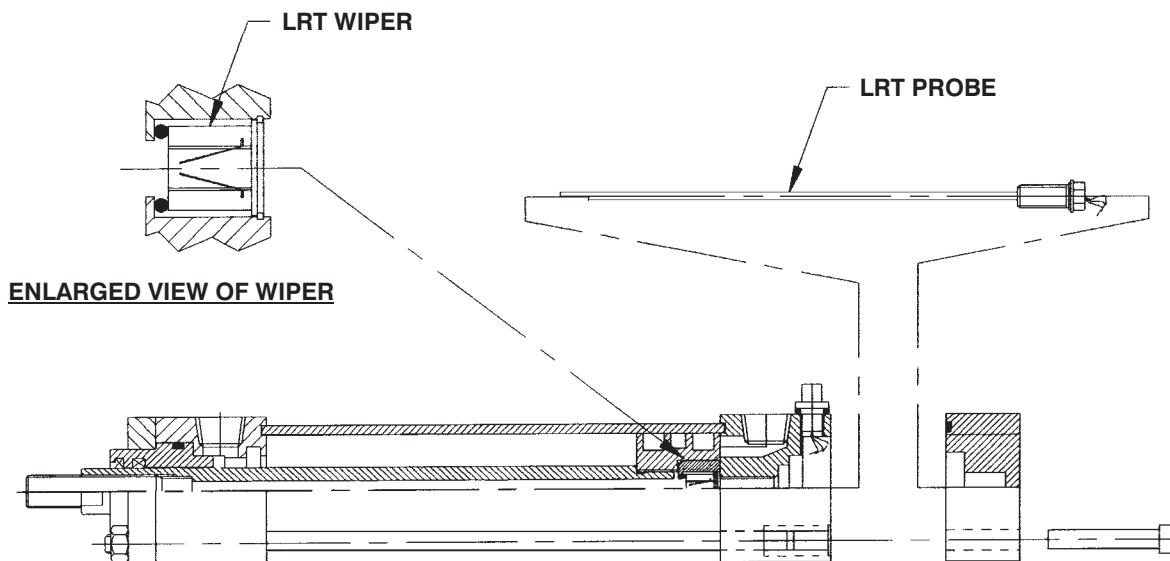


POSITION FEEDBACK LOW FRICTION CYLINDER

"HOW IT WORKS"



The 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. The resulting voltage is directed externally via wiring. The output voltage is proportional to the wiper position on the resistive element, which allows the cylinder position to be determined.

For example, in a 12-inch stroke cylinder, if the output voltage is 0 VDC when fully retracted and 10 VDC when fully extended, voltage readings of 2.5 and 5.833 VDC would indicate cylinder extensions of 3 inches and 7 inches.

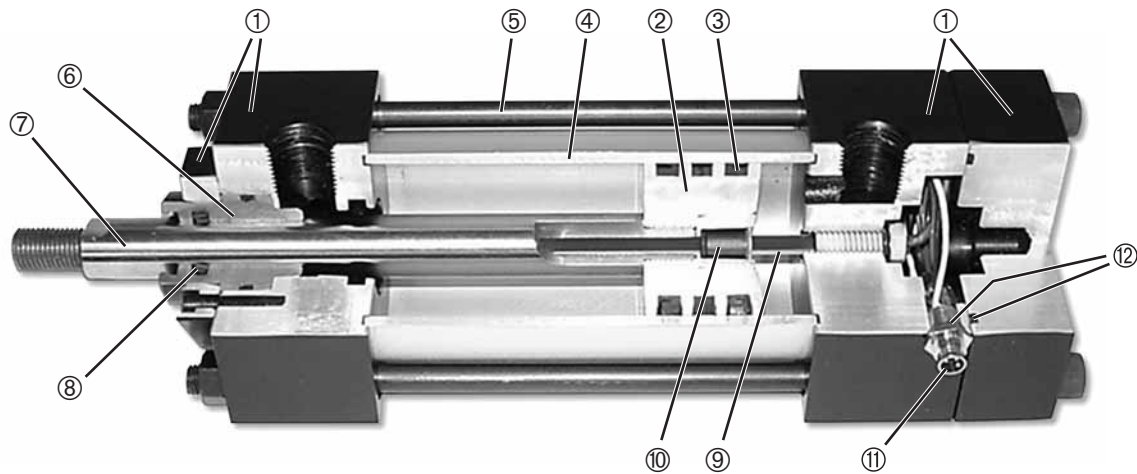
The accuracy of an LRT is determined by three factors: resolution, linearity and repeatability.

Resolution refers to the smallest change that can be detected on the LRT. The 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 equal parts. When 10 VDC is 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, i.e., the longer the stroke, the less resolution.

Linearity refers to the maximum deviation of the output voltage to a straight line. The 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 TRD Position Feedback Cylinder is $\pm 0.001"$.

POSITION FEEDBACK LOW FRICTION (PFLF) CYLINDER "CONSTRUCTION"



- ① **HEAD, CAP & RETAINER** – Precision machined from high strength 6061-T6 aluminum alloy. Black anodized for corrosion resistance.
- ② **PISTON** – Precision machined from high strength aluminum alloy for light weight and extended cycle life.
- ③ **PISTON SEALS** – Seals are low friction and packed with special low friction non-migrating Teflon® based grease for permanent lubrication. Lip seals are pressure activated and wear compensating.
- ④ **CYLINDER TUBE** – Precision machined from 6063-T832 high tensile aluminum alloy and hard coat to 60 Rc for wear resistance and extended cycle life.
- ⑤ **TIE RODS** – Prestressed tie rod construction eliminates axial loading of cylinder tube and maintains compression on tube end seals.
- ⑥ **BEARING** – Precision machined from graphite filled cast iron and Teflon® coated to reduce friction and extend cycle life. Design allows increased lubrication in effective bearing area.
- ⑦ **PISTON ROD** – Precision machined from high yield, polished and chrome plated steel.
- ⑧ **ROD SEAL** – Seals are low friction and packed with special low friction non-migrating Teflon® based grease for permanent lubrication. Lip seals are pressure activated and wear compensating. (**Rod wiper is omitted unless requested** - see options note on performance).
- ⑨ **LINEAR RESISTIVE TRANSDUCER (LRT) PROBE** – The LRT probe is an anodized aluminum probe with Delrin® threaded flange, o-ring and back-up washer. The probe has infinite resolution, nonlinearity of ± 1 percent of full stroke and a rated life of 10 million cycles. Typical probe input is 10 VDC, input impedance required is 1 Mohm with a temperature rating of 0° to +200 °F.
- ⑩ **LINEAR RESISTIVE TRANSDUCER (LRT) WIPER** – The LRT wiper is completely assembled precision molded assembly with a rated life of 1000 linear miles.
- ⑪ **(3) PIN CONNECTOR** - This connector is supplied on all PFLF cylinders. The connector has a universal 8mm (3) pin DIN male connection.
- ⑫ **O-RINGS** - To provide a positive seal to prevent any contaminants or liquids from entering cylinder cavity and affecting cylinder performance.

FEATURES OF THE PFLF CYLINDER

- Continuous Position Sensing
- Highly Accurate: Infinite resolution, linearity of ± 1 percent of full stroke, $\pm .001$ " mechanical repeatability
- Strokes up to 24"
- Easily Repairable
- Electronic Controllers available for dual set point and scalable analog output applications
- Closed Loop Pneumatic Control Systems (PCS) available for 1½" thru 4" bores
- Permanently Lubricated seals
- Quick Connect (IP67) Standard on all models

NEW 3 YEAR WARRANTY

TRD Manufacturing Incorporated, A Bimba Company, is an employee owned company. We take great pride in our products. TRD Manufacturing, Inc. warrants its cylinders for a full 3 years to be free from defects in material and workmanship. TRD Manufacturing, Inc. must be notified prior to returning product for warranty evaluation. Contact your local TRD distributor to obtain an RGA (Returned Goods Authorization Number) for proper tracking and expedite service on all warranty evaluations. TRD will repair or replace free of charge any products returned to the factory within 3 years of shipment that is proven to be defective in material and/or workmanship.

A complete explanation of defects is required with the returned product. The TRD warranty applies only to products used properly and under normal operating conditions. All products are to be used in a safe manner, in properly designed systems. Safeguards to prevent personal injury or equipment damage must be used and are the sole responsibility of the user.

In no event shall TRD Manufacturing, Inc. be liable for any consequential damages or installation costs resulting from delay or failure of delivery, defective material or workmanship or out of a breach by TRD Manufacturing, Inc. of any contract.

POSITION FEEDBACK LOW FRICTION CYLINDER

"HOW TO ORDER"

PFLF - MS4 - 4 X 10 - KK3 - MPR

SERIES	
PFLF	ANODIZED ALUMINUM

STROKE
2" - 24" (1½" - 2½")
3" - 24" (3¼" - 8")

BORE
1½", 2", 2½", 3 ¼"
4", 5", 6" & 8"

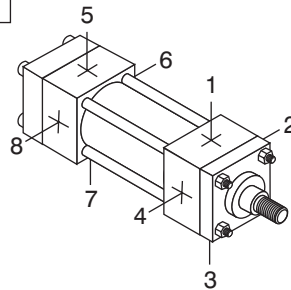
NFPA MOUNTS	
MX0	NO MOUNT
MP1	REAR PIVOT CLEVIS (1½" - 8" BORE)
MP2	REAR PIVOT CLEVIS (1½" - 6" BORE)
MP4	REAR PIVOT EYE (1½" - 4" BORE)
MT1	FRONT TRUNNION (1½" - 8" BORE)
MT2	REAR TRUNNION (1½" - 8" BORE)
MT4	INTERMEDIATE TRUNNION (1½" - 8" BORE)
MX3	EXTENDED TIE-RODS (HEAD) (1½" - 8" BORE)
MF1	FRONT FLANGE (1½" - 6" BORE)
MF2	REAR FLANGE (1½" - 6" BORE)
ME3	FRONT MOUNTING HOLES (8" BORE)
MS1	FRONT & REAR END FOOT (1½" - 8" BORE)
MS2	SIDE LUG (1½" - 4" STD., 5" - 8" CONSULT FACTORY)
MS4	BOTTOM TAPPED HOLES (1½" - 8" BORE)

OPTIONS	
B*	¼" BUMPERS BOTH ENDS
BH*	¼" BUMPER HEAD END
BC*	¼" BUMPER CAP END
"A" =	EXTENDED PISTON ROD THREAD (SPECIFY)
"C" =	EXTENDED PISTON ROD (SPECIFY)
EN	ELECTROLESS NICKEL PLATED
KK2	LARGE MALE ROD THREAD
KK3	FEMALE ROD THREAD
KK4	FULL DIAMETER MALE ROD THREAD
MPR	MAGNETIC PISTON FOR REED SWITCHES
MPH	MAGNETIC PISTON FOR HALL SWITCHES
OP	OPTIONAL PORT LOCATION (SPECIFY)
XX=	SPECIAL VARIATIONS (SPECIFY)

* URETHANE BUMPERS ADD ¼" PER END OF CYLINDER

STANDARD PORT POSITIONS AND FEEDBACK CABLE CONNECTOR POSITION

- STANDARD PORT POSITIONS @ 1 AND 5
- STANDARD CABLE CONNECTOR POSITION 6
- SPECIFY NON-STANDARD LOCATIONS WHEN ORDERING



OPTIONS AVAILABLE BUT NOT RECOMMENDED (WILL AFFECT CYLINDER PERFORMANCE)	
H	HEAD CUSHION
MS	METALLIC ROD SCRAPER
RW	ROD WIPER

PFLF MOUNTS

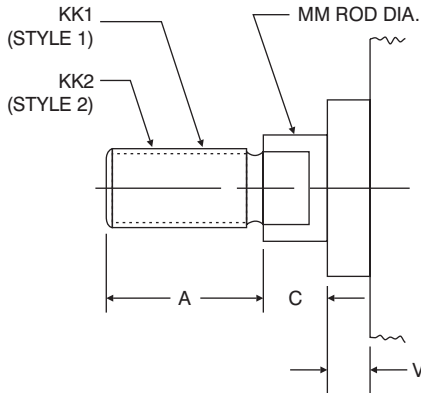
 MX0 1½"-8" Bores Page 6	 MS4 1½"-8" Bores Page 7	 MP1 1½"-8" Bores Page 7	 MP2 1½"-6" Bores Page 7	 MP4 1½"-4" Bores Page 7
 MT1 1½"-8" Bores Page 8	 MT2 1½"-8" Bores Page 8	 MT4 1½"-8" Bores Page 8	 MF1 1½"-6" Bores Page 9	 MF2 1½"-6" Bores Page 9
 MX3 1½"-8" Bores Page 9	 MS1 1½"-8" Bores Page 10	 MS2 1½"-4" Bores Consult factory for larger size. Page 10	 ME3 8" Bore Page 10	

POSITION FEEDBACK LOW FRICTION CYLINDER

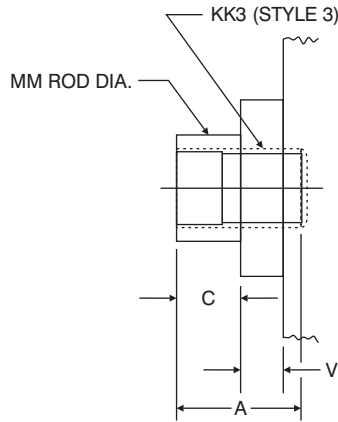
"DIMENSIONS"

PISTON ROD END STYLES

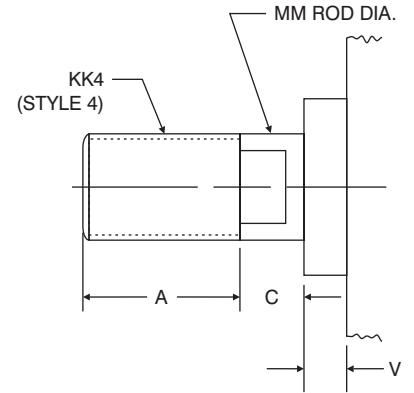
STYLE 1 & 2
KK1 & KK2



STYLE 3*
KK3

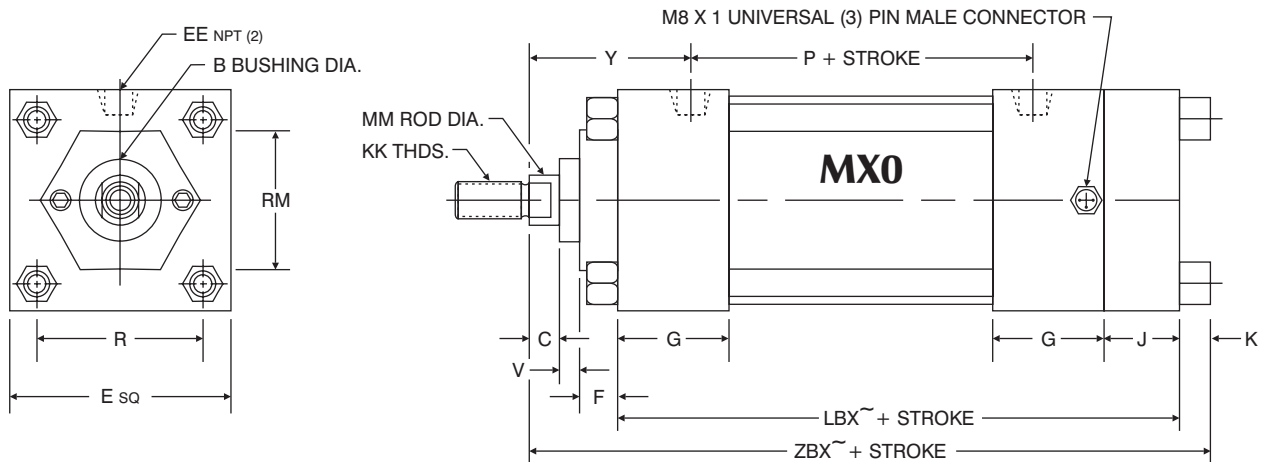


STYLE 4
KK4



BORE	MM ROD DIAMETER	STANDARD		OPTIONAL				C	V		
		Style 1 - Male	Style 2 - Male	Style 3 - Female	Style 4 - Male	KK1	A			KK2	A
1½, 2, 2½	5/8 STANDARD	7/16-20	¾	½-20	¾	7/16-20	¾	5/8-18	¾	3/8	¼
¾, 4, 5	1 STANDARD	¾-16	1 1/8	7/8-14	1 1/8	¾-16	1 1/8	1-14	1 1/8	½	¼
6 & 8	1 3/8 STANDARD	1-14	1 5/8	1¼-12	1 5/8	1-14	1 5/8	1 3/8-12	1 5/8	5/8	3/8

*KK (Style 3 - Female) will have a recessed plug due to thru hole in rod.



'MX0' PFLF CYLINDER DIMENSIONS

Standard Rod Diameters only

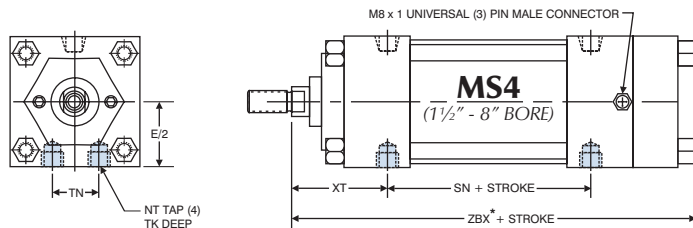
BASIC DIMENSIONS 'MX0' PFLF CYLINDERS (STANDARD ROD DIAMETERS)																			
BORE	ROD DIAMETER	A	B	C	E	EE	F	G	J	K	KK	LBX~	MM	P	R	RM	V	Y	ZBX~
1½	5/8 STANDARD	¾	1 1/8	3/8	2	3/8	3/8	1½	1	¼	7/16-20	5 1/8	5/8	2 3/8	1.43	2 SQ.	¼	1 7/8	6 3/8~
2	5/8 STANDARD	¾	1 1/8	3/8	2½	3/8	3/8	1½	1	5/16	7/16-20	5 1/8	5/8	2 3/8	1.84	1¼ HEX	¼	1 7/8	6 7/16~
2½	5/8 STANDARD	¾	1 1/8	3/8	3	3/8	3/8	1½	1	5/16	7/16-20	5¼	5/8	2½	2.19	1¼ HEX	¼	1 7/8	6 9/16~
¾	1 STANDARD	1 1/8	1½	½	3¾	½	5/8	1¾	1¼	3/8	¾-16	6	1	2¾	2.76	2¾*	¼	2 3/8	7¾~
4	1 STANDARD	1 1/8	1½	½	4½	½	5/8	1¾	1¼	3/8	¾-16	6	1	2¾	3.32	2¾*	¼	2 3/8	7¾~
5	1 STANDARD	1 1/8	1½	½	5½	½	5/8	1¾	1¼	½	¾-16	6¼	1	3	4.10	2¾*	¼	2 3/8	8 1/8~
6	1 3/8 STANDARD	1 5/8	2	5/8	6½	¾	5/8	2	1½	½	1-14	7	1 3/8	3¼	4.88	3½*	3/8	2¾	9 1/8~
8	1 3/8 STANDARD	1 5/8	2	5/8	8½	¾	5/8	2	1½	5/8	1-14	7 1/8	1 3/8	3 3/8	6.44	3½*	3/8	2¾	9 3/8~

* RM dimension is round retainer diameter

~ NON NFPA Dimensions

POSITION FEEDBACK LOW FRICTION CYLINDER

"DIMENSIONS"

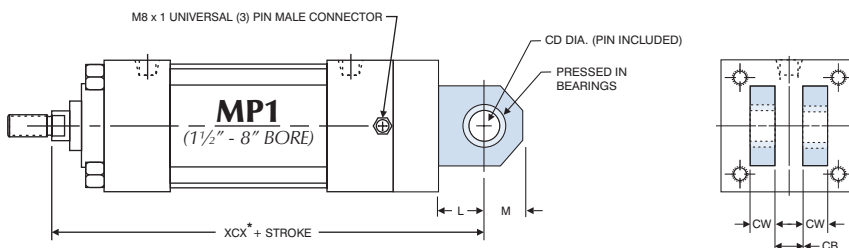


'MS4' PFLF CYLINDER DIMENSIONS

Standard Rod Diameters only

BORE	ROD DIAMETER	E/2	NT	TK	TN	XT	ADD STROKE	
							SN	ZBX*
1 1/2	5/8 STANDARD	1	1/4-20	3/8	5/8	1 15/16	2 1/4	6 3/8
2	5/8 STANDARD	1 1/4	5/16-18	1/2	7/8	1 15/16	2 1/4	6 7/16
2 1/2	5/8 STANDARD	1 1/2	3/8-16	5/8	1 1/4	1 15/16	2 3/8	6 9/16
3 1/4	1 STANDARD	1 7/8	1/2-13	3/4	1 1/2	2 7/16	2 5/8	7 3/4
4	1 STANDARD	2 1/4	1/2-13	3/4	2 1/16	2 7/16	2 5/8	7 3/4
5	1 STANDARD	2 3/4	5/8-11	1	2 11/16	2 7/16	2 7/8	8 1/8
6	1 3/8 STANDARD	3 1/4	3/4-10	1 1/8	3 1/4	2 13/16	3 1/8	9 1/8
8	1 3/8 STANDARD	4 1/4	3/4-10	1 1/8	4 1/2	2 13/16	3 1/4	9 3/8

NOTE: All cylinder dimensions not shown are standard 'MX0' cylinder dimensions.



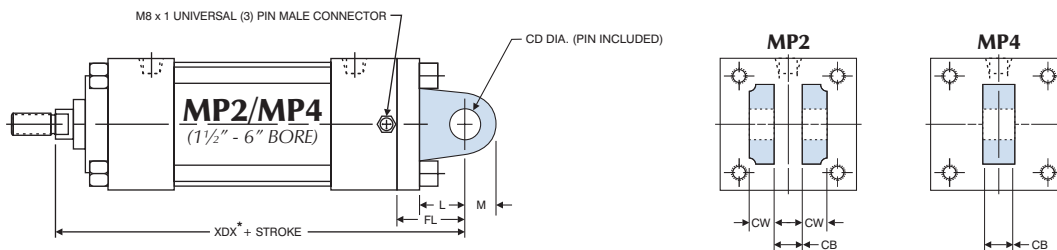
'MP1' PFLF CYLINDER DIMENSIONS

Standard Rod Diameters only

BORE	ROD DIAMETER	CB	CD	CW	L	M	ADD STROKE
							XCX*
1 1/2	5/8 STANDARD	3/4	1/2	1/2	3/4	5/8	6 7/8
2	5/8 STANDARD	3/4	1/2	1/2	3/4	5/8	6 7/8
2 1/2	5/8 STANDARD	3/4	1/2	1/2	3/4	5/8	7
3 1/4	1 STANDARD	1 1/4	3/4	5/8	1 1/4	7/8	8 5/8
4	1 STANDARD	1 1/4	3/4	5/8	1 1/4	7/8	8 5/8
5	1 STANDARD	1 1/4	3/4	5/8	1 1/4	7/8	8 7/8
6	1 3/8 STANDARD	1 1/2	1	3/4	1 1/2	1	10 1/8
8	1 3/8 STANDARD	1 1/2	1	3/4	1 1/2	1	10 1/4

NOTE: All cylinder dimensions not shown are standard 'MX0' cylinder dimensions.

NOTE:
1 1/2" & 2" bore MP1 extruded mounts are thru tie rod construction, 2 1/2" bore and larger the rear MP1 cap is bolted on.



'MP2' & 'MP4' CAST PFLF CYLINDER DIMENSIONS

Standard Rod Diameters only

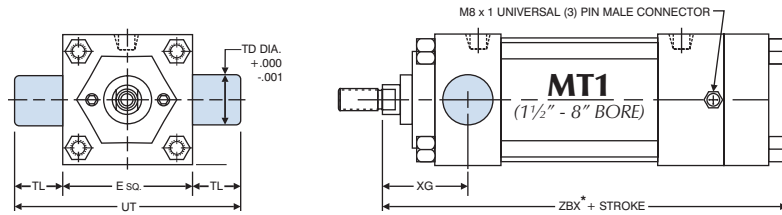
BORE	ROD DIAMETER	CB	CD	CW	L	M	FL	ADD STROKE
								XDX*
1 1/2	5/8 STANDARD	3/4	1/2	1/2	3/4	5/8	1 1/8	6 1/4
2	5/8 STANDARD	3/4	1/2	1/2	3/4	5/8	1 1/8	6 1/4
2 1/2	5/8 STANDARD	3/4	1/2	1/2	3/4	5/8	1 1/8	6 3/8
3 1/4	1 STANDARD	1 1/4	3/4	5/8	1 1/4	7/8	1 7/8	8
4	1 STANDARD	1 1/4	3/4	5/8	1 1/4	7/8	1 7/8	8
5	1 STANDARD	1 1/4	3/4	5/8	1 1/4	7/8	1 7/8	8 1/4
6	1 3/8 STANDARD	1 1/2	1	3/4	1 1/2	1	2 1/4	9 3/8

NOTE: All cylinder dimensions not shown are standard 'MX0' cylinder dimensions.

NOTE:
MP4 CAST MOUNT not available for 5" & 6" bores. Special WELDED MOUNTS are available. Consult factory for more information.

POSITION FEEDBACK LOW FRICTION CYLINDER

"DIMENSIONS"

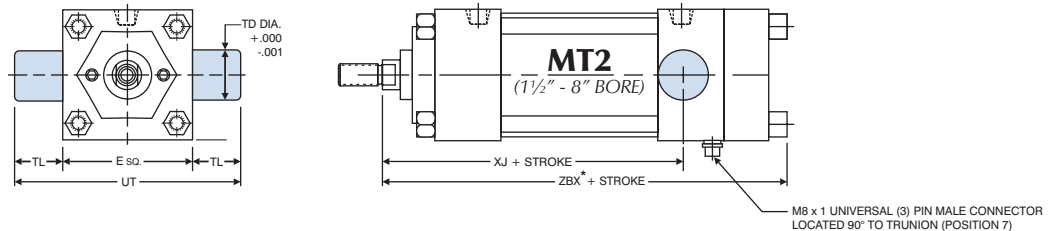


'MT1' PFLF CYLINDER DIMENSIONS

Standard Rod Diameters only

BORE	ROD DIAMETER	E	TD	TL	UT	XG	ADD STROKE ZBX*
1 1/2	5/8 STANDARD	2	1	1	4	1 3/4	6 3/8
2	5/8 STANDARD	2 1/2	1	1	4 1/2	1 3/4	6 7/16
2 1/2	5/8 STANDARD	3	1	1	5	1 3/4	6 9/16
3 1/4	1 STANDARD	3 3/4	1	1	5 3/4	2 1/4	7 3/4
4	1 STANDARD	4 1/2	1	1	6 1/2	2 1/4	7 3/4
5	1 STANDARD	5 1/2	1	1	7 1/2	2 1/4	8 1/8
6	1 3/8 STANDARD	6 1/2	1 3/8	1 3/8	9 1/4	2 5/8	9 1/8
8	1 3/8 STANDARD	8 1/2	1 3/8	1 3/8	11 1/4	2 5/8	9 3/8

NOTE: All cylinder dimensions not shown are standard 'MX0' cylinder dimensions.

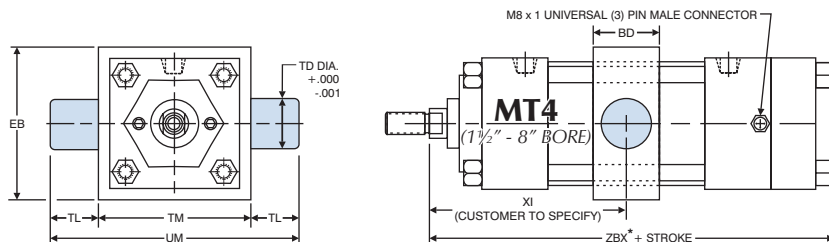


'MT2' PFLF CYLINDER DIMENSIONS

Standard Rod Diameters only

BORE	ROD DIAMETER	E	TD	TL	UT	XJ	ADD STROKE ZBX*
1 1/2	5/8 STANDARD	2	1	1	4	4 1/8	6 3/8
2	5/8 STANDARD	2 1/2	1	1	4 1/2	4 1/8	6 7/16
2 1/2	5/8 STANDARD	3	1	1	5	4 1/4	6 9/16
3 1/4	1 STANDARD	3 3/4	1	1	5 3/4	5	7 3/4
4	1 STANDARD	4 1/2	1	1	6 1/2	5	7 3/4
5	1 STANDARD	5 1/2	1	1	7 1/2	5 1/4	8 1/8
6	1 3/8 STANDARD	6 1/2	1 3/8	1 3/8	9 1/4	5 7/8	9 1/8
8	1 3/8 STANDARD	8 1/2	1 3/8	1 3/8	11 1/4	6	9 3/8

NOTE: All cylinder dimensions not shown are standard 'MX0' cylinder dimensions.



'MT4' PFLF CYLINDER DIMENSIONS

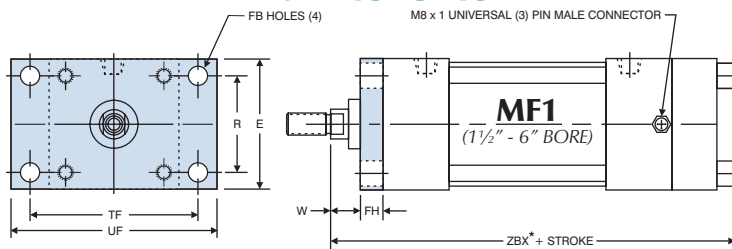
Standard Rod Diameters only

BORE	ROD DIAMETER	BD	EB	TD	TL	TM	UM	XI	ADD STROKE ZBX*
1 1/2	5/8 STANDARD	1 1/4	2 1/2	1	1	2 1/2	4 1/2	CUSTOMER TO SPECIFY	6 3/8
2	5/8 STANDARD	1 1/2	3	1	1	3	5		6 7/16
2 1/2	5/8 STANDARD	1 1/2	3 1/2	1	1	3 1/2	5 1/2		6 9/16
3 1/4	1 STANDARD	2	4 1/4	1	1	4 1/2	6 1/2		7 3/4
4	1 STANDARD	2	5	1	1	5 1/4	7 1/4		7 3/4
5	1 STANDARD	2	6	1	1	6 1/4	8 1/4		8 1/8
6	1 3/8 STANDARD	2	7	1 3/8	1 3/8	7 5/8	10 3/8		9 1/8
8	1 3/8 STANDARD	2 1/2	9 1/2	1 3/8	1 3/8	9 3/4	12 1/2		9 3/8

NOTE: All cylinder dimensions not shown are standard 'MX0' cylinder dimensions.

POSITION FEEDBACK LOW FRICTION CYLINDER

"DIMENSIONS"

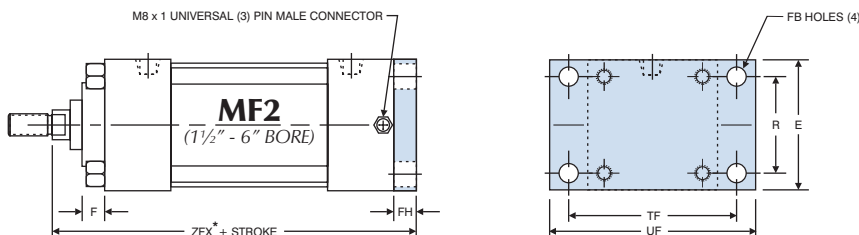


'MF1' PFLF CYLINDER DIMENSIONS

Standard Rod Diameters only

BORE	ROD DIAMETER	E	FB	FH	R	TF	UF	W	ADD STROKE*
									ZBX*
1 1/2	5/8 STANDARD	2	5/16	3/8	1.43	2 3/4	3 3/8	5/8	6 3/8
2	5/8 STANDARD	2 1/2	3/8	3/8	1.84	3 3/8	4 1/8	5/8	6 7/16
2 1/2	5/8 STANDARD	3	3/8	3/8	2.19	3 7/8	4 5/8	5/8	6 9/16
3 1/4	1 STANDARD	3 3/4	7/16	5/8	2.76	4 11/16	5 1/2	3/4	7 3/4
4	1 STANDARD	4 1/2	7/16	5/8	3.32	5 7/16	6 1/4	3/4	7 3/4
5	1 STANDARD	5 1/2	9/16	5/8	4.10	6 5/8	7 5/8	3/4	8 1/8
6	1 3/8 STANDARD	6 1/2	9/16	3/4	4.88	7 5/8	8 5/8	7/8	9 1/8

NOTE: All cylinder dimensions not shown are standard 'MX0' cylinder dimensions.

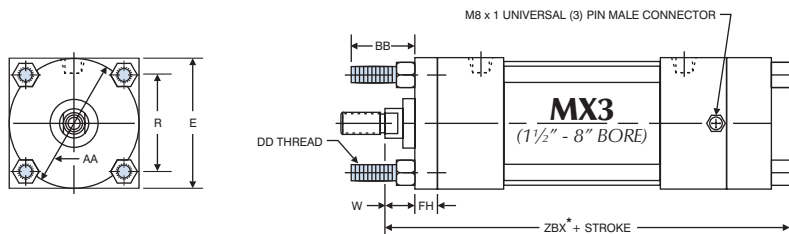


'MF2' PFLF CYLINDER DIMENSIONS

Standard Rod Diameters only

BORE	ROD DIAMETER	E	FB	FH	R	TF	UF	F	ADD STROKE*
									ZFX*
1 1/2	5/8 STANDARD	2	5/16	3/8	1.43	2 3/4	3 3/8	3/8	5 1/2
2	5/8 STANDARD	2 1/2	3/8	3/8	1.84	3 3/8	4 1/8	3/8	5 1/2
2 1/2	5/8 STANDARD	3	3/8	3/8	2.19	3 7/8	4 5/8	3/8	5 5/8
3 1/4	1 STANDARD	3 3/4	7/16	5/8	2.76	4 11/16	5 1/2	5/8	6 3/4
4	1 STANDARD	4 1/2	7/16	5/8	3.32	5 7/16	6 1/4	5/8	6 3/4
5	1 STANDARD	5 1/2	9/16	5/8	4.10	6 5/8	7 5/8	5/8	7
6	1 3/8 STANDARD	6 1/2	9/16	3/4	4.88	7 5/8	8 5/8	5/8	7 7/8

NOTE: All cylinder dimensions not shown are standard 'MX0' cylinder dimensions.



'MX3' PFLF CYLINDER DIMENSIONS

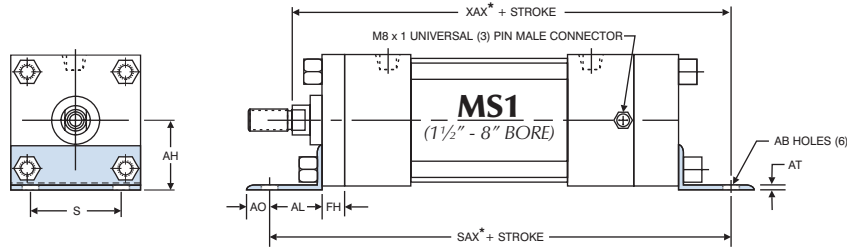
Standard Rod Diameters only

BORE	ROD DIAMETER	E	FH	R	AA	BB	DD	W	ADD STROKE*
									ZBX*
1 1/2	5/8 STANDARD	2	3/8	1.43	2.02	1	1/4-28	5/8	6 3/8
2	5/8 STANDARD	2 1/2	3/8	1.84	2.6	1 1/8	5/16-24	5/8	6 7/16
2 1/2	5/8 STANDARD	3	3/8	2.19	3.1	1 1/8	5/16-24	5/8	6 9/16
3 1/4	1 STANDARD	3 3/4	5/8	2.76	3.9	1 3/8	3/8-24	3/4	7 3/4
4	1 STANDARD	4 1/2	5/8	3.32	4.7	1 3/8	3/8-24	3/4	7 3/4
5	1 STANDARD	5 1/2	5/8	4.10	5.8	1 13/16	1/2-20	3/4	8 1/8
6	1 3/8 STANDARD	6 1/2	3/4	4.88	6.9	1 13/16	1/2-20	7/8	9 1/8
8	1 3/8 STANDARD	8 1/2	5/8**	6.44	9.1	2 5/16**	5/8-18	1 5/8	9 3/8

NOTE: All cylinder dimensions not shown are standard 'MX0' cylinder dimensions.

** 8" bore has round retainer, not a full square retainer as smaller bores.
"BB" dimension is from head.

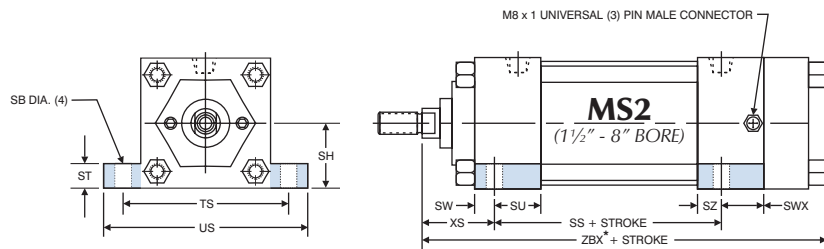
POSITION FEEDBACK LOW FRICTION CYLINDER "DIMENSIONS"



'MS1' PFLF CYLINDER DIMENSIONS Standard Rod Diameters only

BORE	ROD DIAMETER	AB	AH	AL	AO	AT	FH	S	ADD STROKE	
									SAX*	XAX*
1 1/2	5/8 STANDARD	7/16	1 3/16	1	3/8	1/8	3/8	1 1/4	7 1/2	7 1/8
2	5/8 STANDARD	7/16	1 7/16	1	3/8	1/8	3/8	1 3/4	7 1/2	7 1/8
2 1/2	5/8 STANDARD	7/16	1 5/8	1	3/8	1/8	3/8	2 1/4	7 5/8	7 1/4
3 1/4	1 STANDARD	9/16	1 15/16	1 1/4	1/2	1/8	5/8	2 3/4	9 1/8	8 5/8
4	1 STANDARD	9/16	2 1/4	1 1/4	1/2	1/8	5/8	3 1/2	9 1/8	8 5/8
5	1 STANDARD	11/16	2 3/4	1 3/8	5/8	3/16	5/8	4 1/4	9 5/8	9
6	1 3/8 STANDARD	13/16	3 1/4	1 3/8	5/8	3/16	3/4	5 1/4	10 1/2	10
8	1 3/8 STANDARD	13/16	4 1/4	1 13/16	11/16	1/4	5/8**	7 1/8	10 3/4	10 9/16

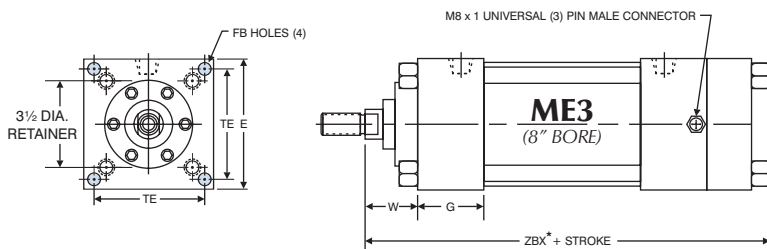
NOTE: All cylinder dimensions not shown are standard 'MX0' cylinder dimensions.
**8" bore cylinders have round retainer, bracket bolted to head.



'MS2' PFLF CYLINDER DIMENSIONS Standard Rod Diameters only

BORE	ROD DIAMETER	SB	SH	ST	SU	SW	SZ	TS	US	XS	SWX*	ADD STROKE	
												SS	ZBX*
1 1/2	5/8 STANDARD	7/16	1	1/2	1 1/8	3/8	5/8	2 3/4	3 1/2	1 3/8	7/8	2 7/8	6 3/8
2	5/8 STANDARD	7/16	1 1/4	1/2	1 1/8	3/8	5/8	3 1/4	4	1 3/8	7/8	2 7/8	6 7/16
2 1/2	5/8 STANDARD	7/16	1 1/2	1/2	1 1/8	3/8	5/8	3 3/4	4 1/2	1 3/8	7/8	3	6 9/16
3 1/4	1 STANDARD	9/16	1 7/8	3/4	1 1/4	1/2	3/4	4 3/4	5 3/4	1 7/8	1	3 1/4	7 3/4
4	1 STANDARD	9/16	2 1/4	3/4	1 1/4	1/2	3/4	5 1/2	6 1/2	1 7/8	1	3 1/4	7 3/4
5	1 STANDARD	13/16	2 3/4	1	1 1/16	11/16	9/16	6 7/8	8 1/4	2 1/16	1 3/16	3 1/8	8 1/8
6	1 3/8 STANDARD	13/16	3 1/4	1	1 5/16	11/16	13/16	7 7/8	9 1/4	2 5/16	1 3/16	3 5/8	9 1/8
8	1 3/8 STANDARD	13/16	4 1/4	1	1 5/16	11/16	13/16	9 7/8	11 1/4	2 5/16	1 3/16	3 3/4	9 3/8

NOTE: All cylinder dimensions not shown are standard 'MX0' cylinder dimensions.
1 1/2" - 4" standard, consult factory for 5" - 8".



'ME3' PFLF CYLINDER DIMENSIONS Standard Rod Diameters only

BORE	ROD DIAMETER	E	TE	W	G	FB	ADD STROKE
							ZBX*
8	1 3/8 STANDARD	8 1/2	7.57	1 5/8	2	11/16	9 3/8

NOTE: All cylinder dimensions not shown are standard 'MX0' cylinder dimensions.

POSITION FEEDBACK LOW FRICTION CYLINDER "SPECIFICATIONS"

Repeatability: ±.001" Cylinder Only

Refer to specifications in the following sections for positioning or measuring repeatability. Power supply ripple and A/D error will reduce repeatability when PFLF is utilized with industrial control systems.

Nonlinearity: ± 1% 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 the cylinder)

Rated Life of Probe: 10 million cycles

Rated Life of Wiper: 1000 linear miles

Pressure Rating: 150 psi

Temperature Rating: 0° to 200°F

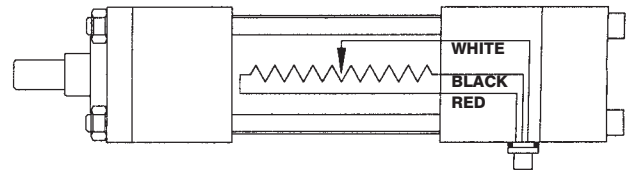
(Cylinder & Probe)

Maximum Speed: 25 in./sec.

Interface: 8mm DIN connector

NEMA: 6 (IP67)

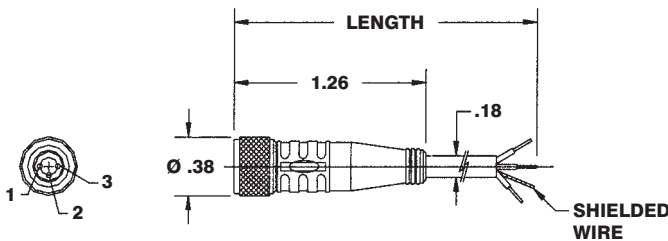
WIRE DESCRIPTION	PROBE/ PLUG WIRE COLORS	PLUG PIN NUMBERS	QUICK CONNECT CABLE/ WIRE COLORS
INPUT (+)	Red	3	Blue
GROUND (-)	Black	2	Black
OUTPUT	White	1	Brown



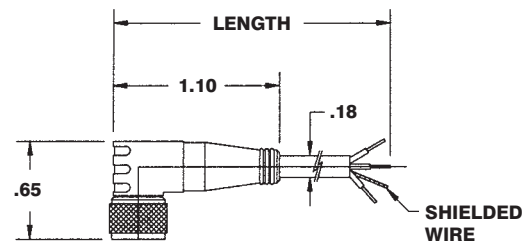
STROKE = 0, OUTPUT VOLTAGE = 0 VOLTS
STROKE = FULL, OUTPUT VOLTAGE = 10 VOLTS



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

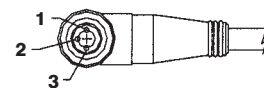


Right Angle-Models
C5 (2m), C5X (5m)



CONDUCTOR COLORS:

- 1 - BROWN
- 2 - BLACK
- 3 - BLUE

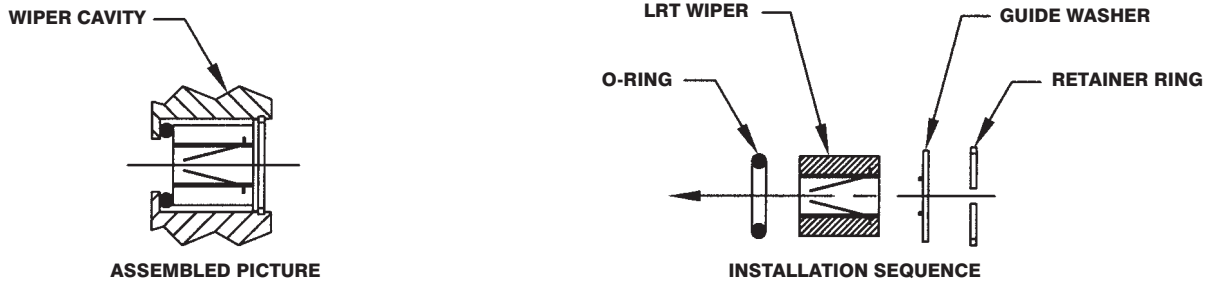


Note: All models have a M8 x 1 female thread.

Cable: 24 A.W.G. PVC insulated, fine stranded copper conductors, with Gray PVC jacket with stripped and tinned ends.

POSITION FEEDBACK LOW FRICTION CYLINDER

"COMPONENTS/REPAIR KITS"



LRT Wiper Replacement Kit

PART NO.	DESCRIPTION	REMARKS
PFLF-WK	POSITION FEEDBACK WIPER KIT	KIT TO CONSIST OF THE FOLLOWING: (1) O-RING, (1) LTR WIPER, (1) GUIDE WASHER, (1) RETAINING RING, (3) WIRE CONNECTORS & WIPER/PROBE INSTALLATION INSTRUCTION SHEET

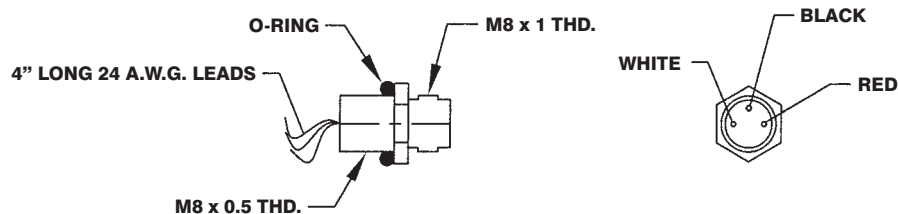


PROBE WIRE COLORS:
RED = SUPPLY (+)
BLACK = GROUND (-)
WHITE = OUTPUT

LRT Probe Replacement Kit

PART NO.	DESCRIPTION	REMARKS
PFLF-PRK-STROKE	POSITION FEEDBACK PROBE REPLACEMENT KIT	KIT TO CONSIST OF THE FOLLOWING: (1) LRT PROBE WITH O-RING & BACK-UP WASHER, (3) WIRE CONNECTORS & WIPER/PROBE INSTALLATION INSTRUCTION SHEET

Replacement LRT probe ordering example: 8" stroke PFLF cylinder, replacement probe would be PART NO. PFLF-PRK-8. Fractional stroke length cylinders use the next whole number. Example: 8½" stroke replacement probe would be PFLF-PRK-9.



(3) Pin Connector Replacement Kit

PART NO.	DESCRIPTION	REMARKS
PFLF-CK	POSITION FEEDBACK CONNECTOR KIT	KIT TO CONSIST OF THE FOLLOWING: (1) 3 PIN CONNECTOR WITH O-RING & (3) WIRE CONNECTORS

PFLF Basic Cylinder Seal Kits

BORE	PART NO.	BORE	PART NO.	BORE	PART NO.	BORE	PART NO.
1½	PFLF-SK-625-150	2½	PFLF-SK-625-250	4	PFLF-SK-100-400	6	PFLF-SK-137-600
2	PFLF-SK-625-200	3¼	PFLF-SK-100-325	5	PFLF-SK-100-500	8	PFLF-SK-137-800

Replacement PFLF cylinder seal kit to consist of the following:
 (2) low friction piston seals, (2) tube end seals, (1) rod seal, (1) bushing o-ring, and (1) container of low friction grease

Note: basic seal kit **DOES NOT** include wiper, probe, or connector kits