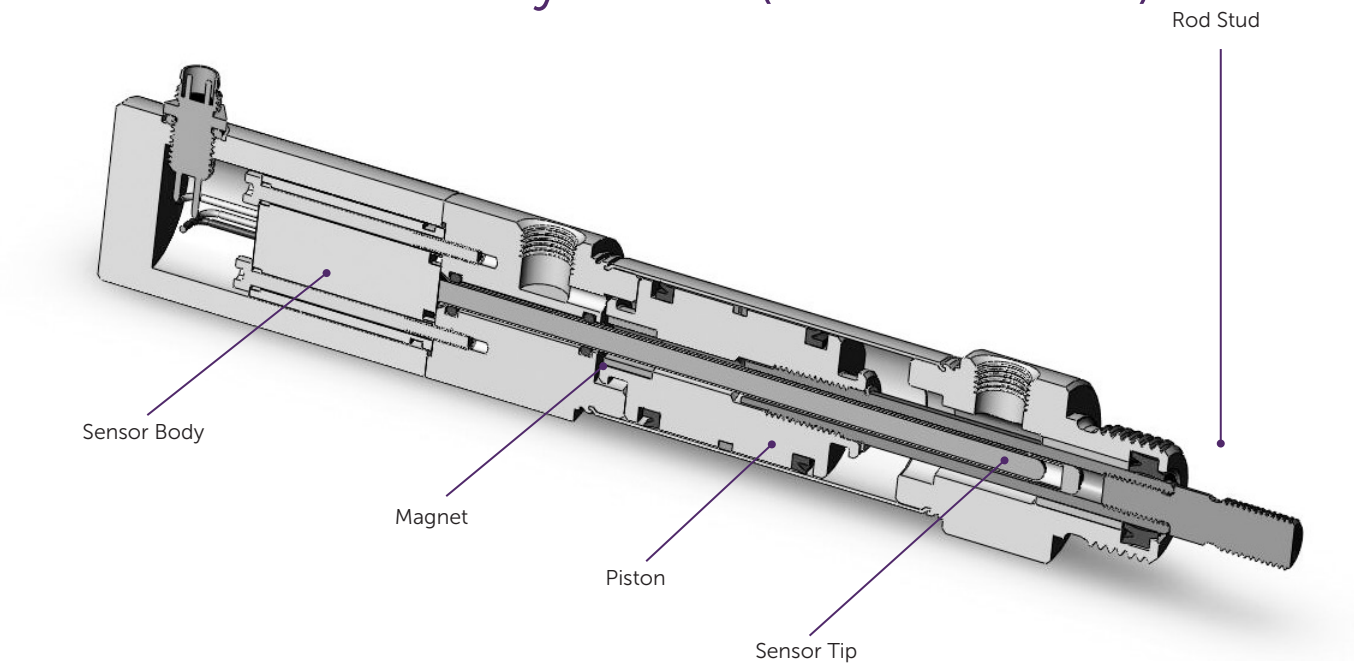
Position Feedback Cylinders (PFCN Models)



The Position Feedback Cylinders Non-Contact (Model PFCN) is similar to the original Model PFC, except it employs a magnetostrictive sensor instead of a LRT. The new technology is ideal for applications that involve dirty or moist environments, rapid oscillation over a small increment of stroke, and vibration. In addition, it is relatively immune to air line contamination. It is calibrated to produce exactly 0 volts fully retracted and 10 volts fully extended. Like our original PFC, it is available with or without a rod lock.

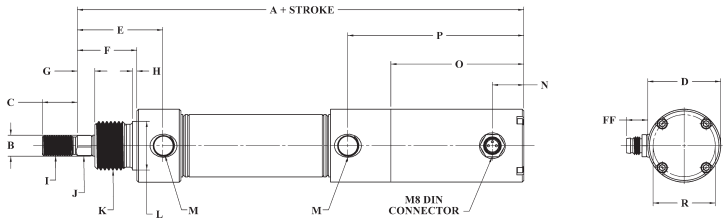
IMI Bimba's Non-Contact Position Feedback Cylinders employ a new magnetostrictive sensor. The sensor tip, fixed inside the cylinder, senses position as a magnet mounted to the piston moves back and forth across the sensor tip's length. This provides many important advantages, and makes the Non-Contact Position Feedback Cylinder the preferred solution for closed-loop pneumatic positioning applications.

Features and Benefits

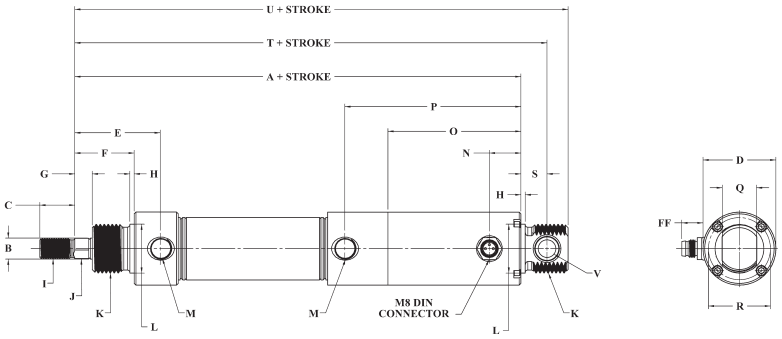
- The PFCN is immune to many of the conditions that deteriorate older technology PFC's, such as the presence of moisture, dirt, dirty air lines, and debris generated as pneumatic products wear, especially at high speeds.
- The PFCN is immune to wear from oscillation back and forth over a narrow range of stroke.
- The PFCN is calibrated for 0 volts fully retracted and 10 volts fully extended for all stroke lengths. Both offset and scale factor are user adjustable. This simplifies installation of multiple cylinders in an application and recalibration of replacement cylinders.
- The PFCN connector is sealed to IP68.
- Avoid applications that subject the non-contact PFC to:
  - Side loads (Guiding is required. For detail on acceptable side loads contact IMI Bimba Technical Support.)
  - High speeds above 10 in/sec with no means to control impact energy at end of stroke
  - High temperatures 200°F
  - Low temperatures below - 20°F
  - High electric or magnetic fields

Mount Dimensions (PFCN Models)

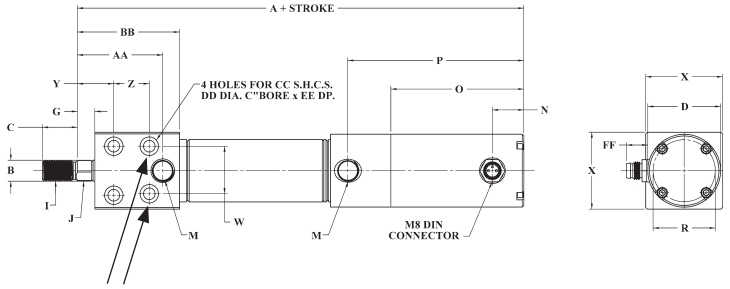
Nose Mount



Universal Mount for stud or pivot (includes bushing)



Block Mount



These two holes are not present on 09 bore only.

Bore	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1-1/16" (09)	7.47	0.38	0.63	1.31	1.54/Option L 1.52	1.06	0.31	0.08	3/8-24 UNF	0.31	7/8-14 UNF	0.87	1/8 NPT	0.56
1-1/2" (17)	7.80	0.50	0.88	1.58	1.72	1.13	0.31	0.09	7/16-20 UNF	0.44	1-1/8-12 UNF	1.12	1/4 NPT	0.56
2" (31)	7.75	0.63	1.00	2.09	2.10	1.38	0.38	0.11	1/2-20 UNF	0.50	1-1/4-12 UNF	1.25	1/4 NPT	0.40
2-1/2" (50)	8.31	0.75	1.25	2.58	2.28	1.50	0.44	0.13	5/8-18 UNF	0.63	1-3/8-12 UNF	1.37	3/8 NPT	0.40
3" (70)	8.62	0.75	1.25	3.13	2.53	1.69	0.44	0.13	5/8-18 UNF	0.63	1-1/2-12 UNF	1.62	3/8 NPT	0.40

Bore	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF
1-1/16" (09)	2.38	3.14	0.62	1.11	0.47	7.94	8.31	0.31	0.88	1.38	0.75	N/A	1.52	1.82	#10	0.33	0.20	0.38
1-1/2" (17)	2.38	3.25	0.74	1.33	0.56	8.36	8.83	0.38	1.25	1.75	0.69	0.75	1.68	2.00	1/4	0.41	0.25	0.38
2" (31)	2.03	2.91	0.86	1.63	0.63	8.38	8.88	0.44	1.44	2.25	0.75	1.00	1.75	2.41	3/8	0.58	0.39	0.38
2-1/2" (50)	2.00	3.03	0.99	2.06	0.75	9.06	9.69	0.50	1.88	2.75	0.88	1.25	2.13	2.72	7/16	0.67	0.45	0.38
3" (70)	2.00	3.03	0.99	2.44	0.81	9.43	10.06	0.50	2.25	3.25	0.94	1.38	2.31	2.91	1/2	0.77	0.52	0.38

Bumper length adder 0.25"

Specifications (PFCN Non-Contact Models)

Positioning error due to temperature		
Microns/°C	Inches/°C	Inches/°F
20	0.000787	0.000437

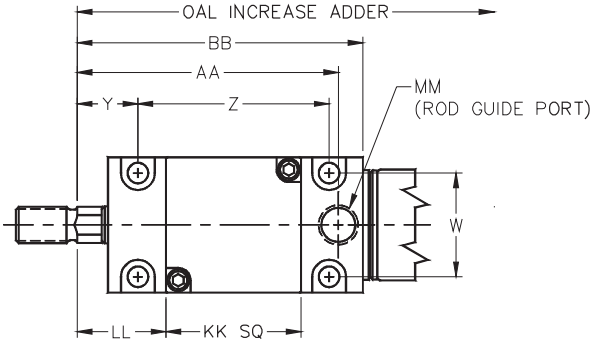
- Operating temperature: -20° to 200° F (-28° to 93° C)
- Accuracy: ± 0.016 inch maximum anywhere along the stroke (calculated value combining Non-Linearity, Repeatability, Hysteresis effects at a constant temperature)
- Non-Linearity: ± 0.011 inch
- Repeatability: ± 0.006 inch
- Signal output: 0 V DC ± 6 mV retracted and 10 V DC ± 6 mV extended, all stroke lengths (into 100 kOhms minimum and 300 pF maximum)
- Excitation (Supply) Voltage: 24 ± 10% V DC (50mA maximum current)
- Maximum end of stroke impact speed: 10 in/sec.
- Rated Life of the Cylinder: 1400 linear miles (at 10 inches/sec, no load, room temperature dry, 5 micron filtered air, continuous cycling)
- Over voltage and reverse polarity protection
- Cylinder RoHs compliant

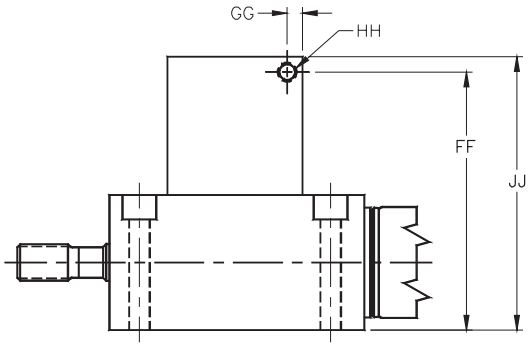
NOTE: The device that digitizes the PFCN feedback output must have an input impedance of at least 100 kOhms.

Estimated Cylinder Weights (lbs)

	1-1/16"	1-1/2"	2"	2-1/2"	3"
PFCN	0.81	1.35	2.48	3.93	5.68
PFCN-X	0.82	1.43	2.59	4.10	5.87
PFCN-BF	0.95	1.57	2.90	4.64	6.79
Adder WT/IN	0.05	0.08	0.14	0.18	0.24

Dimensions (PFCNL Models)





Bore	W	Y	Z	AA	BB	FF	GG	HH	JJ	KK	LL	MM	OAL Increase Adder
1-1/16" (09)	1.06	0.62	1.95	2.66	2.91	2.62	0.16	#10-32	2.78	1.38	0.90	1/8 NPT	1.08
1-1/2" (17)	1.25	0.64	2.75	3.36	3.68	3.13	0.25	1/8 NPT	3.38	1.75	1.14	1/4 NPT	1.68
2" (31)	1.62	0.82	3.13	3.97	4.34	4.20	0.38	1/8 NPT	4.45	2.25	1.26	1/4 NPT	1.94
2-1/2" (50)	1.88	0.87	3.62	4.62	5.05	5.34	0.33	1/4 NPT	5.67	2.75	1.31	3/8 NPT	2.33
3" (70)	2.25	0.90	4.17	5.17	5.59	5.86	0.50	1/4 NPT	6.28	3.25	1.35	3/8 NPT	2.69

NOTE: All other dimensions are same as the non-contact PFCN cylinders.

Accessories (PFCN Models)

Bore	Mounting Nut	Mounting Bracket	Rod Clevis	Pivot Bracket
1-1/16" (09)	D-2545	D-8316	D-8310-A	D-8322-A
1-1/2" (17)	D-8484	D-8318	D-8311-A	D-8324-A
2" (31)	D-508	D-8319	D-8313-A	D-8325-A
2-1/2" (50)	D-2540	D-8320	D-8314-A	D-8326-A
3" (70)	D-5379	D-19127	D-8314-A	D-8326-A

Controllers

– 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.

Cables (for connection to standard plug connector)

Model	Description
C4-S	Straight Female Shielded Cord Set IP67, 2m
C4X-S	Straight Female Shielded Cord Set IP67, 5m
C5-S	Right Angle Female Shielded Cord Set IP67, 2m
C5X-S	Right Angle Female Shielded Cord Set IP67, 5m
SPCS-CBL-PWR-CMD	SPCS Quick Connect, Female/Strip Wire, 2m
SPCS-CBL-FBK	SPCS Female Connector, Both Ends, 2m
SPCS-USB-CBL	SPCS USB Setup Cable, 2m

The model number of Non-Contact 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 Non-Contact Position Feedback unit with 2" bore, 6" stroke, universal mount, and additional options is shown below.

PFCN - 31 6 - X L

Bore Size	
09	1-1/16"
17	1-1/2"
31	2"
50	2-1/2"
70	3"

Standard Stroke Lengths*
1", 2", 3", 4", 5", 6", 7", 8", 9", etc.

* 0.5" increments, 1" minimum.

Mounting	
Blank	Front nose
BF	Block front
X	Universal mount

Options	
B	Bumpers[1]
EE	0.375 - 3/8" extra rod extension, etc.
L	Low friction[2]

[1] Bumpers (used to control end of stroke impact) will lengthen the time required for the piston to settle into position at end of stroke as they slowly compress.

[2] Low friction option includes special seals and lubrication.

Approximate Power Factors		
1-1/16"	=	0.9
1-1/2"	=	1.7
2"	=	3.1
2-1/2"	=	5.0
3"	=	7.0

For example, a PFCN-096-BF will exert a force of 0.9 times the air lines pressure; a PFCN-506-XB will exert a force of 5.0 times the air line pressure.

The model number of Non-Contact Position Feedback Rod Lock cylinders consists of an alphanumeric cluster designating product type, bore size, stroke length, mounting styles, 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 Non-Contact PFC Rod Lock unit with 3" bore, 3" stroke, universal mount, and additional options is shown below.

PFCNL - 70 3 - X B

Bore Size	
09	1-1/16"
17	1-1/2"
31	2"
50	2-1/2"
70	3"

Standard Stroke Lengths*
1", 2", 3", 4", 5", 6", 7", 8", 9", etc.

* 0.5" increments, 0.5" minimum.

Mounting	
Blank	Block front
X	Universal mount

Options	
B	Bumpers
EE	0.375 - 3/8" extra rod extension, etc.