12
20	11
25	10



Bimba Twist Clamp Cylinders

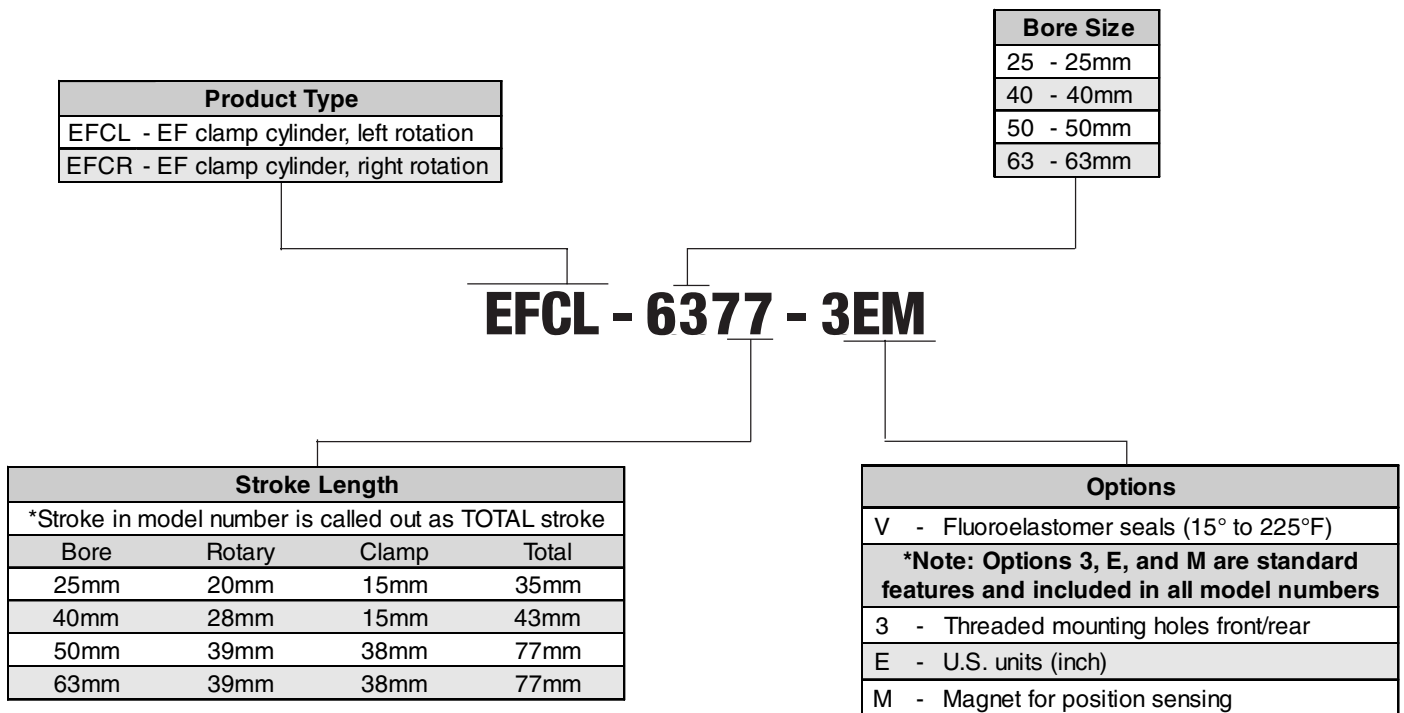


The Bimba Twist Clamp Cylinder combines linear and 90-degree rotary motion with an internal pin/cam mechanism. The rotary action moves a clamping arm away from the workpiece, allowing for easy loading and unloading of parts.

How to Order

The model number for all EF Twist Clamp cylinders consists of three alphanumeric clusters. These designate product type, bore size and stroke length, and options.

Please note the following features are standard, and are included in all model numbers: **3** (threaded front/rear mounting holes), **E** (US/inch units), and **M** (magnetic position sensing).

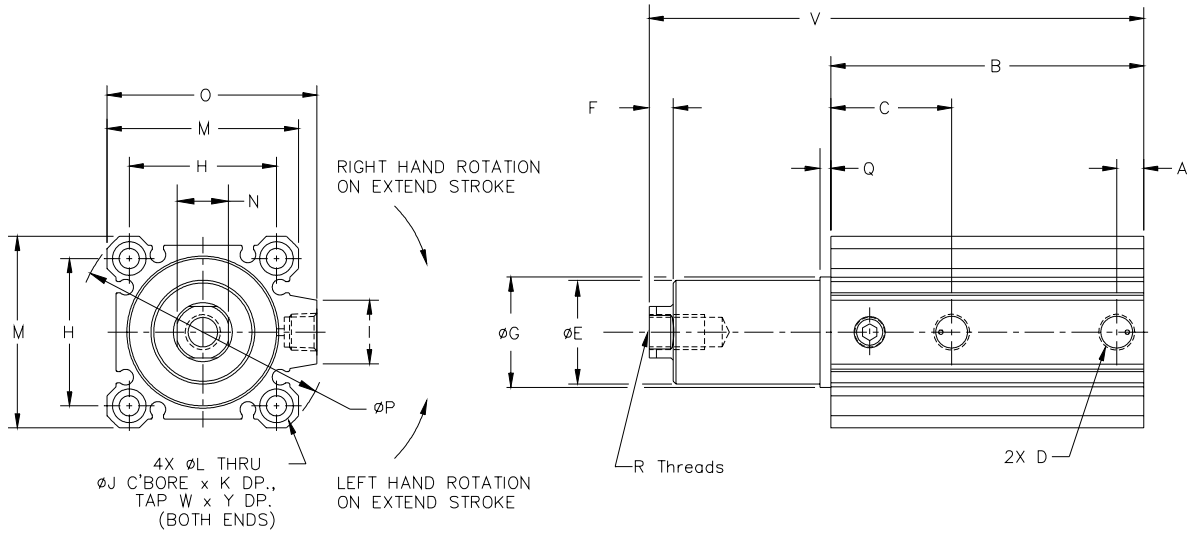


List Prices

Bore	Base Price (includes stroke)	Options V-fluoroelastomer Seals
25mm	\$176.40	\$15.55
40mm	266.15	24.65
50mm	325.25	27.20
63mm	402.45	35.30

Bimba Twist Clamp Cylinders

Dimensions

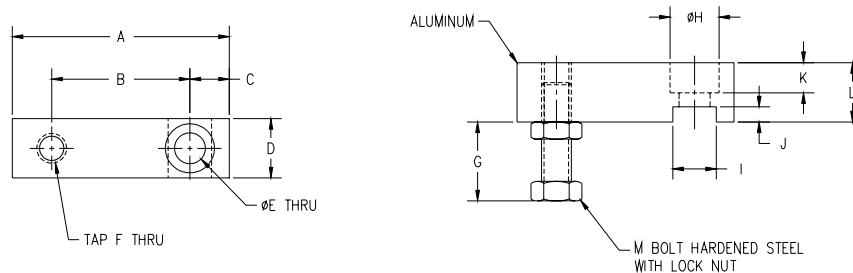


Bore	A	B	C	D	E	F	G	H	I	J
25mm	0.20	3.27	1.22	#10-32	0.90	0.16	0.905	1.10	0.41	0.35
40mm	0.29	3.34	1.29	1/8 NPT	0.88	0.26	1.180	1.57	0.68	0.35
50mm	0.37	4.98	1.29	1/4 NPT	1.39	0.30	1.456	1.97	0.79	0.44
63mm	0.38	5.12	1.37	1/4 NPT	1.82	0.30	1.888	2.36	0.79	0.56

Bore	K	L	M	N	Rod Dia.	O	P	Q	R	V	W	Y
25mm	0.28	0.22	1.57	0.39	0.47	1.57	2.05	0.16	5/16-24	4.47	1/4-20	0.67
40mm	0.28	0.22	2.05	0.54	0.63	2.24	2.72	0.11	3/8-24	5.30	1/4-20	0.67
50mm	0.31	0.27	2.52	0.66	0.79	2.80	3.39	0.14	1/2-20	8.35	5/16-18	0.86
63mm	0.41	0.35	3.03	0.66	0.79	3.31	4.06	0.16	1/2-20	8.47	7/16-14	1.12

Accessories

Clamp Arm Accessory	
Model Number	List Price
EFCA-25-E	\$33.10
EFCA-40-E	33.10
EFCA-50-E	49.65
EFCA-63-E	49.65



Bore	A	B	C	D	E	F	G	H	I	J	K	L	M
25mm	2.00	1.38	0.38	0.63	0.34	1/4-20	1.13	0.50	0.393	0.08	0.32	0.63	1/4-20
40mm	2.75	1.75	0.50	0.75	0.39	3/8-16	1.00	0.62	0.550	0.19	0.38	0.75	3/8-16
50mm	3.44	2.50	0.50	0.88	0.53	3/8-16	1.00	0.78	0.668	0.19	0.50	0.88	3/8-16
63mm	3.44	2.50	0.50	0.88	0.53	3/8-16	1.00	0.78	0.668	0.19	0.50	0.88	3/8-16

Bimba Twist Clamp Cylinders

How it Works/Materials of Construction



The Guide Pin rides in the Cam Bushing. The bottom portion of stroke is linear travel. As the cylinder extends, the pin follows the groove and creates 90 degrees of rotary motion.

Engineering Specifications

Operating Medium: Air
 Maximum Operating Pressure: 140 psi
 Ambient and Fluid Temperature: +15 to +160 degrees F
 Lubrication: PTFE grease

Flat-I /
Square Flat-I

Flat-II /
Square Flat-II

F02, F03, F04
(multiple power)

F0P
(multiple position)

Flat
Accessories

EF1 / EF2

Stopper /
Twist Clamp

Extruded
Flat Lift Table

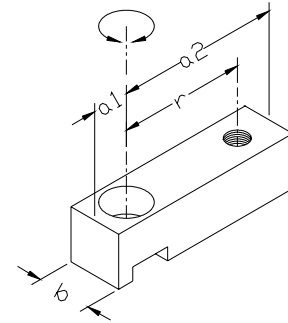
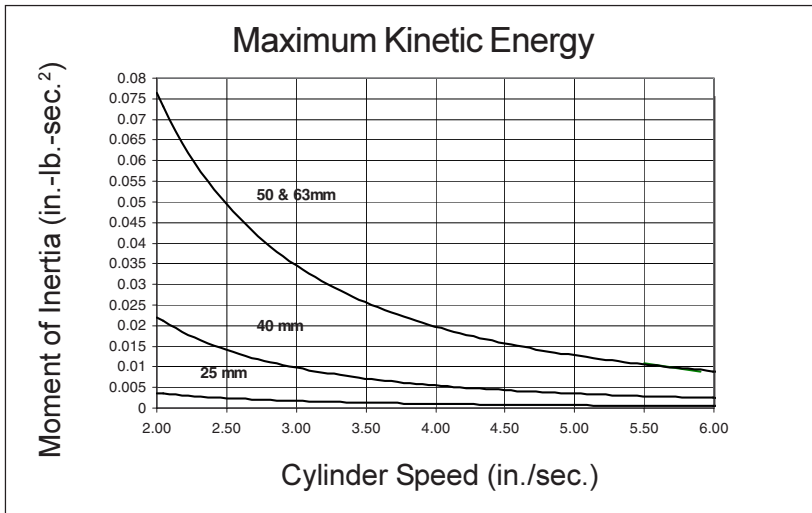
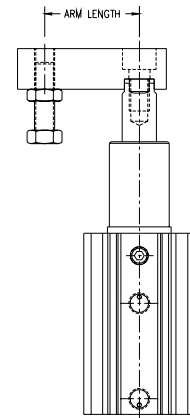
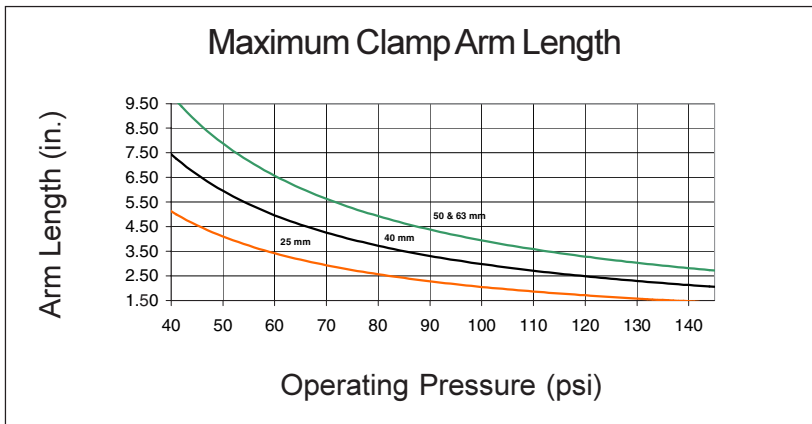
Twin Bore

NPA / LPA

Diaphragm /
Miniature Cube

Bimba Twist Clamp Cylinders

Engineering Specifications



$$I = \frac{W_{a1}}{g} * \frac{4(a1)^2 + b^2}{12} + \frac{W_{a2}}{g} * \frac{4(a2)^2 + b^2}{12}$$

Example, for standard EFCA-40-E

a1 = .50 in. Wa1 = .028 lbs.
a2 = 2.25 in. Wa2 = .127 lbs.
b = .75 in.
r = 1.75 in.
g = 386 in./sec.²
clamp bolt and nut = .081 lbs.

$$I_{\text{arm}} = \frac{.028 \text{ lb.}}{386 \text{ in./sec.}^2} * \frac{4 (.50 \text{ in.})^2 + (.75 \text{ in.})^2}{12} + \frac{.127 \text{ lb.}}{386 \text{ in./sec.}^2} * \frac{4(2.25 \text{ in.})^2 + (.75 \text{ in.})^2}{12}$$

$$I_{\text{arm}} = .000578 \text{ in.-lb.-sec.}^2$$

$$I_{\text{bolt/nut}} = \frac{.081 \text{ lbs.}}{386 \text{ in./sec.}^2} * (1.75 \text{ in.})^2 = .000642 \text{ in.-lb.-sec.}^2$$

$$I_{\text{total}} = .000578 + .000642 = 0.00122 \text{ in.-lb.-sec.}^2$$

Operating Precautions:

- Do not clamp during rotary portion of stroke.
- Cylinder should be mounted vertically.
- Any force applied to clamped part perpendicular to clamping direction should not exceed 5% of the clamp force.

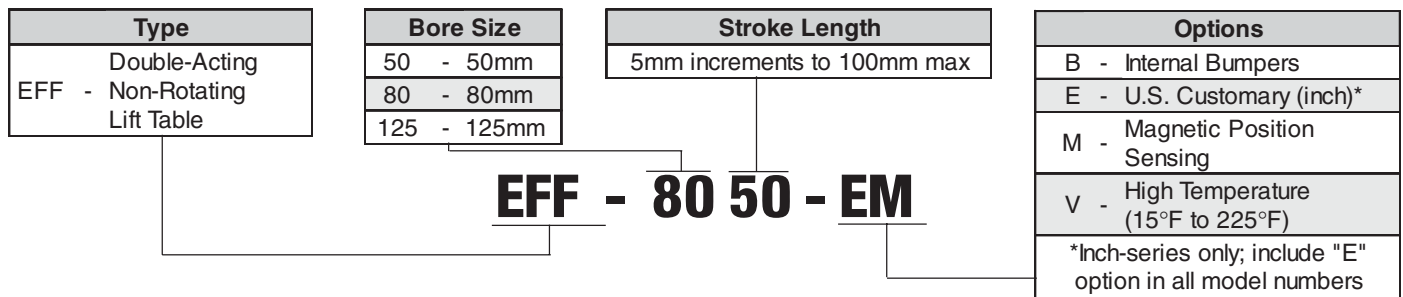
Bimba Extruded Flat Lift Table



The Lift Table is an EF1-based, guided cylinder with four shafts for maximum rigidity. It is designed for lifting applications where other non-rotating cylinders cannot handle an overhung load and space is at a premium.

- Four-shaft support withstands offset loads and moments.
- Simple, efficient design provides economical alternative to other costly guided actuators.
- Joins the EF family of products, so shares all the same benefits--long service life, low friction operation, fast delivery.
- Convenient wide tooling mounting surface.
- Intended for vertical lifting applications (should not be mounted horizontally or with tooling plates facing down).

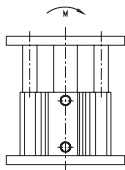
How to Order



List Prices

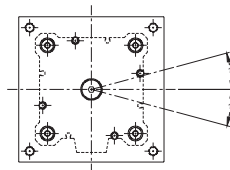
	50mm	80mm	125mm
Base	\$164.00	\$245.75	\$409.50
Add per 5mm	4.00	4.50	5.50
B	8.00	14.50	21.25
M	11.25	17.75	27.75
V	26.25	41.75	69.00

Engineering Specifications



Maximum Moment
Due to Side or Overhung Load

Bore	Max Moment
50mm	45 in-lb
80mm	125 in-lb
125mm	175 in-lb



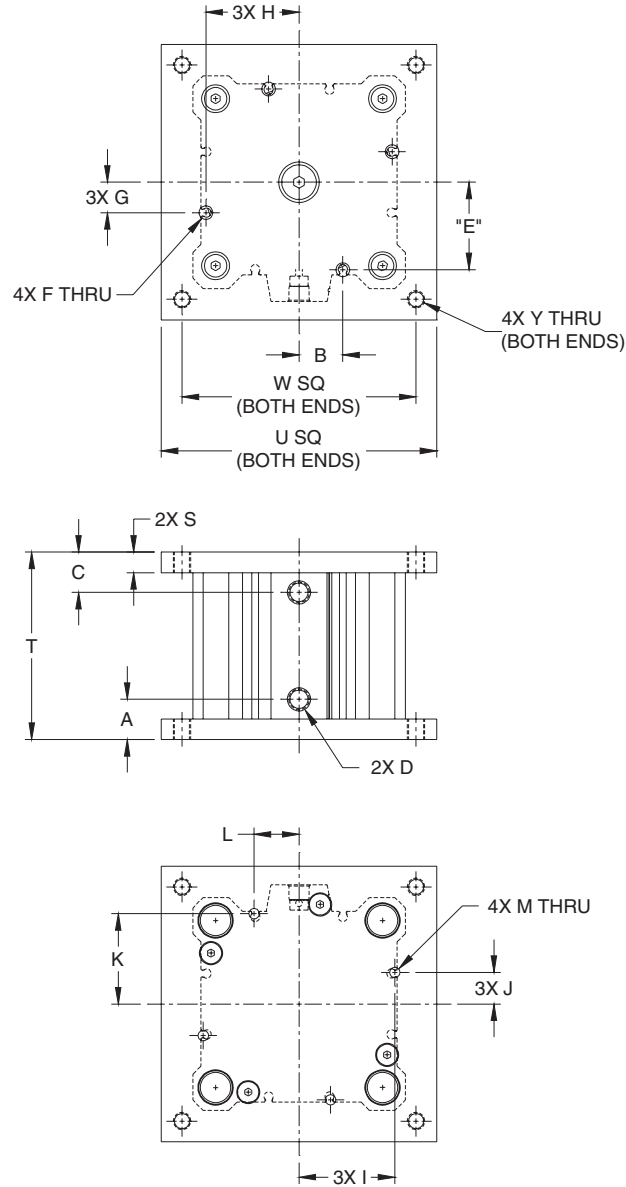
Non-Rotational Accuracy

Bore	Accuracy
50mm	+/- .17°
80mm	+/- .14°
125mm	+/- .11°

Materials of Construction

Component	Material
Cylinder Body	PTFE-impregnated hard anodized aluminum
Rear Mounting Plate	Anodized Aluminum
Guide Shafts	Hard Chrome Plated Stainless Steel
Guide Shaft Bearings	Composite Plastic
Tooling Plate	Anodized Aluminum
Piston Rod	Stainless Steel
Rod Guide	Aluminum Alloy
Seals	Nitrile (Fluoroelastomer optional)
Piston	Aluminum Alloy

Bimba Extruded Flat Lift Table



Dimensions (inches)

Bore	A	B	C	D	E	F	G	H	I	J	K	L	M	S	T	U	W	Y
50mm	0.58	0.56	0.58	1/8 NPT	1.06	0.25	0.58	1.05	1.09	0.60	1.11	0.58	0.25	0.25	See Table Below	3.00	2.50	#10-32 UNF
80mm	0.73	0.80	0.73	1/8 NPT	1.59	0.25	0.55	1.68	1.74	0.57	1.64	0.82	0.19	0.38		5.00	4.25	5/16-24 UNF
125mm	1.00	1.07	1.00	3/8 NPT	2.43	0.25	0.85	2.52	2.57	0.87	2.48	1.09	0.19	0.50		7.00	5.88	1/2-20 UNF

Overall Length, Dimension "T"

Bore	Without M Option	With M Option
50mm	Strokes: 0-24mm	Strokes: 0-21mm
	1.86	2.22
	Strokes: 25-100mm	Strokes: 22-100mm
	0.88 + Stroke	1.39 + Stroke
80mm	Strokes: 0-22mm	Strokes: 0-18mm
	2.14	2.30
	Strokes: 23-100mm	Strokes: 19-100mm
	1.28 + Stroke	1.59 + Stroke
125mm	Strokes: 0-37mm	Strokes: 0-30mm
	3.03	3.25
	Strokes: 38-100mm	Strokes: 31-100mm
	1.58 + Stroke	2.07 + Stroke

Bimba Metric Twin Bore Series Cylinders

The Bimba Twin Bore Cylinder is a small cross-section, double-bore cylinder that provides highly accurate linear motion. The cylinder incorporates extra long piston rod bearings, resulting in high radial load capacity. Single and double end rod units are available in both Delrin® and ball bushing styles. The highly precise Air Table incorporates a rigid linear rail with recirculating ball bearings.

BASIC TWIN BORE (TB)

- Dual bores exert twice the force of a traditional cylinder while providing smooth, non-rotating actuation. The cylinder is symmetric and can be mounted from either side to allow convenient port access.



DOUBLE END TWIN BORE (TBD)

- Double rod end provides a saddle-mount unit with improved loading and resistance to deflection.

TWIN BORE AIR TABLE (TBA)

- Smooth, precise movement is achieved via integration of a highly accurate recirculating ball bushing rail.



Delrin® is a trademark of Dupont.

Flat-I /
Square Flat-I

Flat-II /
Square Flat-II

F02, F03, F04
(multiple power)

F0P
(multiple position)

Flat
Accessories

EF1 / EF2

Stopper /
Twist Clamp

Extruded
Flat Lift Table

Twin Bore

NPA / LPA

Diaphragm /
Miniature Cube

Bimba Twin Bore Series Cylinders

How to Order

The model number for all Twin Bore cylinders consists of three alphanumeric clusters. These designate product type, bore size and stroke length, and options. Please refer to the charts below for an example of

model number TB-1610-EX. This is a double-acting 16mm bore, Twin Bore Cylinder, with 10mm stroke, ball bushings, and U.S. customary threads.

PRODUCT TYPE	
TB	- Twin Bore Actuator
TBD	- Twin Bore; Double End
TBA	- Twin Bore Air Table

STANDARD STROKE LENGTHS (mm)	BORE SIZE													
	TB & TBD							TBA						
	6	8	12	16	20	25	32	6	8	12	16	20	25	32
10	X	X	X	X	X	X	X	X	X	X	X	X	X	X
15	N/A	N/A	X	X	X	X	X	N/A	N/A	N/A	N/A	N/A	N/A	N/A
20	X	X	X	X	X	X	X	X	X	X	X	X	X	X
25	N/A	N/A	X	X	X	X	X	N/A	N/A	N/A	N/A	N/A	N/A	N/A
30	X	X	X	X	X	X	X	X	X	X	X	X	X	X
35	N/A	N/A	X	X	X	X	X	N/A	N/A	N/A	N/A	N/A	N/A	N/A
40	X	X	X	X	X	X	X	X	X	X	X	X	X	X
45	N/A	N/A	X	X	X	X	X	N/A	N/A	N/A	N/A	N/A	N/A	N/A
50	X	X	X	X	X	X	X	X	X	X	X	X	X	X
60	N/A	N/A	X	X	X	X	X	N/A	N/A	N/A	N/A	N/A	N/A	N/A
70	N/A	N/A	X	X	X	X	X	N/A	N/A	N/A	N/A	N/A	N/A	N/A
75	N/A	X	X	X	X	X	X	N/A	X	X	X	X	X	X
80	N/A	N/A	N/A	X	X	X	X	N/A	N/A	N/A	N/A	N/A	N/A	N/A
90	N/A	N/A	N/A	X	X	X	X	N/A	N/A	N/A	N/A	N/A	N/A	N/A
100	N/A	N/A	N/A	X	X	X	X	N/A	N/A	X	X	X	X	X
125	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	X	X	X	X
150	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	X	X	X

BORE SIZE
6mm
8mm
12mm
16mm
20mm
25mm
32mm

TB-1610-EX

OPTIONS	
(Enter in alphabetical order)	
A1	- Stroke adjustment, both ends ¹
A2	- Stroke adjustment, extend only ¹
A3	- Stroke adjustment, retract only ¹
E	- U.S. customary units (inch)
F	- Full-Flow Port Orifice
K _ _	- Shock absorbers ^{1,2}
	First _ will be: 1-Shock both ends
	2-Shock extend only
	3-Shock retract only
	Second _ will be: 1-Light shock
	2-Standard shock
	3-Heavy shock
M	- Magnetic position sensing
S	- Side mounting holes ³
V	- High temperature; -15° to 135°C (0° to 275°F) ⁴
X	- Ball bushings ^{3,4}

Combination Availability

Options	All Bore Sizes
A1	E; M; V
A2	E; K31, 2,or 3; M; V
A3	E; K21, 2,or 3; M; V
E	A1, 2,or 3; K11, 2,or 3; K21, 2,or 3; K31, 2,or 3; M; S; V; X
K11, 2 or 3	E; M; V
K21, 2 or 3	A3; E; M; V
K31, 2 or 3	A2; E; M; V
M	A1, 2,or 3; K11, 2,or 3; E; K21, 2,or 3; K31, 2,or 3; S; V; X
S	E; M; V; X
V	A1, 2,or 3; E; K11, 2,or 3; K21, 2,or 3; K31, 2,or 3; M; S; X
X	E; M; S; V

Bumpers standard on all models

¹TBA Models Only (Standard on TB and TBD)

²N/A on 6mm bore

³TB and TBD Models Only

NOTE: TB and TBD stroke lengths are available in any 0.1mm increment up to 225mm maximum (12 – 32 bores only). Consult your distributor for pricing of any stroke length not listed as standard above. TBA models available only in those stroke lengths listed as standard above.

⁴Not available on 6mm and 8mm

Bimba Metric Twin Bore Series Cylinders

List Prices

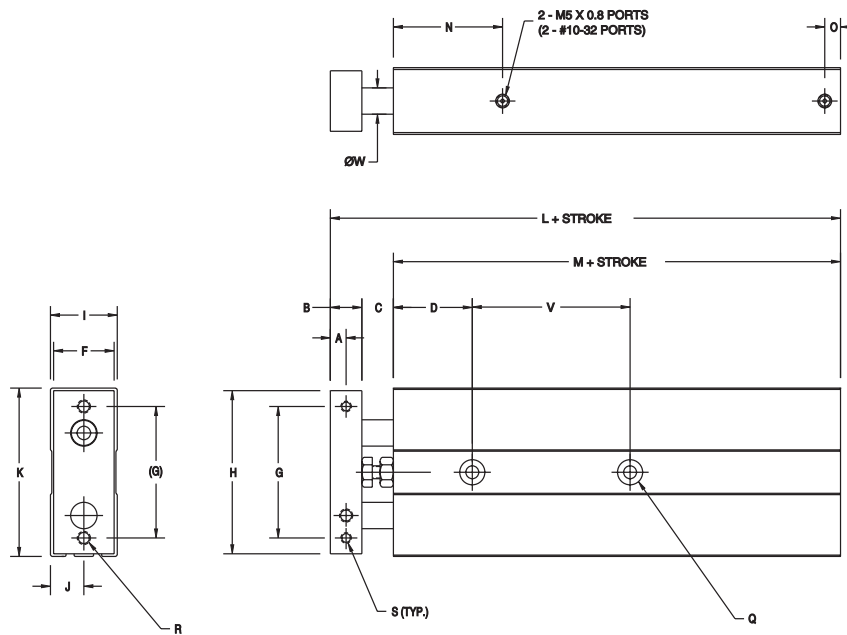
Model Type	Bore Size						
	6mm	8mm	12mm	16mm	20mm	25mm	32mm
TB	\$77.50	\$76.00	\$74.25	\$72.50	\$77.75	\$83.25	\$89.50
add per 5mm	1.50	1.50	1.50	3.00	3.00	3.00	3.50
TBD	157.75	161.00	124.25	127.00	136.00	145.50	156.50
add per 5mm	3.75	3.75	3.75	6.00	6.00	6.00	7.00
TBA; Prices by Stroke							
10mm	220.25	240.00	300.00	308.75	368.75	426.75	477.75
20mm	245.25	251.25	300.00	308.75	368.75	426.75	477.75
30mm	267.25	277.75	300.00	308.75	368.75	426.75	477.75
40mm	345.75	351.50	327.00	337.00	402.25	466.25	522.25
50mm	373.25	384.75	353.75	362.75	435.50	506.00	566.75
75mm	N/A	401.25	407.50	430.25	484.50	565.50	633.25
100mm	N/A	N/A	486.00	497.50	564.75	644.50	722.00
125mm	N/A	N/A	N/A	575.75	643.25	731.75	819.50
150mm	N/A	N/A	N/A	N/A	721.50	818.75	917.25

Options	Bore Size						
	6mm	8mm	12mm	16mm	20mm	25mm	32mm
A- Stroke Adjustment (TBA; per end)	\$25.25	\$26.25	\$28.25	\$28.25	32.50	\$32.50	\$37.75
F- Full-flow Port Orifice	N/A	N/A	5.50	5.50	5.50	7.00	7.00
K- Shock Absorbers (TBA; per end)	N/A	62.50	67.50	67.50	81.00	89.00	97.25
M - MRS Position Sensing	4.25	4.50	5.00	5.50	6.00	6.50	7.00
S - Side Mount Holes	3.25	3.50	4.00	4.00	4.75	4.75	5.50
V - High Temperature	N/A	N/A	11.00	13.00	13.00	15.00	17.25
X - Ball Bushings (TB)	N/A	N/A	33.75	34.50	42.75	43.75	59.25
X - Ball Bushings (TBD)	N/A	N/A	67.50	69.00	85.25	87.50	118.50

No Charge Options: E

Bimba Metric Twin Bore Series Cylinders

TB Cylinder Dimensions mm (inch)



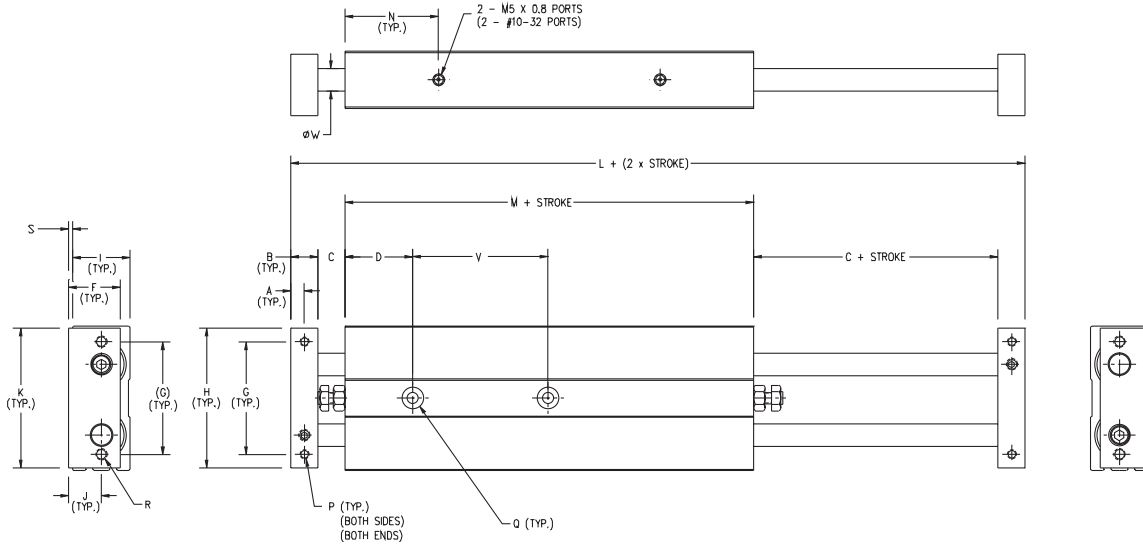
Bore	A	B	C	D	F	G	H	I	J	K	L	M
6	2.8 (0.11)	5.5 (0.22)	8 (0.32)	13 (0.51)	12 (0.47)	25 (0.98)	31 (1.22)	13.2 (0.52)	6.4 (0.25)	32 (1.26)	58.5 (2.30)	45 (1.77)
8	3 (0.12)	6 (0.24)	8 (0.32)	13 (0.51)	13 (0.51)	28 (1.10)	36 (1.42)	14.7 (0.58)	7.3 (0.29)	37.8 (1.49)	64 (2.52)	50 (1.97)
12	4 (0.16)	8 (0.32)	9 (0.35)	20 (0.79)	15 (0.59)	35 (1.38)	44 (1.73)	17.3 (0.68)	8.7 (0.34)	46 (1.81)	72 (2.83)	55 (2.17)
16	5 (0.20)	10 (0.39)	9 (0.35)	30 (1.18)	18 (0.71)	45 (1.77)	55 (2.17)	20.4 (0.80)	10.2 (0.40)	57 (2.24)	80 (3.16)	61 (2.41)
20	6 (0.24)	12 (0.47)	12 (0.47)	30 (1.18)	23 (0.91)	50 (1.97)	62 (2.44)	25.4 (1.00)	12.7 (0.50)	64 (2.52)	94 (3.70)	70 (2.76)
25	6 (0.24)	12 (0.47)	12 (0.47)	30 (1.18)	28 (1.10)	66 (2.60)	78 (3.07)	30.4 (1.20)	15.2 (0.60)	80 (3.15)	96 (3.78)	72 (2.84)
32	8 (0.32)	16 (0.63)	14 (0.55)	30 (1.18)	36 (1.42)	80 (3.15)	96 (3.78)	38.4 (1.51)	19.2 (0.76)	98 (3.86)	115 (4.51)	85 (3.33)

Bore	N	O	Q (Body Mounting Holes)	R	S	T (Ports)
6	16 (0.63)	6.7 (0.27)	M4x0.7 6H (#8-32 UNC-2B)	M3x0.5 6H (#4-40 UNC-2B)	M3x0.5 6H (#4-40 UNC-2B)	M5x0.8 6H (#10-32 UNF-2B)
8	16.1 (0.64)	6.7 (0.27)	M4x0.7 6H (#8-32 UNC-2B)	M3x0.5 6H (#4-40 UNC-2B)	M3x0.5 6H (#4-40 UNC-2B)	M5x0.8 6H (#10-32 UNF-2B)
12	30.6 (1.20)	5 (0.20)	M4x0.7 6H (#8-32 UNC-2B)	M4x0.7 6H (#8-32 UNC-2B)	M3x0.5 6H (#4-40 UNC-2B)	M5x0.8 6H (#10-32 UNF-2B)
16	36.2 (1.42)	4.5 (0.18)	M5x0.8 6H (#10-32 UNF-2B)	M5x0.8 6H (#10-32 UNF-2B)	M4x0.7 6H (#8-32 UNC-2B)	M5x0.8 6H (#10-32 UNF-2B)
20	41.5 (1.63)	6 (0.24)	M6x1 6H (1/4-20 UNC-2B)	M5x0.8 6H (#10-32 UNF-2B)	M4x0.7 6H (#8-32 UNC-2B)	M5x0.8 6H (#10-32 UNF-2B)
25	45 (1.77)	5 (0.20)	M8x1.25 6H (5/16-18 UNC-2B)	M6x1 6H (1/4-20 UNC-2B)	M5x0.8 6H (#10-32 UNF-2B)	M5x0.8 6H (#10-32 UNF-2B)
32	53 (2.09)	7.2 (0.28)	M8x1.25 6H (5/16-18 UNC-2B)	M6x1 6H (1/4-20 UNC-2B)	M5x0.8 6H (#10-32 UNF-2B)	G 1/8 (NPT 1/8)

Bore	V Based on Stroke																W						
	0-10mm		11-20mm		0-20mm		21-25mm		21-30mm		26-50mm		31-40mm		41-50mm			51-75mm		51-80mm		81-100mm	
6	15 (0.59)	20 (0.79)	N/A	N/A	N/A	N/A	25 (0.98)	N/A	N/A	30 (1.18)	35 (1.38)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3 (.12)
8	15 (0.59)	20 (0.79)	N/A	N/A	N/A	N/A	25 (0.98)	N/A	N/A	30 (1.18)	35 (1.38)	47.5 (1.87)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4 (.16)
12	N/A	N/A	N/A	N/A	30 (1.18)	30 (1.18)	N/A	N/A	40 (1.58)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	50 (1.97)	N/A	N/A	N/A	N/A	6 (.24)	
16	N/A	N/A	N/A	N/A	25 (0.98)	35 (1.38)	N/A	N/A	35 (1.38)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	45 (1.77)	55 (2.17)	55 (2.17)	55 (2.17)	55 (2.17)	55 (2.17)	8 (.32)
20	N/A	N/A	N/A	N/A	30 (1.18)	30 (1.18)	N/A	N/A	40 (1.58)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	60 (2.36)	60 (2.36)	60 (2.36)	60 (2.36)	60 (2.36)	60 (2.36)	10 (.39)
25	N/A	N/A	N/A	N/A	30 (1.18)	30 (1.18)	N/A	N/A	40 (1.58)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	60 (2.36)	60 (2.36)	60 (2.36)	60 (2.36)	60 (2.36)	60 (2.36)	12 (.47)
32	N/A	N/A	N/A	N/A	40 (1.58)	40 (1.58)	N/A	N/A	50 (1.97)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	70 (2.76)	70 (2.76)	70 (2.76)	70 (2.76)	70 (2.76)	70 (2.76)	16 (.63)

Bimba Metric Twin Bore Series Cylinders

TBD Cylinder Dimensions mm (inch)



Bore	A	B	C	D	F	G	H	I	J	K	L	M	N
6	2.8 (0.11)	5.5 (0.22)	8 (0.32)	13 (0.51)	12 (0.47)	25 (0.98)	31 (1.22)	13.2 (0.52)	7.8 (0.31)	32 (1.26)	92.9 (3.66)	66 (2.60)	16 (0.63)
8	3 (0.12)	6 (0.24)	8 (0.32)	13 (0.51)	13 (0.51)	28 (1.10)	36 (1.42)	14.7 (0.58)	8.6 (0.34)	37.8 (1.49)	92.9 (3.66)	66 (2.60)	16.1 (0.64)
12	4 (0.16)	8 (0.32)	9 (0.35)	20 (0.79)	15 (0.59)	35 (1.38)	44 (1.73)	17.3 (0.68)	8.7 (0.34)	46 (1.81)	116.3 (4.58)	82.3 (3.24)	30.6 (1.20)
16	5 (0.20)	10 (0.39)	9 (0.35)	30 (1.18)	18 (0.71)	45 (1.77)	55 (2.17)	20.4 (0.80)	10.2 (0.40)	57 (2.24)	131.5 (5.18)	93.5 (3.68)	36.2 (1.42)
20	6 (0.24)	12 (0.47)	12 (0.47)	30 (1.18)	23 (0.91)	50 (1.97)	62 (2.44)	25.4 (1.00)	12.7 (0.50)	64 (2.52)	154.2 (6.07)	106.2 (4.18)	41.5 (1.63)
25	6 (0.24)	12 (0.47)	12 (0.47)	30 (1.18)	28 (1.10)	66 (2.60)	78 (3.07)	30.4 (1.20)	15.2 (0.60)	80 (3.15)	160.9 (6.33)	112.9 (4.45)	45 (1.77)
32	8 (0.32)	16 (0.63)	14 (0.55)	30 (1.18)	36 (1.42)	80 (3.15)	96 (3.78)	38.4 (1.51)	19.2 (0.76)	98 (3.86)	192.6 (7.58)	132.6 (5.22)	53 (2.09)

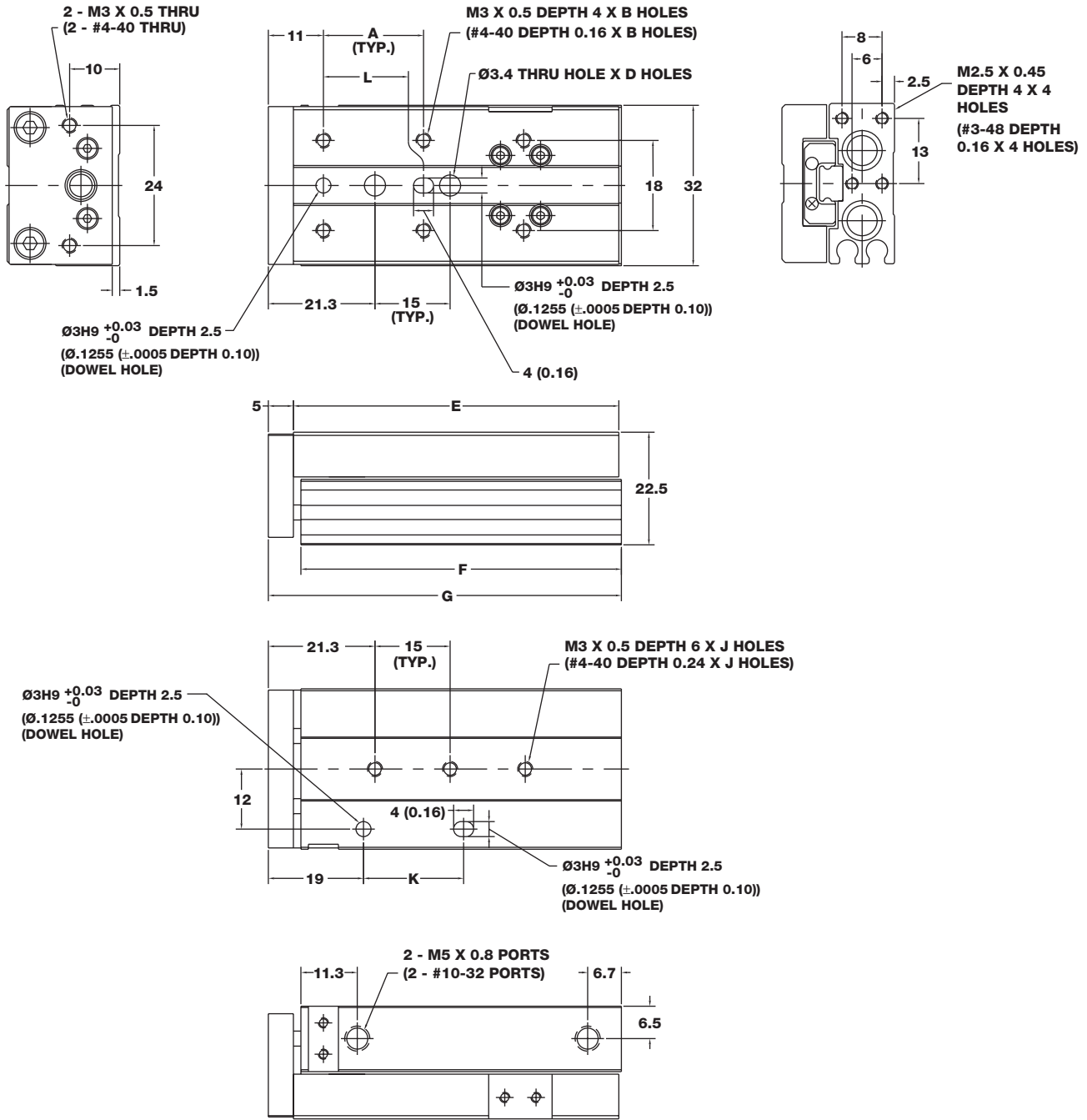
Bore	P	Q (Body Mounting Holes)	R	S	T (Ports)
6	M3x0.5 6H (#4-40 UNC-2B)	M4x0.7 6H (#8-32 UNC-2B)	M3x0.5 6H (#4-40 UNC-2B)	1.3 (.05)	M5x0.8 6H (#10-32 UNF-2B)
8	M3x0.5 6H (#4-40 UNC-2B)	M4x0.7 6H (#8-32 UNC-2B)	M4x0.7 6H (#8-32 UNC-2B)	1.3 (.05)	M5x0.8 6H (#10-32 UNF-2B)
12	M3x0.5 6H (#4-40 UNC-2B)	M4x0.7 6H (#8-32 UNC-2B)	M4x0.7 6H (#8-32 UNC-2B)	1.8 (.07)	M5x0.8 6H (#10-32 UNF-2B)
16	M4x0.7 6H (#8-32 UNC-2B)	M5x0.8 6H (#10-32 UNF-2B)	M5x0.8 6H (#10-32 UNF-2B)	1.8 (.07)	M5x0.8 6H (#10-32 UNF-2B)
20	M4x0.7 6H (#8-32 UNC-2B)	M6x1 6H (1/4-20 UNC-2B)	M5x0.8 6H (#10-32 UNF-2B)	1.8 (.07)	M5x0.8 6H (#10-32 UNF-2B)
25	M5x0.8 6H (#10-32 UNF-2B)	M8x1.25 6H (5/16-18 UNC-2B)	M6x1 6H (1/4-20 UNC-2B)	1.8 (.07)	M5x0.8 6H (#10-32 UNF-2B)
32	M5x0.8 6H (#10-32 UNF-2B)	M8x1.25 6H (5/16-18 UNC-2B)	M6x1 6H (1/4-20 UNC-2B)	1.8 (.07)	G 1/8 (NPT 1/8)

Bore	V Based on Stroke											W
	0-10mm	11-20mm	0-20mm	21-25mm	21-30mm	26-50mm	31-40mm	41-50mm	51-75mm	51-80mm	81-100mm	
6	15 (0.59)	20 (0.79)	N/A N/A	N/A N/A	25 (0.98)	N/A N/A	30 (1.18)	35 (1.38)	N/A N/A	N/A N/A	NA (NA)	3 (.12)
8	15 (0.59)	20 (0.79)	N/A N/A	N/A N/A	25 (0.98)	N/A N/A	30 (1.18)	35 (1.38)	47.5 (1.87)	N/A N/A	NA (NA)	4 (.16)
12	N/A N/A	N/A N/A	30 (1.18)	30 (1.18)	N/A N/A	40 (1.58)	N/A N/A	N/A N/A	N/A N/A	50 (1.97)	NA (NA)	6 (.24)
16	N/A N/A	N/A N/A	25 (0.98)	35 (1.38)	N/A N/A	35 (1.38)	N/A N/A	N/A N/A	N/A N/A	45 (1.77)	55 (2.17)	8 (.32)
20	N/A N/A	N/A N/A	30 (1.18)	30 (1.18)	N/A N/A	40 (1.58)	N/A N/A	N/A N/A	N/A N/A	60 (2.36)	60 (2.36)	10 (.39)
25	N/A N/A	N/A N/A	30 (1.18)	30 (1.18)	N/A N/A	40 (1.58)	N/A N/A	N/A N/A	N/A N/A	60 (2.36)	60 (2.36)	12 (.47)
32	N/A N/A	N/A N/A	40 (1.58)	40 (1.58)	N/A N/A	50 (1.97)	N/A N/A	N/A N/A	N/A N/A	70 (2.76)	70 (2.76)	16 (.63)

Bimba Metric Twin Bore Series Cylinders

TBA Cylinder: 6mm Bore

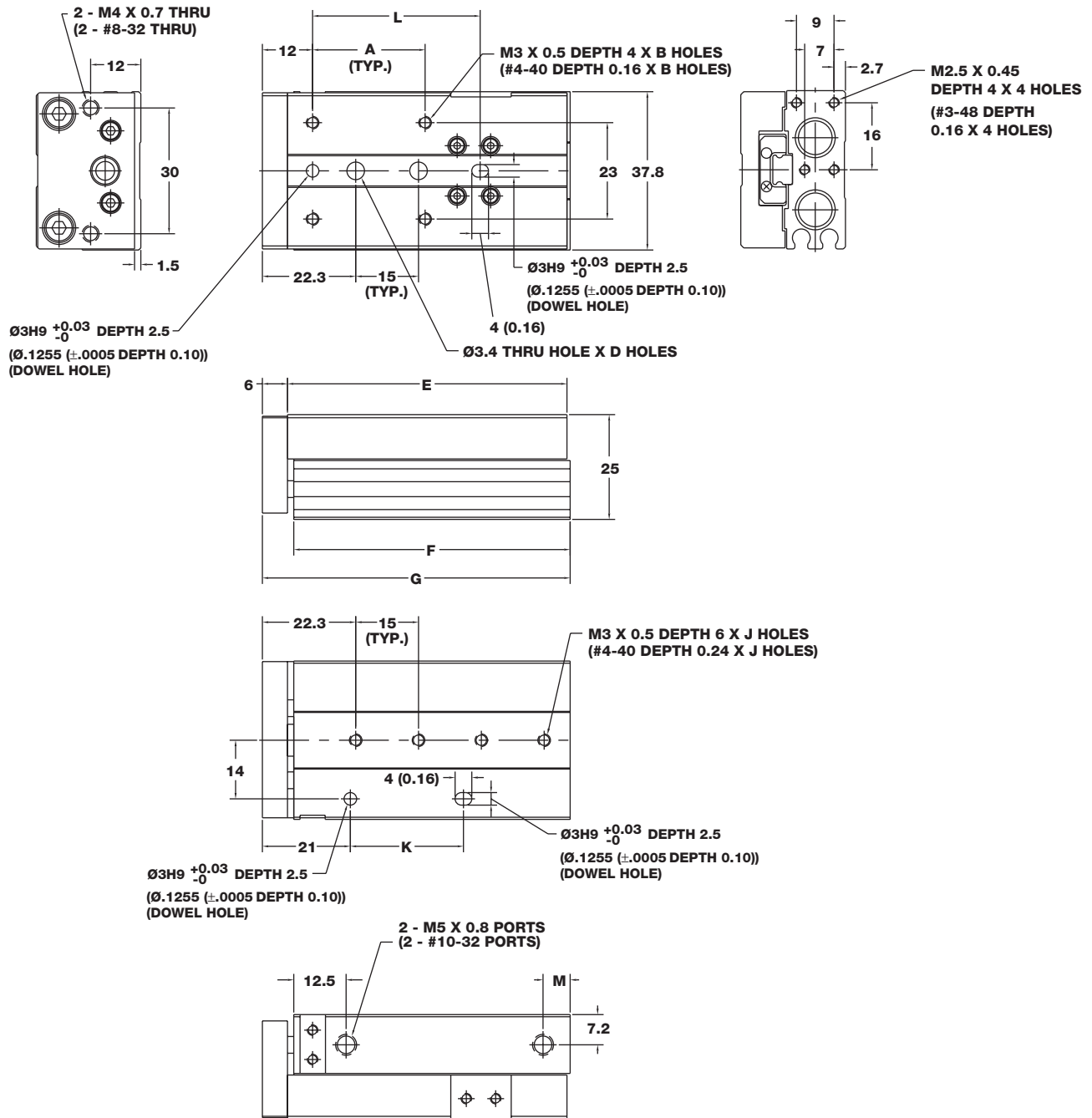
Dimensions mm (inch)



Stroke	A	B	D	E	F	G	J	K	L
10	20 (0.79)	4	2	45 (1.77)	44 (1.73)	50.5 (1.99)	2	16 (0.63)	20 (0.79)
20	30 (1.18)	4	2	55 (2.17)	54 (2.13)	60.5 (2.38)	3	18 (0.71)	20 (0.79)
30	20 (0.79)	6	2	65 (2.56)	64 (2.52)	70.5 (2.78)	3	20 (0.79)	20 (0.79)
40	28 (1.10)	6	3	95 (3.74)	94 (3.70)	100.5 (3.96)	5	28 (1.10)	35 (1.38)
50	38 (1.50)	6	3	104.5 (4.11)	104.5 (4.11)	111 (4.37)	6	28 (1.10)	35 (1.38)

Bimba Metric Twin Bore Series Cylinders

TBA Cylinder: 8mm Bore Dimensions mm (inch)

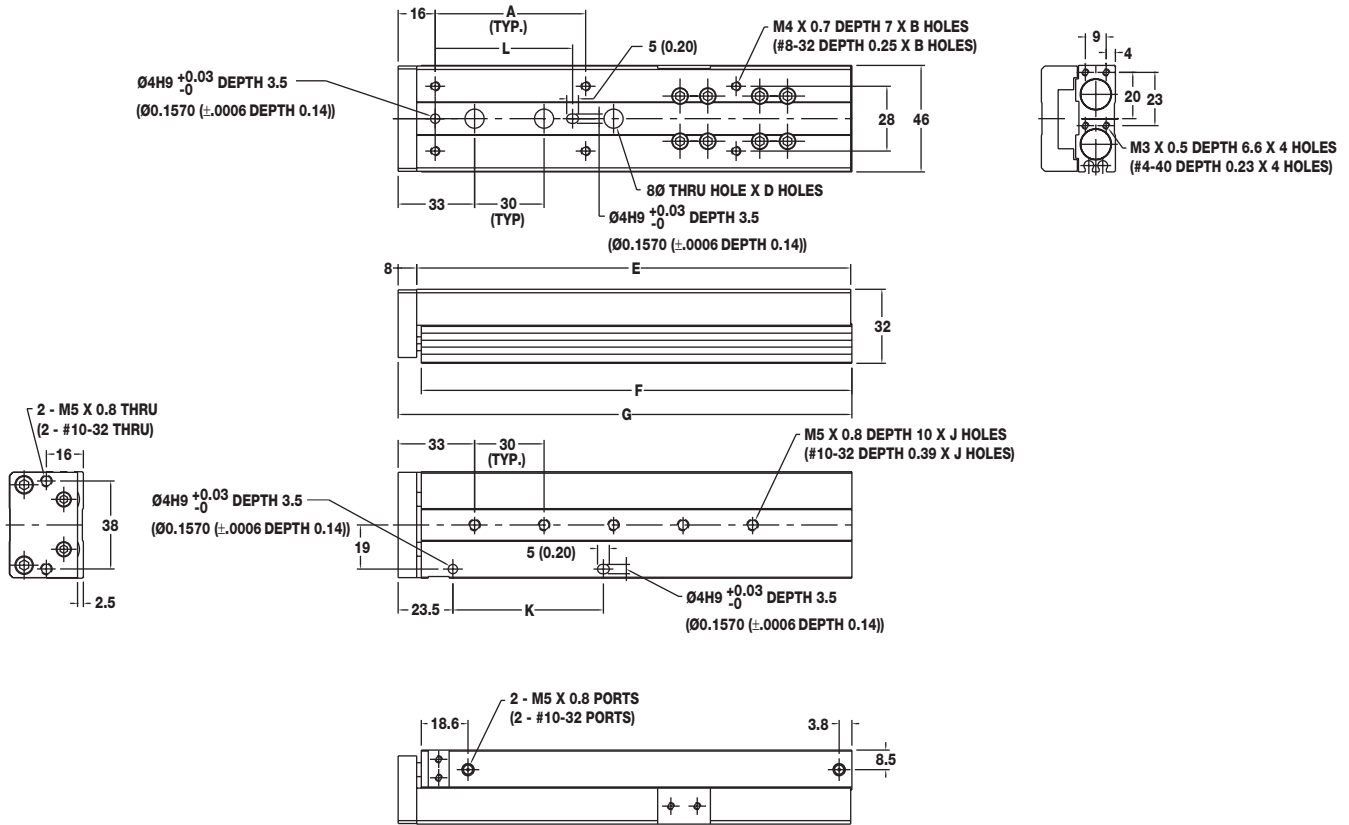


Stroke	A	B	D	E	F	G	J	K	L	M
10	25 (0.98)	4	3	49.7 (1.96)	49 (1.93)	55.5 (2.19)	3	19 (0.75)	18 (0.71)	6.5 (0.26)
20	25 (0.98)	4	3	56.7 (2.23)	56 (2.21)	62.5 (2.46)	3	28 (1.10)	18 (0.71)	6.5 (0.26)
30	40 (1.58)	4	2	66.7 (2.63)	66 (2.60)	72.5 (2.85)	3	28 (1.10)	40 (1.58)	6.5 (0.26)
40	50 (1.97)	4	3	91.2 (3.59)	90.4 (3.56)	97 (3.82)	5	31 (1.22)	50 (1.97)	11 (0.43)
50	38 (1.50)	6	3	102.3 (4.03)	101.5 (4.0)	108 (4.25)	6	58 (2.28)	50 (1.97)	6.5 (0.26)
75	50 (1.97)	6	5	133.7 (5.27)	133 (5.24)	139.5 (5.49)	8	60 (2.36)	50 (1.97)	6.5 (0.26)

Bimba Metric Twin Bore Series Cylinders

TBA Cylinder: 12mm Bore

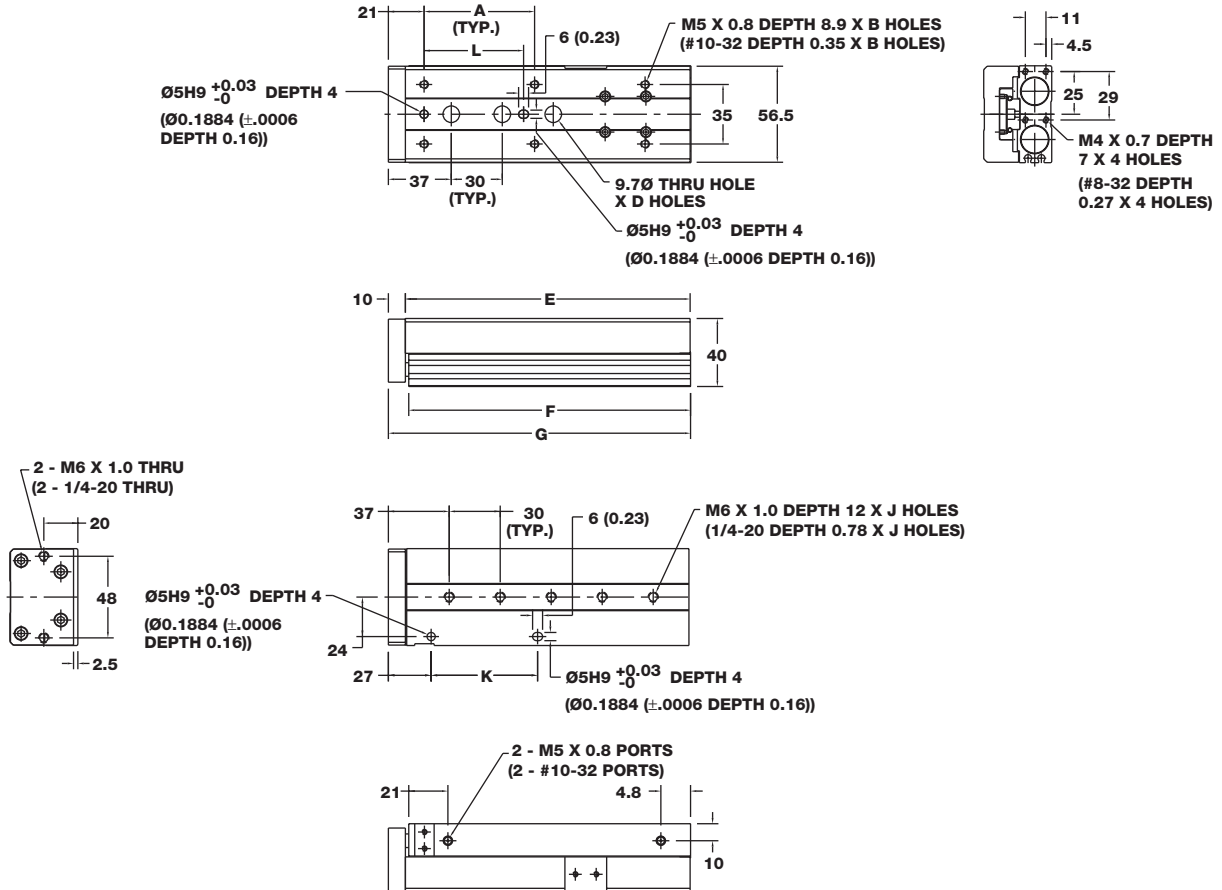
Dimensions mm (inch)



Stroke	A	B	D	E	F	G	J	K	L
10	35 (1.38)	4	1	73 (2.86)	71 (2.80)	81 (3.20)	2	35 (1.38)	35 (1.38)
20	35 (1.38)	4	1	73 (2.86)	71 (2.80)	81 (3.20)	2	35 (1.38)	35 (1.38)
30	35 (1.38)	4	1	73 (2.86)	71 (2.80)	81 (3.20)	2	35 (1.38)	35 (1.38)
40	50 (1.97)	4	1	85 (3.36)	83 (3.28)	93 (3.67)	2	50 (1.97)	50 (1.97)
50	35 (1.38)	6	1	105 (4.12)	103 (4.06)	113 (4.46)	3	35 (1.38)	35 (1.38)
75	55 (2.17)	6	2	151 (5.93)	149 (5.88)	159 (6.27)	4	55 (2.17)	55 (2.17)
100	65 (2.56)	6	3	189 (7.43)	187 (7.37)	197 (7.76)	5	65 (2.56)	65 (2.56)

Bimba Metric Twin Bore Series Cylinders

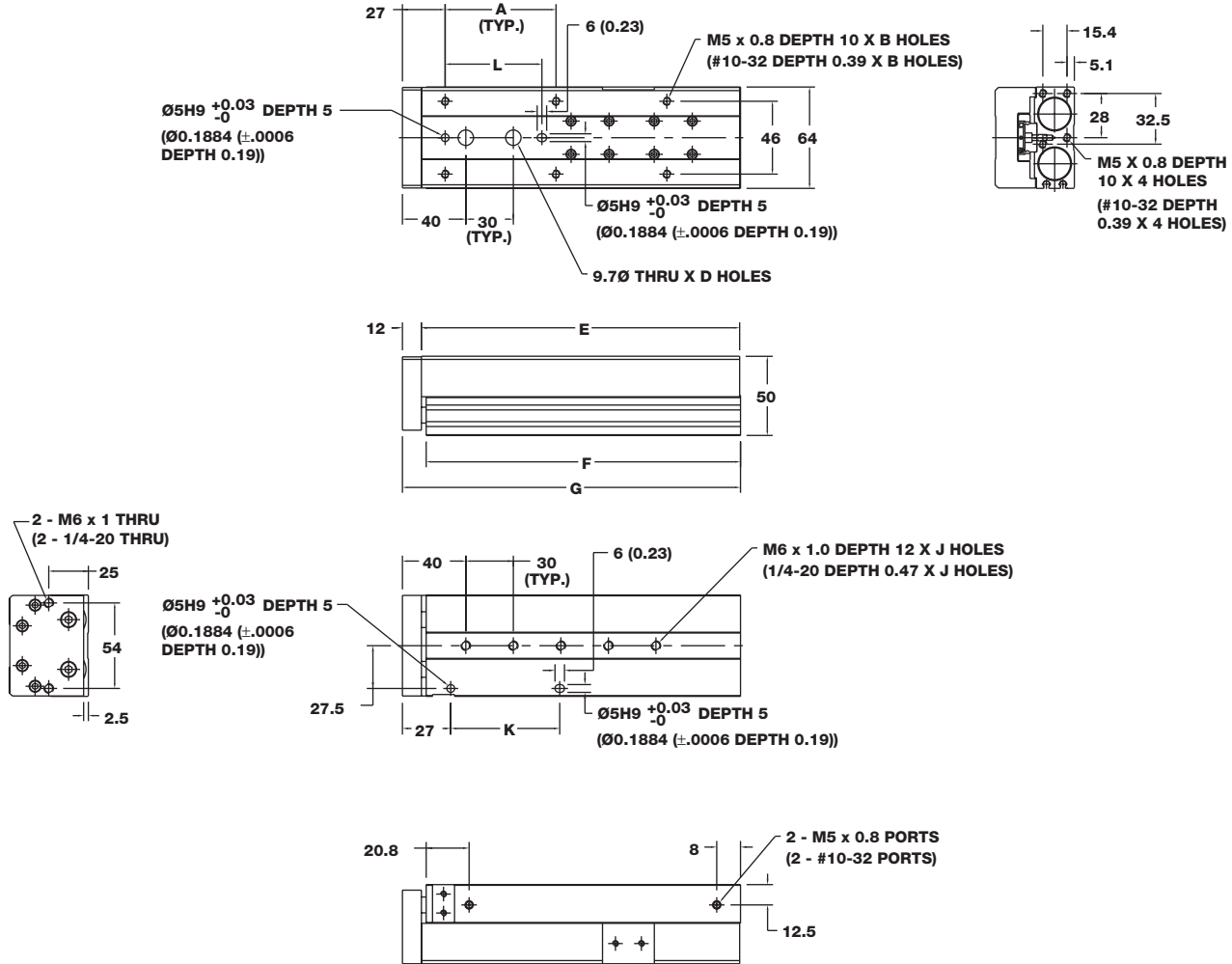
TBA Cylinder: 16mm Bore Dimensions mm (inch)



Stroke	A	B	D	E	F	G	J	K	L
10	35 (1.38)	4	1	79 (3.11)	77 (3.05)	89 (3.52)	2	35 (1.38)	35 (1.38)
20	35 (1.38)	4	1	79 (3.11)	77 (3.05)	89 (3.52)	2	35 (1.38)	35 (1.38)
30	35 (1.38)	4	1	79 (3.11)	77 (3.05)	89 (3.52)	2	35 (1.38)	35 (1.38)
40	40 (1.58)	6	1	89 (3.50)	87 (3.44)	99 (3.91)	3	40 (1.57)	40 (1.57)
50	30 (1.18)	6	1	116 (4.56)	114 (4.51)	126 (4.98)	3	30 (1.18)	30 (1.18)
75	55 (2.17)	6	2	145 (5.71)	143 (5.65)	155 (6.12)	4	55 (2.17)	55 (2.17)
100	65 (2.56)	6	3	170 (6.69)	168 (6.63)	180 (7.10)	5	65 (2.56)	65 (2.56)
125	70 (2.70)	8	4	205 (8.07)	203 (8.01)	215 (8.48)	6	70 (2.76)	64 (2.52)

Bimba Metric Twin Bore Series Cylinders

TBA Cylinder: 20mm Bore Dimensions mm (inch)

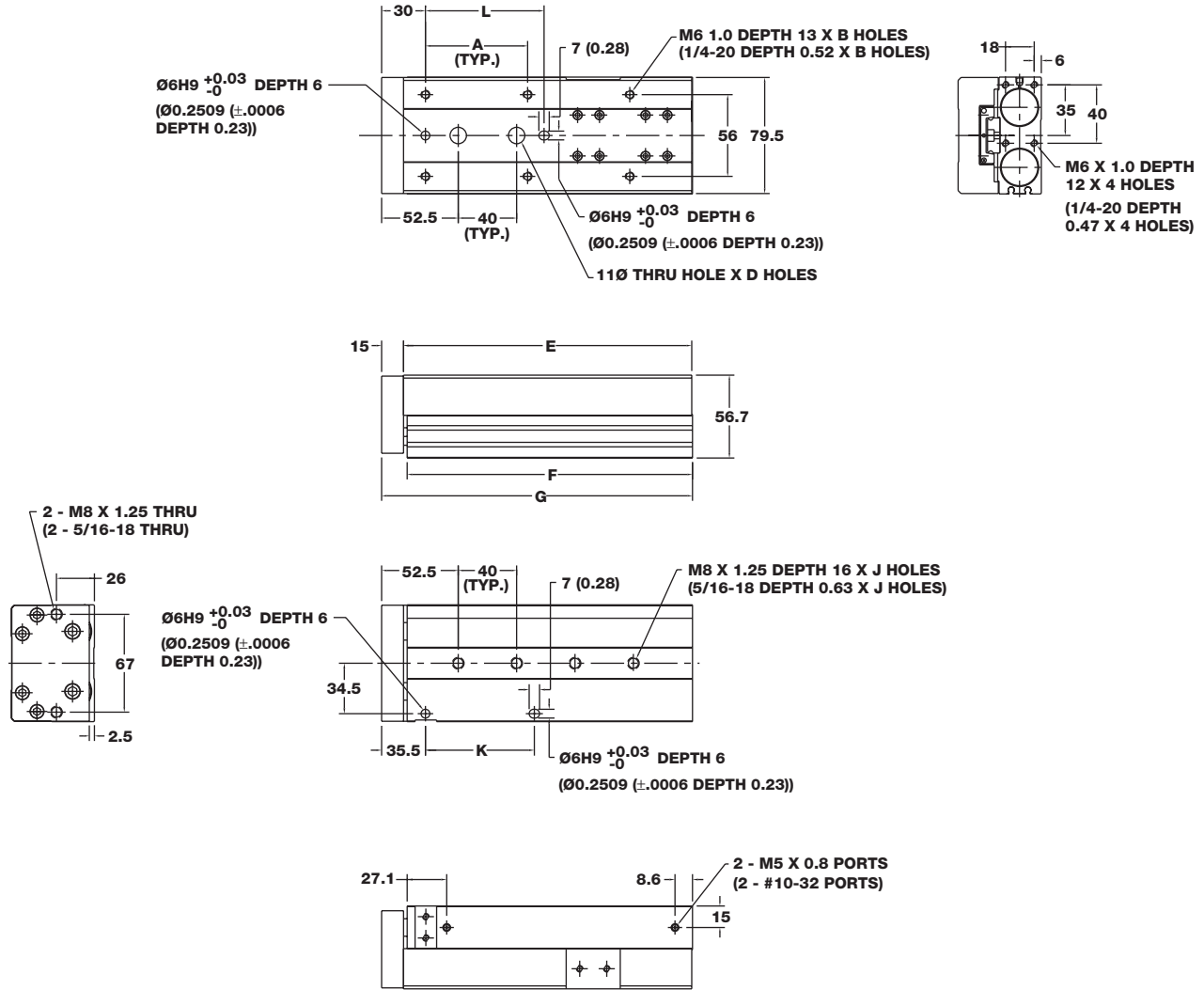


Stroke	A	B	D	E	F	G	J	K	L
10	50 (1.97)	4	1	84 (3.30)	81.5 (3.21)	96 (3.78)	2	50 (1.97)	50 (1.97)
20	50 (1.97)	4	1	84 (3.30)	81.5 (3.21)	96 (3.78)	2	50 (1.97)	50 (1.97)
30	50 (1.97)	4	1	84 (3.30)	81.5 (3.21)	96 (3.78)	2	50 (1.97)	50 (1.97)
40	60 (2.36)	4	1	94 (3.69)	91.5 (3.60)	106 (4.17)	2	60 (2.36)	60 (2.36)
50	35 (1.38)	6	1	108.5 (4.27)	106.5 (4.19)	121 (4.76)	3	35 (1.38)	35 (1.38)
75	60 (2.36)	6	2	140 (5.51)	138 (5.44)	152.5 (6.01)	4	60 (2.36)	60 (2.36)
100	70 (2.76)	6	3	200.5 (7.89)	198.5 (7.82)	213 (8.39)	5	70 (2.76)	64 (2.52)
125	70 (2.76)	8	4	230 (9.06)	228 (8.98)	242.5 (9.55)	6	70 (2.76)	64 (2.52)
150	80 (3.15)	8	5	263 (10.36)	261 (10.28)	275.5 (10.85)	7	80 (3.15)	80 (3.15)

Bimba Metric Twin Bore Series Cylinders

TBA Cylinder: 25mm Bore

Dimensions mm (inch)

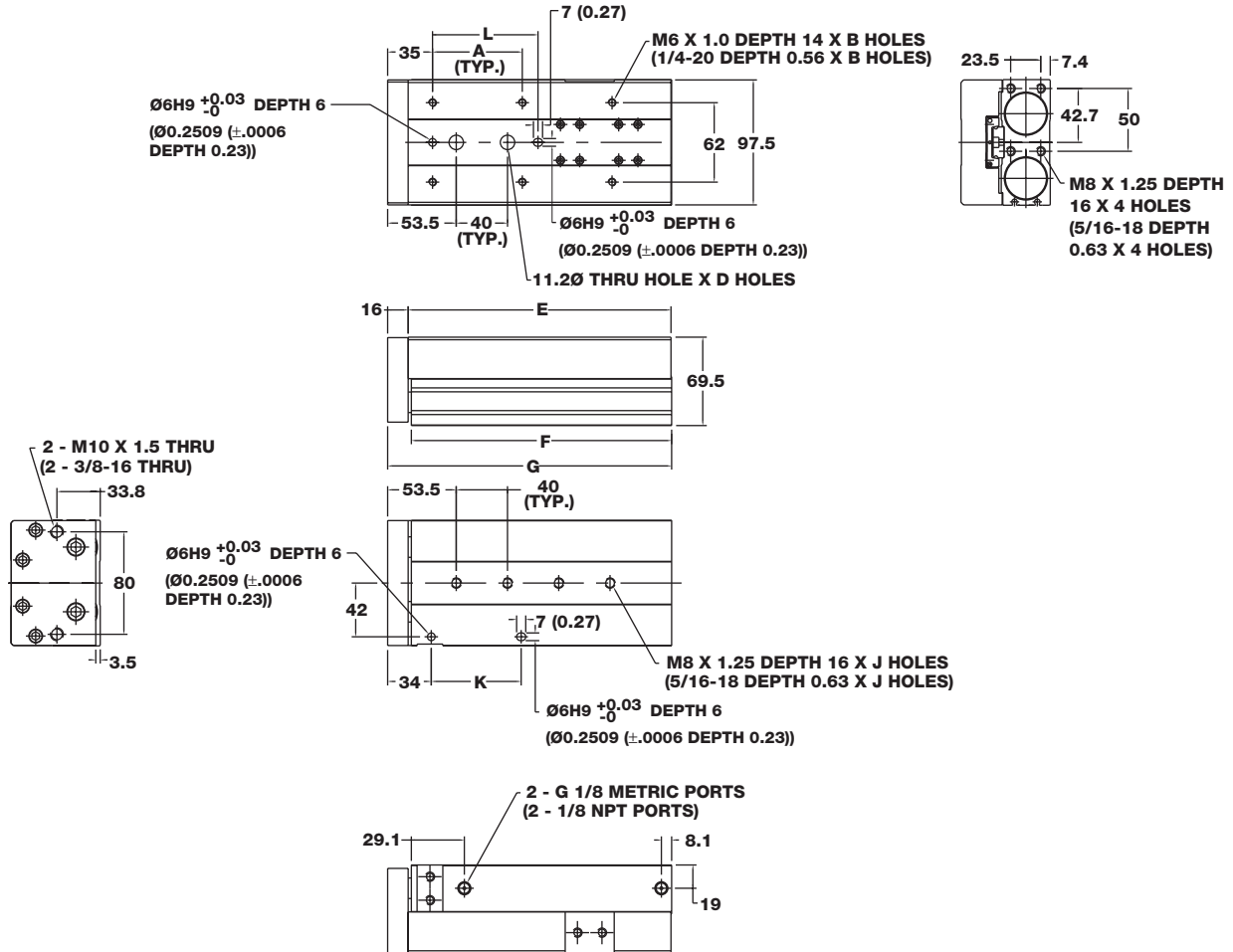


Stroke	A	B	D	E	F	G	J	K	L
10	50 (1.97)	4	1	92.5 (3.64)	90.5 (3.56)	108 (4.25)	2	50 (1.97)	50 (1.97)
20	50 (1.97)	4	1	92.5 (3.64)	90.5 (3.56)	108 (4.25)	2	50 (1.97)	50 (1.97)
30	50 (1.97)	4	1	92.5 (3.64)	90.5 (3.56)	108 (4.25)	2	50 (1.97)	50 (1.97)
40	60 (2.36)	4	1	102.5 (4.04)	100.5 (3.96)	118 (4.65)	2	60 (2.36)	60 (2.36)
50	35 (1.38)	6	1	115.5 (4.55)	113.5 (4.47)	131 (5.16)	2	35 (1.38)	35 (1.38)
75	60 (2.36)	6	1	156.5 (6.16)	154.5 (6.08)	172 (6.77)	3	60 (2.36)	60 (2.36)
100	70 (2.76)	6	2	197.5 (7.78)	195.5 (7.70)	213 (8.39)	4	70 (2.76)	76 (2.99)
125	75 (2.95)	8	3	253.5 (9.98)	251.5 (9.90)	269 (10.59)	5	75 (2.95)	75 (2.95)
150	80 (3.15)	8	3	270.5 (10.65)	268.5 (10.57)	286 (11.26)	6	80 (3.15)	80 (3.15)

Bimba Metric Twin Bore Series Cylinders

TBA Cylinder: 32mm Bore

Dimensions mm (inch)

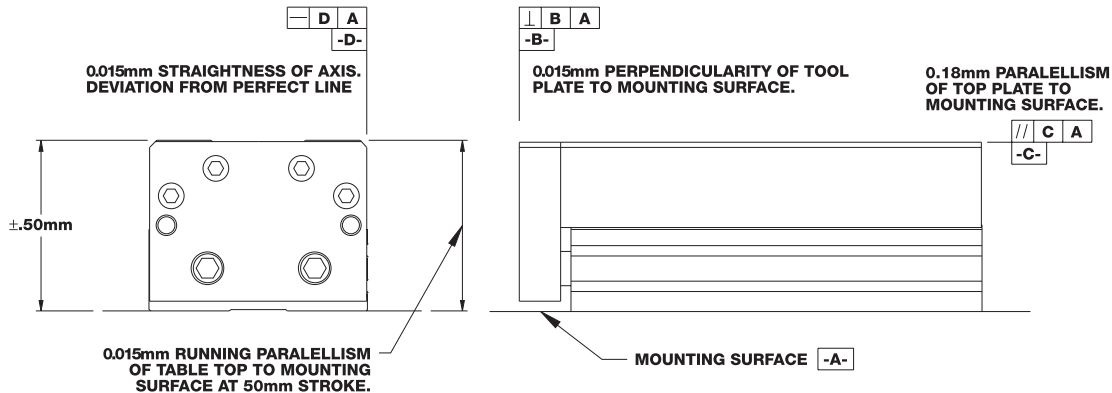


Stroke	A	B	D	E	F	G	J	K	L
10	50 (1.97)	4	NA	102 (4.02)	100 (3.94)	119 (4.67)	2	50 (1.97)	50 (1.97)
20	50 (1.97)	4	NA	102 (4.02)	100 (3.94)	119 (4.67)	2	50 (1.97)	50 (1.97)
30	50 (1.97)	4	NA	102 (4.02)	100 (3.94)	119 (4.67)	2	50 (1.97)	50 (1.97)
40	60 (2.36)	4	1	112 (4.41)	110 (4.34)	129 (5.06)	2	60 (2.36)	60 (2.36)
50	35 (1.38)	6	1	125 (4.93)	123 (4.85)	142 (5.58)	2	35 (1.38)	35 (1.38)
75	60 (2.36)	6	1	171 (6.73)	169 (6.66)	188 (7.39)	3	60 (2.36)	60 (2.36)
100	70 (2.76)	6	2	207 (8.15)	205 (8.08)	224 (8.80)	4	70 (2.76)	76 (2.99)
125	75 (2.95)	8	3	265 (10.44)	263 (10.36)	282 (11.09)	5	75 (2.95)	75 (2.95)
150	80 (3.15)	8	3	298 (11.74)	296 (11.66)	315 (12.39)	6	80 (3.15)	80 (3.15)

Bimba Metric Twin Bore Series Cylinders

Engineering Specifications

Twin Bore Air Table (Model TBA)



Engineering Specifications

Operating Medium:	Air
Maximum Operating Pressure:	10 bar (140 psi)
Temperature Range:	-10° to 70°C (15° to 160°F)
Lubrication:	PTFE Grease
Expected Service Life:	2500 kilometers (1500 miles)*

*For filtered, lubricated air, no-load conditions; if unlubricated, life is approximately 1/3.

Twin Bore Style

(Model TB; Standard Bearings and Option X)

Maximum Radial Load kg-Force (lbs.)



Maximum allowable load for horizontally mounted cylinder with rods aligned in horizontal direction.

TB Standard Maximum Radial Loads Kgf (lbs)														
Model No.	10		20		30		40		50		75		100	
TB-6	0.15	(0.33)	0.12	(0.26)	0.10	(0.21)	0.08	(0.18)	0.07	(0.16)	N/A	N/A	N/A	N/A
TB-8	0.14	(0.31)	0.11	(0.24)	0.09	(0.20)	0.08	(0.17)	0.07	(0.15)	0.05	(0.11)	N/A	N/A
TB-12	1.0	(2.14)	0.8	(1.77)	0.7	(1.51)	0.6	(1.31)	0.5	(1.16)	0.4	(0.90)	N/A	N/A
TB-16	1.5	(3.31)	1.3	(2.80)	1.1	(2.42)	1.0	(2.14)	0.9	(1.91)	0.7	(1.51)	0.6	(1.25)
TB-20	2.3	(5.07)	2.0	(4.36)	1.7	(3.83)	1.6	(3.41)	1.4	(3.07)	1.1	(2.47)	0.9	(2.06)
TB-25	3.1	(6.76)	2.7	(5.85)	2.3	(5.15)	2.1	(4.60)	1.9	(4.16)	1.5	(3.35)	1.3	(2.81)
TB-32	5.8	(12.82)	5.1	(11.30)	4.6	(10.10)	4.2	(9.13)	3.8	(8.33)	3.1	(6.84)	2.6	(5.80)

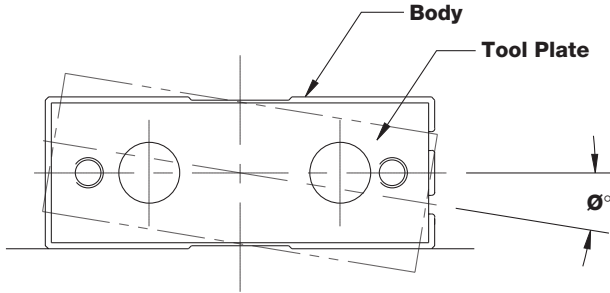
TB-X Maximum Radial Loads Kgf (lbs)														
Model No.	10		20		30		40		50		75		100	
TB-12-X	0.7	(1.50)	0.6	(1.28)	0.5	(1.11)	0.4	(0.98)	0.4	(0.88)	0.3	(0.70)	N/A	N/A
TB-16-X	0.9	(2.08)	0.8	(1.80)	0.7	(1.58)	0.6	(1.42)	0.6	(1.28)	0.5	(1.03)	0.4	(0.86)
TB-20-X	1.4	(3.06)	1.2	(2.69)	1.1	(2.41)	1.0	(2.17)	0.9	(1.98)	0.7	(1.63)	0.6	(1.38)
TB-25-X	1.5	(3.36)	1.4	(2.97)	1.2	(2.67)	1.1	(2.42)	1.0	(2.21)	0.8	(1.82)	0.7	(1.55)
TB-32-X	2.7	(5.97)	2.4	(5.35)	2.2	(4.85)	2.0	(4.43)	1.9	(4.08)	1.6	(3.41)	1.3	(2.93)

Bimba Metric Twin Bore Series Cylinders

Engineering Specifications

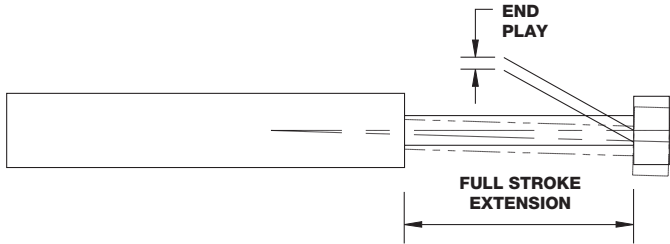
**(Model TB; Standard Bearings and Option X) Maximum Radial Load kg-Force (lbs.)
Non-Rotational Accuracy (degrees)**

Maximum allowable value for \varnothing° in a free unloaded condition.



TB Model (Standard Bushings)	
Model No.	Degrees (\pm)
TB-6	0.15
TB-8	0.12
TB-12	0.10
TB-16	0.08
TB-20	0.08
TB-25	0.06
TB-32	0.05
TB Model - X Option (Ball Bushing)	
Model No.	Degrees (\pm)
TB-12	0.02
TB-16	0.02
TB-20	0.02
TB-25	0.01
TB-32	0.01

(Model TB; Standard Bearings and Option X) Maximum End Play mm (inch)



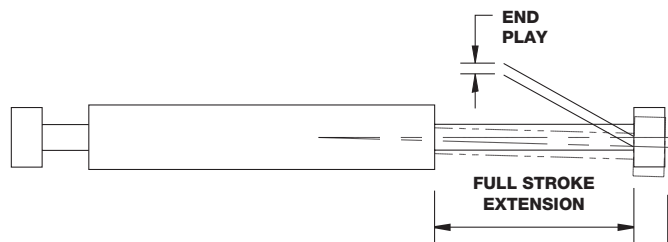
Maximum allowable movement of the tooling plate in the vertical direction with rods aligned in horizontal direction

TB Model									
Model No.	Stroke Length mm								
	10	20	30	40	50	75	100		
(Standard Bushings)									
TB-6	0.243 (0.010)	0.327 (0.013)	0.410 (0.016)	0.494 (0.019)	0.577 (0.023)	N/A	N/A	N/A	N/A
TB-8	0.255 (0.010)	0.343 (0.013)	0.431 (0.017)	0.519 (0.020)	0.607 (0.024)	0.828 (0.033)	N/A	N/A	
TB-12	0.224 (0.009)	0.283 (0.011)	0.341 (0.013)	0.400 (0.016)	0.458 (0.018)	0.604 (0.024)	0.750 (0.030)		
TB-16	0.229 (0.009)	0.283 (0.011)	0.337 (0.013)	0.391 (0.015)	0.445 (0.018)	0.581 (0.023)	0.716 (0.028)		
TB-20	0.252 (0.010)	0.305 (0.012)	0.359 (0.014)	0.412 (0.016)	0.466 (0.018)	0.600 (0.024)	0.734 (0.029)		
TB-25	0.231 (0.009)	0.278 (0.011)	0.325 (0.013)	0.372 (0.015)	0.420 (0.017)	0.537 (0.021)	0.655 (0.026)		
TB-32	0.224 (0.009)	0.260 (0.010)	0.297 (0.012)	0.334 (0.013)	0.370 (0.015)	0.462 (0.018)	0.553 (0.022)		
(Option X - Ball Bushing)									
	Stroke Length mm								
	10	20	30	40	50	75	100		
TB-12-X	0.143 (0.006)	0.185 (0.007)	0.228 (0.009)	0.271 (0.011)	0.313 (0.012)	0.420 (0.017)	0.526 (0.021)		
TB-16-X	0.140 (0.006)	0.178 (0.007)	0.216 (0.008)	0.254 (0.010)	0.291 (0.011)	0.386 (0.015)	0.480 (0.019)		
TB-20-X	0.133 (0.005)	0.165 (0.006)	0.197 (0.008)	0.229 (0.009)	0.260 (0.010)	0.340 (0.013)	0.419 (0.017)		
TB-25-X	0.154 (0.006)	0.190 (0.007)	0.225 (0.009)	0.261 (0.010)	0.296 (0.012)	0.385 (0.015)	0.474 (0.019)		
TB-32-X	0.156 (0.006)	0.185 (0.007)	0.214 (0.008)	0.243 (0.010)	0.273 (0.011)	0.346 (0.014)	0.419 (0.016)		

Bimba Metric Twin Bore Series Cylinders

Engineering Specifications

(Model TBD; Standard Bearings and Option X) Maximum End Play mm (inch)



Maximum allowable movement of the tooling plate in the vertical direction with rods aligned in horizontal direction

TBD Model										
Model No. (Standard Bushings)	Stroke Length mm									
	10	20	30	40	50	75	100			
TBD-6	0.076 (0.003)	0.089 (0.003)	0.098 (0.004)	0.106 (0.004)	0.112 (0.004)	N/A	N/A	N/A	N/A	
TBD-8	0.068 (0.003)	0.080 (0.003)	0.088 (0.003)	0.095 (0.004)	0.101 (0.004)	0.111 (0.004)	N/A	N/A	N/A	
TBD-12	0.063 (0.002)	0.071 (0.003)	0.077 (0.003)	0.082 (0.003)	0.086 (0.003)	0.094 (0.004)	0.100 (0.004)	0.100 (0.004)	0.100 (0.004)	
TBD-16	0.068 (0.003)	0.075 (0.003)	0.081 (0.003)	0.086 (0.003)	0.091 (0.004)	0.099 (0.004)	0.105 (0.004)	0.105 (0.004)	0.105 (0.004)	
TBD-20	0.074 (0.003)	0.082 (0.003)	0.088 (0.003)	0.094 (0.004)	0.099 (0.004)	0.108 (0.004)	0.115 (0.005)	0.115 (0.005)	0.115 (0.005)	
TBD-25	0.069 (0.003)	0.076 (0.003)	0.082 (0.003)	0.087 (0.003)	0.092 (0.004)	0.101 (0.004)	0.107 (0.004)	0.107 (0.004)	0.107 (0.004)	
TBD-32	0.078 (0.003)	0.084 (0.003)	0.089 (0.003)	0.093 (0.004)	0.097 (0.004)	0.104 (0.004)	0.110 (0.004)	0.110 (0.004)	0.110 (0.004)	
(Option X - Ball Bushing)	Stroke Length mm									
	10	20	30	40	50	75	100			
TBD-12-X	0.007 (0.0003)	0.008 (0.0003)	0.009 (0.0003)	0.009 (0.0004)	0.010 (0.0004)	0.011 (0.0004)	0.012 (0.0005)	0.012 (0.0005)	0.012 (0.0005)	
TBD-16-X	0.006 (0.0002)	0.006 (0.0002)	0.007 (0.0003)	0.007 (0.0003)	0.008 (0.0003)	0.009 (0.0003)	0.009 (0.0004)	0.009 (0.0004)	0.009 (0.0004)	
TBD-20-X	0.008 (0.0003)	0.009 (0.0004)	0.010 (0.0004)	0.011 (0.0004)	0.012 (0.0005)	0.013 (0.0005)	0.014 (0.0005)	0.014 (0.0005)	0.014 (0.0005)	
TBD-25-X	0.009 (0.0004)	0.010 (0.0004)	0.011 (0.0004)	0.012 (0.0005)	0.013 (0.0005)	0.014 (0.0006)	0.015 (0.0006)	0.015 (0.0006)	0.015 (0.0006)	
TBD-32-X	0.010 (0.0004)	0.010 (0.0004)	0.011 (0.0004)	0.012 (0.0005)	0.013 (0.0005)	0.014 (0.0005)	0.015 (0.0006)	0.015 (0.0006)	0.015 (0.0006)	

Flat-I /
Square Flat-I

Flat-II /
Square Flat-II

F02, F03, F04
(multiple power)

F0P
(multiple position)

Flat
Accessories

EF1 / EF2

Stopper /
Twist Clamp

Extruded
Flat Lift Table

Twin Bore

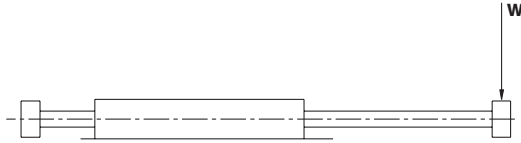
NPA / LPA

Diaphragm /
Miniature Cube

Bimba Metric Twin Bore Series Cylinders

Engineering Specifications

Twin Bore, Double-End Style (Model TBD; Standard Bearings and Option X)
Maximum Radial Load kg-Force (lbs.)



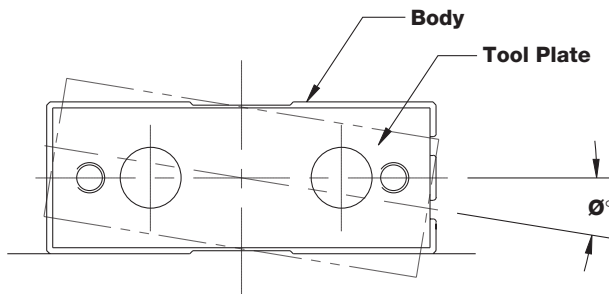
Maximum allowable load for horizontally mounted Double Rod End cylinder with rods aligned in horizontal direction.

TBD Standard Maximum Radial Loads Kgf (lbs)														
Model No.	10		20		30		40		50		75		100	
TBD-6	0.83	(1.83)	0.79	(1.75)	0.77	(1.69)	0.75	(1.65)	0.73	(1.62)	N/A	N/A	N/A	N/A
TBD-8	0.90	(1.98)	0.86	(1.90)	0.84	(1.84)	0.82	(1.80)	0.81	(1.77)	0.78	(1.72)	N/A	N/A
TBD-12	1.5	(3.35)	1.5	(3.27)	1.5	(3.22)	1.4	(3.18)	1.4	(3.15)	1.4	(3.09)	N/A	N/A
TBD-16	2.3	(4.97)	2.2	(4.89)	2.2	(4.83)	2.2	(4.79)	2.2	(4.76)	2.1	(4.70)	2.1	(4.66)
TBD-20	3.3	(7.29)	3.3	(7.19)	3.2	(7.11)	3.2	(7.05)	3.2	(7.01)	3.1	(6.92)	3.1	(6.86)
TBD-25	4.3	(9.46)	4.2	(9.33)	4.2	(9.22)	4.2	(9.14)	4.1	(9.07)	4.1	(8.95)	4.0	(8.87)
TBD-32	7.5	(16.44)	7.4	(16.21)	7.3	(16.02)	7.2	(15.88)	7.2	(15.76)	7.1	(15.53)	7.0	(15.37)

TBD-X Maximum Radial Loads Kgf (lbs)														
Model No.	10		20		30		40		50		75		100	
TBD-12-X	12.1	(26.70)	11.9	(26.09)	11.7	(25.65)	11.5	(25.33)	11.4	(25.08)	11.2	(24.64)	N/A	N/A
TBD-16-X	15.0	(33.04)	14.8	(32.51)	14.6	(32.13)	14.5	(31.84)	14.4	(31.61)	14.2	(31.20)	14.1	(30.94)
TBD-20-X	21.1	(46.37)	20.8	(45.71)	20.6	(45.22)	20.4	(44.84)	20.2	(44.54)	20.0	(43.99)	19.8	(43.62)
TBD-25-X	23.5	(51.64)	23.1	(50.89)	22.9	(50.32)	22.7	(49.87)	22.5	(49.51)	22.2	(48.86)	22.0	(48.42)
TBD-32-X	44.7	(98.38)	44.1	(96.98)	43.6	(95.89)	43.2	(95.01)	42.9	(94.29)	42.2	(92.94)	41.8	(92.01)

Non-Rotational Accuracy (degrees)

Maximum allowable value for \emptyset° in a free unloaded condition.



TBD Model (Standard Bushings)	
Model No.	Degrees (\pm)
TBD-6	0.15
TBD-8	0.12
TBD-12	0.10
TBD-16	0.08
TBD-20	0.08
TBD-25	0.06
TBD-32	0.05
TBD Model - X Option (Ball Bushing)	
Model No.	Degrees (\pm)
TBD-12	0.02
TBD-16	0.02
TBD-20	0.02
TBD-25	0.01
TBD-32	0.01

Bimba Metric Twin Bore Series Cylinders

Engineering Specifications

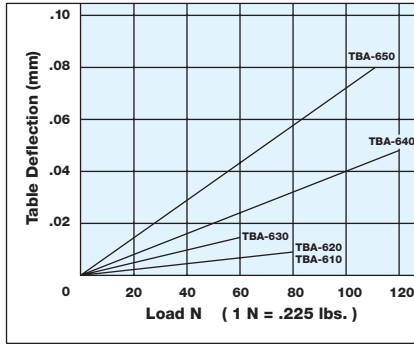
Twin Bore Air Table (Model TBA)



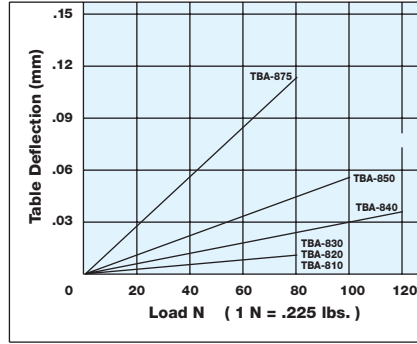
Table deflection by pitch moment

Table pitch deflection due to static pitch moment applied at arrow for fully extended stroke of slide table.

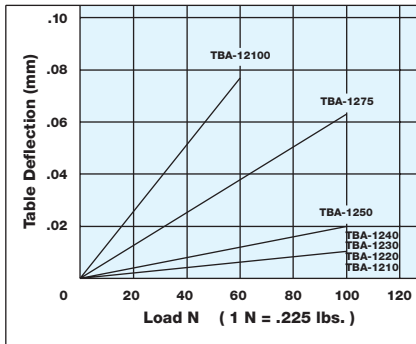
TBA-6



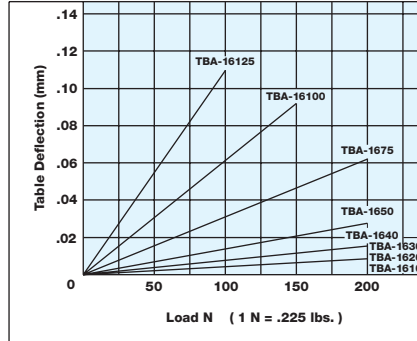
TBA-8



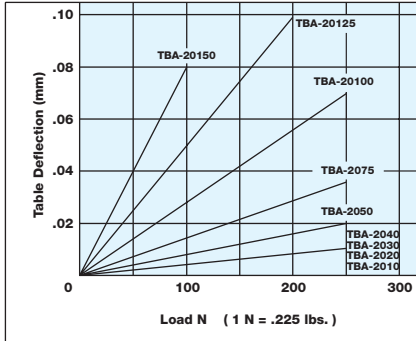
TBA-12



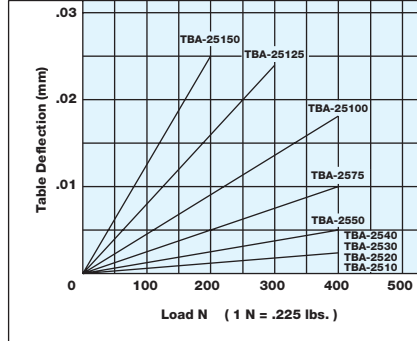
TBA-16



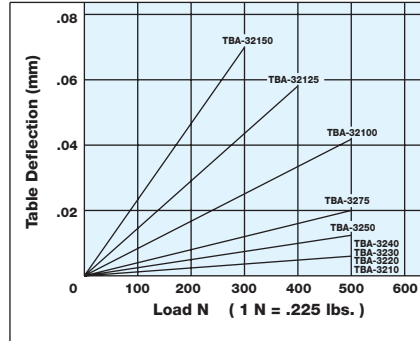
TBA-20



TBA-25



TBA-32



Bimba Metric Twin Bore Series Cylinders

Engineering Specifications

Twin Bore Air Table (Model TBA)

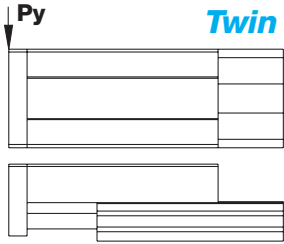
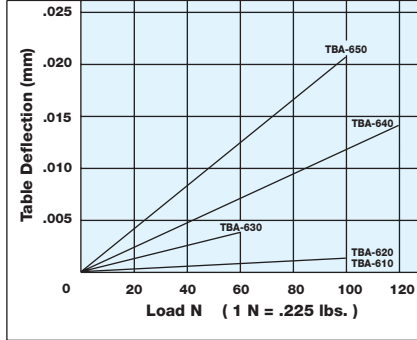


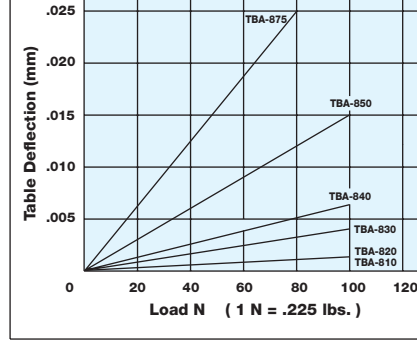
Table deflection by yaw moment

Table yaw deflection due to static yaw moment applied at arrow for fully extended stroke of slide table.

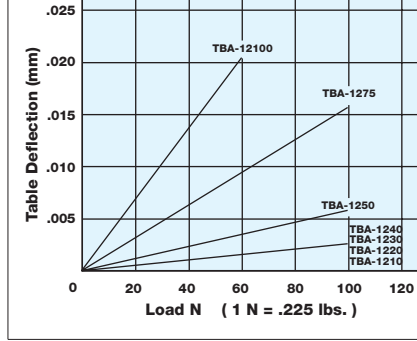
TBA-6



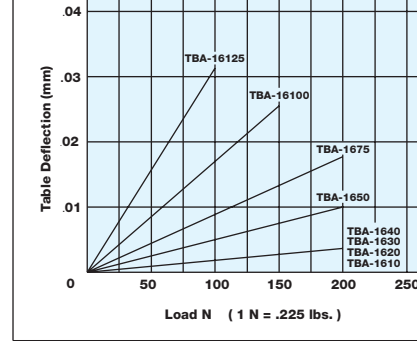
TBA-8



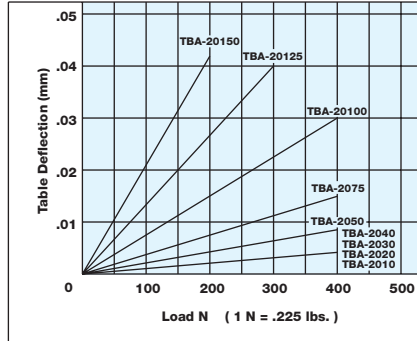
TBA-12



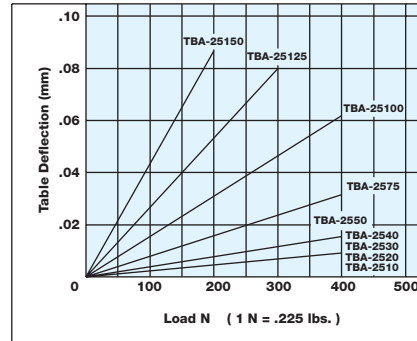
TBA-16



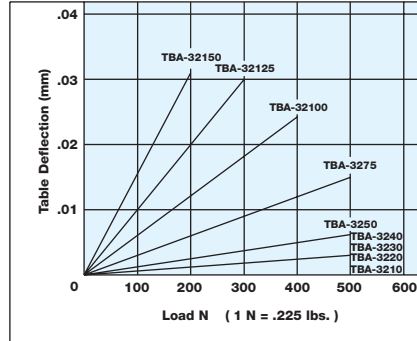
TBA-20



TBA-25



TBA-32

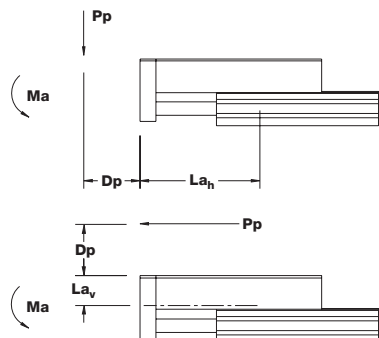


Bimba Metric Twin Bore Series Cylinders

Engineering Specifications

Twin Bore Air Table (Model TBA)

Formula for calculation of allowable static load P_p , P_y and P_r



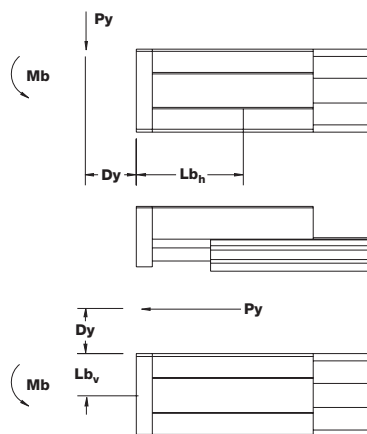
$$P_p = \frac{Ma \times 1000}{D_p + La} \text{ (Newtons)}$$

D_p = Distance from load point to body (mm).

La = Moment arm (mm) see chart.

Ma (Pitching Moment)

Model	Stroke (mm)	Maximum Allowable Moment (Nm)								
		10	20	30	40	50	75	100	125	150
TBA-6		2.55	2.55	2.55	8.65	8.65	N/A	N/A	N/A	N/A
TBA-8		2.55	2.55	2.55	8.65	8.65	8.65	N/A	N/A	N/A
TBA-12		5.39	5.39	5.39	5.39	5.39	14.1	14.1	N/A	N/A
TBA-16		8.72	8.72	8.72	8.72	31.5	31.5	31.5	31.5	N/A
TBA-20		31.5	31.5	31.5	31.5	31.5	31.5	42.1	42.1	42.1
TBA-25		44.9	44.9	44.9	44.9	44.9	44.9	72.2	72.2	72.2
TBA-32		44.9	44.9	44.9	44.9	44.9	120	120	120	120



$$P_y = \frac{Mb \times 1000}{D_y + Lb} \text{ (Newtons)}$$

D_y = Distance from load point to body (mm).

Lb = Moment arm (mm) see chart.

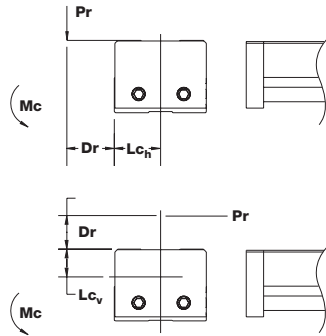
Mb (Yawing Moment)

Model	Stroke (mm)	Maximum Allowable Moment (Nm)								
		10	20	30	40	50	75	100	125	150
TBA-6		2.55	2.55	2.55	8.65	8.65	N/A	N/A	N/A	N/A
TBA-8		2.55	2.55	2.55	8.65	8.65	8.65	N/A	N/A	N/A
TBA-12		5.39	5.39	5.39	5.39	5.39	14.1	14.1	N/A	N/A
TBA-16		8.72	8.72	8.72	8.72	31.5	31.5	31.5	31.5	N/A
TBA-20		31.5	31.5	31.5	31.5	31.5	31.5	42.1	42.1	42.1
TBA-25		44.9	44.9	44.9	44.9	44.9	44.9	72.2	72.2	72.2
TBA-32		44.9	44.9	44.9	44.9	44.9	120	120	120	120

Bimba Metric Twin Bore Series Cylinders

Engineering Specifications

Twin Bore Air Table (Model TBA)



$$Pr = \frac{Mc \times 1000}{Dr + Lc} \text{ (Newtons)}$$

Dr = Distance from load point to body (mm).

Lc = Moment arm (mm) see chart.

Mc (Rolling Moment)

Model \ Stroke (mm)	Maximum Allowable Moment (Nm)								
	10	20	30	40	50	75	100	125	150
TBA-6	5.1	5.1	5.1	13.1	13.1	N/A	N/A	N/A	N/A
TBA-8	5.1	5.1	5.1	13.1	13.1	13.1	N/A	N/A	N/A
TBA-12	15.2	15.2	15.2	15.2	15.2	22.8	22.8	N/A	N/A
TBA-16	22.8	22.8	22.8	22.8	38.1	38.1	38.1	38.1	N/A
TBA-20	46.2	46.2	46.2	46.2	46.2	46.2	46.2	46.2	46.2
TBA-25	66.5	66.5	66.5	66.5	66.5	66.5	77.7	77.7	77.7
TBA-32	75.7	75.7	75.7	75.7	75.7	91.2	91.2	91.2	91.2

Bore/Stroke Constants

Model \ Stroke (mm)	Lah and Lbh Moment Lever Arm (mm)								
	10	20	30	40	50	75	100	125	150
TBA-6	30.5	40.5	50.4	71.6	81.6	N/A	N/A	N/A	N/A
TBA-8	30.5	41	51	72.8	83.1	108.1	N/A	N/A	N/A
TBA-12	58	58	58	68	78	120	145	N/A	N/A
TBA-16	63.5	63.5	63.5	73.5	89.5	114.5	139.5	164.5	N/A
TBA-20	70.5	70.5	70.5	80.5	92.5	117.5	157	182	207
TBA-25	77	77	77	87.5	98.5	124.5	165	190	215
TBA-32	79	79	79	89	99	139.5	165.5	190.5	215

Model	Moment Lever Arm Distances (mm)			
	La _v	Lb _v	Lc _h	Lc _v
TBA-6	9.1	15.7	15.7	9.1
TBA-8	9.1	18.6	18.6	9.1
TBA-12	12.5	23	23	12.5
TBA-16	15.5	28.5	28.5	15.5
TBA-20	20.5	32	32	20.5
TBA-25	22.5	40	40	22.5
TBA-32	27	49	49	27

Note: 1 N-m = 8.851 in.-lbs.
1N-m = .7376 ft.-lbs

Bimba Metric Twin Bore Series Cylinders

Theoretical Cylinder Forces

Force = Power Factor x Input Pressure

Bore	Direction	Power Factor (When Input pressure in bar)	Power Factor (When input pressure in psi)
6mm	Extend*	0.57	0.09
	Retract	0.42	0.07
8mm	Extend*	1.00	0.16
	Retract	0.75	0.12
12mm	Extend*	2.2	0.4
	Retract	1.6	0.2
16mm	Extend*	4.0	0.6
	Retract	3.0	0.4
20mm	Extend*	6.2	1.0
	Retract	4.8	0.8
25mm	Extend*	9.8	1.6
	Retract	7.6	1.2
32mm	Extend*	16.0	2.4
	Retract	12.0	1.8

*For TBD models use Retract Power Factors only; Extend is not applicable.
 BAR x Power Factor = kg
 PSI x Power Factor = Pounds

Flat-I /
Square Flat-I

Flat-II /
Square Flat-II

F02, F03, F04
(multiply power)

F0P
(multiply position)

Flat
Accessories

EF1 / EF2

Stopper /
Twist Clamp

Extruded
Flat Lift Table

Twin Bore

NPA / LPA

Diaphragm /
Miniature Cube

Bimba Metric Twin Bore Series Cylinders

Weights

TB Cylinder

Bore	Approx. Base Wt. of Cylinder gf (oz.)	Wt. Added Per 5mm of Stk gf (oz.)
6	52.3 (1.85)	4.9 (0.17)
8	75.5 (2.66)	6.5 (0.23)
12	127.4 (4.5)	9.4 (0.3)
16	212.6 (7.5)	13.6 (0.4)
20	345.6 (12.1)	19.1 (0.6)
25	551.8 (19.4)	28.0 (0.9)
32	1046.5 (36.9)	44.4 (1.5)

TBD Cylinder

Bore	Approx. Base Wt. of Cylinder gf (oz.)	Wt. Added Per 5mm of Stk gf (oz.)
6	81.8 (2.89)	5.5 (0.19)
8	109.7 (3.87)	7.4 (0.26)
12	208.7 (7.3)	11.6 (0.4)
16	361.3 (12.7)	17.6 (0.6)
20	580.9 (20.4)	25.3 (0.8)
25	943.1 (33.2)	36.9 (1.3)
32	1835.6 (64.7)	60.1 (2.1)

TBA Cylinder

Bore	Weight of Cylinder Based on Stroke Length gf (oz.)				
	10mm	20mm	30mm	40mm	50mm
6	119.6 (4.22)	139.4 (4.92)	158.6 (5.60)	219.8 (7.75)	240.5 (8.48)
8	159.8 (5.64)	178.5 (6.30)	202.9 (7.16)	267.2 (9.42)	295.0 (10.41)
12	236.0 (8.3)	240.4 (8.4)	244.9 (8.6)	283.0 (9.9)	342.0 (12.0)
16	378.7 (13.3)	386.5 (13.6)	394.4 (13.9)	433.1 (15.2)	561.4 (19.8)
20	631.4 (22.2)	643.7 (22.7)	656.0 (23.1)	728.0 (25.6)	827.9 (29.2)
25	992.5 (35.0)	1010.2 (35.6)	1027.9 (36.2)	1128.3 (39.8)	1253.4 (44.2)
32	1660.0 (58.5)	1691.6 (59.6)	1723.1 (60.7)	1882.1 (66.3)	2078.8 (73.3)

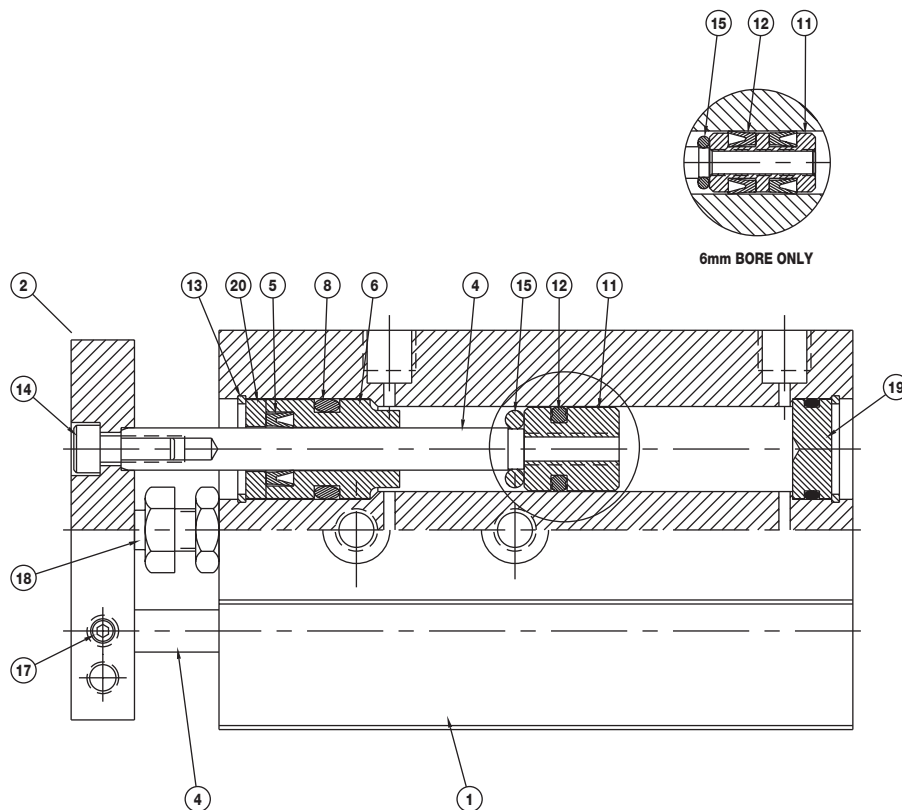
TBA Cylinder

Bore	Weight of Cylinder Based on Stroke Length gf (oz.)			
	75mm	100mm	125mm	150mm
6	N/A	N/A	N/A	N/A
8	391.0 (13.79)	N/A	N/A	N/A
12	479.9 (16.9)	616.9 (21.7)	N/A	N/A
16	699.8 (24.6)	821.7 (28.9)	984.5 (34.7)	N/A
20	1047.4 (36.9)	1438.4 (50.7)	1645.0 (58.0)	1872.4 (66.0)
25	1636.0 (57.7)	2019.1 (71.2)	2525.8 (89.1)	2710.5 (95.6)
32	2741.4 (96.7)	3277.9 (115.6)	4093.6 (144.4)	4591.6 (161.9)

Bimba Metric Twin Bore Series Cylinders

Twin Bore

Standard Model 6mm – 8mm Bore



Part #	Description	Material
1	Body	Aluminum - (Anodized over wear surfaces)
2	End Block	Anodized Aluminum
4	Rod	Hard Chrome Plated Carbon Steel
5	Rod Seal	Nitrile
6	Rod Guide	White Delrin®
8	Rod Guide Seal	Nitrile
11	Piston	Aluminum
12	Piston Seal	Nitrile
13	Snap Ring	Zinc Plated Carbon Steel
14	Socket Head Cap Screw	Zinc Plated Carbon Steel
15	Bumper	Urethane
17	Socket Head Set Screw	Zinc Plated Carbon Steel
18	Stroke Adjuster/Bumper	Stainless Bolt with Urethane Bumper
19	Rear Head	Anodized Aluminum
20	Rod Seal Retainer	Stainless Steel

Flat-I/
Square Flat-I

Flat-II/
Square Flat-II

F02, F03, F04
(multiple power)

F0P
(multiple position)

Flat
Accessories

EF1/EF2

Stopper/
Twist Clamp

Extruded
Flat Lift Table

Twin Bore

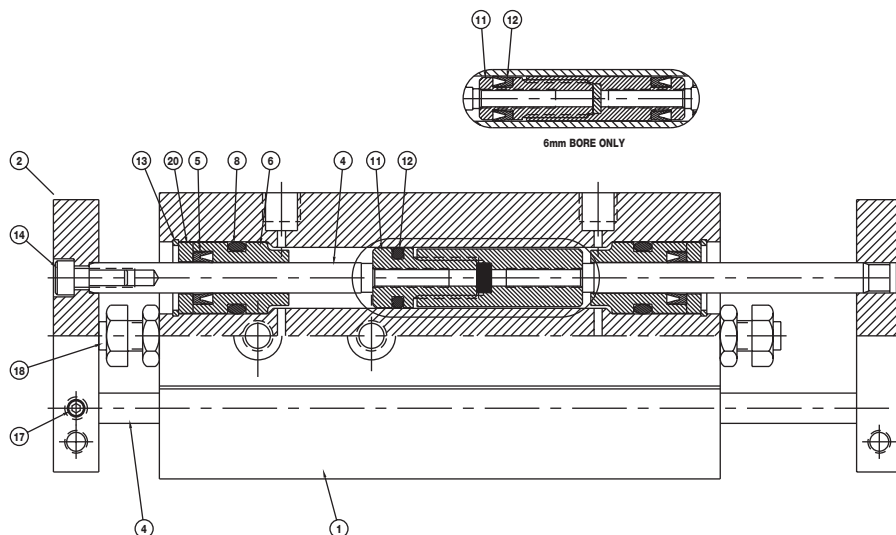
NPA/LPA

Diaphragm/
Miniature Cube

Bimba Metric Twin Bore Series Cylinders

Twin Bore

TBD (Double Rod End) 6mm – 8mm Bore

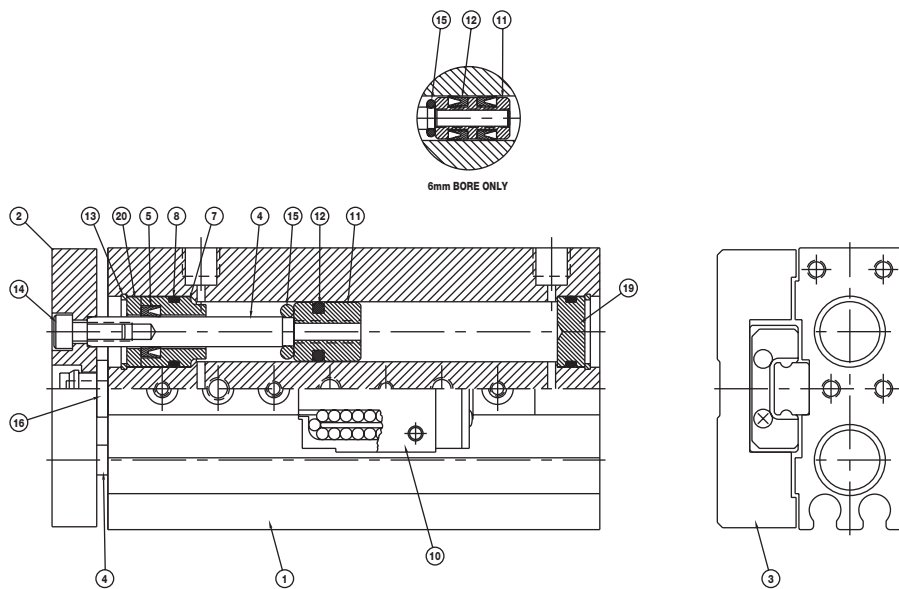


Part #	Description	Material
1	Body	Aluminum - (Anodized over wear surfaces)
2	End Block	Anodized Aluminum
4	Rod	Hard Chrome Plated Carbon Steel
5	Rod Seal	Nitrile
6	Rod Guide	White Delrin
8	Rod Guide Seal	Nitrile
11	Piston	Aluminum
12	Piston Seal	Nitrile
13	Snap Ring	Zinc Plated Carbon Steel
14	Socket Head Cap Screw	Zinc Plated Carbon Steel
17	Socket Head Set Screw	Zinc Plated Carbon Steel
18	Stroke Adjuster/Bumper	Stainless Bolt with Urethane Bumper
20	Rod Seal Retainer	Stainless Steel

Bimba Metric Twin Bore Series Cylinders

Twin Bore

TBA (Air Table Model) 6mm – 8mm Bore



Part #	Description	Material
1	Body	Aluminum - (Anodized over wear surfaces)
2	End Block	Anodized Aluminum
3	Table Plate	Anodized Aluminum
4	Rod	Hard Chrome Plated Carbon Steel
5	Rod Seal	Nitrile
7	Rod Guide	Anodized Aluminum
8	Rod Guide Seal	Nitrile
10	Table Bearing	Stainless Steel Rail + Stainless Steel Bearings
11	Piston	Aluminum
12	Piston Seal	Nitrile
13	Snap Ring	Zinc Plated Carbon Steel
14	Socket Head Cap Screw	Zinc Plated Carbon Steel
15	Bumper	Urethane
19	Rear Head	Anodized Aluminum
20	Rod Seal Retainer	Stainless Steel

Flat-I/
Square Flat-I

Flat-II/
Square Flat-II

F02, F03, F04
[multiple power]

F0P
[multiple position]

Flat
Accessories

EF1/EF2

Stopper/
Twist Clamp

Extruded
Flat Lift Table

Twin Bore

NPA/LPA

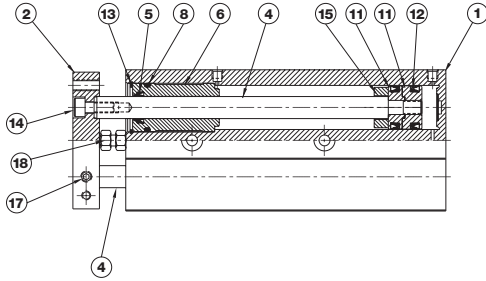
Diaphragm/
Miniature Cube

Bimba Metric Twin Bore Series Cylinders

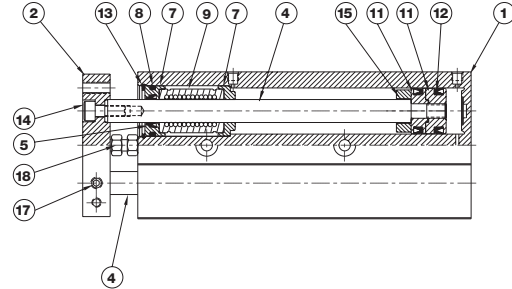
Twin Bore

12mm – 32mm Bore

Standard Model



Ball Bearing Model (Option X)

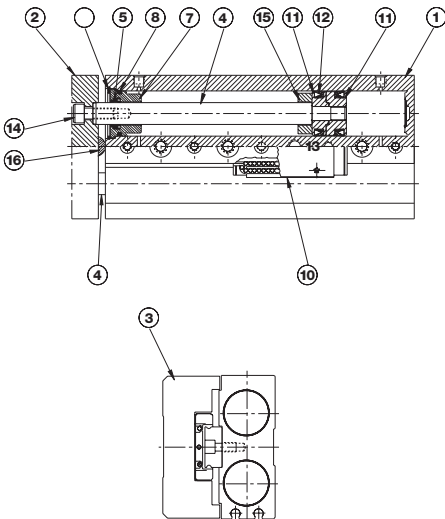


Part List

Part #	Description	Material
1	Body	Aluminum - (Anodized over wear surfaces)
2	End Block	Anodized Aluminum
4	Rod	Hard Chrome Plated Carbon Steel
5	Rod Seal/Wiper	Nitrile (Standard) or Fluoroelastomer (High Temperature Option)
6	Rod Guide	White Delrin
7	Rod Guide	Anodized Aluminum
8	Rod Guide Seal	Nitrile (Standard) or Fluoroelastomer (High Temperature Option)
9	Ball Bushing	Stainless Steel
11	Piston	Aluminum
12	Piston Seal	Nitrile (Standard) or Fluoroelastomer (High Temperature Option)
13	Snap Ring	Zinc Plated Carbon Steel
14	Socket Head Cap Screw	Zinc Plated Carbon Steel
15	Bumper	Urethane
17	Socket Head Set Screw	Zinc Plated Carbon Steel
18	Stroke Adjuster/Bumper	Stainless Bolt w/Urethane Bumper

Twin Bore

Air Table Model (TBA) 12mm – 32mm Bore



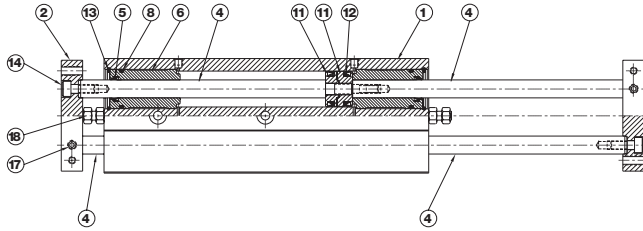
Part List

Part #	Description	Material
1	Body	Aluminum - (Anodized over wear surfaces)
2	End Block	Anodized Aluminum
3	Table Plate	Anodized Aluminum
4	Rod	Hard Chrome Plated Carbon Steel
5	Rod Seal/Wiper	Nitrile (Standard) or Fluoroelastomer (High Temperature Option)
7	Rod Guide	Anodized Aluminum
8	Rod Guide Seal	Nitrile (Standard) or Fluoroelastomer (High Temperature Option)
10	Table Bearing	Stainless Steel Rail + Stainless Steel Bearings
11	Piston	Aluminum
12	Piston Seal	Nitrile (Standard) or Fluoroelastomer (High Temperature Option)
13	Snap Ring	Zinc Plated Carbon Steel
14	Socket Head Cap Screw	Zinc Plated Carbon Steel
15	Bumper	Urethane
16	Bumper	Urethane

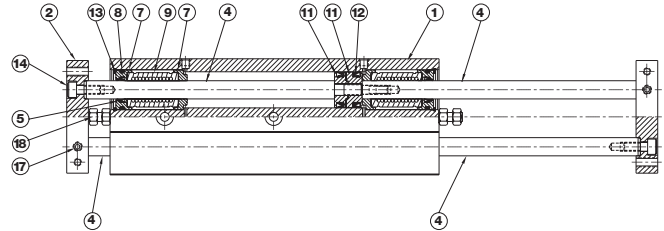
Bimba Metric Twin Bore Series Cylinders

Twin Bore

TBD (Double Rod End) 12mm – 32mm Bore Standard Model



Ball Bearing Model (Option X)



Part List

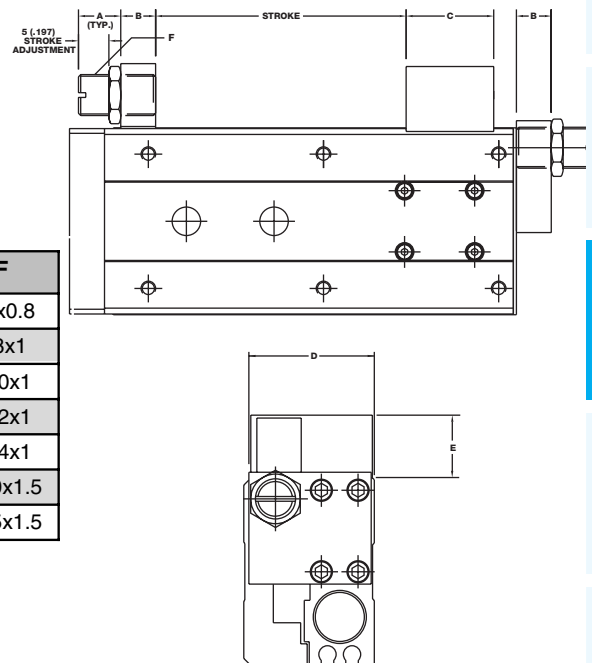
Part #	Description	Material
1	Body	Aluminum - (Anodized over wear surfaces)
2	End Block	Anodized Aluminum
4	Rod	Hard Chrome Plated Carbon Steel
5	Rod Seal/Wiper	Nitrile (Standard) or Fluoroelastomer (High Temperature Option)
6	Rod Guide	White Delrin
7	Rod Guide	Anodized Aluminum
8	Rod Guide Seal	Nitrile (Standard) or Fluoroelastomer (High Temperature Option)
9	Ball Bushing	Stainless Steel
11	Piston	Aluminum
12	Piston Seal	Nitrile (Standard) or Fluoroelastomer (High Temperature Option)
13	Snap Ring	Zinc Plated Carbon Steel
14	Socket Head Cap Screw	Zinc Plated Carbon Steel
17	Socket Head Set Screw	Zinc Plated Carbon Steel
18	Stroke Adjuster/Bumper	Stainless Bolt w/Urethane Bumper

Options

Stroke Adjuster (Options A1, A2, A3)

Provides 5mm (.197) of stroke adjustment at the end of stroke.
(Option A1 shown)

Bore	A	B	C	D	E	F
6	7.7 (0.30)	6 (0.24)	12.5 (0.49)	21.7 (0.85)	9 (0.35)	M5x0.8
8	8 (0.31)	6 (0.24)	14.3 (0.56)	24.6 (0.97)	12.2 (0.48)	M8x1
12	10 (.39)	8 (.31)	18.1 (.71)	30 (1.18)	17 (.67)	M10x1
16	10 (.39)	10 (.39)	21.1 (.83)	37.5 (1.48)	18 (.71)	M12x1
20	10 (.39)	12 (.47)	30 (1.18)	47.5 (1.87)	22 (.87)	M14x1
25	10 (.39)	16 (.63)	30 (1.18)	54.5 (2.15)	24.5 (.96)	M20x1.5
32	10 (.39)	16 (.63)	32 (1.26)	67.3 (2.65)	32.3 (1.27)	M25x1.5



Flat-I/
Square Flat-I

Flat-II/
Square Flat-II

F02, F03, F04
(multiple power)

F0P
(multiple position)

Flat
Accessories

EF1/EF2

Stopper/
Twist Clamp

Extruded
Flat Lift Table

Twin Bore

NPA/LPA

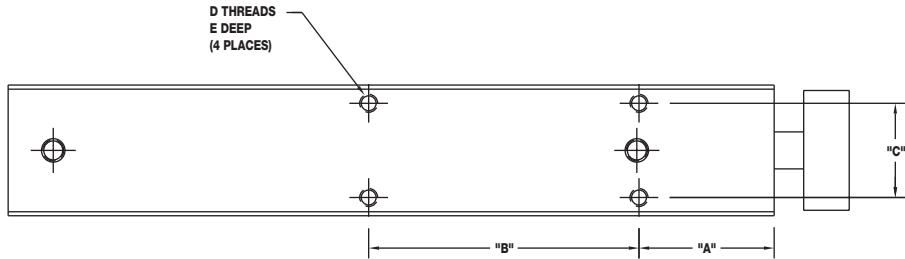
Diaphragm/
Miniature Cube

Bimba Metric Twin Bore Series Cylinders

Options

Side Mounting Holes (Option S)

Use for Models TB and TBD cylinders.



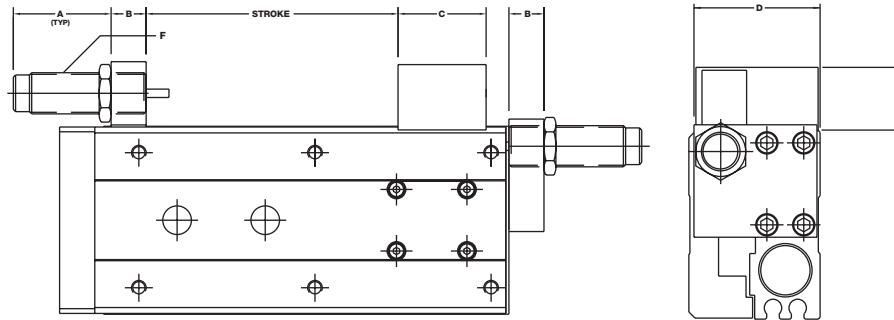
Bore	A	B	Stroke Length	C	D		E
					Standard	Option E	
6mm	10 (0.394)	23 (0.906)	0-10mm	6 (0.236)	M2x0.4	#2-56 UNC	3 (0.118)
		33 (1.299)	11-20mm				
		43 (1.693)	21-30mm				
		53 (2.087)	31-40mm				
		63 (2.480)	41-50mm				
8mm	10 (0.394)	23 (0.906)	0-10mm	7 (0.276)	M2.5x0.45	#3-48 UNC	3 (0.118)
		33 (1.299)	11-20mm				
		43 (1.693)	21-30mm				
		53 (2.087)	31-40mm				
		63 (2.480)	41-50mm				
		88 (3.465)	51-75mm				
12mm	20 (.787)	30 (1.181)	0-25mm	10 (.394)	M3x.5	#4-40 UNC	4.5 (.177)
		40 (1.575)	26-50mm				
		50 (1.969)	51-75mm				
16mm	30 (1.181)	25 (.984)	0-20mm	12 (.472)	M4x0.7	#8-32 UNC	4.5 (.177)
		35 (1.378)	21-50mm				
		45 (1.772)	51-80mm				
		55 (2.165)	81-100mm				
20mm	30 (1.181)	30 (1.181)	0-25mm	16 (.630)	M4x0.7	#8-32 UNC	4.5 (.177)
		40 (1.575)	26-50mm				
		60 (2.362)	51-100mm				
25mm	30 (1.181)	30 (1.181)	0-20mm	22 (.866)	M5x0.8	#10-32 UNF	7.4 (.290)
		40 (1.575)	21-50mm				
		60 (2.362)	51-80mm				
32mm	30 (1.181)	40 (1.575)	0-25mm	25 (.984)	M5x0.8	#10-32 UNF	7.5 (.295)
		50 (1.969)	26-50mm				
		70 (2.756)	51-100mm				

Bimba Metric Twin Bore Series Cylinders

Options

Shock Absorbers (Option K)

Provides shock absorption at the ends of stroke. The shock absorbers are available in three dampening levels: light duty, standard duty, and heavy duty, so the shock can be selected based on the energies of the application. Shock absorbers can also be provided at either end of stroke or at both ends.



Bore	A	B	C	D	E	F
8	22.5 (0.89)	6 (0.24)	14.3 (0.56)	24.6 (0.97)	12.2 (0.48)	M8x1
12	20.7 (.81)	8 (.31)	18.1 (.71)	30 (1.18)	17 (.67)	M10x1
16	39.8 (1.57)	10 (.39)	21.1 (.83)	37.5 (1.48)	18 (.71)	M12x1
20	70.2 (2.76)	12 (.47)	30 (1.18)	47.5 (1.87)	22 (.87)	M14x1
25	82.7 (3.26)	16 (.63)	30 (1.18)	54.5 (2.15)	24.5 (.96)	M20x1.5
32	90.4 (3.56)	16 (.63)	32 (1.26)	67.3 (2.65)	32.3 (1.27)	M25x1.5

See the following section on how to size the shock absorber to a specific application. Shock absorbers within a given bore size have the same dimensions regardless of dampening strength.

How to Size The Shock Absorber

“The shock absorber is pre selected for size by the bore diameter of the cylinder. However, the “dampening strength must be selected to choose the proper shock absorber. To calculate the necessary shock, the following values must be known.

Cylinder Bore Diameter	d(mm)
Operating Pressure	p(bar)
Load on the Actuator	W(kg)
Impact Velocity	v(m / sec)
(impact velocity may be estimated at 2 times average velocity.)	
Weight Constant	k1
Cylinder Constant	k2
Shock Constant	k3
Cycles per Hour	c
Mounting Orientation (horizontal or vertical)	

Et (Total Energy) equals the sum of Ek (Kinetic Energy) and Ew (Work Energy). Note the “Work Energy calculation varies with mounting orientation, Ewh for horizontal and Ewv for”vertical applications.

$$E_k = (W/2) + k_1 \times v^2 \text{ [Nm]}$$

$$E_{wh} = k_2 \times p \times k_3 \text{ [Nm]}$$

$$E_{wv} = ((k_2 \times p) + W + k_1) \times k_3 \text{ [Nm]}$$

$$E_t = E_k + E_w \text{ [Nm]}$$

$$E_tC = E_t \times c \text{ [Nm / hr]}$$

Et and EtC must not exceed maximum values listed below. Dampening must be chosen from graphs on page 2.100.

Bimba Metric Twin Bore Series Cylinders

Options

Shock Specifications

Model Bore	Shock Bore (mm)	K ₃ Shock Constant	Thread Size	E _t Max Nm per Cycle	E _t C Max Nm per Hour	Max Shock Force (N)	Max Propelling Force (N)	Shock Weight (g)
8	5.6	0.0051	M8x1	0.45	3954	N/A	N/A	9
12	7.1	0.006	M10x1.0	2.2	4100	700	89	12
16	6	0.010	M12x1.0	5.0	14125	1000	220	42
20	7	0.016	M14x1.0	21.5	34000	2225	530	71
25	11	0.022	M20x1.5	45.0	53700	3110	890	200
32	13	0.025	M25x1.5	73.5	70000	4440	1550	285

Weight Constant (k₁)

Stroke	Bore					
	8	12	16	20	25	32
10	0.08	0.17	0.29	0.51	0.82	1.34
20	0.10	0.17	0.29	0.52	0.84	1.38
30	0.12	0.17	0.30	0.53	0.86	1.41
40	0.15	0.20	0.33	0.58	0.92	1.51
50	0.20	0.23	0.42	0.64	0.99	1.63
75	0.22	0.32	0.50	0.78	1.22	2.05
100	N/A	0.40	0.57	1.02	1.46	2.38
125	N/A	N/A	0.67	1.15	1.76	2.86
150	N/A	N/A	N/A	1.29	1.88	3.17

Shock Graph Legend

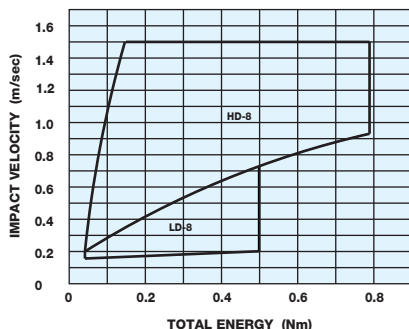
Bore	Dampening		
	Light Duty	Std. Duty	Heavy Duty
8	LD-8	N/A	HD-8
12	LD-12	SD-12	HD-12
16	LD-16	SD-16	HD-16
20	LD-20	SD-20	HD-20
25	LD-25	SD-25	HD-25
32	LD-32	SD-32	HD-32
Order Code	1	2	3

Cylinder Constant (k₂)

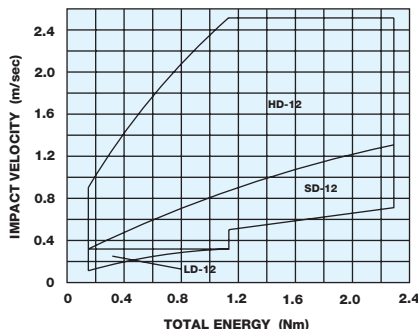
Bore	k
8	10.06
12	22.62
16	40.22
20	62.84
25	98.19
32	160.87

Based on bore diameter, impact velocity (v), and calculated Total Energy (E_t), choose the LD, SD, or HD shock from the appropriate graph.

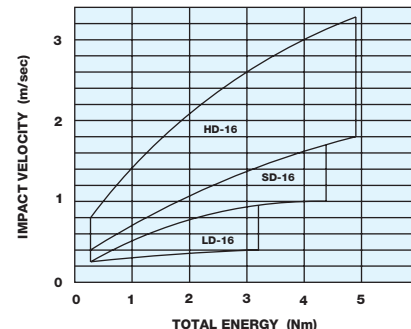
8mm Bore



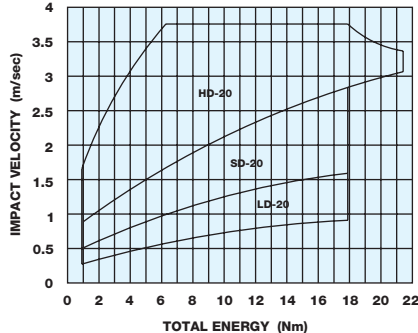
12mm Bore



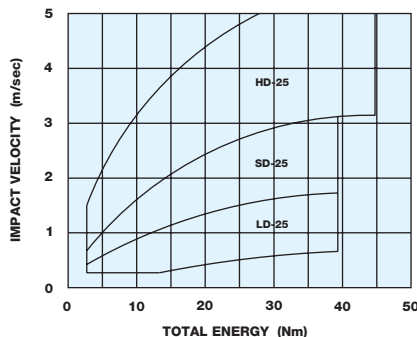
16mm Bore



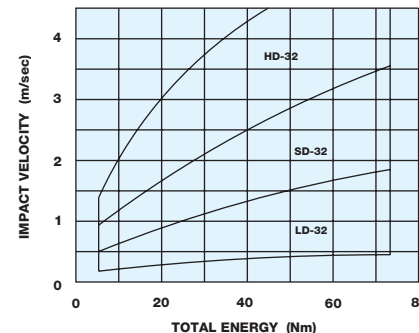
20mm Bore



25mm Bore



32mm Bore



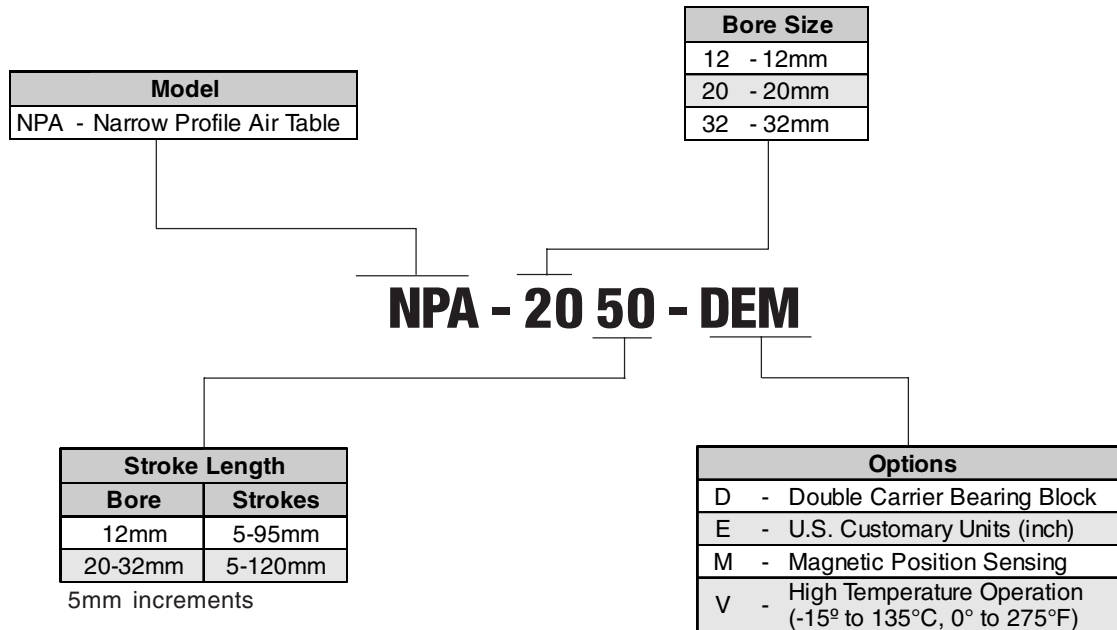
Note: A minimum impact velocity of .25 m/sec. is necessary before shock will be effective.

Bimba Narrow Profile Air Table Actuators



The NPA actuator provides precise load guiding with a recirculating ball rail above its bore. Two bearing styles are offered (single/double bearing block) to accommodate both lower cost and higher precision/cost applications. With standard strokes up to 120mm, the NPA offers longer travel length than any competitive actuator of its type.

How to Order

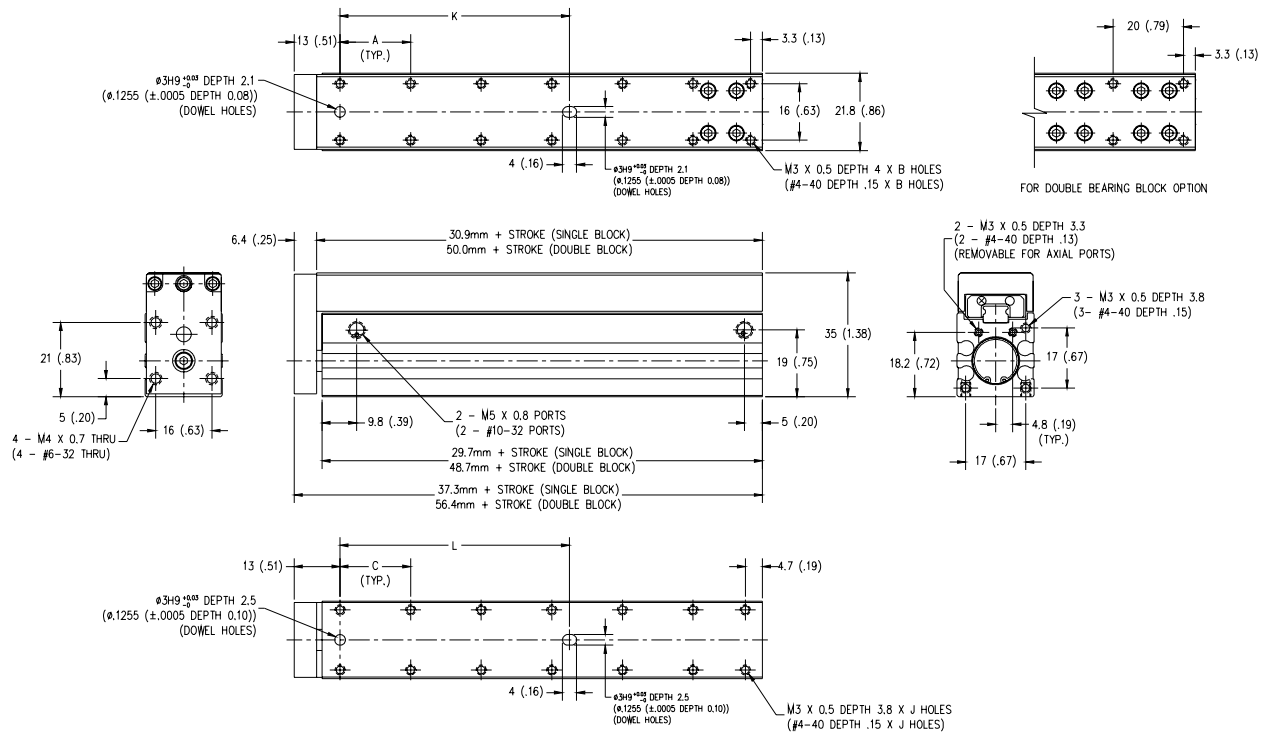


Price List

Bore	Base Price by Stroke				Options		
	5-35 mm	40-65 mm	70-95mm	100-120mm	D	M	V
12mm	\$251.50	\$273.00	\$337.25	N/A	80.50	5.50	6.75
20mm	315.75	364.00	449.50	540.50	160.75	10.75	8.50
32mm	449.50	476.25	556.50	695.75	198.00	10.75	10.25

Bimba Narrow Profile Air Table Actuators

Dimensions NPA-12

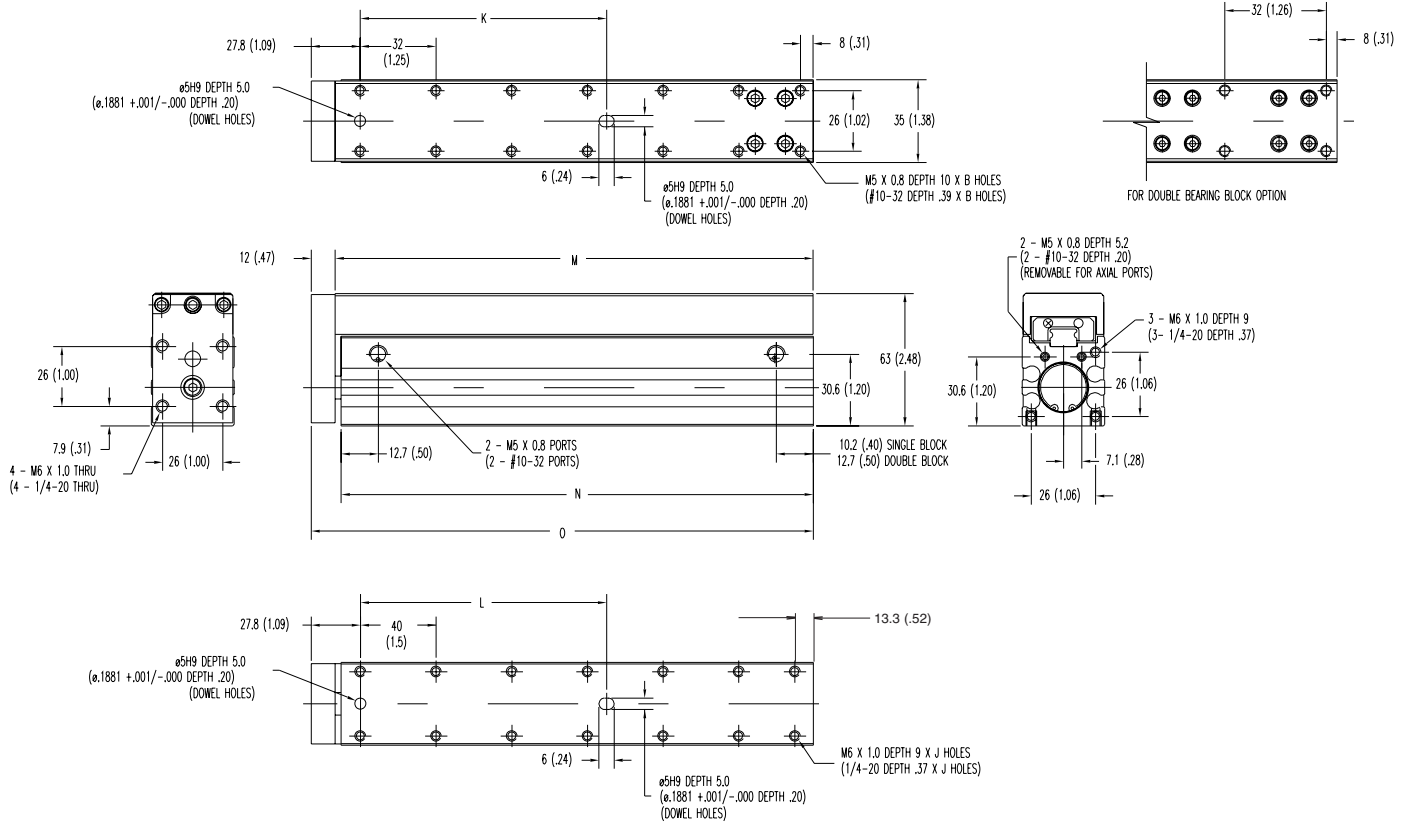


Stroke	A	B	BB*	C	CC*	J	JJ*	K	KK*	L	LL*
5	26 (1.02)	4	6	25 (0.98)	20 (0.79)	4	6	26 (1.02)	45 (1.77)	25 (0.98)	44 (1.73)
10	31 (1.22)	4	6	30 (1.18)	20 (0.79)	4	6	31 (1.22)	50 (1.97)	30 (1.18)	49 (1.92)
15	36 (1.42)	4	6	35 (1.37)	20 (0.79)	4	6	36 (1.42)	55 (2.17)	35 (1.37)	54 (2.12)
20	41 (1.61)	4	6	40 (1.57)	20 (0.79)	4	8	41 (1.61)	60 (2.36)	40 (1.57)	59 (2.32)
25	20 (0.79)	6	8	20 (0.79)	20 (0.79)	6	8	46 (1.81)	65 (2.56)	45 (1.77)	64 (2.51)
30	20 (0.79)	6	8	20 (0.79)	20 (0.79)	6	8	51 (2.01)	65 (2.56)	50 (1.96)	65 (2.56)
35	20 (0.79)	8	8	20 (0.79)	20 (0.79)	8	8	56 (2.20)	65 (2.56)	55 (2.16)	65 (2.56)
40	20 (0.79)	8	8	20 (0.79)	20 (0.79)	8	10	61 (2.40)	65 (2.56)	60 (2.36)	65 (2.56)
45	20 (0.79)	8	10	20 (0.79)	20 (0.79)	8	10	65 (2.56)	65 (2.56)	65 (2.56)	65 (2.56)
50	20 (0.79)	8	10	20 (0.79)	20 (0.79)	8	10	65 (2.56)	65 (2.56)	65 (2.56)	65 (2.56)
55	20 (0.79)	8	10	20 (0.79)	20 (0.79)	8	10	65 (2.56)	65 (2.56)	65 (2.56)	65 (2.56)
60	20 (0.79)	10	10	20 (0.79)	20 (0.79)	10	12	65 (2.56)	65 (2.56)	65 (2.56)	65 (2.56)
65	20 (0.79)	10	12	20 (0.79)	20 (0.79)	10	12	65 (2.56)	65 (2.56)	65 (2.56)	65 (2.56)
70	20 (0.79)	10	12	20 (0.79)	20 (0.79)	10	12	65 (2.56)	65 (2.56)	65 (2.56)	65 (2.56)
75	20 (0.79)	10	12	20 (0.79)	20 (0.79)	10	12	65 (2.56)	65 (2.56)	65 (2.56)	65 (2.56)
80	20 (0.79)	12	12	20 (0.79)	20 (0.79)	12	14	65 (2.56)	65 (2.56)	65 (2.56)	65 (2.56)
85	20 (0.79)	12	14	20 (0.79)	20 (0.79)	12	14	65 (2.56)	65 (2.56)	65 (2.56)	65 (2.56)
90	20 (0.79)	12	14	20 (0.79)	20 (0.79)	12	14	65 (2.56)	65 (2.56)	65 (2.56)	65 (2.56)
95	20 (0.79)	14	14	20 (0.79)	20 (0.79)	12	16	65 (2.56)	65 (2.56)	65 (2.56)	65 (2.56)

*Double letter dimensions represent double bearing block option.

Bimba Narrow Profile Table Actuators

Dimensions NPA-20

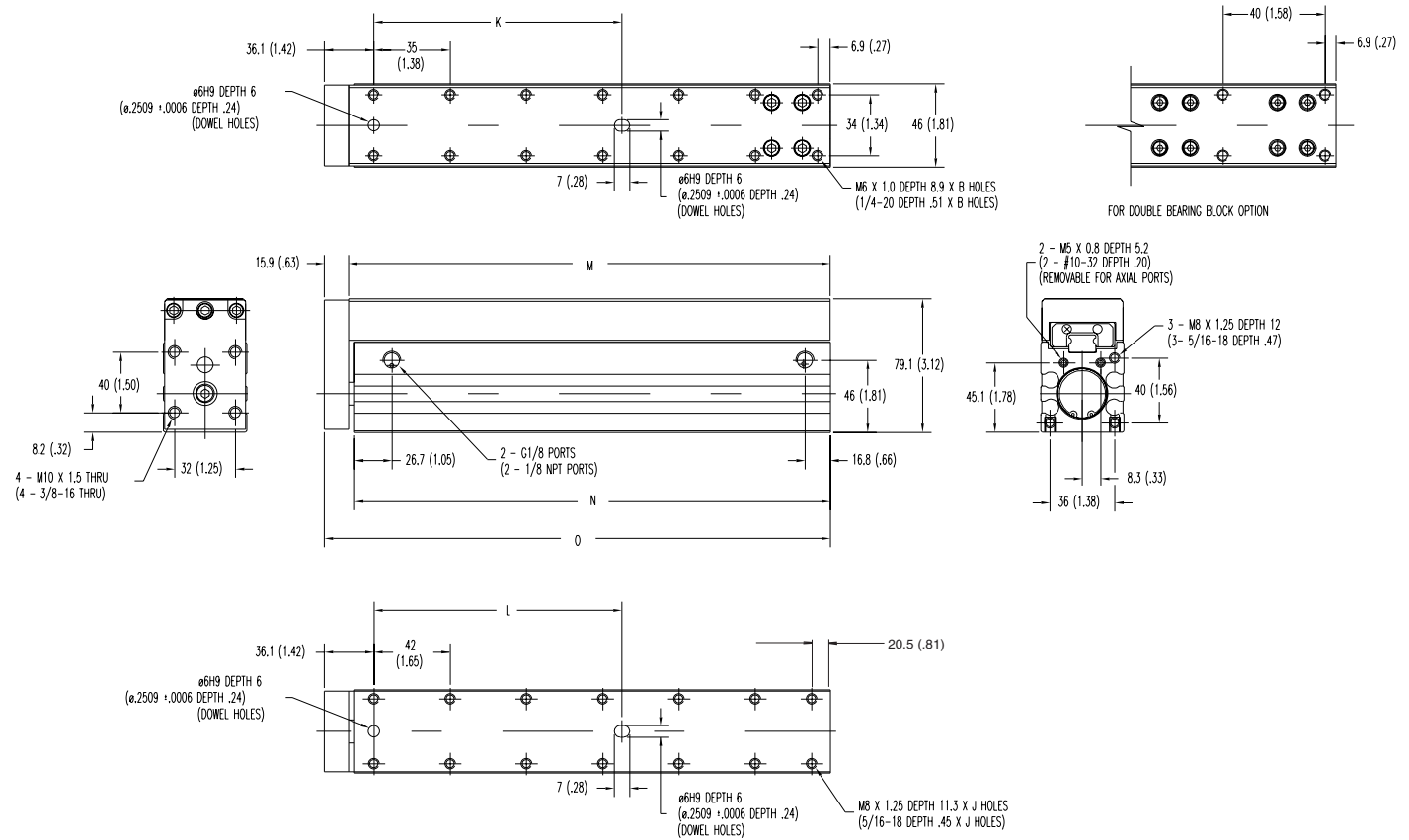


English Dimensions in Parentheses
Double Letter Dimensions represent double bearing block option ("D")

Stroke	B	BB	J	JJ	K	KK	L	LL	M	MM	N	NN	O	OO
5mm	4	6	4	6	40 (1.58)	50 (1.97)	40 (1.58)	50 (1.97)	64 (2.50)	105 (4.12)	62 (2.42)	103 (4.04)	64 (2.52)	105 (4.14)
10mm	4	6	4	6	40 (1.58)	50 (1.97)	40 (1.58)	60 (2.36)	69 (2.70)	110 (4.32)	67 (2.62)	108 (4.23)	69 (2.62)	110 (4.33)
15mm	4	6	4	6	40 (1.58)	50 (1.97)	40 (1.58)	60 (2.36)	74 (2.90)	120 (4.71)	72 (2.81)	118 (4.63)	74 (2.81)	120 (4.73)
20mm	4	6	4	6	50 (1.97)	50 (1.97)	50 (1.97)	60 (2.36)	79 (3.09)	120 (4.71)	77 (3.01)	118 (4.63)	79 (3.01)	120 (4.73)
25mm	4	8	6	8	50 (1.97)	50 (1.97)	50 (1.97)	60 (2.36)	89 (3.49)	125 (4.91)	87 (3.41)	123 (4.82)	89 (3.41)	125 (4.92)
30mm	4	8	6	8	50 (1.97)	50 (1.97)	50 (1.97)	60 (2.36)	89 (3.49)	130 (5.10)	87 (3.41)	128 (5.02)	89 (3.41)	130 (5.12)
35mm	4	8	6	8	50 (1.97)	50 (1.97)	50 (1.97)	70 (2.76)	94 (3.69)	135 (5.30)	92 (3.60)	133 (5.22)	94 (3.60)	135 (5.32)
40mm	6	8	6	8	50 (1.97)	50 (1.97)	50 (1.97)	70 (2.76)	99 (3.88)	140 (5.50)	97 (3.80)	138 (5.41)	99 (3.80)	140 (5.51)
45mm	6	8	6	8	50 (1.97)	50 (1.97)	50 (1.97)	70 (2.76)	104 (4.08)	150 (5.89)	102 (4.00)	148 (5.81)	104 (4.00)	150 (5.91)
50mm	6	8	6	8	60 (2.36)	60 (2.36)	60 (2.36)	70 (2.76)	109 (4.28)	150 (5.89)	107 (4.19)	148 (5.81)	109 (4.19)	150 (5.91)
55mm	6	10	6	8	60 (2.36)	60 (2.36)	60 (2.36)	70 (2.76)	119 (4.67)	155 (6.09)	117 (4.59)	153 (6.00)	119 (4.59)	155 (6.10)
60mm	6	10	6	10	60 (2.36)	60 (2.36)	60 (2.36)	70 (2.76)	119 (4.67)	160 (6.28)	117 (4.59)	158 (6.20)	119 (4.59)	160 (6.30)
65mm	6	10	8	10	60 (2.36)	60 (2.36)	60 (2.36)	70 (2.76)	124 (4.87)	165 (6.48)	122 (4.78)	163 (6.40)	124 (4.78)	165 (6.50)
70mm	8	10	8	10	60 (2.36)	60 (2.36)	60 (2.36)	70 (2.76)	129 (5.06)	170 (6.68)	127 (4.98)	168 (6.59)	129 (4.98)	170 (6.70)
75mm	8	10	8	10	70 (2.76)	70 (2.76)	70 (2.76)	70 (2.76)	134 (5.26)	180 (7.07)	132 (5.18)	178 (6.99)	134 (5.18)	180 (7.09)
80mm	8	10	8	10	70 (2.76)	70 (2.76)	70 (2.76)	70 (2.76)	139 (5.46)	180 (7.07)	137 (5.37)	178 (6.99)	139 (5.37)	180 (7.09)
85mm	8	12	8	10	70 (2.76)	70 (2.76)	70 (2.76)	70 (2.76)	149 (5.85)	185 (7.27)	147 (5.77)	183 (7.19)	149 (5.77)	185 (7.29)
90mm	8	12	8	10	70 (2.76)	70 (2.76)	70 (2.76)	70 (2.76)	149 (5.85)	190 (7.46)	147 (5.77)	188 (7.38)	149 (5.77)	190 (7.48)
95mm	8	12	8	10	70 (2.76)	70 (2.76)	70 (2.76)	70 (2.76)	154 (6.05)	195 (7.66)	152 (5.96)	193 (7.58)	154 (5.96)	195 (7.68)
100mm	10	12	8	12	70 (2.76)	70 (2.76)	70 (2.76)	70 (2.76)	159 (6.24)	200 (7.86)	157 (6.16)	198 (7.78)	159 (6.16)	200 (7.88)
105mm	10	12	10	12	70 (2.76)	70 (2.76)	70 (2.76)	70 (2.76)	164 (6.44)	210 (8.25)	162 (6.36)	208 (8.17)	164 (6.36)	210 (8.27)
110mm	10	12	10	12	70 (2.76)	70 (2.76)	70 (2.76)	80 (3.15)	169 (6.64)	210 (8.25)	167 (6.56)	208 (8.17)	169 (6.56)	210 (8.27)
115mm	10	12	10	12	70 (2.76)	70 (2.76)	70 (2.76)	80 (3.15)	179 (7.03)	215 (8.45)	177 (6.95)	213 (8.37)	179 (6.95)	215 (8.47)
120mm	10	14	10	12	70 (2.76)	70 (2.76)	70 (2.76)	80 (3.15)	179 (7.03)	220 (8.65)	177 (6.95)	218 (8.56)	179 (6.95)	220 (8.66)

Bimba Narrow Profile Air Table Actuators

Dimensions NPA-32



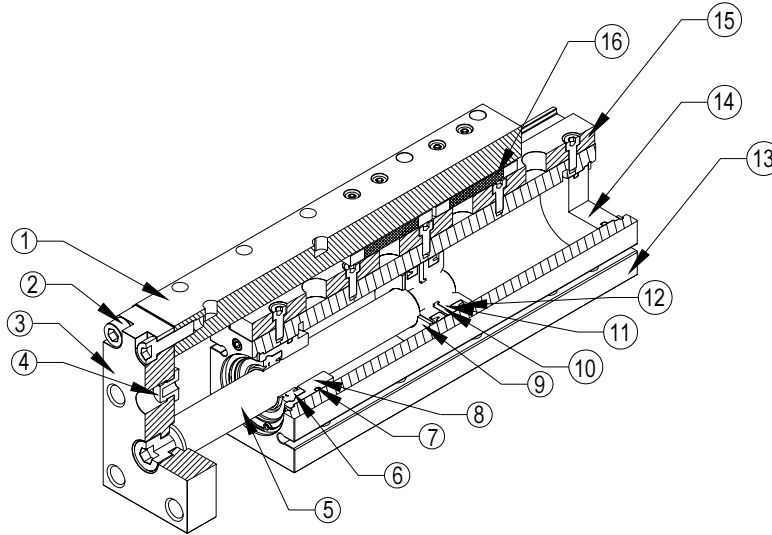
English Dimensions in Parentheses

Double Letter Dimensions represent double bearing block option ("-D")

Stroke	B	BB	J	JJ	K	KK	L	LL	M	MM	N	NN	O	OO
5mm	4	6	4	4	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	80 (3.16)	105 (4.12)	78 (3.08)	102 (4.04)	78 (3.80)	121 (4.76)
10mm	4	6	4	4	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	85 (3.35)	110 (4.32)	83 (3.27)	107 (4.23)	83 (3.99)	126 (4.96)
15mm	4	6	4	6	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	90 (3.55)	120 (4.71)	88 (3.47)	118 (4.63)	88 (4.19)	136 (5.35)
20mm	4	6	4	6	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	95 (3.75)	120 (4.71)	93 (3.67)	118 (4.63)	93 (4.39)	136 (5.35)
25mm	4	6	4	6	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	100 (3.94)	125 (4.91)	98 (3.86)	123 (4.82)	98 (4.59)	141 (5.55)
30mm	4	6	4	6	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	105 (4.14)	130 (5.10)	103 (4.06)	128 (5.02)	103 (4.78)	146 (5.74)
35mm	6	6	4	6	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	110 (4.34)	135 (5.30)	108 (4.26)	133 (5.22)	108 (4.98)	151 (5.94)
40mm	6	6	6	6	60 (2.36)	60 (2.36)	60 (2.36)	60 (2.36)	120 (4.73)	140 (5.50)	118 (4.65)	137 (5.41)	118 (5.37)	156 (6.14)
45mm	6	6	6	6	60 (2.36)	60 (2.36)	60 (2.36)	60 (2.36)	120 (4.73)	145 (5.69)	118 (4.65)	142 (5.61)	118 (5.37)	161 (6.33)
50mm	6	6	6	6	60 (2.36)	60 (2.36)	60 (2.36)	60 (2.36)	125 (4.93)	150 (5.89)	123 (4.85)	147 (5.81)	123 (5.57)	166 (6.53)
55mm	6	8	6	8	60 (2.36)	60 (2.36)	60 (2.36)	60 (2.36)	130 (5.13)	160 (6.28)	128 (5.04)	158 (6.20)	128 (5.77)	176 (6.92)
60mm	6	8	6	8	60 (2.36)	60 (2.36)	60 (2.36)	60 (2.36)	135 (5.32)	160 (6.28)	133 (5.24)	158 (6.20)	133 (5.96)	176 (6.92)
65mm	8	8	6	8	60 (2.36)	60 (2.36)	60 (2.36)	60 (2.36)	140 (5.52)	165 (6.48)	138 (5.44)	163 (6.40)	138 (6.16)	181 (7.12)
70mm	8	8	6	8	60 (2.36)	60 (2.36)	60 (2.36)	60 (2.36)	145 (5.72)	170 (6.68)	143 (5.63)	167 (6.59)	143 (6.36)	186 (7.32)
75mm	8	8	6	8	60 (2.36)	60 (2.36)	60 (2.36)	60 (2.36)	150 (5.91)	175 (6.87)	148 (5.83)	172 (6.79)	148 (6.55)	191 (7.51)
80mm	8	8	8	8	60 (2.36)	60 (2.36)	60 (2.36)	60 (2.36)	160 (6.31)	180 (7.07)	158 (6.22)	177 (6.99)	158 (6.95)	196 (7.71)
85mm	8	10	8	8	60 (2.36)	60 (2.36)	60 (2.36)	60 (2.36)	160 (6.31)	185 (7.27)	158 (6.22)	182 (7.19)	158 (6.95)	201 (7.91)
90mm	8	10	8	10	60 (2.36)	60 (2.36)	60 (2.36)	60 (2.36)	165 (6.50)	190 (7.47)	163 (6.42)	188 (7.38)	163 (7.14)	206 (8.11)
95mm	10	10	8	10	60 (2.36)	60 (2.36)	60 (2.36)	60 (2.36)	170 (6.70)	200 (7.86)	168 (6.62)	198 (7.78)	168 (7.34)	216 (8.50)
100mm	10	10	8	10	76 (2.99)	76 (2.99)	76 (2.99)	76 (2.99)	175 (6.90)	200 (7.86)	173 (6.82)	198 (7.78)	173 (7.54)	216 (8.50)
105mm	10	10	8	10	76 (2.99)	76 (2.99)	76 (2.99)	76 (2.99)	180 (7.09)	205 (8.06)	178 (7.01)	202 (7.97)	178 (7.73)	221 (8.70)
110mm	10	10	8	10	76 (2.99)	76 (2.99)	76 (2.99)	76 (2.99)	185 (7.29)	210 (8.25)	183 (7.21)	207 (8.17)	183 (7.93)	226 (8.89)
115mm	10	12	10	10	76 (2.99)	76 (2.99)	76 (2.99)	76 (2.99)	190 (7.49)	215 (8.45)	188 (7.41)	212 (8.37)	188 (8.13)	231 (9.09)
120mm	10	12	10	10	76 (2.99)	76 (2.99)	76 (2.99)	76 (2.99)	200 (7.88)	220 (8.65)	198 (7.80)	218 (8.56)	198 (8.52)	236 (9.29)

Bimba Narrow Profile air Table Actuators

Engineering Specifications



Part #	Description	Material
1	Table	Aluminum, anodized
2	SHCS	Steel, zinc plated
3	Tooling Plate	Aluminum, anodized
4	Retract Bumper	Urethane
5	Piston Rod	Stainless steel, hard chrome plated
6	Rod Seal	Nitrile (fluoroelastomer optional)
7	Rod Guide Seal	Nitrile (fluoroelastomer optional)
8	Rod Guide	Aluminum
9	Extend Bumper	Urethane
10	Magnet	Nitrile base
11	Piston	Aluminum
12	Piston Seal	Nitrile (fluoroelastomer optional)
13	Body	Aluminum, anodized
14	Rear Head	Aluminum
15/16	Table Bearing	Stainless steel

Operating Medium: Air
Maximum Operating Pressure: 10 bar (140 psi)
Temperature Range: -10° to 70°C (15° to 160°F)

Bimba Narrow Profile Air Table Actuators

Engineering Specifications

	$Pp = \frac{Ma \times 1000}{Dp + La} \text{ (Newtons)}$ <p>Dp = Distance from load point to body (mm) La = Moment arm (mm) see chart</p>
	$Py = \frac{Mb \times 1000}{Dy + Lb} \text{ (Newtons)}$ <p>Dy = Distance from load point to body (mm) Lb = Moment arm (mm) see chart</p>
	$Pr = \frac{Mc \times 1000}{Dr + Lc} \text{ (Newtons)}$ <p>Dr = Distance from load point to body (mm) Lc = Moment arm (mm) see chart</p>

	Maximum Allowable Moment (Nm)					
	12mm		20mm		32mm	
	Standard	Option D	Standard	Option D	Standard	Option D
Ma	2.55	8.65	22.0	27.0	36.0	70.2
Mb	2.55	8.65	22.0	27.0	36.0	70.2
Mc	5.10	13.10	59.0	70.0	107.0	157.0

	Moment Lever Arm Constants (mm)					
	12mm		20mm		32mm	
	Standard	Option D	Standard	Option D	Standard	Option D
Lah	25 + stroke	32 + stroke	45 + stroke	46 + stroke	60 + stroke	38 + stroke
Lbh	25 + stroke	32 + stroke	45 + stroke	46 + stroke	60 + stroke	38 + stroke
Lav	10.9	10.9	21.2	21.2	22.0	22.0
Lbv	10.6	10.6	17.5	17.5	23.0	23.0
Lch	10.6	10.6	17.5	17.5	23.0	23.0
Lcv	10.9	10.9	21.2	21.2	22.0	22.0

Bimba Low Profile Air Table Actuators



The LPA actuator was developed for applications that require precise load guiding, with ultra-tight space constraints. This actuator minimizes thickness with a linear recirculating ball rail located next to the bore.

How to Order and List Prices

Model/Price	Dimensions mm (inch)
<p>LPA: Low Profile Air Table Actuator</p> <p>Part Number: LPA-8□ -options</p> <p>Stroke Length: 10, 20, 30, 40, 50, 75mm</p> <p>List Price: 10, 20, 30 stroke: \$231.75 40, 50, 75 stroke: \$334.75</p> <p>Options: M (MRS position sensing for MS switch series): \$4.50 E (US customary-inch): N/C</p>	

Stroke	A	B	C	D	E	F	G	H
10	25.0 (0.984)	25.0 (0.984)	4	25.0 (0.984)	49.7 (1.958)	50.2 (1.977)	58.7 (2.312)	30.0 (1.181)
20	25.0 (0.984)	25.0 (0.984)	4	35.0 (1.378)	59.7 (2.352)	60.2 (2.371)	68.7 (2.706)	35.0 (1.378)
30	24.0 (0.945)	48.0 (1.890)	6	45.0 (1.772)	69.7 (2.746)	70.2 (2.765)	78.7 (3.100)	45.0 (1.772)
40	26.0 (1.024)	52.0 (2.048)	6	65.0 (2.559)	89.7 (3.531)	90.2 (3.550)	98.7 (3.885)	65.0 (2.559)
50	32.0 (1.260)	64.0 (2.520)	6	75.0 (2.953)	99.7 (3.925)	100.2 (3.944)	108.7 (4.279)	75.0 (2.953)
75	30.0 (1.181)	90.0 (3.543)	8	100.0 (3.937)	124.7 (4.909)	125.2 (4.928)	133.7 (5.263)	105.0 (4.134)

For engineering specifications, basic operating parameters, materials of construction, loading, and accuracy, refer to TBA-8, page 2.89. For equation constants, use TBA-8 values, except: $L = L_a = 7.1$ and $L_{bv} - L_{ch} = 23$

Bimba Diaphragm Cylinders



This 1-1/4" bore diaphragm cylinder is designed for a clamping application with minimal friction losses. Its short overall height allows the cylinder to fit into a tight space with minimal friction.

How to Order and List Prices

Model/Price	Dimensions (inch)
<p>Model Number: CSS-00119-A</p> <p>Stroke length: .12"</p> <p>List price: \$38.10</p> <p>Availability: Stock Item</p>	

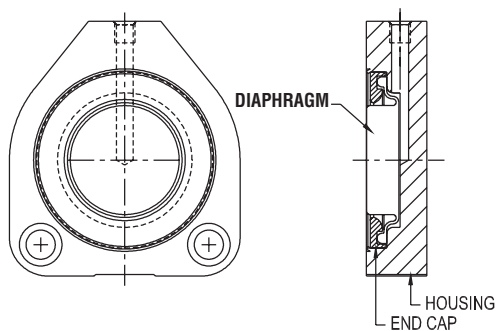
Engineering Specifications

Maximum Operating Pressure: 120 psi
 Operating Temperature: 150° F
 Lubrication: Pre-lubricated
 Cylinder Body: Aluminum
 Diaphragm: 50 Durometer EPDM
 with reinforced polyester fabric

Note:

- Output force will be approximately 15% less than theoretical when units are not extended full stroke.
- Cylinders should not be operated without a part being clamped (extension should be limited by customer to maximize life).

How it Works



Bimba Miniature "Cube" Cylinders



CFS-01011-A is a double-acting, miniature "cube" cylinder (1/2" x 1/2" x 1/2") ideal for applications requiring low output force in extremely tight spaces. This cylinder has been successfully applied in various semiconductor industry applications.

Several are mounted side-by-side in a test fixture for circuit board continuity testing. Another application involves silicon wafer processing, in which the cylinders are used to clamp wafers during certain operations.

How to Order and List Prices

Model Price	Dimensions (inch)
<p>CFS-01011-A</p> <p>Bore Size: .188"</p> <p>Stroke Length: .125"</p> <p>List Price: \$39.70</p> <p>Availability: Stock Item</p>	

Engineering Specifications

Maximum Operating Pressure:	100 psi
Power Factors:	Extend .028 Retract .015
Cylinder Body:	Aluminum Alloy
Piston Rod:	303 Stainless Steel
Rod Bearing:	Brass
Weight:	.25 oz. (7.8 grams)
Lubrication:	Silicone Fluid

Notes