WORLD CLASS PERFORMANCE
FABCO-AIR
PNEUMATIC PRODUCTS

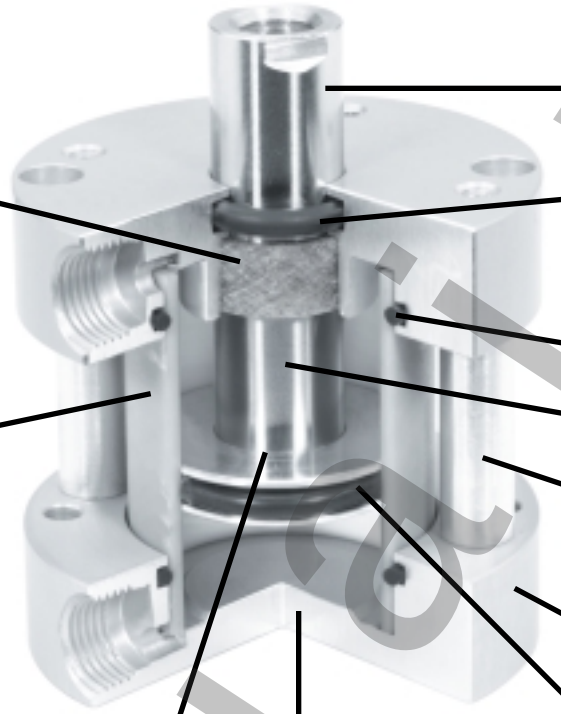
Pancake® II Air Cylinders

Superior Interchangable Industrial Air Cylinders

Pancake® II Cylinders

Product Index

The Pancake® II Direct Interchange Air Cylinders



A better Piston Rod Bushing:
- Captive in cylinder head
- Nonmetallic Duralon®
- Self lubricating
- Higher load bearing capacity
- Lower coefficient of friction
- No slip-stick

A superior Cylinder Wall
- High strength composite
- Highly impact resistant
- Self lubricating
- Extremely smooth interior
- Low coefficient of friction
- Minimal heat build up

Hard chrome plated stainless steel piston rod

Captive rod seal
- In precision machined groove
- Internally lubricated Buna-N O'Ring

Buna N O'Ring tube seals

Magnalube®G lubrication

Aluminum alloy spacers (clear anodized) enclose stainless steel tie bolts

Aluminum alloy heads (clear anodized)

High strength threaded fastener and adhesive mates piston to rod

Thick cover prevents impact damage

Internally lubricated Buna N O'Ring or optional U-Cup seals

Superior Interchangeable Industrial Air Cylinders

Innovation – For over 40 years our famous Pancakes® have dominated as the world's first compact air cylinder line. Today, backed by decades of engineering and manufacturing innovation, our new ***Pancake® II*** composite body air cylinders continue in the Pancake® tradition with a wide selection of models and options.

Packed with value – Stainless steel tie bolts and aluminum spacers lock precision machined heads tightly around a unique, high strength, composite cylinder barrel. The barrel's extremely smooth, self-lubricating interior surface insures highly reliable performance and extended seal life. Its high impact resistance reduces chances of cylinder failure due to dings or dents. Zero slip-stick avoids problems that metal cylinders encounter when they sit in a static condition for extended periods of time. Combined with hard chrome plated stainless steel piston rods and a unique, nonmetallic rod bearing, the new Fabco-Air cylinder assembly assures optimal operation and longer product life.

Exceptional Piston Rod Bearing – The better the bearing, the more cycle life you can expect from your air cylinders. ***Pancake® II*** cylinders incorporate a truly superior rod bearing material - Duralon® with the same field-proven performance you have come to expect from the six other Fabco-Air cylinder families.

Duralon® Rod Bearings Excel

Load Capacity (psi) Machine Design 1972/73 Bearing Reference Issue	
Porous Bronze	4,500
Porous iron	8,000
Phenolics	6,000
Nylon®	1,000
TFE	500
Reinforced Telfon®	2,500
*TFE fabric	60,000
Polycarbonate	1,000
Acetal	1,000
Carbon-graphite	600

Friction Properties	Coefficient	Slip-stick
Steel-on-steel	.50	Yes
Bronze-on-steel	.35	Yes
Sintered Bronze-on-steel with mineral oil	.13	No
Bronze-on-steel with mineral oil	.16	No
Copper lead alloy-on-steel	.22	Yes
Acetal-on-steel	.20	No
Nylon-on-steel	.32	Yes
Duralon-on-steel	.05 - .16	No

* Shows Duralon bearing classification. Not to be used for design purposes.

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Duralon® is a composite of a Teflon®/Dacron® fabric liner bonded to a supporting filament-wound, high strength, fiberglass and epoxy resin shell. Resistant to corrosion, moisture and temperature to 325°F, the bearing is reliable in any environment. It has an extremely high load bearing capacity, very low friction, and will not gall or score the piston rod (see physical properties in the table above).

Pancake® II Cylinders

Available in 5 styles
8 Bore sizes 1/2" thru 4"
Strokes to 4" standard

- Double acting, single rod
- Double acting, double rod
- Double acting, hole thru double rod
- Single acting, spring retracted rod
- Reverse acting, spring extended rod

Ratings – Standard Units all Series

- Body ..... Self-lubricating composite
- Heads ..... Clear anodized aluminum alloy
- Tie Bolts ..... Stainless steel
- Rod ..... Chrome plated stainless steel
- Piston ..... Aluminum alloy
- Rod end ... Female thread with wrench flats
- Ports ..... Position #1
- Seals ..... Internally lubricated Buna-N
- Lubrication ..... Magnalube®-G
- Rod bushing ..... PTFE composite bearing
- Stroke tolerance . . . . . ± 1/64"
- Media . . . . . Air
- Pressure rating, maximum . . . . . 200 psi
- Minimum recommended operating pressure . . . . . 15 psi
- Temperature rating Cylinder . . . . . –25° to +225°F (–32° to +121°C)
- Temperature rating Electronic sensors . . . . . –4° to +176°F (–20° to +80°C)

Approximate Spring Forces

Bore	Maximum Force	Spring Rate (lbs/inch) for Stroke Range			
		0.12 to 1" Stroke	1.001 to 2" Stroke	2.001 to 3" Stroke	3.001 to 4" Stroke
1/2 (1)	5.25	4.25	2.13	1.42	1.06
3/4 (2)	10.00	6.00	3.00	2.00	1.50
1-1/16 (3)	13.00	6.50	3.25	2.17	1.63
1-1/2 (4)	13.00	6.50	3.25	2.17	1.63
2 (5)	13.00	6.50	3.25	2.17	1.63
2-1/2 (6)	25.00	12.50	6.25	4.17	3.13
3 (7)	25.00	12.50	6.25	4.17	3.13
4 (8)	25.00	12.50	6.25	4.17	3.13

Cylinder Sizing Guide

Bore Diameter	1/2	3/4	1-1/16	1-1/2	2	2 1/2	3	4
Rod Diameter	0.25	0.31	0.50	0.63	0.75	0.75	0.88	1.00
Rod Area	0.05	0.08	0.19	0.31	0.44	0.44	0.60	0.79
Push Area (Single Rod)	0.20	0.44	0.88	1.76	3.14	4.91	7.07	12.57
Push Area (Double Rod)	0.15	0.36	0.69	1.45	2.66	4.47	6.47	11.78
Pull Area	0.15	0.36	0.69	1.45	2.66	4.47	6.47	11.78

How to Order

Series	Model	Action	Bore	Stroke
P - ***Pancake II***	**S** - single rod **W** - double rod **T** - double rod, hole thru	**D** - double acting **R** - single acting, spring retract (Model S only) **X** - single acting, spring extend (Model S only)	**1** - 1/2" **2** - 3/4" **3** - 1-1/16" **4** - 1-1/2" **5** - 2" **6** - 2-1/2" **7** - 3" **8** - 4"	**0.125** - 1/8" **0.250** - 1/4" **0.375** - 3/8" **0.500** - 1/2" etc., thru **4.000** - 4" (see pages 6 & 7)

Model Number	Series	Model	Action	Bore	–	Mounting	Stroke	–	Options

Mounting

Counterbored mounting holes are standard in the basic model and need not be specified. For other mounting specify only one option code.

- CB - Screw clearance holes, both ends[1]
- CF - Screw clearance holes, front[1]
- CR - Screw clearance holes, rear[1]
- F - Nose mount (all except double rod models)[2]
- HB - Threaded mounting holes, both ends
- HF - Threaded mounting holes, front
- HR - Threaded mounting holes, rear
- PM - Pivot mount, pin 90° from port
- SM - Pivot mount, pin in-line with port
- TB - Trunnion mount, both ends[3]
- TF - Trunnion mount, front[3]
- TR - Trunnion mount, rear[3]

[1] "Screw clearance" to allow bolt head to pass through; No counter bores
[2] Includes heavy duty rear head and rod wiper
[3] Not available in 1/2" bore.

How to Order

1. Specify **P**, Model, Action, and Bore
2. Specify the Mounting and Stroke
3. Specify the Options in alphabetical order

Ordering example: **PTD4-HF2.500-TCFV**

Pancake II with double rod hole thru, double acting, 1-1/2" bore, front threaded mounting holes, 2-1/2" stroke, coarse female rod thread, and Viton seals.

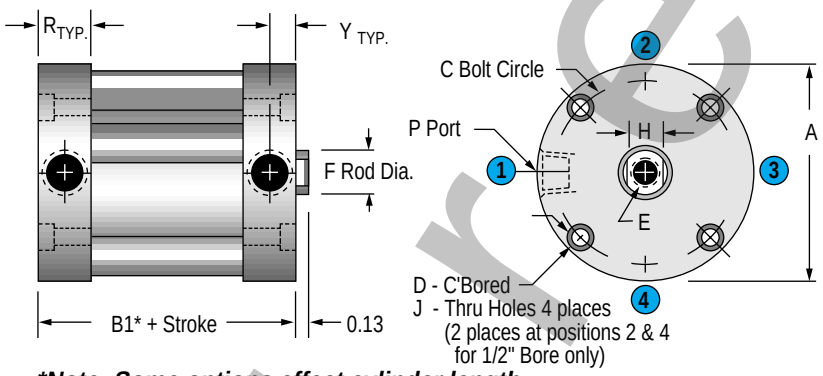
Options ***Enter in alphabetical order***

- B - Bumpers, both ends[1]
- BF - Bumper, front only[1]
- BR - Bumper, rear only[1]
- E - Magnet on piston for position sensing (see length adders page 9) 3/8" stroke minimum[2]
- H - Heavy duty rear head (see length adder page 9)
- J - Failsafe operation (single acting, spring retract models)[3]
- L - Low friction seals (see length adders page 9)
- M, M1, M3, M4 - Magnet on piston and adhesive mounted dovetail extrusion to hold 1/4" dovetail sensors. (see sensors page 23; length adders page 9) 3/8" stroke min.[2]
- P2, P3, P4 - Front port position other than standard
- Q - Low temperature operation (–40°F to +200°F)
- TCF - Coarse female rod thread, dimension E (page 7)
- TCM - Male rod end with coarse thread (page 8)
- TFM - Male rod end with fine thread (page 8)
- TN - Non-threaded rod
- T1, T3, T4 - Additional adhesive mounted dovetail extrusions located in position 1, 3, or 4
- V - Viton seals for media compatibility (–15°F to +225°F)
- W - Rod wiper, Buna N only (page 8)
- X - **EXTRA** rod extension
  Example: X0.5 = 1/2" **EXTRA** Rod Extension
  X1 = 1" **EXTRA** Rod Extension

[1] Stroke is reduced by .03 per end; .06 for option B; Spring retracted, BR only; Spring extended, BF only.
[2] Not available with Viton seals or low temperature seals.
[3] Not available in 1/2" bore.

Pancake® II Cylinders

Model PSD
Double Acting, Single Rod



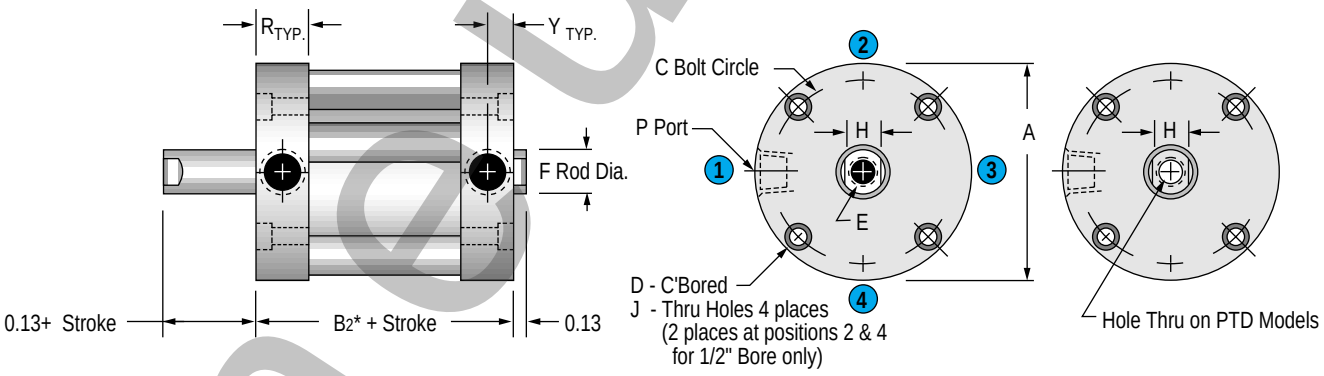
***Note: Some options effect cylinder length**

Standard Strokes – All Models: • 1/8 • 1/4 • 3/8 • 1/2 • 5/8 • 3/4 • 7/8 • 1 • 1-1/4 • 1-1/2 • 1-3/4 • 2 • 2-1/2 • 3 • 3-1/2 • 4

Model PWD Double Acting, Double Rod
Model PTD Double Acting, Hole Thru Double Rod

Hole Thru Diameter (PTD)

Bore	Female Rod Thread	Male Rod Thread
1/2 (1)	0.14	N/A
3/4 (2)	0.14	0.09
1-1/16 (3)	0.22	0.16
1-1/2 (4)	0.28	0.19
2 (5)	0.38	0.25
2-1/2 (6)	0.38	0.25
3 (7)	0.44	0.31
4 (8)	0.50	0.38



***Note: Some options effect cylinder length**

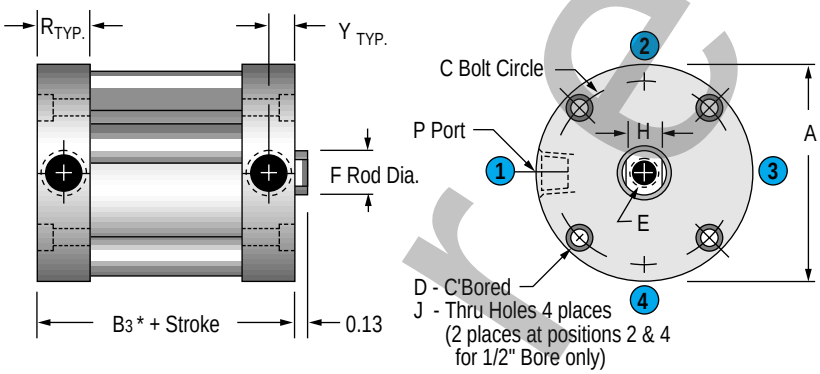
Dimensions (inches)

Bore	A	B1*	B2*	B3* for Stroke Range				B4* for Stroke Range				C	D C'Bore
				0-1	1.001-2	2.001-3	3.001-4	0-1	1.001-2	2.001-3	3.001-4		
1/2 (1)	1.12	0.56	0.69	0.81	1.38	1.96	2.52	1.06	1.62	2.14	3.21	0.88	0.20 x 0.13 dp
3/4 (2)	1.50	0.56	0.69	0.81	1.38	1.94	2.50	1.06	1.62	2.19	2.75	1.22	0.24 x 0.15 dp
1-1/16 (3)	2.00	0.88	0.94	0.88	1.50	2.13	2.75	1.38	2.00	2.63	3.25	1.69	0.24 x 0.15 dp
1-1/2 (4)	2.62	0.88	1.00	0.88	1.50	2.13	2.75	1.38	2.00	2.63	3.25	2.19	0.34 x 0.22 dp
2 (5)	3.12	0.94	1.06	0.94	1.56	2.19	2.81	1.44	2.06	2.69	NA	2.69	0.34 x 0.22 dp
2-1/2 (6)	3.75	1.19	1.31	1.19	2.06	2.94	3.81	1.94	2.81	2.81	NA	3.25	0.40 x 0.27 dp
3 (7)	4.25	1.25	1.38	1.25	2.12	3.00	3.88	2.00	2.88	2.88	NA	3.78	0.40 x 0.27 dp
4 (8)	5.50	1.56	1.69	1.56	2.44	3.31	4.19	2.31	3.19	3.19	NA	4.94	0.49 x 0.33 dp

Model PSR

Single Acting, Spring Retract

See table on page 4 for spring forces



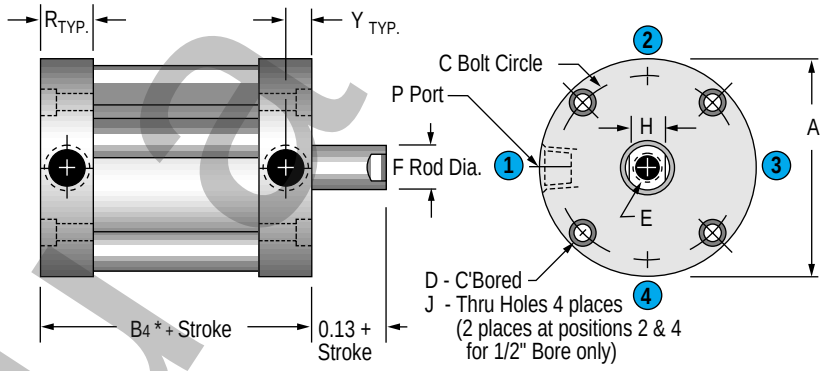
*Note: Some options effect cylinder length

Standard Strokes – All Models: • 1/8 • 1/4 • 3/8 • 1/2 • 5/8 • 3/4 • 7/8 • 1 • 1-1/4 • 1-1/2 • 1-3/4 • 2 • 2-1/2 • 3 • 3-1/2 • 4

Model PSX

Reverse Acting, Spring Extend

See table on page 4 for spring forces



*Note: Some options effect cylinder length

Approximate Cylinder Weights (ounces) PSD, PSR, PWD, PTD, PSX

Bore	PSD, PSR Base	PSD, PSR Adder per 1/8 of Stroke	PWD, PTD Base	PWD, PTD Adder per 1/8 of Stroke Model PWD	PWD, PTD Adder per 1/8 of Stroke for Model PTD	PSX Base	PSX Adder per 1/8 of Stroke	Nose Mount Option Adder to Base Weight
1/2 (1)	1.15	.06	1.26	.14	.08	1.25	.06	0.1
3/4 (2)	1.82	.08	2.03	.18	.13	1.92	.08	0.2
1-1/16 (3)	4.70	.24	5.61	.37	.25	5.09	.24	1.1
1-1/2 (4)	9.22	.32	10.84	.55	.42	10.08	.32	1.8
2 (5)	12.48	.40	14.71	.64	.50	13.44	.40	2.7
2-1/2 (6)	21.50	.48	27.10	.74	.59	24.00	.48	3.1
3 (7)	27.74	.64	36.78	1.01	.76	31.20	.64	3.5
4 (8)	53.47	.80	69.50	1.20	.92	59.33	.80	5.9

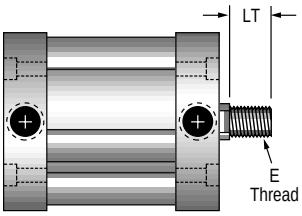
Dimensions (inches)

Bore	E Standard	E Coarse	E Depth for Stroke Range 1/8 – 1/2	E Depth for Stroke Range 5/8 +	F	H	J Hole	P Port	R	Y
1/2 (1)	#8-32 UNC	N/A	0.30-0.46	0.46	0.25	0.22	0.13	#10-32 UNF	0.34	0.14
3/4 (2)	#10-32 UNF	#10-24 UNC	0.30-0.46	0.46	0.31	0.25	0.15	#10-32 UNF	0.34	0.14
1-1/16 (3)	5/16-24 UNF	5/16-18 UNC	0.37-0.63	0.70	0.50	0.44	0.15	1/8 NPT	0.50	0.25
1-1/2 (4)	3/8-24 UNF	3/8-16 UNC	0.37-0.70	0.70	0.63	0.50	0.20	1/8 NPT	0.50	0.25
2 (5)	1/2-20 UNF	1/2-13 UNC	0.30-0.63	0.70	0.75	0.63	0.20	1/8 NPT	0.53	0.25
2-1/2 (6)	1/2-20 UNF	1/2-13 UNC	0.42-0.70	0.70	0.75	0.63	0.26	1/4 NPT	0.66	0.33
3 (7)	5/8-18 UNF	5/8-11 UNC	0.45-0.73	0.73	0.88	0.75	0.26	1/4 NPT	0.69	0.33
4 (8)	3/4-16 UNF	3/4-10 UNC	0.40-0.70	0.80	1.00	0.88	0.33	3/8 NPT	0.84	0.42

Pancake® II Cylinders

Model Options

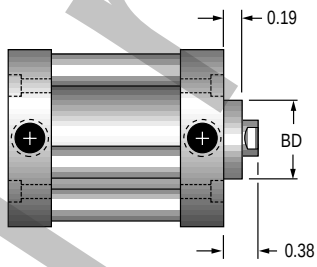
Male Rod Ends (Option TCM or TFM)



Thread Sizes

Bore	E Thread TCM (Coarse)	E Thread TFM (Fine)	LT
1/2 (1)	N/A	#8-32 UNC	0.38
3/4 (2)	#10-24 UNC	#10-32 UNF	0.38
1-1/16 (3)	5/16-18 UNC	5/16-24 UNF	0.50
1-1/2 (4)	3/8-16 UNC	3/8-24 UNF	0.50
2 (5)	1/2-13 UNC	1/2-20 UNF	0.63
2-1/2 (6)	1/2-13 UNC	1/2-20 UNF	0.63
3 (7)	5/8-11 UNC	5/8-18 UNF	0.75
4 (8)	3/4-10 UNC	3/4-16 UNF	0.75

Rod Wiper (Option W) Buna-N only



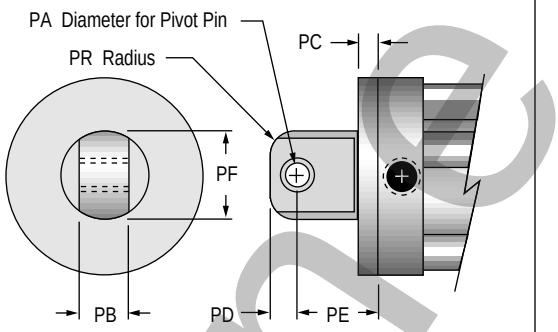
Boss Dia.

Bore	BD
1/2 (1)	0.56
3/4 (2)	0.69
1-1/16 (3)	0.88
1-1/2 (4)	1.00
2 (5)	1.13
2-1/2 (6)	1.13
3 (7)	1.25
4 (8)	1.38

Mounting Options

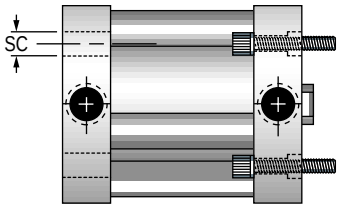
Pivot Mount

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



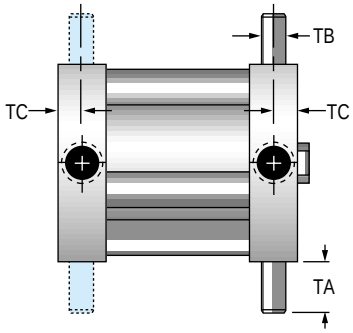
Screw Clearance Holes

Available either or both ends.
(CR shown)



Trunnion Mount

Available rear, front or both.
Not available on 1/2" bore.
(TF shown solid)



Dimensions (inches)

Bore	PA	PB	PC	PD	PE	PF	PR	SC	TA	TB	TC
1/2 (1)	0.19	0.38	0.19	0.25	0.75	0.63	0.19	0.17	NA	NA	NA
3/4 (2)	0.19	0.38	0.19	0.25	0.75	0.75	0.19	0.23	0.31	0.125	0.17
1-1/16 (3)	0.19	0.38	0.25	0.25	0.81	0.75	0.19	0.25	0.50	0.250	0.25
1-1/2 (4)	0.38	0.75	0.25	0.44	1.19	1.38	0.38	0.34	0.50	0.250	0.25
2 (5)	0.38	0.75	0.31	0.44	1.25	1.38	0.38	0.34	0.50	0.250	0.25
2-1/2 (6)	0.38	0.75	0.38	0.44	1.31	1.38	0.38	0.41	0.63	0.312	0.33
3 (7)	0.63	1.00	0.38	0.56	1.69	1.88	0.38	0.41	0.63	0.312	0.33
4 (8)	0.63	1.00	0.44	0.56	1.75	1.88	0.38	0.50	0.75	0.375	0.42

Deviations from Standard Dimensions (Options L, H, E, M)

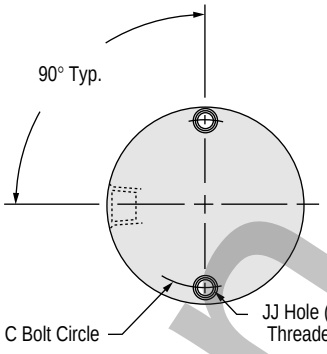
Length Adder (inches)					
Bore	Low Friction Seals (L)	Heavy Duty Rear Head‡ (H)	Magnetic Position Sensing† (E or M)		
			PSD, PWD, PTD	PSR	PSX
1/2 (1)	0.25	0.13	0.88	0.63	0.38
3/4 (2)	0.25	0.13	0.88	0.88	0.88
1-1/16 (3)	0.38	0.19	0.88	0.88	0.88
1-1/2 (4)	0.38	0.19	0.88	0.88	0.88
2 (5)	0.38	0.19	0.88	0.88	0.88
2-1/2 (6)	0.38	0.25	0.88	0.88	0.88
3 (7)	0.50	0.25	0.88	0.88	0.88
4 (8)	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/minute) occurs between the piston and rear head. It increases the overall length of the cylinder as shown.
† A minimum stroke of 3/8" is required to sense end-of-stroke positions. For low friction seals used in conjunction with magnetic position sensing, use "E" or "M" length adder only.

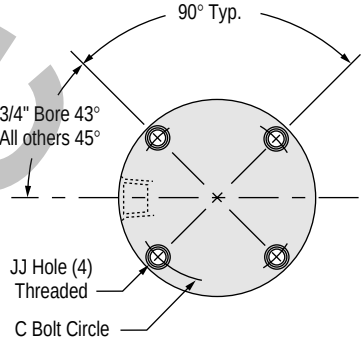
Threaded Mounting Holes

1/2" Bore

Available either or both ends. (HR shown)

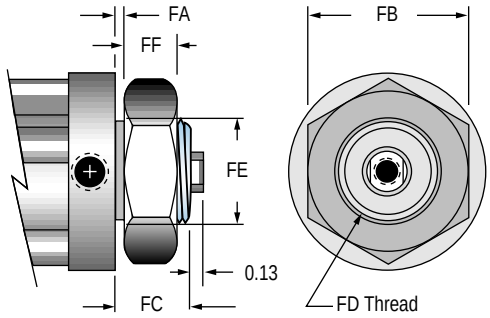


3/4" Bore & Up



Nose Mount

Available on PSD, PSR, and PSX. (F shown)
Includes rod wiper and heavy duty rear head.
See length adder above.



Dimensions (inches)								
Bore	C	JJ	FA	FB	FC	FD	FE	FF
1/2 (1)	0.88	#4 – 40 UNC	.06	0.75 Hex	.38	1/2 – 20 UNF-2A	.50	.31
3/4 (2)	1.22	#6 – 32 UNC	.06	0.75 Hex	.38	5/8 – 18 UNF-2A	.62	.25
1-1/16 (3)	1.69	# 6 – 32 UNC	.13	1.50 Hex	.75	1– 14 UNF-2A	1.00	.55
1-1/2 (4)	2.19	# 10 – 24 UNC	.13	1.88 Hex	.75	1-1/4 – 12 UNF-2A	1.25	.52
2 (5)	2.69	# 10 – 24 UNC	.19	1.88 Hex	.88	1-3/8 – 12 UNF-2A	1.38	.52
2-1/2 (6)	3.25	1/4 – 20 UNC	.25	1.88 Hex	1.00	1-3/8 – 12 UNF-2A	1.38	.52
3 (7)	3.78	1/4 – 20 UNC	.25	1.88 Hex	1.00	1-3/8 – 12 UNF-2A	1.38	.52
4 (8)	4.94	5/16 – 18 UNC	.19	2.62 Hex	1.12	1-3/4 – 12 UN-2A	1.75	.88

Maximum Torque for Nose Mount Option	
Bore	Foot-Pounds
1/2 (1)	12
3/4 (2)	28
1-1/16 (3)	100
1-1/2 (4)	120
2 (5)	130
2-1/2 (6)	130
3 (7)	130
4 (8)	150

Pancake® II Cylinders

Nonrotating, double acting
4 Bore sizes 3/4" thru 2"
Strokes to 4" standard

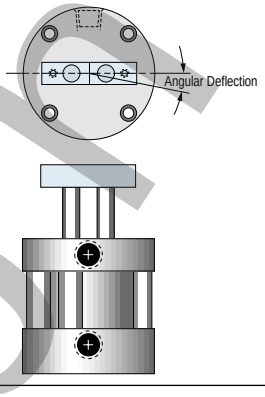
Twin piston rods are incorporated into the cylinder head to achieve NON-ROTATION. The rods are securely fastened to the piston and tied together externally by a rod end tool bar. The tool bar insures that the rods move in tandem and provides an ideal mounting surface for any attachments required by your application. The tool bar is furnished with threaded mounting holes or optional counter-bored mounting holes.

Ratings – Standard Units all Series

- Body . . . . . Self-lubricating composite
- Heads . . . . Clear anodized aluminum alloy
- Tie Bolts . . . . . Stainless steel
- Rod . . . . . Chrome plated stainless steel
- Piston . . . . . Stainless steel
- Rod end . . . . . Tool bar
- Ports . . . . . Position #1
- Seals . . . . . Internally lubricated Buna-N
- Lubrication . . . . . Magnalube®-G
- Rod bushing . . . . . Bronze
- Stroke tolerance . . . . . ± 1/64"
- Media . . . . . Air
- Pressure rating, maximum . . . . . 200 psi
- Minimum recommended operating pressure . . . . . 15 psi
- Temperature rating Cylinder . –25° to +225°F (–32° to +121°C)
- Temperature rating Electronic sensors . . . . . –4° to +176°F (–20° to +80°C)

Allowable Torsion Load and Rotational Tolerance

Side loading should be avoided for any cylinder application. The smaller diameter twin rods will have more deflection due to side load than the one standard rod in a comparable ***Pancake® II*** cylinder. However, the PND Series is designed to work satisfactorily against pure torsional loads. Maximum torsional load per bore size is shown in the following table.



Approximate Angular Deflection (Degrees) due to max. torsional load							
	Torsional	Stroke					
Bore	Load Max.	0 to 1-1/2	2	2-1/2	3	3-1/2	4
3/4	0.3	less than 0.22	0.51	0.98	1.67	2.62	3.88
1-1/16	1.0	less than 0.15	0.33	0.64	1.09	1.71	2.53
1-1/2	5.0	less than 0.08	0.18	0.36	0.61	0.95	1.41
2	10.0	less than 0.03	0.07	0.13	0.22	0.34	0.50

Freeplay Rotational Tolerance				
Bore	3/4" (2)	1-1/16" (3)	1-1/2" (4)	2" (5)
Max. Rotation	±1°	±3/4°	±1/2°	±1/2°

Cylinder Sizing Guide

Bore Diameter	3/4 (2)	1-1/16 (3)	1-1/2 (4)	2 (5)
Rod Diameter	0.19	0.25	0.38	0.50
Rod Area	0.05	0.10	0.22	0.38
Push Area	0.44	0.88	1.76	3.14
Pull Area	0.39	0.78	1.54	2.76

How to Order

Series
P - *Pancake II*

Model
N - Nonrotating, Twin Rod

Action
D - double acting

Bore
2 - 3/4"
3 - 1-1/16"
4 - 1-1/2"
5 - 2"

Stroke
0.125 - 1/8"
0.250 - 1/4"
0.375 - 3/8"
0.500 - 1/2"
etc., thru
4.000 - 4"
(see page 12)

Model Number

Series	Model	Action	Bore	–	Mounting	Stroke	–	Options

Mounting
Counterbored mounting holes are standard in the basic model and need not be specified. For other mounting specify only one option code.

- CB - Screw clearance holes, both ends[1]
- CF - Screw clearance holes, front[1]
- CR - Screw clearance holes, rear[1]
- HB - Threaded mounting holes, both ends
- HF - Threaded mounting holes, front
- HR - Threaded mounting holes, rear
- PM - Pivot mount, pin 90° from port
- SM - Pivot mount, pin in-line with port
- TB - Trunnion mount, both ends
- TF - Trunnion mount, front
- TR - Trunnion mount, rear

[1] "Screw clearance" to allow bolt head to pass through; No counter bores

Options ***Enter in alphabetical order***

- CE - Counterbored rod end tool bar (page 12)
- E - Magnet on piston for position sensing (0.63 length adder) 3/8" stroke minimum[1]
- K - Rod end tool bar rotated 90°
- M, M1, M3, M4 - Magnet on piston and adhesive mounted dovetail extrusion to hold 1/4" dovetail sensors. (see sensors page 23; 0.63 length adder) 3/8" stroke minimum[1]
- P2, P3, P4 - Front port position other than standard (page 12)
- Q - Low temperature operation (–40°F to +200°F)
- T1, T3, T4 - Additional adhesive mounted dovetail extrusions located in position 1, 3, or 4
- V - Viton seals for media compatibility (–15°F to +225°F)
- X - **EXTRA** rod extension
  Example: X0.5 = 1/2" **EXTRA** Rod Extension
  X1 = 1" **EXTRA** Rod Extension

[1]Not available with Viton seals or low temperature seals.

How to Order

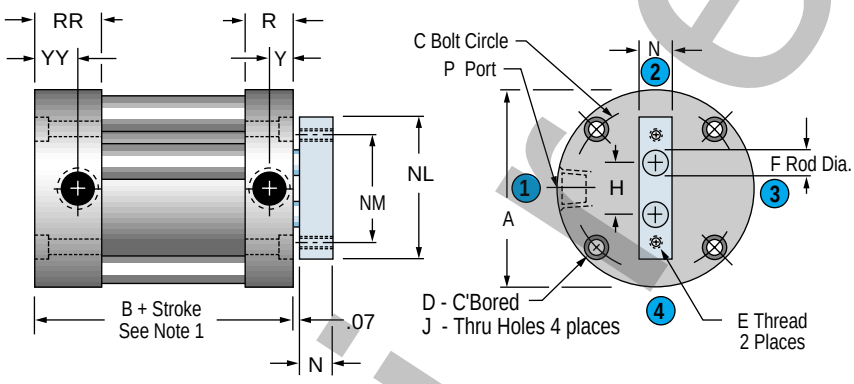
1. Specify **P**, Model, Action and Bore
2. Specify the Mounting and Stroke
3. Specify the Options in alphabetical order

Ordering example: **PND3-PM0.375-CE**
This model number specifies a nonrotating, double acting, cylinder with tool bar, 1-1/16" bore, pivot mounting, 3/8" stroke and counterbored rod end tool bar.

Pancake® II Cylinders

Basic Model PND

Twin Rod, Nonrotating
Double Acting

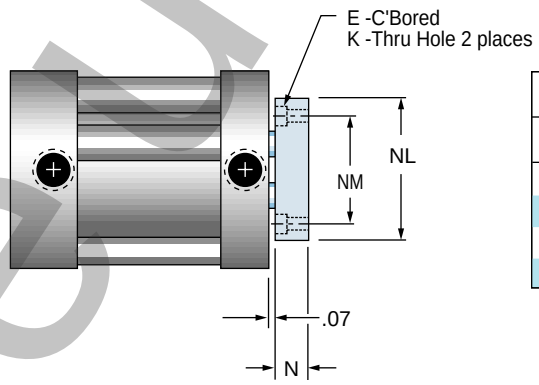


Note 1: Magnetic Position Sensing Length Adder = 0.63
A minimum stroke of 3/8" is required to sense end-of-stroke positions

Standard Strokes – All Models: • 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
Longer strokes available. Contact Engineering or your local Fabco-Air distributor for information.

Counterbored Rod End Tool Bar

Option CE



C'Bore Hole Dimensions (inches)

Bore	E C'Bore	K
3/4 (2)	0.24 x 0.15 dp	0.15
1-1/16 (3)	0.29 x 0.18 dp	0.18
1-1/2 (4)	0.40 x 0.27 dp	0.26
2 (5)	0.49 x 0.33 dp	0.33

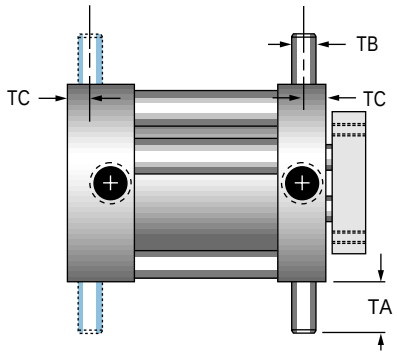
Dimensions (inches)

Bore	A	B	C	D	E Thread	F	H	N	NL	NM	P	R	RR	Y	YY
3/4 (2)	1.50	0.94	1.22	0.24 x 0.15 dp	#6-32 UNC	0.19	0.332	0.38	1.25	0.88	#10-32 UNF	0.34	0.47	0.14	0.27
1-1/16 (3)	2.00	1.31	1.69	0.24 x 0.15 dp	#8-32 UNC	0.25	0.422	0.38	1.44	1.06	1/8 NPT	0.50	0.69	0.25	0.44
1-1/2 (4)	2.62	1.31	2.19	0.34 x 0.22 dp	1/4-20 UNC	0.38	0.562	0.50	2.00	1.50	1/8 NPT	0.50	0.69	0.25	0.44
2 (5)	3.12	1.38	2.69	0.34 x 0.22 dp	5/16-18 UNC	0.50	0.750	0.63	2.50	1.88	1/8 NPT	0.53	0.72	0.25	0.44

Mounting Options

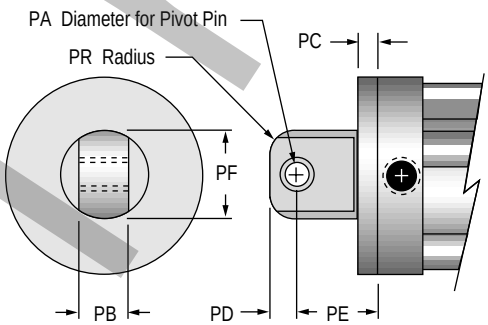
Trunnion Mount

Available rear, front or both.
(TF shown solid)



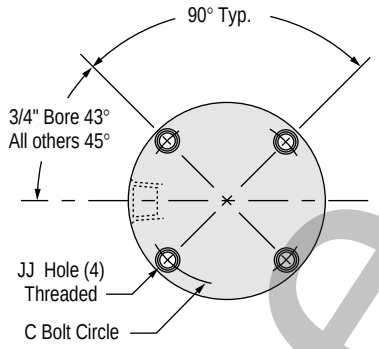
Pivot Mount

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



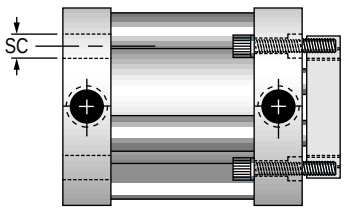
Threaded Mounting Holes

Available either or both ends. (HR shown)



Screw Clearance Holes

Available either or both ends.
(CR shown)



Approximate Cylinder Weights (ounces)

Bore	Base	Adder per 1/8 of Stroke
3/4 (2)	3.1	0.1
1-1/16 (3)	7.4	0.5
1-1/2 (4)	14.3	0.7
2 (5)	21.5	0.9

Dimensions (inches)

Bore	C	JJ	PA	PB	PC	PD	PE	PF	PR	SC	TA	TB	TC
3/4 (2)	1.22	#6-32 UNC	0.19	0.38	0.19	0.25	0.75	0.75	0.19	0.23	0.31	0.125	0.17
1-1/16 (3)	1.69	#6-32 UNC	0.19	0.38	0.25	0.25	0.81	0.75	0.19	0.25	0.50	0.250	0.25
1-1/2 (4)	2.19	#10-24 UNC	0.38	0.75	0.25	0.44	1.19	1.38	0.38	0.34	0.50	0.250	0.25
2 (5)	2.69	#10-24 UNC	0.38	0.75	0.31	0.44	1.25	1.38	0.38	0.34	0.50	0.250	0.25

Pancake® II Cylinders

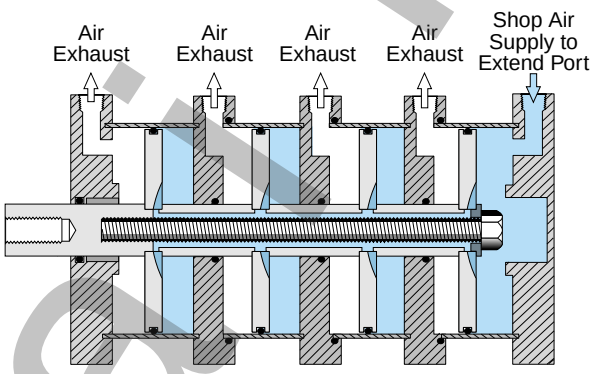
Double acting, single rod end Cylinders multiply force output 3 Bore sizes 2-1/2" thru 4" Strokes to 4" standard

How it Works

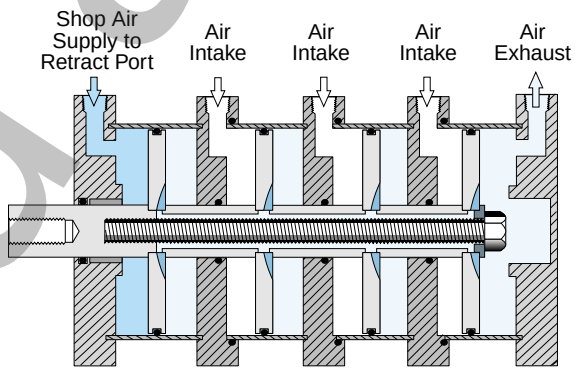
Fabco-Air attaches multiple pistons to a common shaft and provides internal air passages through the shaft to all pistons.

When ***air pressure is applied to the extend port***, all pistons are pressurized simultaneously, enabling tremendous thrust forces to be obtained. (See the handy cylinder sizing guide below for the force multiplying factors.)

When ***air pressure is applied to the retract port*** only one piston is pressurized.



Extend Port - Air supplied to all pistons



Retract Port - Air supplied to front piston only

Ratings – Standard Units all Series

- Body Self-lubricating composite • Head ..... Clear anodized aluminum alloy
- Tie Bolts ..... Stainless steel
- Rod ..... Chrome plated stainless steel
- Piston ..... Aluminum alloy
- Rod end ... Female thread with wrench flats
- Ports ..... Position #1
- Seals ..... Internally lubricated Buna-N
- Lubrication ..... Magnalube®-G
- Rod bushing ..... PTFE composite bearing
- Stroke tolerance . . . . . ± 1/64" per stage
- Media . . . . . Air
- Pressure rating, maximum . . . . . 200 psi
- Minimum recommended operating pressure . . . . . 15 psi
- Temperature rating Cylinder . . . . . –25° to +225°F (–32° to +121°C)
- Temperature rating Electronic sensors . . . . . –4° to +176°F (–20° to +80°C)

Cylinder Sizing Guide

Bore	Bore Model Designation	Extend Power Factor			Retract Power Factor
		PM2	PM3	PM4	
2-1/2	6	9.4	13.8	18.3	4.5
3	7	13.5	20.0	26.5	6.5
4	8	24.3	36.1	47.9	11.8

How to Order

Series
P - *Pancake II*

Multi-Power Model and Action
M2 -2 stage extend, single stage retract
M3 -3 stage extend, single stage retract
M4 -4 stage extend, single stage retract

Bore
6 - 2-1/2"
7 - 3"
8 - 4"

Stroke
0.125 - 1/8"
0.250 - 1/4"
0.375 - 3/8"
0.500 - 1/2"
etc., thru
4.000 - 4"
(see page 16)

Model Number | Series | Model | Action | Bore | – | Mounting | Stroke | – | Options

Mounting

Counterbored mounting holes are standard in the basic model and need not be specified. For other mounting specify only one option code.

CB - Screw clearance holes, both ends[1]
CF - Screw clearance holes, front[1]
CR - Screw clearance holes, rear[1]
HB - Threaded mounting holes, both ends
HF - Threaded mounting holes, front
HR - Threaded mounting holes, rear

[1] "Screw clearance" to allow bolt head to pass through; No counter bores

Options ***Enter in alphabetical order***

E - Magnet on piston for position sensing (see length adders page 17) 3/8" stroke minimum[1]
L - Low friction seals (see length adders page 17)
M, M1, M3, M4 - Magnet on piston and adhesive mounted dovetail extrusion to hold 1/4" dovetail sensors. (see sensors page 23; length adders page 17) 3/8" stroke min.[1]
P2, P3, P4 - Front port position other than standard (page 16)
P6, P7, P8 - Rear port position other than standard (page 16)
Q - Low temperature operation (–40°F to +200°F)
TCF - Coarse female rod thread, dimension E (page 16)
TCM - Male rod end with coarse thread (page 17)
TFM - Male rod end with fine thread (page 17)
TN - Non-threaded rod
T1, T3, T4 - Additional adhesive mounted dovetail extrusions located in position 1, 3, or 4
V - Viton seals for media compatibility (–15°F to +225°F)
W - Rod wiper, Buna N only (page 17)
X - **EXTRA** rod extension
Example: X0.5 = 1/2" **EXTRA** Rod Extension
X1 = 1" **EXTRA** Rod Extension

[1] Not available with Viton seals or low temperature seals.

How to Order

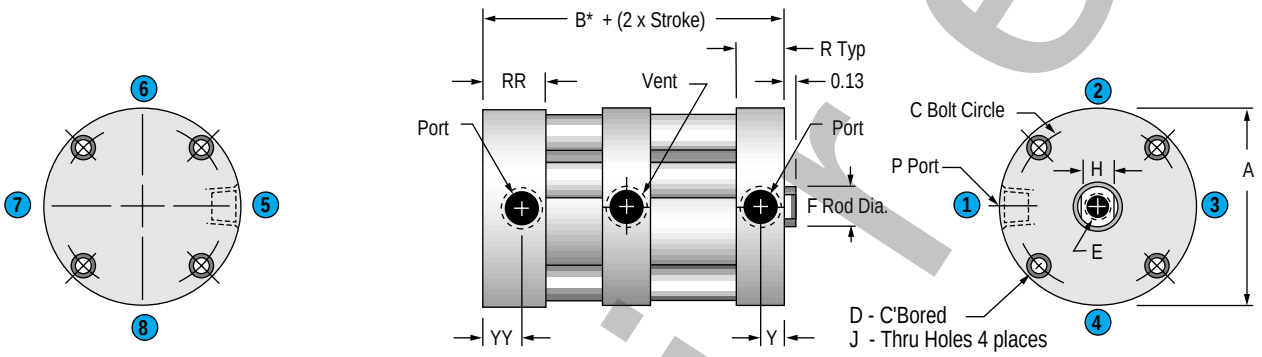
1. Specify **P**, Model, Action and Bore
2. Specify the Mounting and Stroke
3. Specify the Options in alphabetical order

Ordering example: **PM37-HB1.000-TCFV**
This model number specifies a Multi-Power®, 3 stage extend, 1 stage retract, 3" bore cylinder, threaded mounting holes on both ends, 1" stroke, with coarse female rod thread and Viton seals.

Pancake® II Cylinders

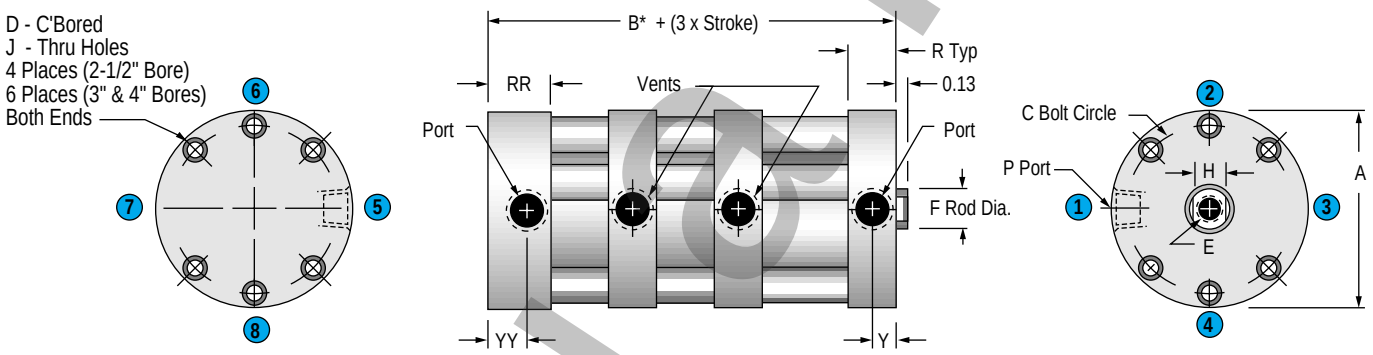
Model PM2

Standard Strokes – All Models: • 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
Special strokes available on request. Contact Engineering or your local Fabco-Air Distributor



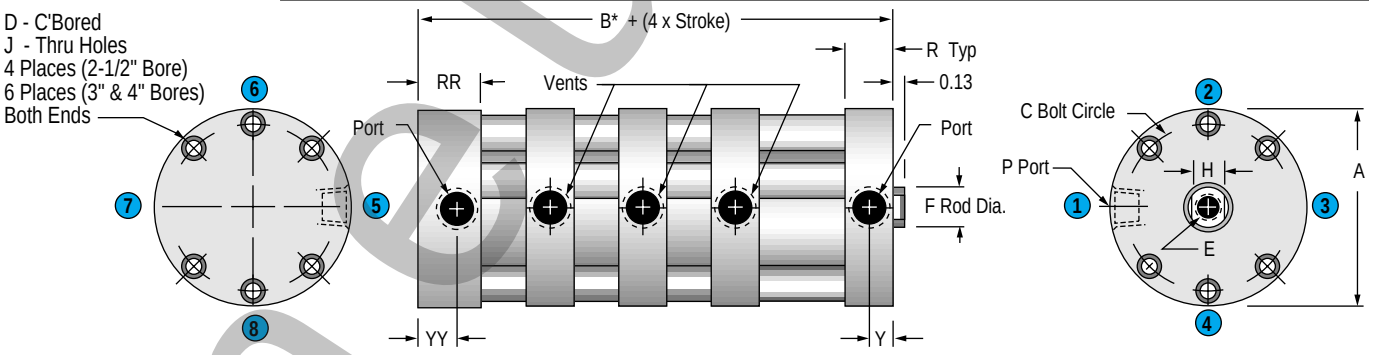
Model PM3

Standard Strokes – All Models: • 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
Special strokes available on request. Contact Engineering or your local Fabco-Air Distributor



Model PM4

Standard Strokes – All Models: • 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
Special strokes available on request. Contact Engineering or your local Fabco-Air Distributor



*Dimension "B" for Strokes .125, .188, and .250

Bore	.125 Stroke			.188 Stroke			.250 Stroke		
	PM2	PM3	PM4	PM2	PM3	PM4	PM2	PM3	PM4
2-1/2 (6)	2.65	3.64	4.63	2.71	3.76	4.81	2.77	3.87	4.97
3 (7)	2.75	3.77	4.79	2.81	3.90	4.98	2.88	4.01	5.15
4 (8)	3.38	4.61	5.85	3.44	4.74	6.04	3.53	4.89	6.24

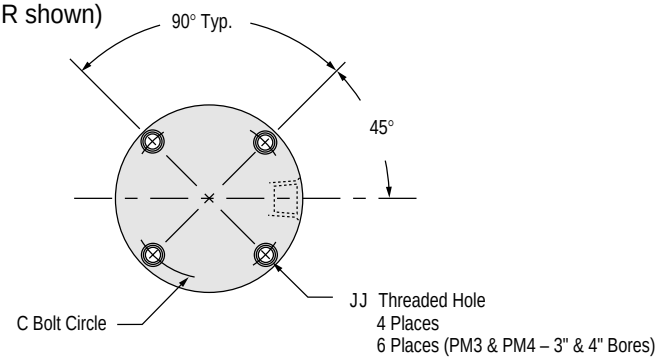
Dimensions (inches)

Bore	A	B* (strokes over .250)			C	D C'Bore	E Female Thread		E Depth for Stroke Range		F	H	J	P	R	RR	Y	YY
		PM2	PM3	PM4			E Standard	E Course	1/8 – 1/2	5/8 +								
2-1/2 (6)	3.75	2.29	3.15	4.02	3.25	0.40 x 0.27 dp	1/2-20 UNF	1/2-13 UNC	0.42-0.70	0.70	0.75	0.63	0.26	1/4 NPT	0.66	0.91	0.33	0.58
3 (7)	4.25	2.39	3.28	4.18	3.78	0.40 x 0.27 dp	5/8-18 UNF	5/8-11 UNC	0.45-0.73	0.73	0.88	0.75	0.26	1/4 NPT	0.69	0.94	0.33	0.58
4 (8)	5.50	3.04	4.15	5.27	4.94	0.49 x 0.33 dp	3/4-16 UNF	3/4-10 UNC	0.40-0.70	0.80	1.00	0.88	0.33	3/8 NPT	0.84	1.22	0.42	0.80

Mounting Options

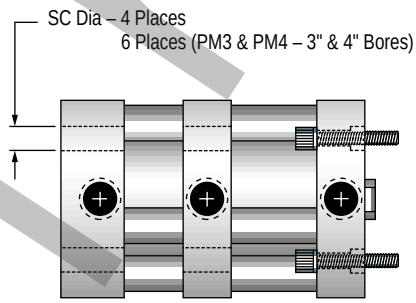
Threaded Mounting Holes

Available either or both ends.
(HR shown)



Screw Clearance Holes

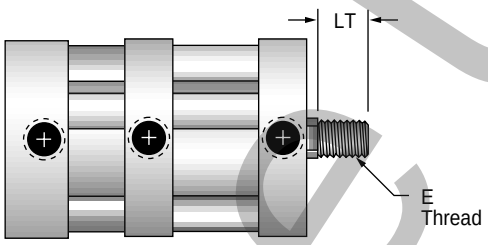
Available either or both ends. (CR shown)
Screw clearance holes are standard on all center sections.



Model Options

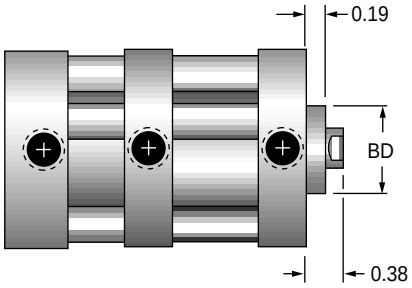
Male Rod Ends (Option TCM or TFM)

(Model PM2 shown)



Rod Wiper (Option W)

Buna-N only. (Model PM2 shown)



Approximate Cylinder Weights (ounces)

Bore	PM2 Base	PM2 Adder per 1/8 Stroke	PM3 Base	PM3 Adder per 1/8 Stroke	PM4 Base	PM4 Adder per 1/8 Stroke
2-1/2 (6)	37.2	1.2	53.3	1.8	69.4	2.4
3 (7)	49.9	1.6	71.0	2.4	92.1	3.2
4 (8)	93.1	2.0	133.8	3.0	174.5	4.0

Dimensions (inches)

Bore	BD	C	JJ	E Male Thread TCM (Coarse)	E Male Thread TFM (Fine)	LT	SC
2-1/2 (6)	1.13	3.25	1/4 – 20 UNC	1/2-13 UNC	1/2-20 UNF	0.63	0.41
3 (7)	1.25	3.78	1/4 – 20 UNC	5/8-11 UNC	5/8-18 UNF	0.75	0.41
4 (8)	1.38	4.94	5/16 – 18 UNC	3/4-10 UNC	3/4-16 UNF	0.75	0.50

Length Adder for Options (inches)

Bore	Series	Low Friction Seals (L)	Magnetic Position Sensing‡ (E or M)	Low Friction Seals & Magnetic Position Sensing‡ (EL or LM)
2-1/2	PM2	0.75	0.88	1.25
	PM3	1.13		1.63
	PM4	1.50		2.00
3	PM2	1.00	0.88	1.38
	PM3	1.50		1.88
	PM4	2.00		2.38
4	PM2	1.00	0.88	1.38
	PM3	1.50		1.88
	PM4	2.00		2.38

‡ 1) A minimum stroke of 3/8" is required to sense end-of-stroke positions.
2) Magnet is applied to front piston.

Pancake® II Cylinders

Double acting, single rod end
Cylinder provides 3 positions
8 Bore sizes 1/2" thru 4"
Strokes to 4" standard

Other multi-position cylinders (4 position, 5 position, etc.) are available as specials. Contact Engineering or your local Fabco-Air distributor for more information.

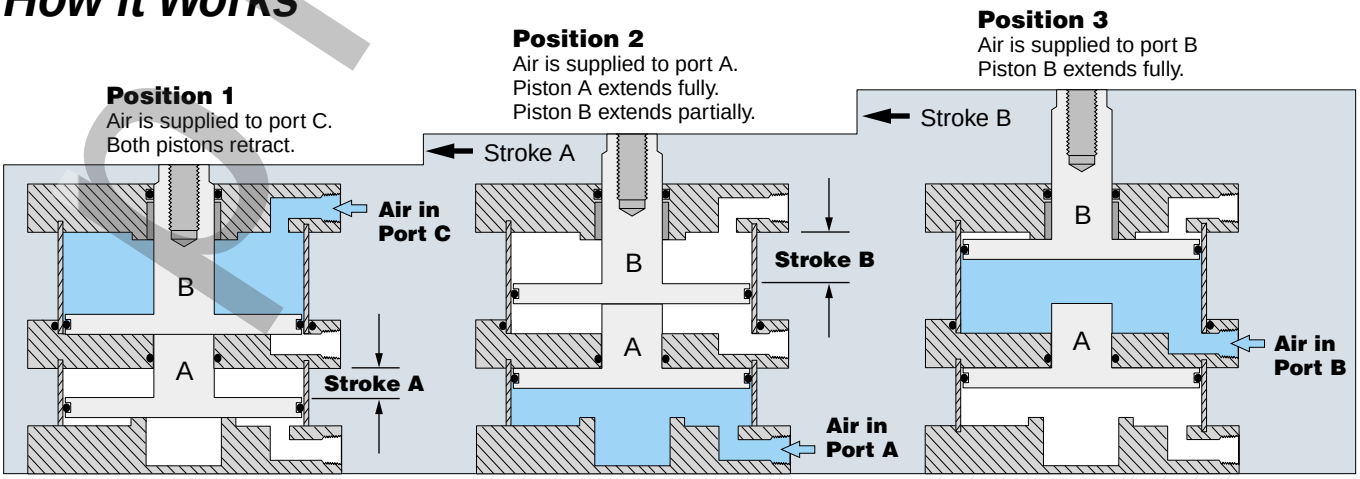
Ratings – Standard Units all Series

- Body . . . . . Self-lubricating composite
- Heads . . . . Clear anodized aluminum alloy
- Tie Bolts . . . . . Stainless steel
- Rod . . . . . Chrome plated stainless steel
- Piston . . . . . Aluminum alloy
- Rod end . . . Female thread & wrench flats
- Ports . . . . . Position #1
- Seals . . . . . Internally lubricated Buna-N
- Lubrication . . . . . Magnalube®-G
- Rod bushing . . . PTFE composite bearing
- Stroke tolerance . . . . . ± 1/64" per stroke
- Media . . . . . Air
- Pressure rating, maximum . . . . . 200 psi
- Minimum recommended operating pressure . . . . . 15 psi
- Temperature rating Cylinder . –25° to +225°F (–32° to +121°C)
- Temperature rating Electronic sensors . . . . . –4° to +176°F (–20° to +80°C)

Cylinder Sizing Guide

Bore Diameter	1/2	3/4	1-1/16	1-1/2	2	2 1/2	3	4
Rod Diameter	0.25	0.31	0.50	0.63	0.75	0.75	0.88	1.00
Rod Area	0.05	0.08	0.19	0.31	0.44	0.44	0.60	0.79
Push Area	0.20	0.44	0.88	1.76	3.14	4.91	7.07	12.57
Pull Area	0.15	0.36	0.69	1.45	2.66	4.47	6.47	11.78

How it Works



How to Order

Series
P - *Pancake II*

Model and Action
3D - 3 position, double acting

Bore
1 - 1/2"
2 - 3/4"
3 - 1-1/16"
4 - 1-1/2"
5 - 2"
6 - 2-1/2"
7 - 3"
8 - 4"

Stroke A		Stroke B	
0.125	- 1/8"	**0.125**	- 1/8"
0.250	- 1/4"	**0.250**	- 1/4"
0.375	- 3/8"	**0.375**	- 3/8"
0.500	- 1/2"	**0.500**	- 1/2"
etc., thru		etc., thru	
4.000	- 4"	**4.000**	- 4"

See page 20 for minimum stroke lengths.

Model Number **Series Model Action Bore – Mounting Stroke A / StrokeB – Options**

Mounting

Counterbored mounting holes are standard in the basic model and need not be specified. For other mounting specify only one option code.

CB - Screw clearance holes, both ends[1]
CF - Screw clearance holes, front[1]
CR - Screw clearance holes, rear[1]
HB - Threaded mounting holes, both ends
HF - Threaded mounting holes, front
HR - Threaded mounting holes, rear
PM - Pivot mount, pin 90° from port
SM - Pivot mount, pin in-line with port

[1] "Screw clearance" to allow bolt head to pass through; No counter bores

Options ***Enter in alphabetical order***

E - Magnet on rod end piston for position sensing (see length adders page 20) 3/8" stroke minimum[1]
L - Low friction seals (see length adders page 20)
M, M1, M3, M4 - Magnet on piston and adhesive mounted dovetail extrusion to hold 1/4" dovetail sensors. (see sensors page 23; length adders page 20) 3/8" stroke min.[1]
P2, P3, P4 - Front port position other than standard (page 20)
P6, P7, P8 - Rear port position other than standard (page 20)
Q - Low temperature operation (–40°F to +200°F)
TCF - Coarse female rod thread, dimension E (page 20)
TCM - Male rod end with coarse thread (page 20)
TFM - Male rod end with fine thread (page 20)
TN - Non-threaded rod
T1, T3, T4 - Additional adhesive mounted dovetail extrusions located in position 1, 3, or 4
V - Viton seals for media compatibility (–15°F to +225°F)
W - Rod wiper, Buna N only (page 20)
X - **EXTRA** rod extension
Example: X0.5 = 1/2" **EXTRA** Rod Extension
X1 = 1" **EXTRA** Rod Extension

[1] Not available with Viton seals or low temperature seals.

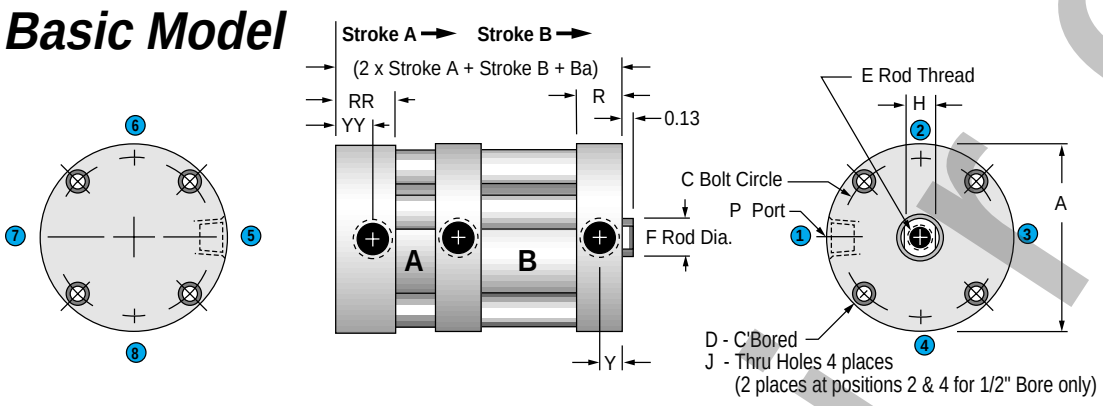
How to Order

1. Specify **P**, Model, Action and Bore
2. Specify the Mounting and Stroke
3. Specify the Options desired

Ordering example: **P3D5-CR0.375/2.000-TCM**
This model number specifies a 3-position, double acting, cylinder , 2" bore, screw clearance holes at rear, 3/8" stroke A, 2" stroke B, and male rod end with coarse thread.

Pancake® II Cylinders

Basic Model



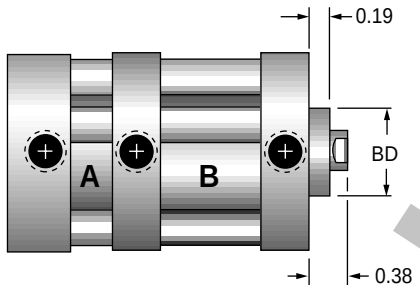
Minimum Stroke*	
Bore	Base Model Stroke A
1/2 (1)	0.19
3/4 (2)	0.19
1-1/16 (3)	0.25
1-1/2 (4)	0.25
2 (5)	0.25
2-1/2 (6)	0.38
3 (7)	0.38
4 (8)	0.34

*Note:
1) No minimum for stroke B.
2) No minimum for stroke A or B with Low Friction Option -L

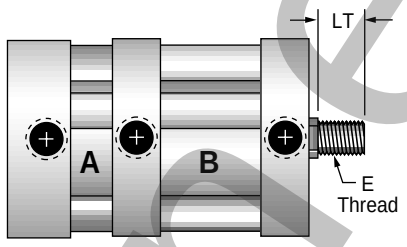
Model Options

Rod Wiper (Option W)

Buna-N only.



Male Rod Ends (Option TCF or TFM)



Deviations from Standard Dimensions (Options L, E, M)

Length Adder (inches)			
Bore	Low Friction Seals (L)	Magnetic Position Sensing‡ (E or M)	Low Friction Seals & Magnetic Position Sensing‡ (EL or LM)
1/2 (1)	0.50	0.88	1.12
3/4 (2)	0.50	0.88	1.12
1-1/16 (3)	0.75	0.88	1.25
1-1/2 (4)	0.75	0.88	1.25
2 (5)	0.75	0.88	1.25
2-1/2 (6)	0.75	0.88	1.25
3 (7)	1.00	0.88	1.38
4 (8)	1.00	0.88	1.38

‡1) A minimum stroke of 3/8" is required to sense end-of-stroke positions.
2) Magnet is applied to piston of stroke B.

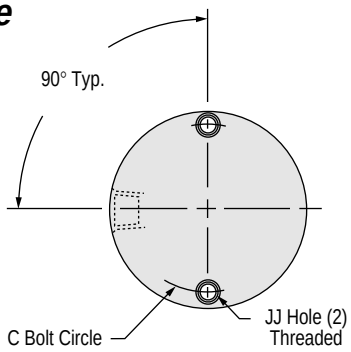
Dimensions (inches)																		
						E Female Thread		E Depth for Stroke Range										
Bore	A	Ba	BD	C	D C'Bore	E Standard	E Course	1/8 – 1/2	5/8 +	F	H	J	LT	P	R	RR	Y	YY
1/2 (1)	1.12	1.14	0.56	0.88	0.20 x 0.13 dp	#8-32 UNC	N/A	0.30-0.46	0.46	0.25	0.22	0.13	0.38	#10-32 UNF	0.34	0.47	0.14	0.27
3/4 (2)	1.50	1.14	0.69	1.22	0.24 x 0.15 dp	#10-32 UNF	#10-24 UNC	0.30-0.46	0.46	0.31	0.25	0.15	0.38	#10-32 UNF	0.34	0.47	0.14	0.27
1-1/16 (3)	2.00	1.67	0.88	1.69	0.24 x 0.15 dp	5/16-24 UNF	5/16-18 UNC	0.37-0.63	0.70	0.50	0.44	0.15	0.50	1/8 NPT	0.50	0.69	0.25	0.44
1-1/2 (4)	2.62	1.70	1.00	2.19	0.34 x 0.22 dp	3/8-24 UNF	3/8-16 UNC	0.37-0.70	0.70	0.63	0.50	0.20	0.50	1/8 NPT	0.50	0.69	0.25	0.44
2 (5)	3.12	1.80	1.13	2.69	0.34 x 0.22 dp	1/2-20 UNF	1/2-13 UNC	0.30-0.63	0.70	0.75	0.63	0.20	0.63	1/8 NPT	0.53	0.72	0.25	0.44
2-1/2 (6)	3.75	2.25	1.13	3.25	0.40 x 0.27 dp	1/2-20 UNF	1/2-13 UNC	0.42-0.70	0.70	0.75	0.63	0.26	0.63	1/4 NPT	0.66	0.91	0.33	0.58
3 (7)	4.25	2.34	1.25	3.78	0.40 x 0.27 dp	5/8-18 UNF	5/8-11 UNC	0.45-0.73	0.73	0.88	0.75	0.26	0.75	1/4 NPT	0.69	0.94	0.33	0.58
4 (8)	5.50	3.00	1.38	4.94	0.49 x 0.33 dp	3/4-16 UNF	3/4-10 UNC	0.40-0.70	0.80	1.00	0.88	0.33	0.75	3/8 NPT	0.84	1.22	0.42	0.80

Mounting Options

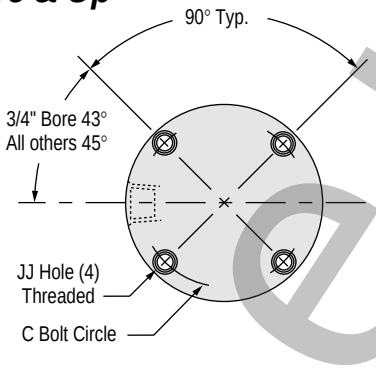
Threaded Mounting Holes

Available either or both ends.
(HR shown)

1/2" Bore

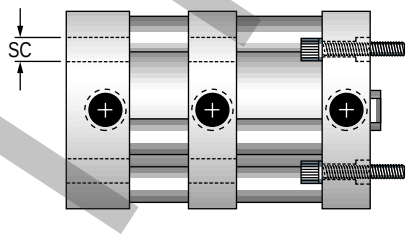


3/4" Bore & Up



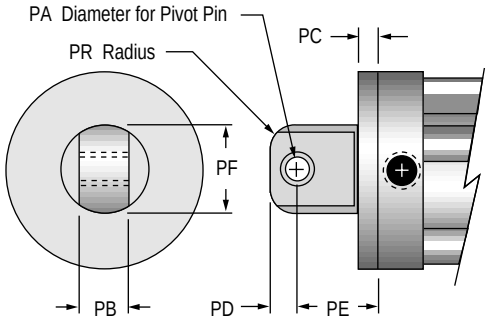
Screw Clearance Holes

Available either or both ends. (CR shown)
Screw clearance holes are standard on all center sections.



Pivot Mount

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



Dimensions (inches)

Bore	C	JJ	PA	PB	PC	PD	PE	PF	PR	SC
1/2 (1)	0.88	#4-40 UNC	0.19	0.38	0.19	0.25	0.75	0.63	0.19	0.17
3/4 (2)	1.22	#6-32 UNC	0.19	0.38	0.19	0.25	0.75	0.75	0.19	0.23
1-1/16 (3)	1.69	#6-32 UNC	0.19	0.38	0.25	0.25	0.81	0.75	0.19	0.25
1-1/2 (4)	2.19	#10-24 UNC	0.38	0.75	0.25	0.44	1.19	1.38	0.38	0.34
2 (5)	2.69	#10-24 UNC	0.38	0.75	0.31	0.44	1.25	1.38	0.38	0.34
2-1/2 (6)	3.25	1/4-20 UNC	0.38	0.75	0.38	0.44	1.31	1.38	0.38	0.41
3 (7)	3.78	1/4-20 UNC	0.63	1.00	0.38	0.56	1.69	1.88	0.38	0.41
4 (8))	4.94	5/16-18 UNC	0.63	1.00	0.44	0.56	1.75	1.88	0.38	0.50

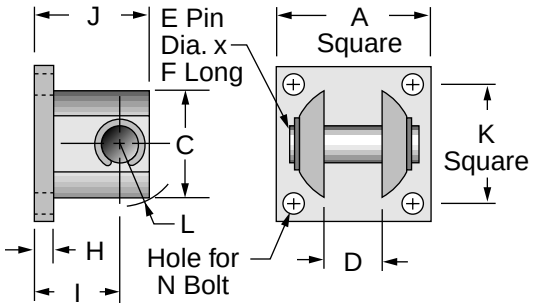
Approximate Cylinder Weights (ounces)

Bore	Base	Adder per 1/8 of Stroke
1/2 (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	1.0
2-1/2 (50)	41.3	1.2
3 (70)	52.9	1.6
4 (125)	102.7	2.0

Selection Guide				
Accessory	Standard Series	PND Series	Multi-Power Series	P3D Series
Clevis Bracket	✓	✓	N/A	✓
Trunnion Bracket	✓	✓	N/A	N/A
Rod Eye	✓	N/A	✓	✓

Clevis Bracket

Anodized aluminum alloy
Chrome plated steel pin included

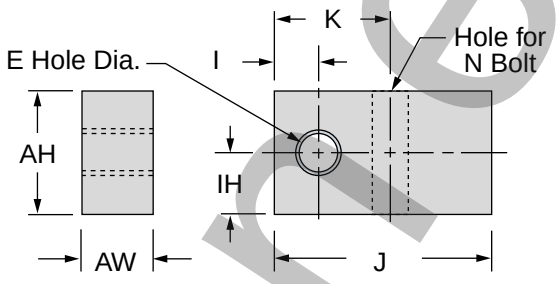


The bracket is intended for mounting with either a rod pivot or pivot mount; it is not intended to mount directly with the rear cylinder head.

Dimensions (inches)												
Kit No.	Bore	A	C	D	E	F	H	I	J	K	L	N
CB-3	1/2 (1) 3/4 (2) 1-1/16 (3)	1.00	0.71	0.39	0.187	0.93	0.16	0.56	0.78	0.75	0.42	#6
CB-6	1-1/2 (4) 2 (5) 2-1/2 (6)	1.75	1.37	0.75	0.375	1.63	0.22	0.94	1.34	1.38	0.80	#10
CB-8	3 (7) 4 (8)	2.50	2.10	1.00	0.625	2.42	0.25	1.25	1.81	2.00	1.19	1/4

Trunnion Bracket (pair)

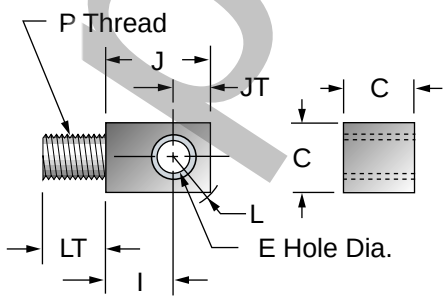
Anodized aluminum alloy
complete with bronze pivot bushings



Dimensions (inches)									
Kit No.	Bore	AH	AW	E	I	IH	J	K	N
TB-2	3/4 (2)	0.63	0.31	0.126	0.22	0.30	1.12	0.56	#10
TB-5	1-1/16 (3) 1-1/2 (4) 2 (5)	0.88	0.50	0.251	0.31	0.38	1.50	0.81	1/4
TB-7	2-1/2 (6) 3 (7)	1.00	0.63	0.313	0.38	0.45	1.63	0.94	5/16
TB-8	4 (8)	1.25	0.75	0.376	0.44	0.55	1.88	1.06	3/8

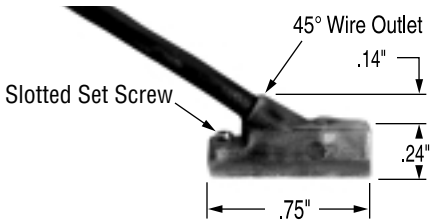
Rod Eye

Steel with bronze pivot bushing and nut

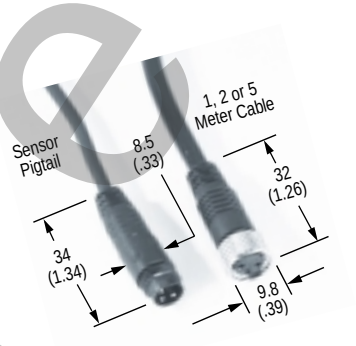


Dimensions (inches)									
Kit No.	Bore	C	E	I	J	JT	L	LT	P
RE-1	1/2 (1)	0.38	0.187	0.47	0.72	0.25	0.32	0.38	#8-32 UNC
RE-2	3/4 (2)	0.38	0.187	0.47	0.72	0.25	0.32	0.38	#10-32 UNF
RE-3	1-1/16 (3)	0.38	0.187	0.47	0.72	0.25	0.32	0.63	5/16-24 UNF
RE-4	1-1/2 (4)	0.75	0.375	0.72	1.16	0.44	0.58	0.63	3/8-24 UNF
RE-6	2 (5) 2-1/2 (6)	0.75	0.375	0.72	1.16	0.44	0.58	0.75	1/2-20 UNF
RE-7	3 (7)	1.00	0.625	1.00	1.63	0.63	0.80	0.88	5/8-18 UNF
RE-8	4 (8)	1.00	0.625	1.00	1.63	0.63	0.80	0.88	3/4-16 UNF

Sensor Specifications & Ordering Information



- Encased in a plastic housing, dovetail style electronic sensors are corrosion resistant. 45° wire outlet allows close mounting.
- Two methods of mounting are available:
  1. Tie bolt spacer mounted clamps (Option -E)
  2. Adhesive mounted dovetail extrusions (Option -M)
- ***Order sensors separately from the table below***



Ordering Guide – Dovetail Style Magnetic Sensor with LED

Sensor Temperature Range
-20° to +80° C (-4° to +176° F)

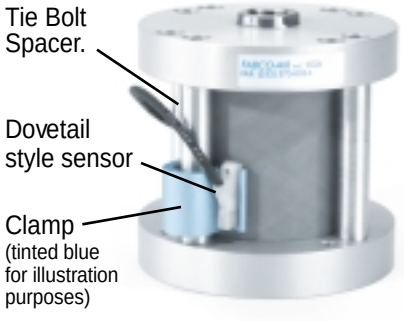
Sensor Type	Prewired 9 ft. Part No.	Quick Disconnect Part No.*	Wire Leads	Electrical Characteristics
Electronic	949-000-031	949-000-331	3	Sourcing PNP 6-24 VDC, 0.20 Amp Max current, 0.5 Voltage Drop
Electronic	949-000-032	949-000-332	3	Sinking NPN 6-24 VDC, 0.20 Amp Max current, 0.5 Voltage Drop

Note: Quick disconnect styles are supplied with 6 inch pigtail with male connector. Order female cordsets separately.*

Female Cordsets for Quick Disconnect

Length	Part No.
1 Meter	CFC-1M
2 Meters	CFC-2M
5 Meters	CFC-5M

Option -E *Magnet on piston – use spacer mounted clamps*



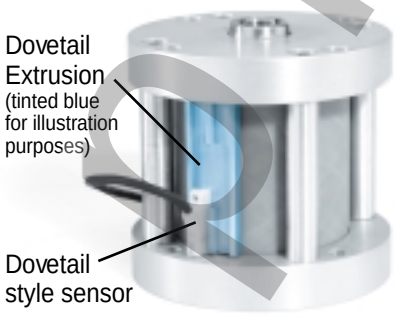
Order clamps and sensors separately

To apply dovetail style sensors first locate clamp in rough position on any of the tie bolt spacers and lock it in place with the set screw.

Next, make fine adjustment by sliding the sensor within the clamp and lock in place with its slotted set screw.

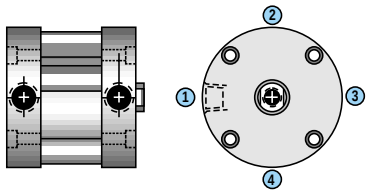
Clamp Selection Guide						
Kit No.	SC-1	SC-2	SC-3	SC-5	SC-7	SC-8
To Fit Bore	1/2	3/4	1-1/16	1-1/2 & 2	2-1/2 & 3	4

Option -M *Magnet on piston and adhesive mounted dovetail extrusions*



Order sensors separately

Specify Option M for mounting rail(s) located in standard position(2).



Specify option M1, M3, or M4 for mounting rail in alternate positions 1, 3, or 4 respectively. Additional dovetail rails may be applied by specifying options T1, T3, or T4.

The design and construction of the ***Pancake II*** allows the cylinder barrel to float approximately 0.020 axially. It can also rotate slightly. The axial movement will be more noticeable than the rotational movement during cylinder cycling and may present what appears to be sensor malfunction when using the extruded dovetail rail. Thus, for extremely precise sensor applications where this may be troublesome, it is recommended to use the spacer-mounted clamps shown above in the -E option to provide a more stable and rigid sensor mount.

Standard Dovetail Rail Positions		
Bore	Stroke Range	Position
1/2"	3/8" to 1-1/4"	1 & 3
1/2"	1-1/2" & above	1
3/4"	3/8" to 1-1/4"	2 & 4‡
3/4"	1-1/2" & above	2
1-1/16" & up	3/8" & above	2

‡Note: When alternate positions are specified, the second of two required dovetail rails will be applied at position 2. (Contact factory for other combinations.)