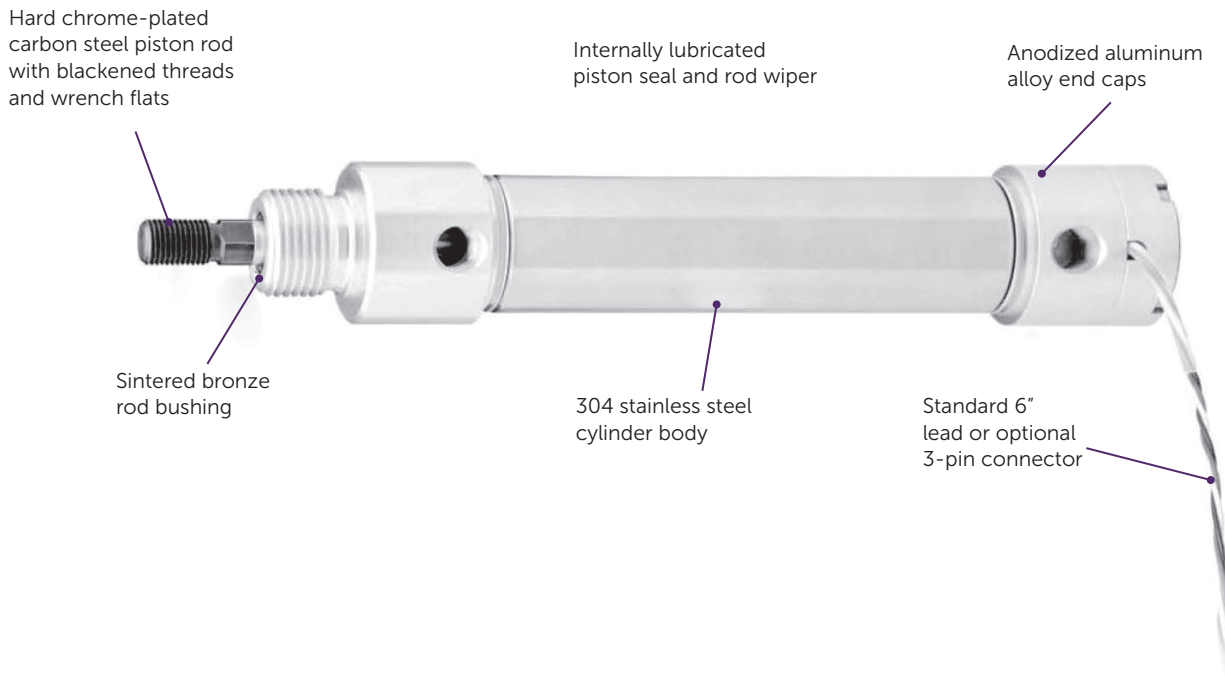


Position Feedback Cylinders (PFC Models)



The Position Feedback Cylinder (Model PFC) is a linear pneumatic actuator that contains an internal LRT (Linear Resistive Transducer). The PFC can be used for measuring and gauging, positioning, and "on-the-fly" applications. It is available with or without a rod lock. Combine the PFC with the IMI Bimba Servo Pneumatic Control Systems, model SPCS-2, to maximize performance.

Features and Benefits

- Higher loads and velocities than multiple position actuators, at a lower price point than electric actuators
- Programmability with electronic controls leads to quicker changeovers and less overall downtime
- Accurate to 0.010", comparable to electric motion
- Closed loop control for precision upstream/downstream communication
- Easy to set up and install

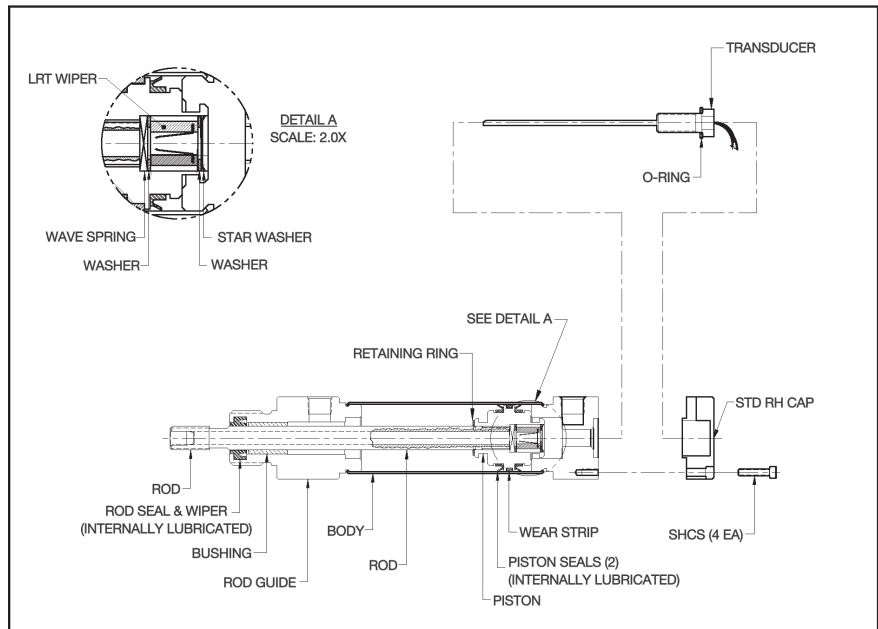
Position Feedback Cylinders (PFC)

The IMI Bimba Position Feedback Cylinder contains a Linear Resistive Transducer (LRT) or potentiometer mounted in the cylinder rear head. The LRT probe, which has a resistive element on one side and a collector strip on the other, is inside the cylinder rod. A wiper assembly is installed in the piston. As the piston moves, an electrical circuit is created between the resistive element and collector strip. A variable resistance (approximately $1K\Omega$ per inch of stroke) proportional to piston position in the cylinder is produced by the cylinder. The cylinder can be easily setup to produce an analog signal compatible with 0-10 VDC PLC analog inputs.

The accuracy of an LRT is determined by three factors: resolution, linearity and repeatability.

Resolution refers to the smallest change that can be detected on the LRT. The IMI Bimba LRT has infinite resolution, and can be divided into as many parts as the electronics allow. For example, with a 12-bit, 4096-part controller, the stroke could be divided into 4096 parts. When 10 VDC are placed on a 10" cylinder, the smallest detectable increment would be $10 \text{ VDC} \div 4096 = 2.4 \text{ millivolts}$ or $0.0024"$. Resolution is stroke sensitive—the longer the stroke, the less the resolution.

Linearity refers to the maximum deviation of the output voltage to a straight line. The IMI Bimba LRT's linearity is ± 1 percent of stroke. Repeatability is the ability of the LRT to provide the same output voltage relative to a unique cylinder position each time the cylinder is cycled. Mechanical repeatability of the IMI Bimba Position Feedback Cylinder is $\pm 0.001"$.



Engineering Specifications (PFC)

Repeatability: $\pm 0.001"$ Cylinder Only.	
Refer to specifications in the following sections for positioning or measuring repeatability. Power supply ripple and A/D error may reduce repeatability when PFC is utilized with industrial control systems.	
Nonlinearity:	± 1 percent of full stroke
Resolution:	Infinite
Signal Input:	10 VDC typical
Input Impedance Required:	1 MOhm
Signal Output:	> 0 to slightly less than FS signal input
(The internal electrical stroke is slightly larger than the mechanical stroke of cylinder)	
Maximum Speed:	25 in./sec.
Rated Life of LRT Wiper:	1,0001 miles of travel
Rated Life of Probe:	10 million cycles ¹
Air Requirements:	Filtered to 5 micron with 0° dewpoint recommended.
	Moisture inside cylinder will cause output signal fluctuation.
Pressure Rating:	150 PSI
Temperature Rating:	0° to 200° F ²
Interface:	6" standard leads or optional 8mm DIN connector
Cylinder Body:	304 stainless steel
Piston Rod:	Hard chrome plated carbon steel with blackened threads and wrench flats
Rod Bushing:	Sintered bronze
End Caps:	Anodized aluminum alloy
Piston Seal:	Internally lubricated urethane (standard)
	Internally lubricated Buna (L option)
Rod Wiper:	Internally lubricated Buna N (omitted on L option)
Rod Seal:	Internally lubricated Buna N (N/A on standard model)

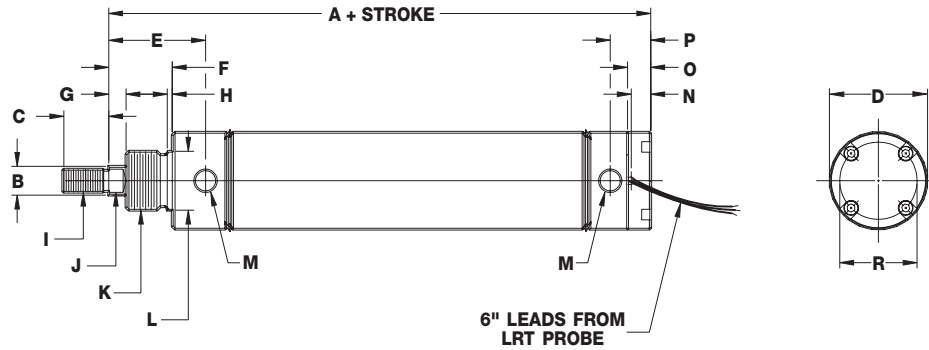
¹ Higher velocities increase wear rate.

² Special low temperature lubrication is required for positioning applications using option L seals below 35° F.

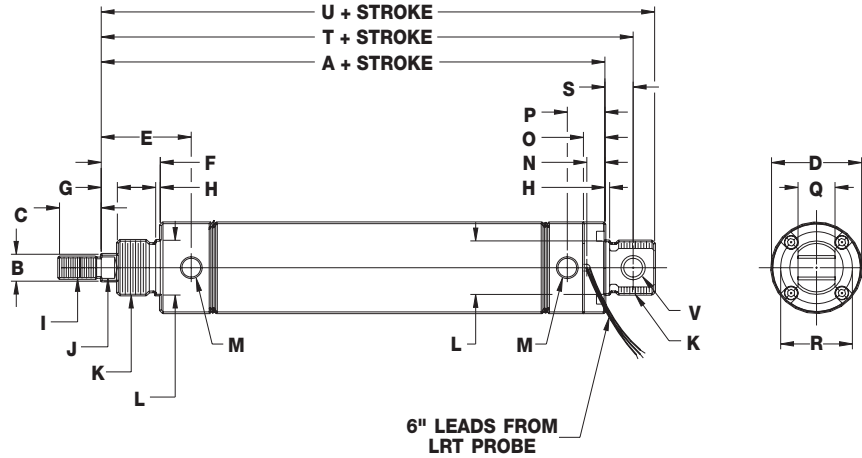
Estimated Cylinder Weights (lbs)					
	1-1/16"	1-1/2"	2	2-1/2"	3
PFC-	0.44	0.88	2.02	2.78	3.62
PFC-X	0.49	0.96	2.14	2.96	3.85
PFC-BF	0.54	1.07	2.28	3.02	4.08
ADDER WT/IN	0.06	0.10	0.15	0.20	0.29

Mount Dimensions (PFC Models)

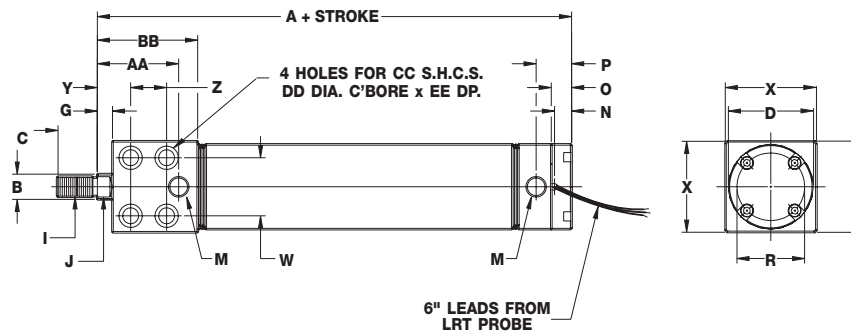
Nose Mount



Universal Mount for stud or pivot (includes bushing)

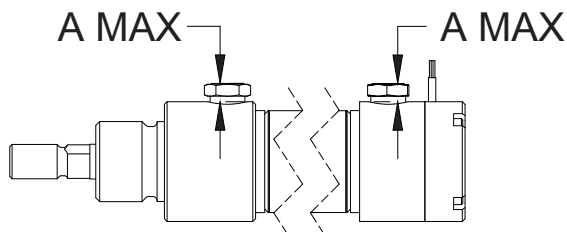


Block Mount



NOTE: Mounting holes farthest from rod end are omitted for -L option for 11/16" bore.

Option FT



Bore	A
1-1/16" (09)	0.35
1-1/2" (17)	0.41
2" (31)	0.41
2-1/2" (50)	0.52
3" (70)	0.52

Dimensions

	1-1/16" Bore (09)	1-1/2" Bore (17)	2" Bore (31)	2-1/2" Bore (50)	3" Bore (70)
A	4.59	4.88	5.72	6.41	6.78
B	Ø 0.38	Ø 0.50	Ø 0.63	Ø 0.75	Ø 0.75
C	0.63	0.88	1.00	1.25	1.25
D	Ø 1.31	Ø 1.58	Ø 2.09	Ø 2.58	Ø 3.13
E	1.75	Option L 1.52	2.10	2.28	2.53
F	1.06	1.13	1.38	1.50	1.69
G	0.31	0.31	0.38	0.44	0.44
H	0.08	0.09	0.11	0.13	0.13
I	3/8-24 UNF	7/16-20 UNF	1/2-20 UNF	5/8-18 UNF	5/8-18 UNF
J	0.31	0.44	0.50	0.63	0.63
K	7/8-14 UNF	1-1/8-12 UNF	1-1/4-12 UNF	1-3/8-12 UNF	1-1/2-12 UNF
L	Ø 0.87	Ø 1.12	Ø 1.25	Ø 1.37	Ø 1.62
M	1/8 NPT	1/4 NPT	1/4 NPT	3/8 NPT	3/8 NPT
N	0.36	0.36	0.42	0.48	0.55
O	0.44	0.44	0.50	0.56	0.63
P	0.84	0.81	0.88	1.12	1.88
Q	0.62	0.74	0.86	0.99	0.99
R	Ø 1.09	Ø 1.36	Ø 1.67	Ø 2.06	Ø 2.44
S	0.47	0.56	0.66	0.75	0.81
T	5.06	5.44	6.38	7.16	7.60
U	5.44	5.91	6.88	7.78	8.22
V	Ø 0.31	Ø 0.38	Ø 0.44	Ø 0.50	Ø 0.50
W	0.88	1.25	1.44	1.88	2.25
X	1.38	1.75	2.25	2.75	3.25
Y	0.75	0.69	0.75	0.88	0.94
Z	0.88	0.75	1.00	1.25	1.38
AA	1.63	Option L 1.52	1.75	2.13	2.31
BB	2.03	2.00	2.41	2.72	2.91
CC	#10	1/4	3/8	7/16	1/2
DD	Ø 0.33	Ø 0.41	Ø 0.58	Ø 0.67	Ø 0.77
EE	0.20	0.25	0.39	0.45	0.52

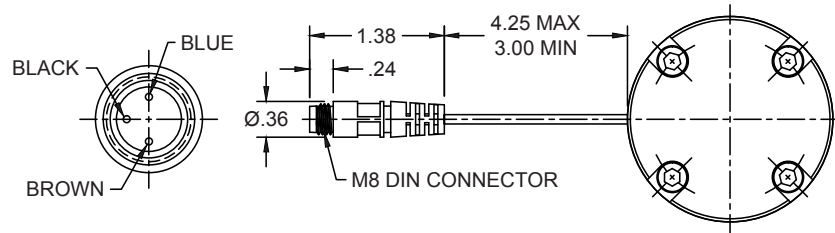
Bumper Length Adder: 0.25"

3-Pin Connector

Wire Colors

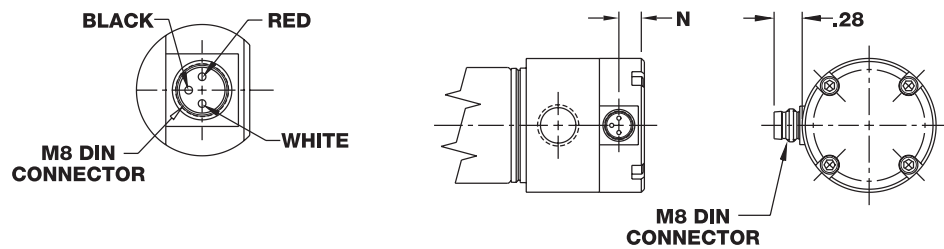
Wires	6" Leads and PA Option	P Option
Input	Red	Blue
Ground	Black	Black
Output	White	Brown

P Option

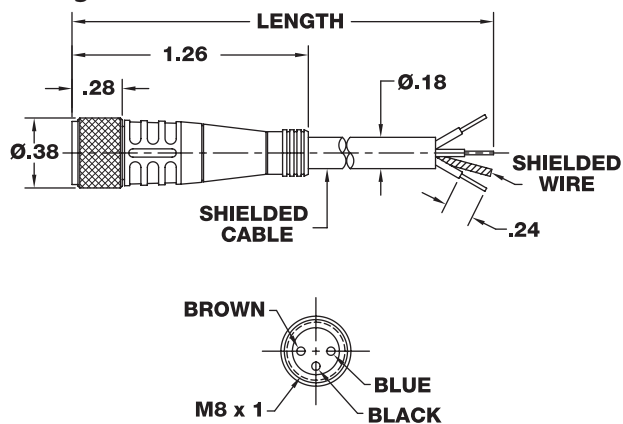


PA Option

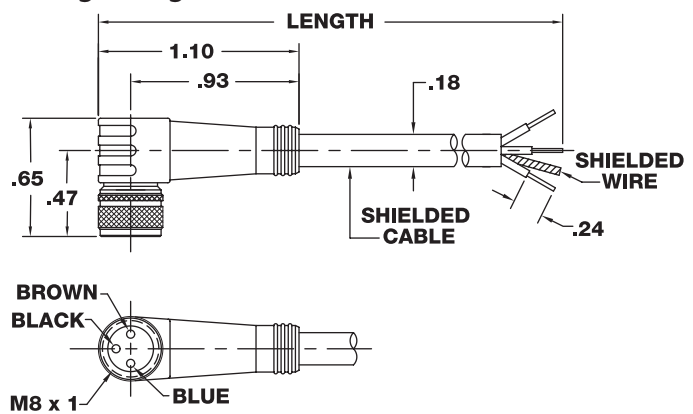
Bore	N (in)
09	0.25
17	0.25
31	0.31
50	0.38
70	0.44



Straight-Models C4-S (2m), C4X-S (5m)

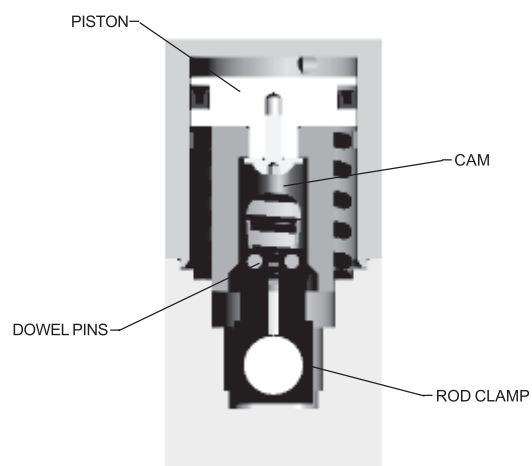
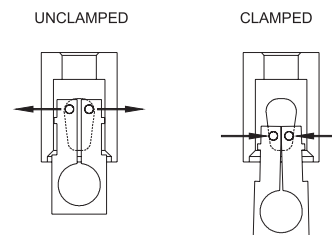
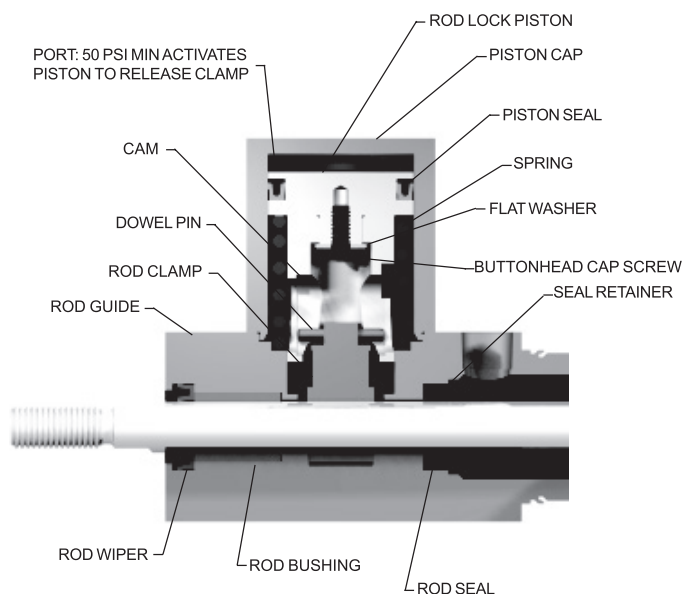


Right Angle-Models C5 (2m), C5X (5m)



PFCL Models

- Dowel pins ride in the cam groove.
- When air pressure is present, piston actuates and dowel pins follow cam to open position, allowing piston rod to travel freely through clamp.
- In absence of pressure, the spring actuates piston and dowels follow to closed position, activating the rod clamp.



Engineering Specifications

Operating Medium:	Air
Operating Pressure:	50 PSI minimum (to actuate lock piston) 125 PSI maximum
Temperature Range:	-20° to 200° F
Lubrication:	HT-99
Cylinder Body:	304 stainless steel
Rod Guide:	Aluminum
Cap:	Anodized aluminum
Piston and Rod Seal:	Buna-N
Rod and Pivot Bushing:	Sintered bronze
Piston Rod:	Hard chrome plated carbon steel
Expected Service Life:	5 million cylinder actuations 1 million lock actuations

*PFC specifications are on pages 464-465.

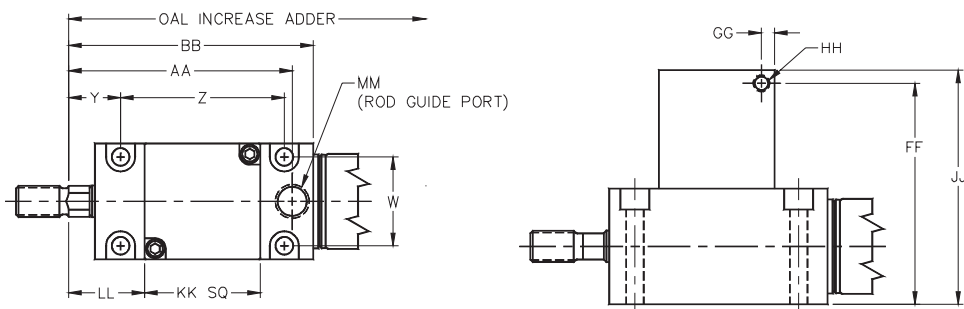
Rod Lock Holding Forces

Bore	Holding Force (lbs)
3/4" (04)	40
1-1/16" (09)	90
1-1/2" (17)	170
2" (31)	310
2-1/2" (50)	500
3" (70)	700

Operating Guidelines/Product Precautions

- The Rod Lock is not a safety device.
- Do not use for intermediate stopping; the cylinder is designed to prevent drift from a stationary position.
- Load weight must not exceed the stated holding force for the cylinder.
- Do not release rod lock if full pressure is present on either extend or retract. Uncontrolled motion will result that could damage internal components or cause personal harm.

Dimensions (PFCL Models)

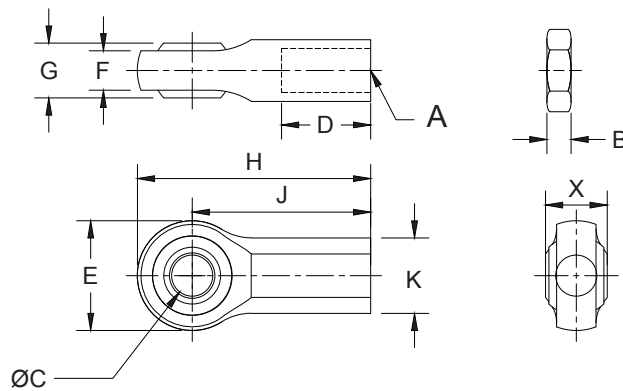


Bore	W	Y	Z	AA	BB	FF	GG	HH	JJ	KK	LL	MM	OAL Increase Adder
1-1/16" (09)	1.06	.62	1.95	2.66	2.91	2.62	.16	#10-32	2.78	1.38	0.90	1/8 NPT	1.08
1-1/2" (17)	1.25	.64	2.75	3.36	3.68	3.13	.25	1/8 NPT	3.38	1.75	1.14	1/4 NPT	1.68
2" (31)	1.62	.82	3.13	3.97	4.34	4.20	.38	1/8 NPT	4.45	2.25	1.26	1/4 NPT	1.94
2-1/2" (50)	1.88	.87	3.62	4.62	5.05	5.34	.33	1/4 NPT	5.67	2.75	1.31	3/8 NPT	2.33
3" (70)	2.25	.90	4.17	5.17	5.59	5.86	.50	1/4 NPT	6.28	3.25	1.35	3/8 NPT	2.69

*All other dimensions are same as the non-contact PFC cylinders.

Accessories (PFC/PFCN)

Rod Eye for Option FT

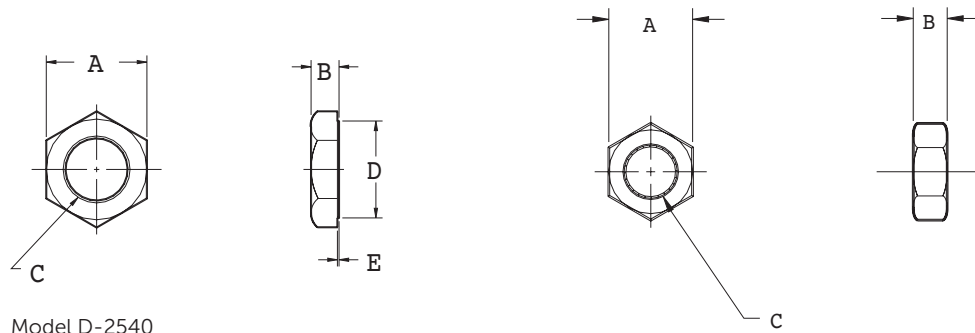


Bore	Model	A	B	C	D	E	F	G	H	J	K	X
1-1/16" (09)	D-117351-A	3/8"-24 THD	0.22	0.375	0.81	1.00	0.36	0.50	2.13	1.63	0.69	0.56
1-1/2" (17)	D-117352-A	7/16"-20 THD	0.25	0.438	0.94	1.13	0.41	0.56	2.38	1.81	0.75	0.63
2" (31)	D-117353-A	1/2"-20 THD	0.31	0.500	1.06	1.31	0.45	0.63	2.78	2.13	0.88	0.75
2-1/2" (50)	D-117354-A	5/8"-18 THD	0.38	0.625	1.38	1.50	0.48	0.75	3.25	2.50	1.00	0.75
3" (70)	D-117354-A	5/8"-18 THD	0.38	0.625	1.38	1.50	0.48	0.75	3.25	2.50	1.00	0.88

Control Units

- SPCS-2 Servo Pneumatic Control Units are described on pages 489-492. Please use the table on page 490 to select the right SPCS products for your applications.

Mounting Nuts

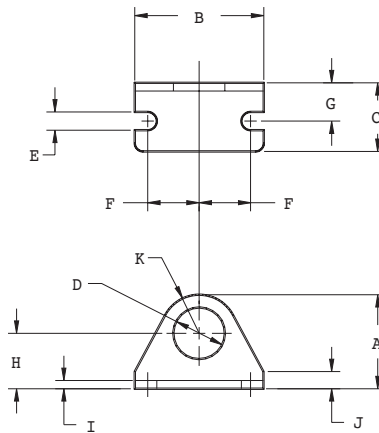


Model D-2540

Models D-2545
D-8484
D-508
D-5379

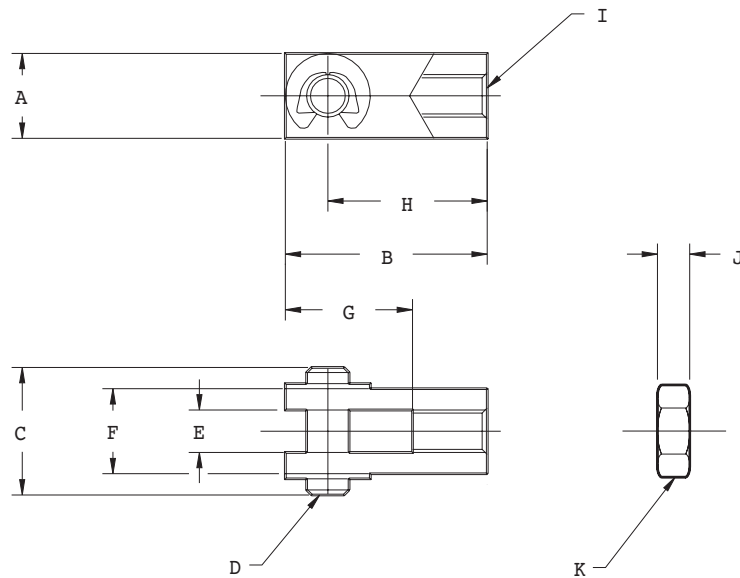
Bore	Model	A	B	C	D	E
1-1/16" (09)	D-2545	1.31	0.48	7/8-14 UNF-2B	N/A	N/A
1-1/2" (17)	D-8484	1.69	0.61	1-1/8-12 UNF-2B	N/A	N/A
2" (31)	D-508	1.88	0.50	1-1/4-12 UNF-2B	1.81	0.03
2-1/2" (50)	D-2540	1.88	0.50	1-3/8-12 UNF-2B	1.81	0.03
3" (70)	D-5379	2.25	0.50	1-1/2-12 UNF-2B	2.25	0.02

Mounting Bracket



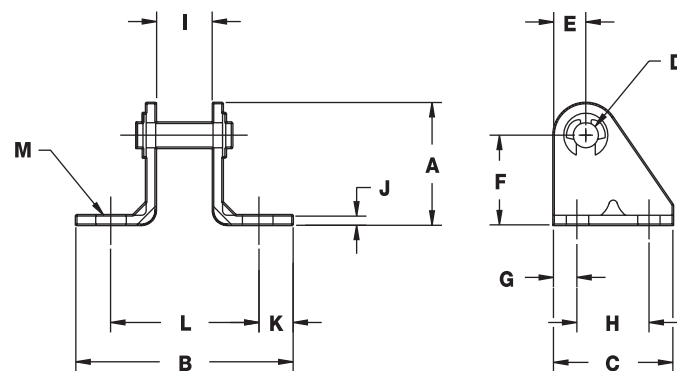
Bore	Model	A	B	C	D	E	F	G	H	I	J
1-1/16" (09)	D-8316	1.75	2.12	1.16	0.875	0.28	0.78	0.66	1.00	0.16	0.32
1-1/2" (17)	D-8318	2.19	2.75	1.44	1.125	0.34	1.06	0.81	1.25	0.19	0.38
2" (31)	D-8319	2.44	3.00	1.59	1.25	0.34	1.19	0.91	1.38	0.22	0.44
2-1/2" (50)	D-8320	2.81	3.75	1.88	1.312	0.41	1.50	1.06	1.62	0.25	0.50
3" (70)	D-19127	3.14	4.38	1.62	1.625	0.34	1.75	1.00	1.89	0.25	0.89

Rod Clevis



Bore	Model	A	B	C	D	E	F	G	H	I	J	K
1-1/16" (09)	D-8310-A	0.62	1.69	0.88	0.312	0.31	0.62	0.94	1.38	3/8-24 THD	0.22	3/8-24 HEX NUT
1-1/2" (17)	D-8311-A	0.75	2.00	1.03	0.375	0.38	0.75	1.12	1.62	7/16-20 THD	0.25	7/16-20 HEX NUT
2" (31)	D-8313-A	0.88	2.31	1.14	0.438	0.44	0.88	1.31	1.88	1/2-20 THD	0.31	1/2-20 HEX NUT
2-1/2" (50) 3" (70)	D-8314-A	1.00	2.75	1.38	0.50	0.50	1.00	1.50	2.25	5/8-18 THD	0.38	5/8-18 HEX NUT

Pivot Bracket

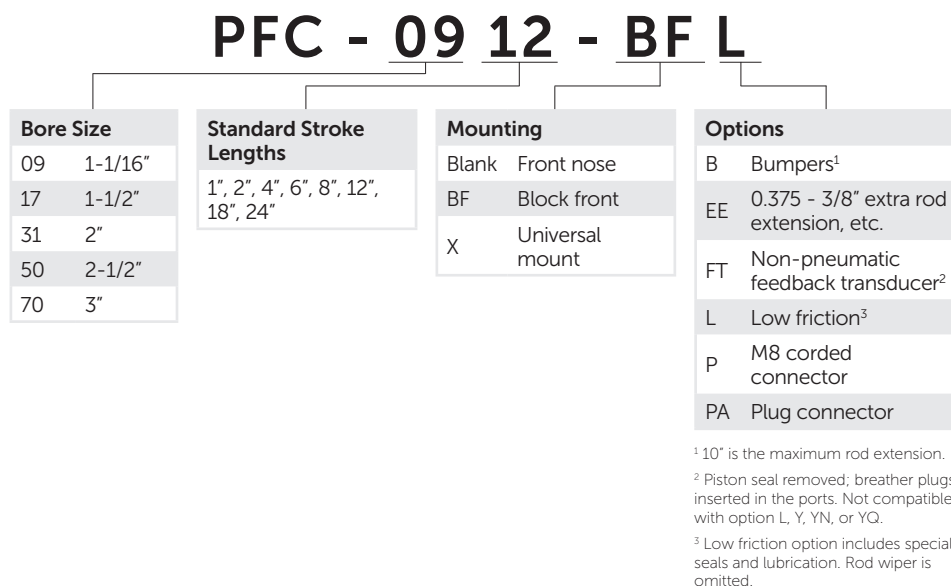


Bore	Model	A	B	C	D	E	F	G	H	I	J	K	L	M
1-1/16" (09)	D-8322-A	1.31	2.38	1.31	0.312	0.31	1.00	0.25	0.81	0.62	0.16	0.31	1.75	0.28
1-1/2" (17)	D-8324-A	1.62	3.00	1.62	0.375	0.38	1.25	0.31	1.00	0.75	0.19	0.44	2.13	0.34
2" (31)	D-8325-A	1.81	3.25	1.81	0.438	0.44	1.38	0.31	1.19	0.88	0.25	0.44	2.38	0.34
2-1/2" (50) 3" (70)	D-8326-A	2.12	4.00	2.12	0.50	0.50	1.62	0.38	1.38	1.00	0.25	0.62	2.75	0.41



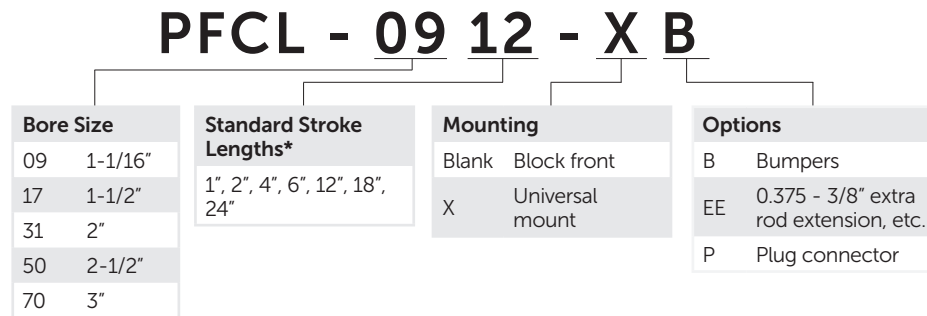
The model number of Position Feedback cylinders consists of an alphanumeric cluster designating product type, bore size, stroke length, mounting style, and other optional components that together make up the complete part number to use in ordering. Use the ordering information below to build a valid part number.

An example of a basic Position Feedback unit with 1-1/16" bore, 12" stroke, block front mount, and additional options is shown below.



The model number of Position Feedback Rod Lock cylinders consists of an alphanumeric cluster designating product type, bore size, stroke length, and other optional components that together make up the complete part number to use in ordering. Use the ordering information below to build a valid part number.

An example of a basic Position Feedback Rod Lock unit with 1-1/16" bore, 12" stroke, and additional options is shown below.



NOTES: Low friction seals on the piston are standard on the PFCL. Rod wiper is included on PFCL to keep out contaminants. Only available in Block Front Mounting on the Rod Guide.