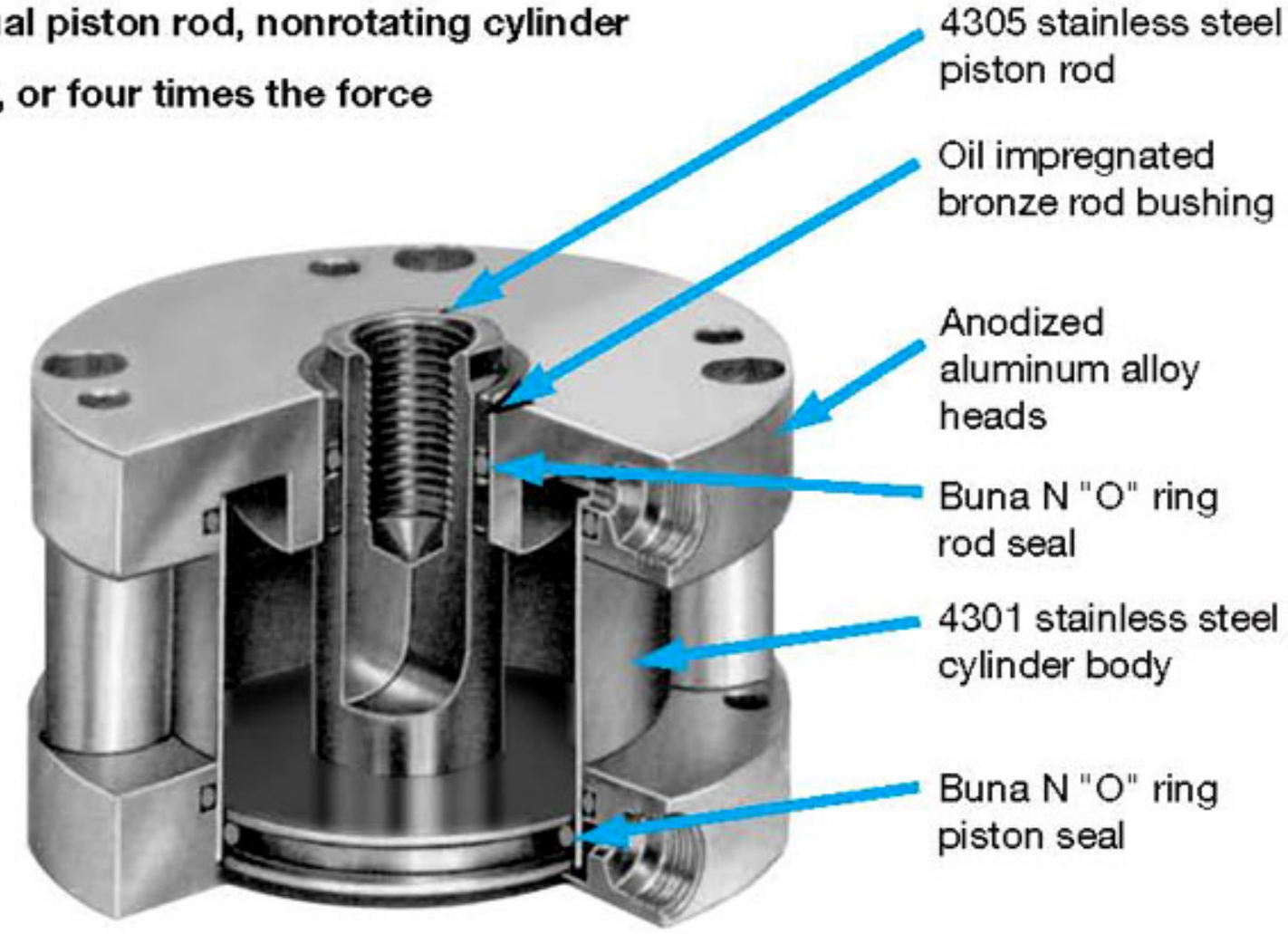
Metric Flat Cylinders
FLAT-1 FITS RIGHT IN!

Flat-1 cylinders were designed with space savings in mind.
Five models offer five ways to save space.

- **Flat-1, the original round cylinder**
- **Square Flat-1, for additional mounting variations**
- **Flat-II, the round, dual piston rod, nonrotating cylinder**
- **Square Flat-II, the square, dual piston rod, nonrotating cylinder**
- **FM2/FM3/FM4 for two, three, or four times the force in a single cylinder**
- **FMP for three positions**



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

- 4301 stainless steel (X5 CrNi 18.9) cylinder body with a mirror finish I.D. Stainless steel fights corrosion and scoring from dirt particles. The result is longer piston seal life.
- Oil impregnated bronze rod bushing is standard in all models. No sacrifice of bushing length to save space.
- Ground and polished 4305 stainless steel (X12 CrNi 18.8) piston rod.
- High strength piston to rod connection.
- Precision machined, anodized aluminum alloy heads.

Approximate Power Factors
(For all models except FM2, FM3, FM4)

14mm	=	15 N/bar
19mm	=	28 N/bar
27mm	=	57 N/bar
38mm	=	113 N/bar
50mm	=	196 N/bar
63mm	=	311 N/bar
76mm	=	453 N/bar
101mm	=	801 N/bar

For example, a 14mm bore model FM-0225 will exert a force of approximately 75N when the supply pressure is 5 bar.

- Body — 4301 Stainless Steel
- Heads — Anodized Aluminum Alloy
- Piston Rod — Ground and Polished 4305 Stainless Steel
- Seals — Buna N (High temperature seals optional)
- Rod Bushing — Oil Impregnated Bronze
- Spring Forces — See Page 3.7
- Pressure Rating — 14 Bar Maximum (Air only)
- Temperature Rating — From -25°C to +65°C

Buna N seals with a temperature range of -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 -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 FM-1715-3V. This is a double acting, 38mm bore, 15mm stroke cylinder with threaded mounting holes both ends and high temperature option.

TYPE		
FM	-	Double Acting, Single End Rod
FMD	-	Double Acting, Double End Rod
FMR	-	Reverse Acting
FMS	-	Single Acting

BORE SIZE				
02	-	14mm	31	- 50mm
04	-	19mm	50	- 63mm
09	-	27mm	70	- 76mm
17	-	38mm	125	- 101mm

STROKE LENGTH
5 - 5mm
40 - 40mm
100 - 100mm
ETC.

FM-1715-3V

MOUNTING OPTIONS

(Enter in numeric order)

No Number	-	Basic model
1	-	Pivot mount
1N	-	Pivot mount 90° from standard
2F*	-	Front trunnion mount
2R*	-	Rear trunnion mount
3	-	Threaded mounting holes, both ends
3F	-	Threaded mounting holes, front
3R	-	Threaded mounting holes, rear
4	-	Screw clearance holes, both ends
4F	-	Screw clearance holes, front
4R	-	Screw clearance holes, rear
5	-	Nose Mount**

*Not available in 14mm bore.
**Available in FM, FMS and FMR models. Includes heavy duty rear head.

OPTIONS

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

B	-	Bumpers both ends[2]
BF	-	Bumper front[2]
BR	-	Bumper rear[2]
FTF	-	Fine female thread (see page 3.4)
H	-	Hollow rod (double end models only) (see page 3.7)
HD	-	Heavy duty rear head (see page 3.6)
G	-	Magnalube® G
J	-	Failsafe operation
MT	-	Male rod end (coarse thread) (see page 3.7)
MTF	-	Male rod end (fine thread) (see page 3.7)
NT	-	Non-threaded rod
P2*, P3, P4*	-	Front port position #2, etc. (see page 3.3)
L	-	Low friction seals (see page 3.6)
M, M1, M3, M4	-	Magnetic position sensing (see Position Sensing Solutions, page 7.7)[1]
Q	-	Low temperature operation (-40°C to 95°C)
S	-	Stainless steel fasteners
T1, T3, T4	-	Additional switch mounting post located in position #1, 3 or 4
V	-	High temperature option (-18 to +205°C)
W	-	Rod wiper (Buna N only) (see page 3.7)
Y	-	Moly-coat (MoS_2 I.D. coating)
EE10	-	10mm extra rod extension, etc.
EE50	-	50mm extra rod extension, etc.

*Not available in 14mm bore
[1]If magnetic position sensing is specified with Fluoroelastomer Seals, standard Buna-N based magnet will be provided. Magnetic position sensing is not reliable above 50°C.
[2]Bumpers reduce stroke by 1.5mm per end

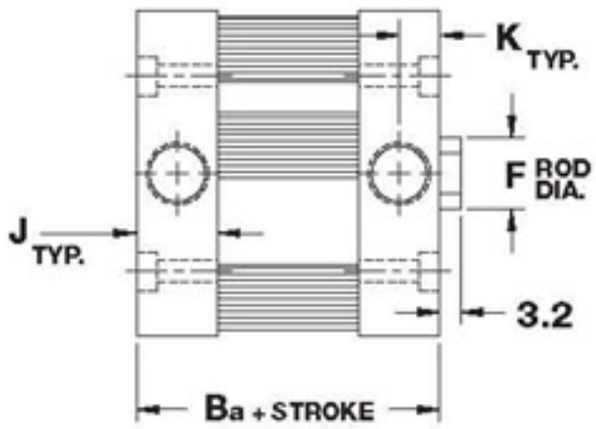
Magnalube® is a trademark of Carleton-Stuart Company.

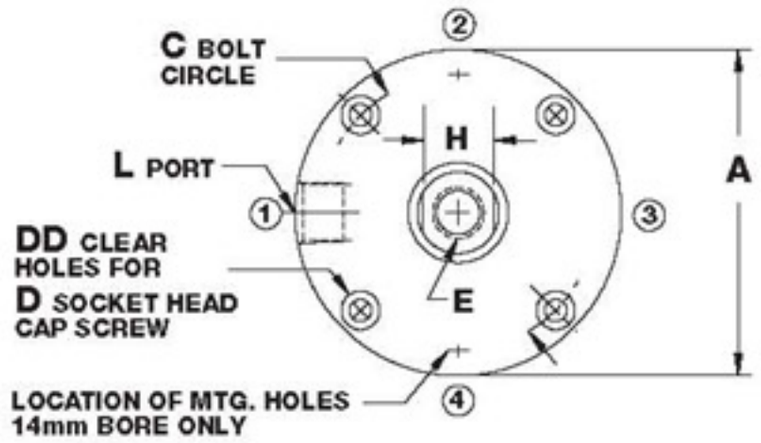
Basic Models

Model FM

(Double Acting,
Single End Rod)

Standard strokes
3.2mm, 5, 10, 15, 20, 25, 30,
40, 50, 80, 100mm

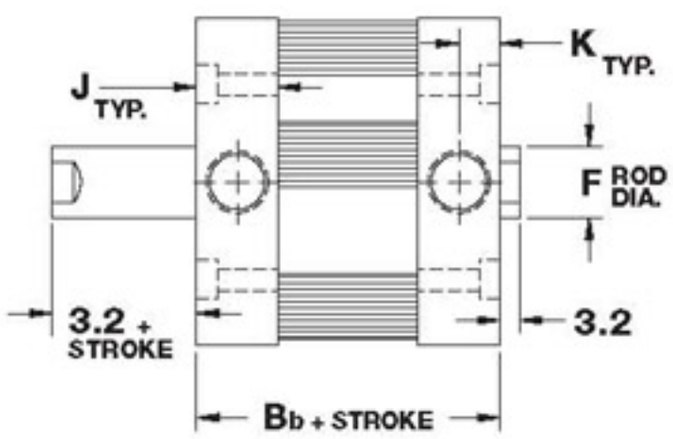


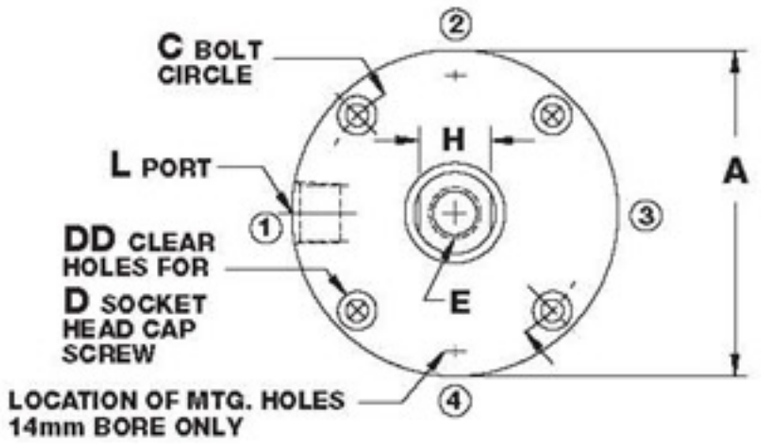


Model FMD

(Double Acting,
Double End Rod)

Standard strokes
3.2mm, 5, 10, 15, 20, 25, 30,
40, 50, 80, 100mm





Model FMS

(Single Acting,
Spring Return,
Rod Normally Retracted)

Standard strokes
3.2mm, 5, 10, 15, 20, 25, 30,
40, 50mm

Contact Distributor for price and dimensions over 50mm stroke. *See page 3.7 for spring forces.*

Model FMR

(Reverse Acting,
Spring Return,
Rod Normally Extended)

Standard strokes
3.2mm, 5, 10, 15, 20, 25, 30,
40, 50mm

Contact Distributor for price and dimensions over 50mm stroke. *See page 3.7 for spring forces.*

Dimensions(mm)

(Basic Model)

Bore	A	Ba*	Bb*	Bc*		Bd*		C	DD	D	E Std.
				0-25mm	26-50mm	0-25mm	26-55mm				
14mm (02)	28.5	14.3	17.4	20.6	34.9	27.0	41.3	22.5	2	M3	M4
19mm (04)	38.0	14.3	17.4	20.6	34.9	27.0	41.3	31.0	4	M3	M5
27mm (09)	50.6	22.2	23.8	22.2	38.1	34.9	50.8	43.0	4	M3	M8
38mm (17)	66.4	22.2	25.4	22.2	38.1	34.9	50.8	56.0	4	M5	M10
50mm (31)	79.1	23.8	27.0	23.8	39.7	36.5	52.4	68.0	4	M5	M12
63mm (50)	95.0	30.2	33.3	30.2	52.4	49.2	88.9	83.0	4	M6	M12
76mm (70)	107.7	31.8	34.9	31.8	54.0	50.8	73.0	96.0	4	M6	M16
101mm (125)	139.5	39.7	42.9	39.7	61.9	58.7	81.0	125.0	4	M8	M20

Bore	E Fine	E Depth	F	H	J	K	L
14mm (02)	M4x0.5	11.7	6.3	5.5	8.7	3.6	M5
19mm (04)	M5x0.5	11.7	7.9	6.0	8.7	3.6	M5
27mm (09)	M8x1.0	17.8	12.7	11.0	12.7	6.4	G 1/8
38mm (17)	M10x1.25	17.8	15.9	12.0	12.7	6.4	G 1/8
50mm (31)	M12x1.25	17.8	19.1	16.0	13.5	6.4	G 1/8
63mm (50)	M12x1.25	17.8	19.1	16.0	16.7	8.3	G 1/8
76mm (70)	M16x1.5	18.5	22.2	19.0	17.5	8.3	G 1/8
101mm (125)	M20x1.5	20.3	25.4	22.0	21.4	10.7	G 1/4

See page 3.6 for length adders for options.