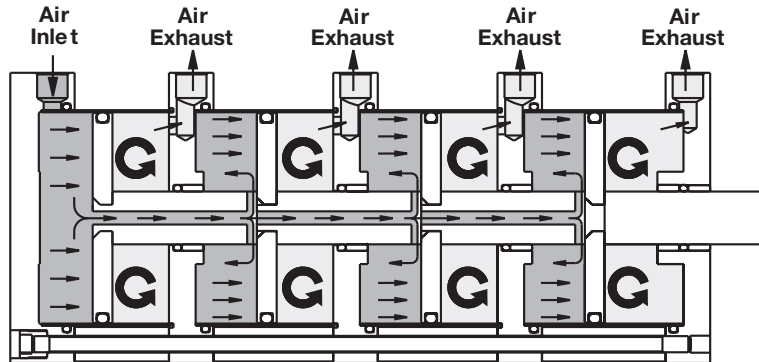


FO2/FO3/FO4 Flat-1® Compact Cylinders

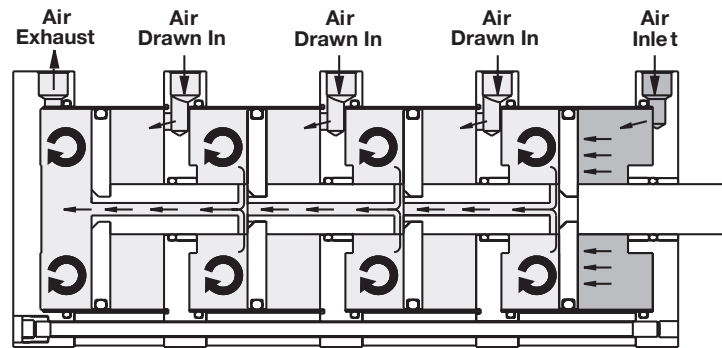


The IMI Bimba FO2, FO3, FO4 Series Flat-1® are double-acting, single end rod cylinders that multiply the force output by supplying air to multiple pistons on extension. They save space and eliminate the need for a higher pressure system. Only one piston is powered on the return stroke, saving air volume and operating costs.

-
- Bore sizes: 2-1/2", 3", 4"
 - 304 stainless steel body prevents corrosion
 - Standard oil impregnated bronze rod bushing
 - Stainless piston rod
 - Precision machined anodized aluminum heads
 - Maximum Pressure: 100 PSI (air only)



Extension-air supplied
to multiple pistons



Retraction-air supplied
to one piston only

Technical Specifications

Materials of Construction

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

Engineering Specifications

Pressure Rating: 100 PSI maximum (air only)

Temperature: -20° F to 150° F (-35° C to 65° C) Standard

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.

FO2, FO3, and FO4 Specifications (in)

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

Dimensions (in)

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

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

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

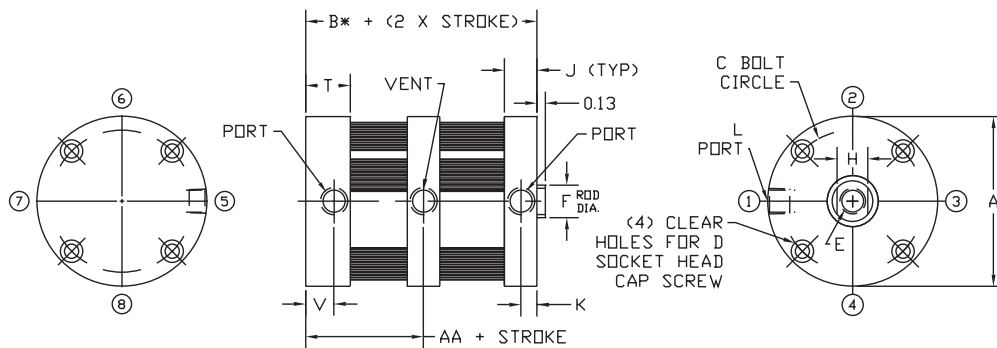
Bore	Type	Final Overall Cylinder Length*		
		Stroke		
		.125	.188	.250
2-1/2" (50)	FO2	2.65	2.71	2.77
	FO3	3.64	3.76	3.87
	FO4	4.63	4.81	4.97
3" (70)	FO2	2.75	2.81	2.88
	FO3	3.77	3.90	4.01
	FO4	4.79	4.98	5.15
4" (125)	FO2	3.38	3.44	3.53
	FO3	4.61	4.74	4.89
	FO4	5.85	6.04	6.24

*See page 176 for length adders for options.

FO2, FO3, and FO4 Basic Models

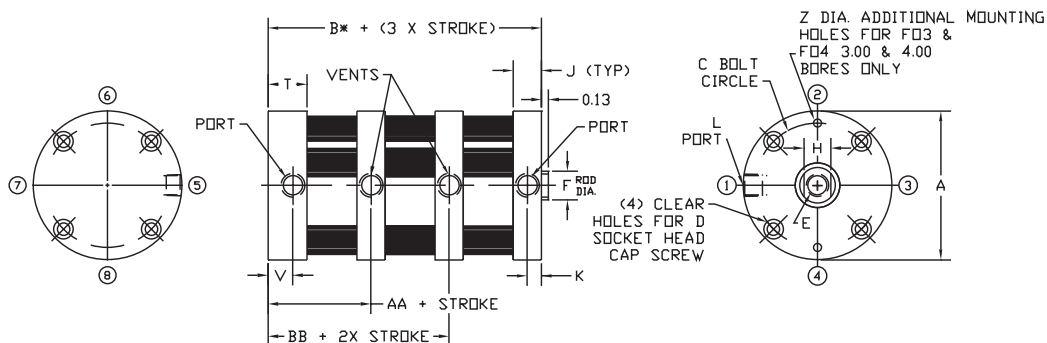
Standard Strokes: 1/8", 1/4", 3/8", 1/2", 5/8", 3/4", 1", 1-1/4", 1-1/2", 1-3/4", 2", 2-1/2", 3", 3-1/2", 4". Special strokes available on request.

Model FO2



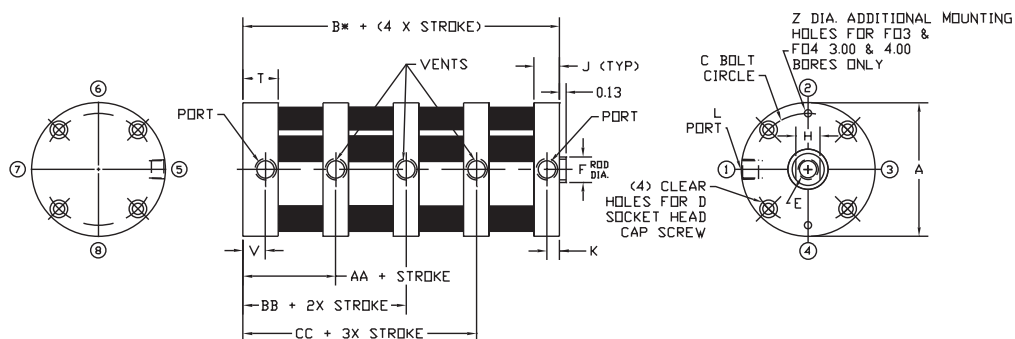
*Some options affect cylinder length, see page 176

Model FO3



*Some options affect cylinder length, see page 176

Model FO4



*Some options affect cylinder length, see page 176

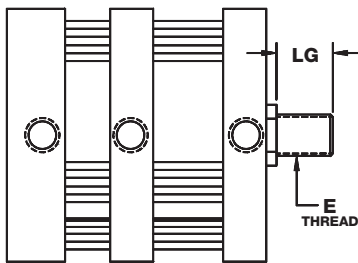
FO2, FO3, and FO4 Basic Models

Options

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

Male Rod Ends (Option MT or CMT)

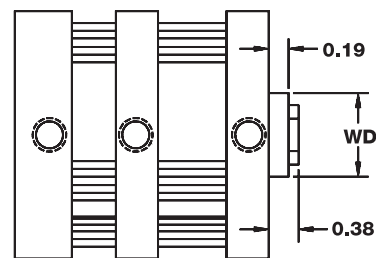
(Model FO2 shown)



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).

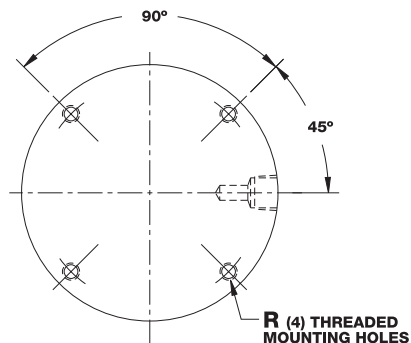


Bore	WD
2-1/2" (50)	1.13
3" (70)	1.25
4" (125)	1.38

Mounting Options

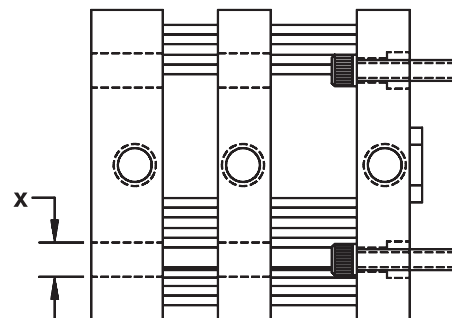
Threaded Mounting Holes

(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





The Model Number for all FO2, FO3, and FO4 Series Flat-1® cylinders consists of alphanumeric clusters. These designate type, bore size, stroke length, mounting, and special options. Please refer to the charts below for an example of a standard FO2 model. This is a 2-1/2" bore, 1" stroke, threaded mounting holes on both ends, and magnetic position sensing.

Type	
FO2	2 Stage Extend, Single Stage Retract
FO2	3 Stage Extend, Single Stage Retract
FO4	4 Stage Extend, Single Stage Retract

Bore Size	
50	2-1/2"
70	3"
125	4"

Stroke Length	
0.25	1/4"
1	1"
ETC.	

FO2 - 50 1 - 3 M

Mounting Options (Enter in numeric order)	
No number	Basic model (standard counterbored mounting holes)
3	Threaded mounting holes, both ends
3F	Threaded mounting holes, front
3R	Threaded mounting holes, rear
4	Screw clearance holes, both ends ¹
4F	Screw clearance holes, front ¹
4R	Screw clearance holes, rear ¹

¹ "Screw clearance" to allow bolt head to pass through; no counter bores (see page 176).

Options (Enter in alphabetical order, except for EE which is last)	
CFT	Coarse female thread (fine thread standard) (see page 174)
CMT	Male rod end (coarse thread) (see page 176)
G	Magnalube® G
L	Low friction seals (see page 176)
M, M1, M3, M4	Magnetic position sensing ¹
P2, P3, P4	Front port position #2, #3, or #4 (see page 175)
P6, P7, P8	Rear port position #6, #7, or #8 (see page 175)
Q	Low temperature operation (-40° F to 200° F)
T1, T3, T4	Additional switch mounting post located in position #1, #3, or #4
V	High temperature option (0° F to 400° F) ²
W	Rod wiper (Buna-N only) (see page 176)
Y	Moly-coat (MoS ₂ , I.D. coating)
EE0.375	3/8" extra rod extension, etc.
EE1	1" extra rod extension, etc.

¹ 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. Overall cylinder length increases with the magnet option.

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

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

FO2, FO3, and FO4 Repair Kits

IMI Bimba FO2, FO3, and FO4 cylinders are repairable. To order repair kits, please provide the correct bore code in the kit part number blank for the desired size repair kit. Optional seals are designated by the suffix option. Repair kits include the standard bronze rod bushing, piston, rod, and body seals. For cylinders with optional composite bushings, please order those bushing as a separate repair part with part number (PF4-___). For cylinders where FKM seals, wipers, or scrapers are required, complete end caps assemblies are provided to allow for easier repair.

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