

NEW PRODUCT

TRD Manufacturing, Inc.

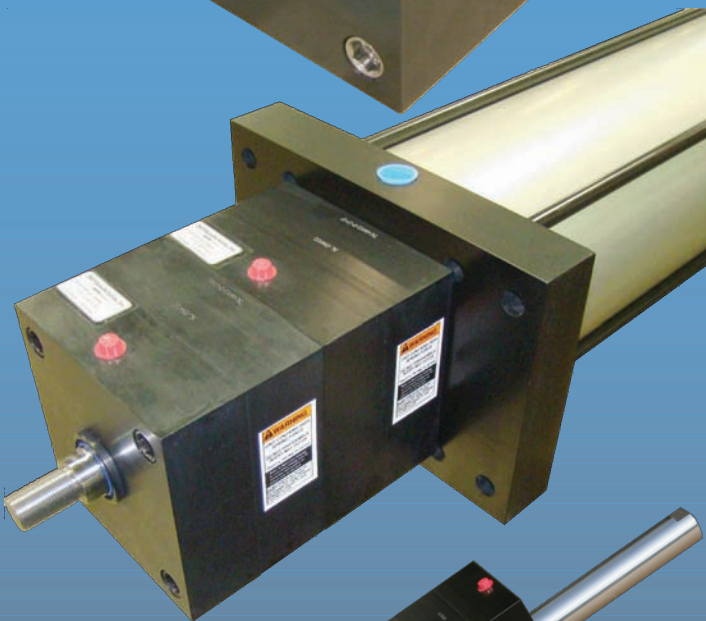
A BIMBA Company

FM Series Rod Lock Cylinder

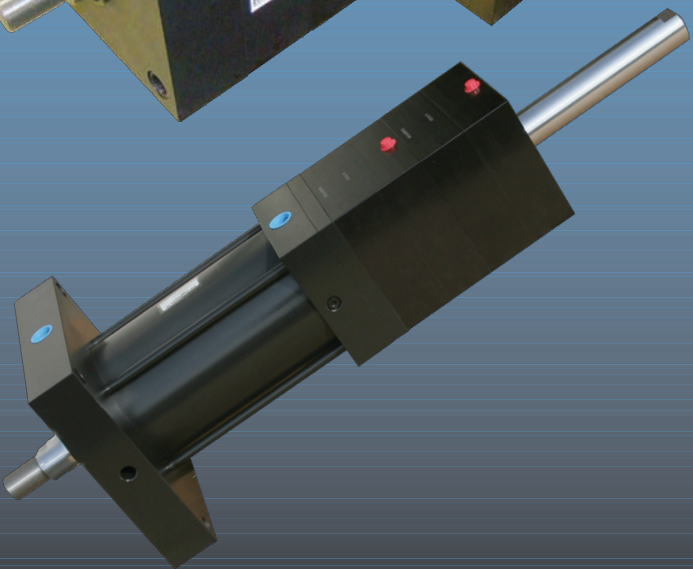
Bore Sizes

1.50" to 6.00" in Standard Rods

2.00" to 6.00" in Oversized Rods

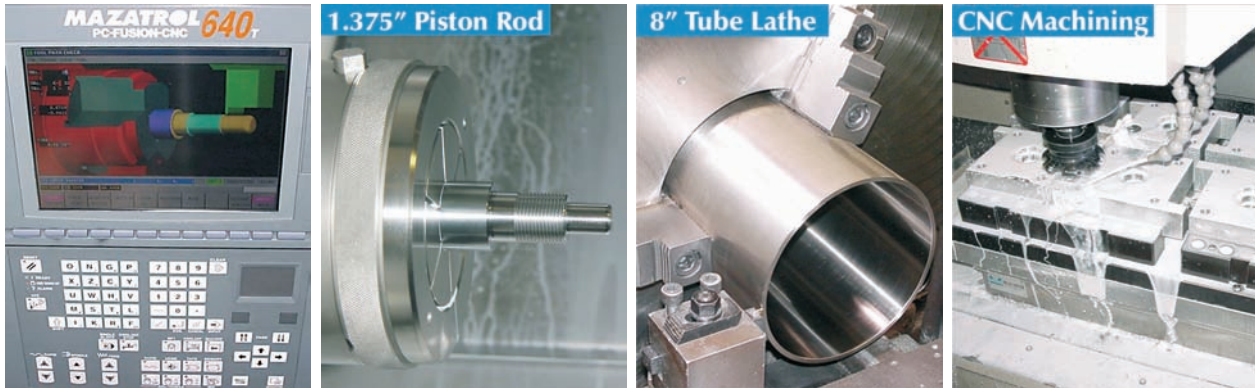


Stand alone Rod Lock



The TRD difference...

Precision machined throughout. We started in business as precision machinists. Every component is machined in a manner to enhance the performance of our products. Cylinder tubes are lathe cut, not sawed. Heads and caps are 100% CNC machined to tight tolerances in jig bored fixtures. Piston and rod diameters and concentricity are held to within two thousandths of an inch, in CNC lathes. The results: cylinders that have a consistent performance and long life. Our cylinders are truly “square”, which eliminates shimming! **Try the TRD difference!**



On time, consistent delivery. Every customer's order is important. Our business is managed so large orders do not disrupt our published delivery schedules.

Cylinder Options and Custom Modifications - Since every cylinder is made to order, you can customize each cylinder to best fit your application. You can choose from our extensive list of standard options, or send us a sketch for a custom solution!

- **Port size, type or location along with cushion locations can be made to your specifications.** (*All NFPA, BSP or SAE Sizes available*)
- **Rod End Styles and Designs:**
 - (5) NFPA Standard rod end styles available
 - Custom or other thread lengths available
 - Metric or other thread styles available
 - Custom rod end styles available - *just send us a sketch!*
 - “Hollow” Rod designs can be gun-drilled to your specifications
- **Most Cylinder Options Ship in 2-3 Days!**

Quick response on all requests. Most requests are answered the day they are received.

Visit us on the web: <http://www.trdmfg.com> e-mail: sales@trdmfg.com

CAD FILES: CONTACT TRD FOR SPECIFIC ROD LOCK CYLINDER MODEL DRAWINGS

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.

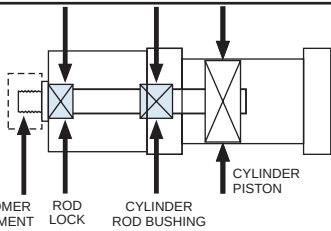
In no event shall TRD Manufacturing, Inc. be liable for any consequential damages or installation costs resulting from delay or failure of delivery, defective material or workmanship or out of a breach by TRD Manufacturing, Inc. of any contract.

SERIES 'FM' (NFPA) CYLINDER WITH ROD LOCK

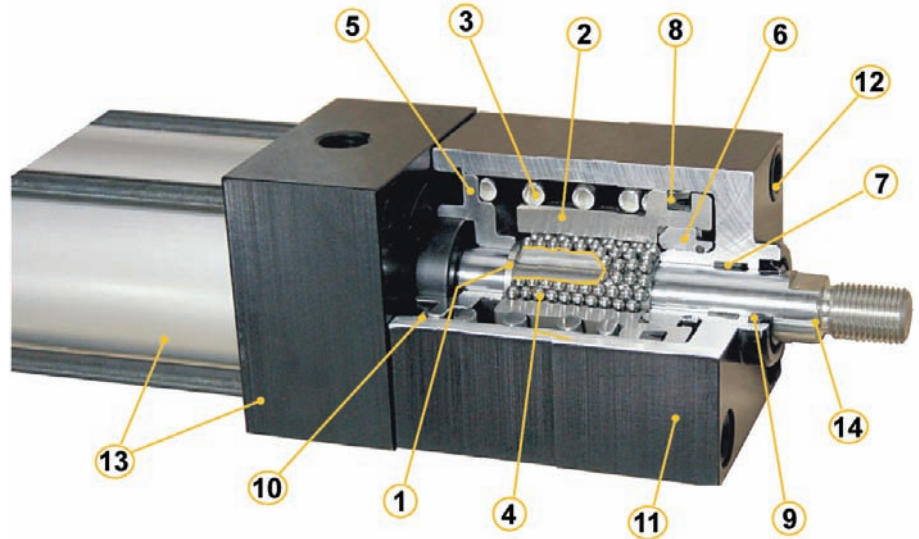
Floating Rod Bushing

SELF ALIGNMENT FEATURE

Rod Bushing is designed to float .002", improving bearing surface alignment.



- Reduces cylinder drag and erratic operation
- Reduces cylinder wear
- Provides a minimum of 25% longer life than "fixed" Rod Bushing designs



HEAVY-DUTY DESIGN FOR RELIABLE, CONSISTENT OPERATION

- (1) **LOCKING COLLAR** – Hardened specialized tool steel, precision ground, multi-split collar design provides 4,000,000-5,000,000 cycles without fatigue or fracture.
- (2) **PISTON-OUTER LOCK HOUSING** – Hardened tool steel, precision ground design also serves as a spring guide for uniform clamp force distribution with virtually no wear.
- (3) **SPRING** – Oversized for maximum power, heavy-duty coil spring (low fatigue) will provide millions of consistent rod lock actuations at full rated load.
- (4) **BALL BEARINGS** – Hardened, precision ground (high grade) steel ball bearings provide total transfer of spring force to locking collar.
- (5) **ROD LOCK GUIDE** (Steel) – Centers Rod Lock to cylinder rod bushing and maintains perfect alignment eliminating binding or rod scraping or reduced locking force due to misalignment.
- (6) **PISTON GUIDE** – Hardened and ground steel guide that centers the piston-outer lock housing and provides bearing surface for piston/spring assembly
- (7) **ROD GUIDE BEARING** – High-load wear strip (PTFE based), self lubricating
- (8) **PISTON SEAL** – Heavy lip design Carboxylated Nitrile construction. Seal is pressure activated and wear compensating for extended life (self lubricating material)
- (9) **ROD WIPER** – Urethane
- (10) **RETAINER RING** (Steel) – Retains coil spring compression (under very high spring force) and internal lock components. (NOTE: Do not remove)
- (11) **HOUSING** – Precision machined from 6061-T6 aluminum, black anodized for corrosion resistance.
- (12) **SLEEVE NUT (Steel)** – Provides (4) tapped holes for mounting unit or MF1 flange.
- (13) **FM SERIES CYLINDER** – Refer to TRD catalog pages 19-30 for specifications and options.
- (14) **CYLINDER PISTON ROD** – Hard chrome plated steel.

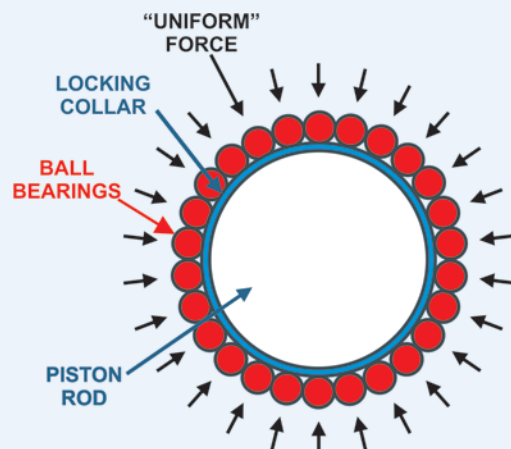
PERMANENT LUBRICATION – Permanently lubricated with Magna-Lube G PTFE based grease on all internal components. No additional lubrication is required.

"100% FILL" Ball Bearing Design

The cavity between the Locking Collar and Outer Lock Housing is 100% filled with ball bearings, providing UNIFORM distribution of Locking (Clamp / Holding) Force.

DESIGN ADVANTAGES:

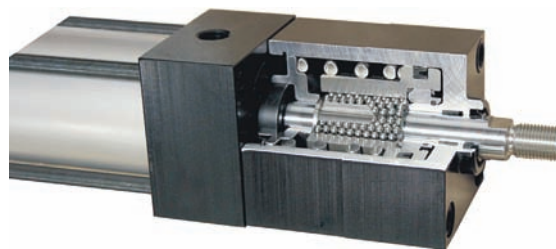
- **LOW METAL FATIGUE** – On all clamping components.
- **SUPERIOR LOCKING FORCES** – HIGHEST LOCKING FORCES IN THE INDUSTRY.
- **NON WEARING** – Low component fatigue eliminates wear and extends life to 4,000,000 - 5,000,000 cycles at full rated load.



The TRD difference...

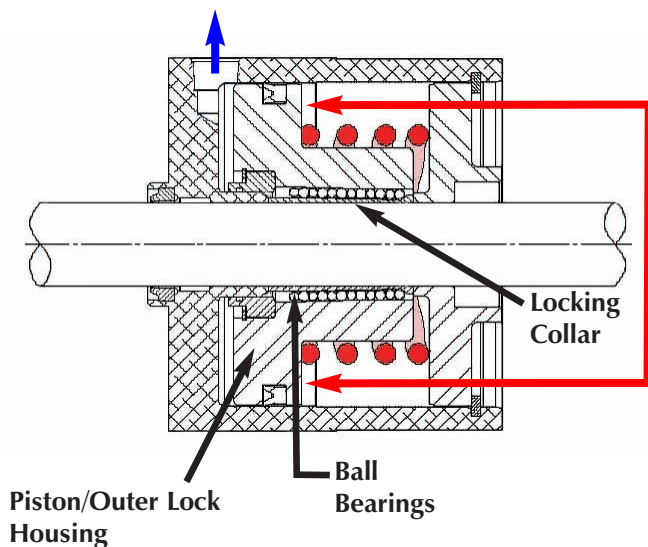
TRD's floating rod bushing design and RL Series Rod Lock = OPTIMIZED RESULTS and SUPERIOR PERFORMANCE.

For rod locks to achieve the rated holding force and maximize cycle life, good alignment must be maintained between the locking mechanism and cylinder rod. With TRD's Floating Rod Bushing design and accurate rod lock alignment - superior performance and trouble-free operation are assured.



OPERATING PRINCIPAL

Air Pressure Exhausted



CLAMPING (Locked) CONDITION:

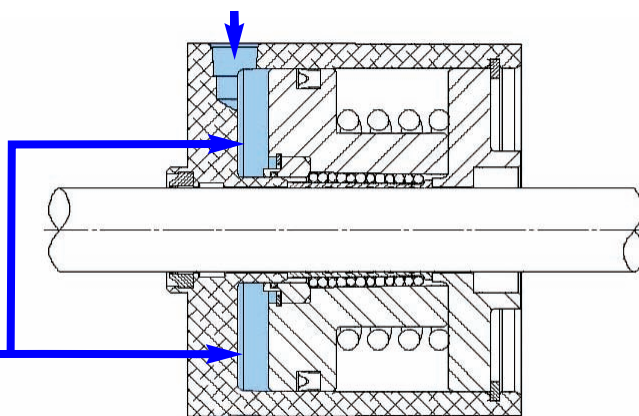
When air pressure is exhausted from rod lock, high spring force is applied to the piston/outer lock housing which utilizes an ultra-fine tapered wedge mechanism. Ball bearings transfer the spring force directly to the locking collar. The locking collar is designed to flex and securely grip the rod. Clamping action does not move or disturb the rod, maintaining rod position during actuation.

**HIGH SPRING FORCE
"LOCKS" PISTON ROD
IN PLACE**

UNCLAMPED CONDITION (Free Moving Piston Rod):

When air pressure is applied to rod lock, the air pressure overcomes the spring force, moving Piston/Outer Locking Housing. This movement provides clearance in the tapered mechanism allowing the Locking Collar to relax and provide free rod movement.

60-150 PSI Air Pressure



**Air pressure moves piston,
compressing spring, which
eliminates locking force**

OPERATING PRESSURE

Cylinder	0 TO 250 PSI AIR
Rod Lock	60 TO 150 PSI AIR

AXIAL MOVEMENT (CLAMPED) *

Standard	.000" to .008"
Close Tol. (Optional)	.000" to .002" - .003"

* Represents clearance within the rod lock unit, .000" movement due to actuation.

OPERATING TEMPERATURE

Standard Seals	10° F to 180° F (-12° C to 82° C)
Fluorocarbon Seals	0° F to 400° F (-18° C to 204° C)

ROD MATERIAL REQUIREMENTS

Diameter	+.000" to -.002" Nominal Diameter
Hardened Shaft	.0005" Minimum hard chrome
Unhardened Shaft	.001" Minimum hard chrome
Finish	6 to 10 micro-inch

APPLICATION & RATED HOLDING FORCE

Rod Locks are used to hold linear cylinder loads stationary in any mounting orientation. Units will lock in both directions to rated holding force. They are not designed to withstand rotational loads or to “brake” the load in dynamic applications. Units are commonly used in work holding applications and for locking tools or fixtures in the event of air pressure loss. They are very common in positioning systems since they will hold the cylinder position very rigidly. Units are also common in E-Stop (emergency stop) applications.

Refer to safety information on page 26 for proper application.

COMMON APPLICATIONS



BASIC CYLINDER FORCE CHART

BORE	ROD DIA.	STROKE TYPE	EFFECTIVE PISTON AREA	POUNDS OF FORCE AT:		
				60 PSI	80 PSI	100 PSI
1.50	ALL	PUSH	1.767	106	142	177
	0.625	PULL	1.460	88	117	146
2	ALL	PUSH	3.142	188	251	314
	0.625	PULL	2.835	170	227	284
2.50	1.000	PULL	2.357	141	189	236
	ALL	PUSH	4.909	295	393	491
3.25	0.625	PULL	4.602	276	368	460
	1.000	PULL	4.124	247	330	412
4	ALL	PUSH	8.296	498	664	830
	1.000	PULL	7.511	451	601	751
5	1.375	PULL	6.811	409	545	681
	ALL	PUSH	12.566	754	1005	1257
6	1.000	PULL	11.781	707	942	1178
	1.375	PULL	11.081	665	886	1108
7	ALL	PUSH	19.635	1178	1571	1964
	1.000	PULL	18.850	1131	1508	1885
8	1.375	PULL	18.150	1089	1452	1815
	ALL	PUSH	28.274	1696	2262	2827
9	1.375	PULL	26.789	1607	2144	2679
	1.750	PULL	25.869	1552	2070	2587

RATED HOLDING FORCE

BORE	ROD DIA.	ROD LOCK MODEL	HOLDING FORCE *
1.50	0.625	RL-063150	200
2.00	0.625	RL-063200	500
	1.000	RL-100200	350
2.50	0.625	RL-063250	650
	1.000	RL-100250	650
3.25	1.000	RL-100325	1000
	1.375	RL-138325	1000
4.00	1.000	RL-100400	1550
	1.375	RL-138400	1550
5.00	1.000	RL-100500	2150
	1.375	RL-138500	2150
6.00	1.375	RL-138600	2850
	1.750	RL-175600	2850

* Holding Force is the minimum rating on clean and dry rods over the entire life of the unit. Add the “Load Weight” to the Basic Cylinder Force when sizing rod lock.



ROD LOCKS ARE 100% TESTED to assure that each unit exceeds the published rated holding force. When properly applied, rod locks will maintain the published holding force over the life of the unit.

HOW TO ORDER: CYLINDER WITH ROD LOCK

FM - MS4 - 2.50 x 10 - HC - RL - 063 250 - MPR

SERIES	
FM	250 PSI AIR

NFPA MOUNTS	
MF1	FRONT FLANGE (1.50"-6.00" Bore)
MF2	REAR FLANGE (1.50"-6.00" Bore)
MP1	REAR PIVOT CLEVIS (1.50"-6.00" Bore)
MP2	REAR PIVOT CLEVIS (1.50"-6.00" Bore)
MP4	REAR PIVOT EYE (1.50"-6.00" Bore)
MS1	FRONT & REAR END ANGLE (1.50"-6.00" Bore)
MS2	SIDE LUG (1.50"-6.00" Bore)
MS4	BOTTOM TAPPED HOLES (1.50"-6.00" Bore)
MT1	FRONT TRUNNION (1.50"-6.00" Bore)
MT2	REAR TRUNNION (1.50"-6.00" Bore)
MXO	NO MOUNT (1.50"-6.00" Bore)
BASE BAR	NON-NFPA (1.50"-4.00" Bore)

BORE	
1.50	2.00
2.50	3.25
4.00	5.00
6.00	

STROKE	
0" to 120"	
Made to Order	

ROD LOCK	
RL	

ROD SIZE	
063	0.625"
100	1.000"
138	1.375"
175	1.750"

BORE	
150	1.50"
200	2.00"
250	2.50"
325	3.25"
400	4.00"
500	5.00"
600	6.00"

CYLINDER OPTIONS	
ADDS LENGTH TO CYLINDER - SEE "OPTION LENGTH ADDER" CHART BELOW.	
A =	EXTENDED PISTON ROD THREAD (Example: A = 2")
AS	ADJUSTABLE STROKE - RETRACT (SPECIFY LENGTH, Example: AS = 4")
A / O	AIR / OIL PISTON
B	.25" URETHANE BUMPER BOTH ENDS
BC	.25" URETHANE BUMPER CAP ONLY
BH	.25" URETHANE BUMPER HEAD ONLY
BP	BUMPER PISTON SEALS (1.50" - 6.00" Bore)
BSP	BSP PORTS (SPECIFY SIZE, Example: BSP = 1/4")
EN	ELECTROLESS NICKEL PLATED
KK2	LARGE MALE ROD THREAD
KK3	FEMALE ROD THREAD
KK3S	STUDDER PISTON ROD (KK3 with Stud, Loctite in place)
KK4	FULL DIAMETER MALE ROD THREAD
KK5	BLANK ROD END (NO THREADS, "A" = 0")
LF	LOW FRICTION SEALS
MA	MICRO-ADJUST (6" MAX. STROKE) Available on Double Rod End Models
MAB	MICRO-ADJUST WITH SOUND DAMPENING BUMPER (6" MAX. STROKE)
MPR	MAGNETIC PISTON FOR REED OR SOLID STATE SWITCHES - TRD MODELS: R10, R10P, RAC, RHT & MSS
NR	NON-ROTATING
OP	OPTIONAL PORT LOCATION OR SIZE (Example: Ports @ 3 & 7)
OS	OVERSIZE ROD DIAMETER (SPECIFY SIZE, Example: OS = 1.38")
RLC =	EXTENDED PISTON ROD (Example: IF RLC = 0.50", THEN 1" ROD EXTENSION IS RLC = 1.50")
SAE	SAE PORTS (SPECIFY SIZE, Example: SAE #10)
SSA	STAINLESS STEEL PISTON ROD, TIE RODS & SLEEVE NUTS, AND FASTENERS
SSF	STAINLESS STEEL FASTENERS
SSR	STAINLESS STEEL PISTON ROD
SST	STAINLESS STEEL TIE RODS & SLEEVE NUTS
ST	STOP TUBE (SPECIFY STOP TUBE LENGTH AND EFFECTIVE STROKE) (Example: FM MS4 2 X 24" EFFECTIVE STROKE-ST=3)
TMS	STEEL CYLINDER TUBE, BLACK EPOXY PAINT FINISH
TH	400 PSI HYDRAULIC NON-SHOCK
VS	FLUOROCARBON SEALS
WB	PISTON WEAR BAND
XX	SPECIAL VARIATION (SPECIFY)

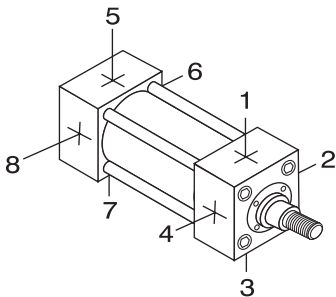
STYLE	
SINGLE ROD (LEAVE BLANK)	
D = DOUBLE ROD END	

CUSHIONS	
H	HEAD CUSHION POSITION 2 IS STANDARD SPECIFY FOR POSITIONS: 1, 3 & 4
LH	LONG HEAD CUSHION POSITION 2 IS STANDARD SPECIFY FOR POSITIONS: 1, 3 & 4
ELH	EXTRA LONG HEAD CUSHION POSITION 2 IS STANDARD SPECIFY FOR POSITIONS: 1, 3 & 4
C	CAP CUSHION POSITION 6 IS STANDARD SPECIFY FOR POSITIONS: 5, 7 & 8
LC	LONG CAP CUSHION POSITION 6 IS STANDARD SPECIFY FOR POSITIONS: 5, 7 & 8
ELC	EXTRA LONG CAP CUSHION POSITION 6 IS STANDARD SPECIFY FOR POSITIONS: 5, 7 & 8
FIXED CUSHIONS	
FCH	FIXED HEAD CUSHION (NON-ADJUSTABLE, NO ADJUSTMENT NEEDED)
FCC	FIXED CAP CUSHION (NON-ADJUSTABLE, NO ADJUSTMENT NEEDED)
FC	FIXED HEAD AND CAP CUSHION (NON-ADJUSTABLE, NO ADJUSTMENT NEEDED)

ADDS LENGTH TO CYLINDER - SEE "OPTION LENGTH ADDER" CHART BELOW.

STANDARD PORT AND CUSHION ADJUSTMENT POSITIONS

- Ports - Positions 1 and 5
- Cushion Adjustment - Positions 2 and 6
- Specify Non-Standard Positions When Ordering



Note: "L" and "EL" CUSHION OPTIONS CAN BE ORDERED AS FIXED CUSHIONS.

Example: FCLH, FCELH

- Notes:
- 1) Ordering example for non-standard cushion locations: H3C7
 - 2) Refer to page 83 of TRD master catalog for assistance in cushion length selection.
 - 3) Cushions can be ordered on same side as ports.

SPECIAL ROD LOCK MODIFICATIONS

Common Rod Lock modifications include metallic rod scraper, close tolerance axial movement, fluorocarbon seals, electroless nickel plating or stainless steel housing.

Consult your local distributor or TRD for more information and delivery.

OPTION LENGTH ADDER						
(ADD TO CATALOG BASIC OVERALL LENGTH DIMENSIONS)						
BORE	OPTION					
	B	BC	BH	ELC	ELH	ST* (STOP TUBE) Example: ST=2
1.50	0.50	0.25	0.25	1.00	1.00	2.00
2.00	0.50	0.25	0.25	1.00	1.00	2.00
2.50	0.50	0.25	0.25	1.00	1.00	2.00
3.25	0.50	0.25	0.25	1.25	1.25	2.00
4.00	0.50	0.25	0.25	1.25	1.25	2.00
5.00	0.50	0.25	0.25	1.25	1.25	2.00
6.00	0.50	0.25	0.25	1.50	1.50	2.00

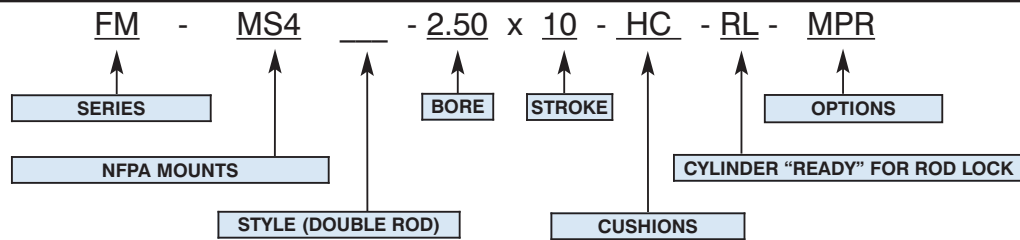
*Note: The desired Stop Tube length adds directly to the overall cylinder length.

'FM' NFPA MOUNTS

 1.50" to 6.00" Bores Page 14	 1.50" to 6.00" Bores Page 15	 1.50" to 6.00" Bores Page 18	 1.50" to 6.00" Bores Page 19	 1.50" to 4.00" Bores Page 20	 1.50" to 6.00" Bores Page 10
 1.50" to 6.00" Bores Page 11	 1.50" to 6.00" Bores Page 12	 1.50" to 6.00" Bores Page 16	 1.50" to 6.00" Bores Page 17	 1.50" to 6.00" Bores Page 8-9	 1.50" to 4.00" Bores Page 13

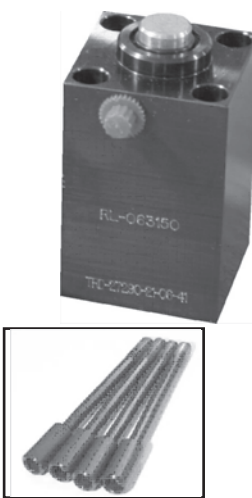
HOW TO ORDER: CYLINDER / ROD LOCK REPLACEMENT PARTS

REPLACEMENT CYLINDERS



Note: Cylinders will ship with standard rod end (KK1) and standard rod extension (RLC dimension) unless otherwise noted by customer.

ROD LOCK PART LIST

					
Bore	Rod Diameter	Rod Lock Model	Rated Holding Force (lbs)	Rod Lock ONLY	Mounting Kit
1.50	0.625	RL-063150	200	RL-063150-1	MK-063150
2.00	0.625	RL-063200	500	RL-063200-1	MK-063200
	1.000	RL-100200	350	RL-100200-1	MK-100200
2.50	0.625	RL-063250	650	RL-063250-1	MK-063250
	1.000	RL-100250	650	RL-100250-1	MK-100250
3.25	1.000	RL-100325	1000	RL-100325-1	MK-100325
	1.375	RL-138325	1000	RL-138325-1	MK-138325
4.00	1.000	RL-100400	1550	RL-100400-1	MK-100400
	1.375	RL-138400	1550	RL-138400-1	MK-138400
5.00	1.000	RL-100500	2150	RL-100500-1	MK-100500
	1.375	RL-138500	2150	RL-138500-1	MK-138500
6.00	1.375	RL-138600	2850	RL-138600-1	MK-138600
	1.750	RL-175600	2850	RL-175600-1	MK-175600

Notes:

Holding Force - The minimum rating over the entire life of the rod lock.
Initial actual holding forces are higher.

DO NOT disassemble Rod Lock - UNIT CONTAINS HIGH SPRING FORCE. Return to TRD Mfg. for service.

Replacement Rod Locks are shipped with a steel shaft. DO NOT remove 60-150 PSI supply air to Rod Lock without steel shaft or cylinder rod in place - permanent damage to Rod Lock may occur.

SERIES 'FM' DIMENSIONS: BASIC CYLINDER (MXO MOUNT) FLUSH MOUNT (WITH SLEEVE NUT CONSTRUCTION)

About Rod End Styles

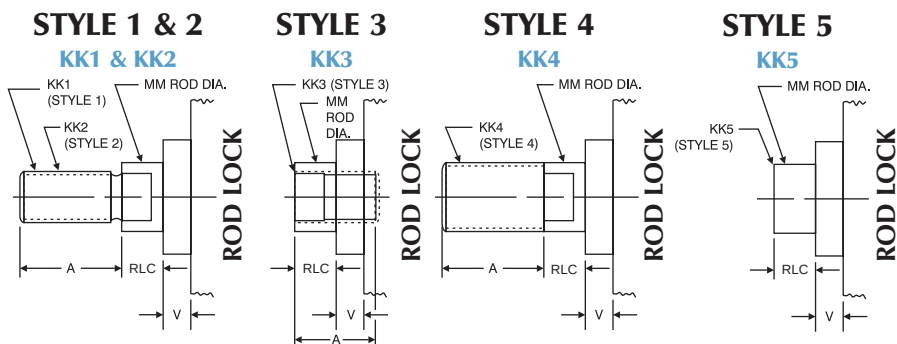
Style 1 Male Rod End is STANDARD

Other NFPA Styles can be specified (See Chart).

Need a rod end not listed?
NO PROBLEM! Each Piston Rod is made to order and does not delay shipment. Coarse (UNC) threads, Metric threads or just plain rod ends are common. Thread lengths are also made to order (Specify: "A"=Length).

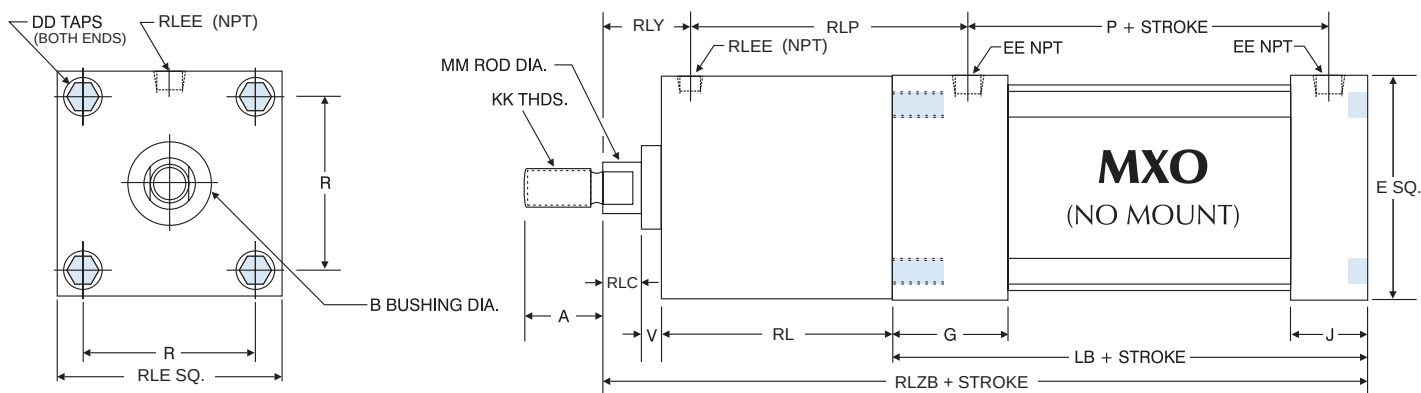
NEED SOMETHING NOT LISTED?
Just send us a sketch.
In most cases, quotes are turned around in one day!

PISTON ROD END STYLES



BORE	MM ROD DIAMETER	STANDARD		OPTIONAL							RLC	V
		Style 1 - Male		Style 2 - Male		Style 3 - Female		Style 4 - Male		Style 5 - Blank		
		KK1	A	KK2	A	KK3	A	KK4	A	KK5		
1.50, 2.00, 2.50	0.625	⁷ / ₁₆ -20	0.750	¹ / ₂ -20	0.750	⁷ / ₁₆ -20	0.750	⁵ / ₈ -18	0.750	No Threads	0.38	0.25
3.25, 4.00, 5.00	1.000	³ / ₄ -16	1.125	⁷ / ₈ -14	1.125	³ / ₄ -16	1.125	1-14	1.125	No Threads	0.50	0.25
6.00	1.375	1-14	1.625	1 ¹ / ₄ -12	1.625	1-14	1.625	1 ³ / ₈ -12	1.625	No Threads	0.63	0.25

STANDARD ROD: 'MXO' (NO MOUNT) WITH ROD LOCK MOUNTED



'FM' SERIES BASIC DIMENSIONS 'MXO' (STANDARD ROD)													ROD LOCK BASIC DIMENSIONS							
BORE	A	B	DD	E	EE	G	J	KK	LB	MM	P	R	RL	RLC	RLE	RLEE	RLP	RLY	V	RLZB
1.50	0.750	1.13	1/4-28	2.00	1/4 NPT	1.50	1.00	7/16-20	3.63	0.625	2.38	1.43	3.00	0.38	1.98	1/8 NPT	3.56	0.94	0.25	7.25
2.00	0.750	1.13	5/16-24	2.50	1/4 NPT	1.50	1.00	7/16-20	3.63	0.625	2.38	1.84	3.00	0.38	2.48	1/8 NPT	3.56	0.94	0.25	7.25
2.50	0.750	1.13	5/16-24	3.00	1/4 NPT	1.50	1.00	7/16-20	3.75	0.625	2.50	2.19	3.25	0.38	2.98	1/8 NPT	3.75	1.00	0.25	7.63
3.25	1.125	1.50	3/8-24	3.75	3/8 NPT	1.75	1.25	3/4-16	4.25	1.000	2.75	2.76	4.00	0.50	3.73	1/4 NPT	4.44	1.31	0.25	9.00
4.00	1.125	1.50	3/8-24	4.50	3/8 NPT	1.75	1.25	3/4-16	4.25	1.000	2.75	3.32	4.00	0.50	4.48	1/4 NPT	4.44	1.31	0.25	9.00
5.00	1.125	1.50	1/2-20	5.50	3/8 NPT	1.75	1.25	3/4-16	4.50	1.000	3.00	4.10	4.00	0.50	5.48	1/4 NPT	4.44	1.31	0.25	9.25
6.00	1.625	2.00	1/2-20	6.50	1/2 NPT	2.00	1.50	1-14	5.00	1.375	3.25	4.88	4.50	0.63	6.48	1/4 NPT	5.06	1.44	0.25	10.38

SERIES 'FM' DIMENSIONS: BASIC CYLINDER (MXO MOUNT) FLUSH MOUNT (WITH SLEEVE NUT CONSTRUCTION)

About Rod End Styles

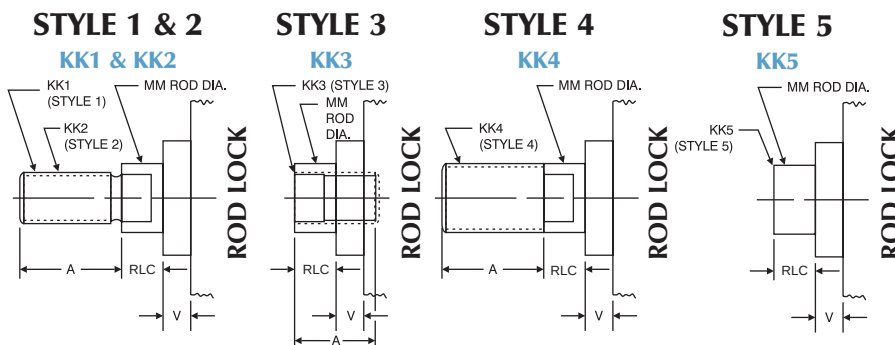
Style 1 Male Rod End is STANDARD

Other NFPA Styles can be specified (See Chart).

Need a rod end not listed?
NO PROBLEM! Each Piston Rod is made to order and does not delay shipment. Coarse (UNC) threads, Metric threads or just plain rod ends are common. Thread lengths are also made to order (Specify: "A"=Length).

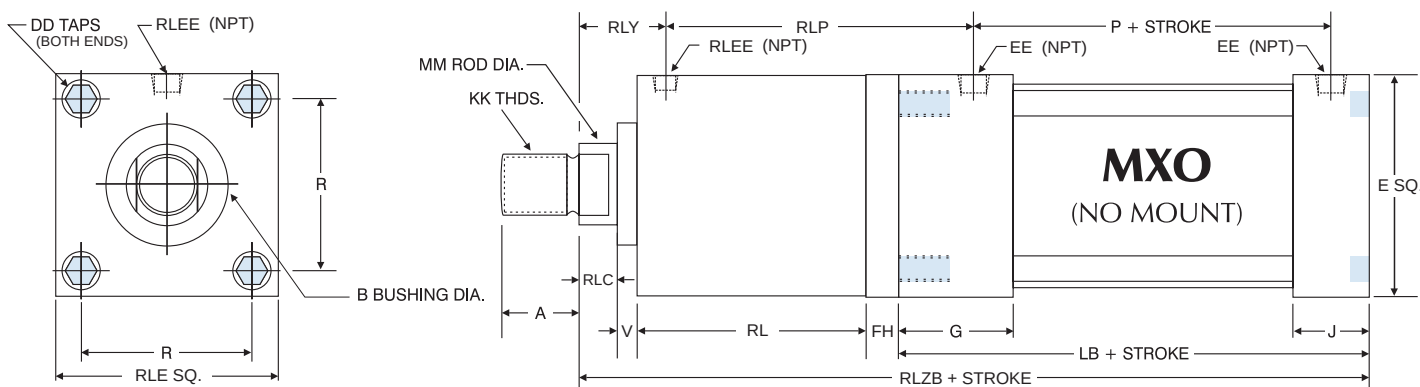
NEED SOMETHING NOT LISTED?
Just send us a sketch.
In most cases, quotes are turned around in one day!

PISTON ROD END STYLES



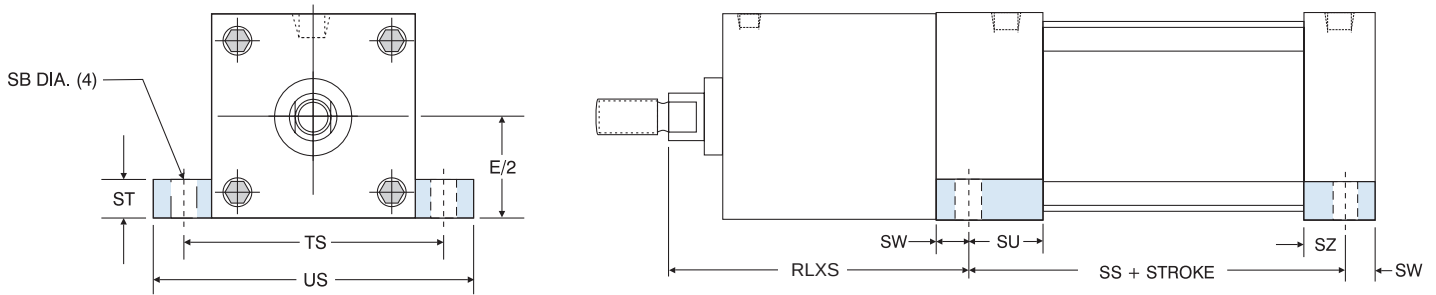
BORE	MM ROD DIAMETER	STANDARD		OPTIONAL							RLC	V
		Style 1 - Male		Style 2 - Male		Style 3 - Female		Style 4 - Male		Style 5 - Blank		
		KK1	A	KK2	A	KK3	A	KK4	A	KK5		
2.00, 2.50	1.000	3/4-16	1.125	7/8-14	1.125	3/4-16	1.125	1-14	1.125	No Threads	0.50	0.25
3.25, 4.00, 5.00	1.375	1-14	1.625	1 1/4-12	1.625	1-14	1.625	1 3/8-12	1.625	No Threads	0.63	0.25
6.00	1.750	1 1/4-12	2.000	1 1/2-12	2.000	1 1/4-12	2.000	1 3/4-12	2.000	No Threads	0.75	0.25

OVERSIZED ROD: 'MXO' (NO MOUNT) WITH ROD LOCK MOUNTED



'FM' SERIES BASIC DIMENSIONS 'MXO' (OVERSIZED ROD)														ROD LOCK BASIC DIMENSIONS							
BORE	A	B	DD	E	EE	FH	G	J	KK	LB	MM	P	R	RL	RLC	RLE	RLEE	RLP	RLY	V	RLZE
2.00	1.125	1.50	⁵ / ₁₆ -24	2.50	¹ / ₄ NPT	0.38	1.50	1.00	³ / ₄ -16	3.63	1.000	2.38	1.84	3.75	0.50	2.48	¹ / ₈ NPT	4.50	1.25	0.25	8.50
2.50	1.125	1.50	⁵ / ₁₆ -24	3.00	¹ / ₄ NPT	0.38	1.50	1.00	³ / ₄ -16	3.75	1.000	2.50	2.19	3.75	0.50	2.98	¹ / ₈ NPT	4.50	1.25	0.25	8.63
3.25	1.625	2.00	³ / ₈ -24	3.75	³ / ₈ NPT	0.63	1.75	1.25	1-14	4.25	1.375	2.75	2.76	4.00	0.63	3.73	¹ / ₄ NPT	5.06	1.44	0.25	9.75
4.00	1.625	2.00	³ / ₈ -24	4.50	³ / ₈ NPT	0.63	1.75	1.25	1-14	4.25	1.375	2.75	3.32	4.00	0.63	4.48	¹ / ₄ NPT	5.06	1.44	0.25	9.75
5.00	1.625	2.00	¹ / ₂ -20	5.50	³ / ₈ NPT	0.63	1.75	1.25	1-14	4.50	1.375	3.00	4.10	4.13	0.63	5.48	¹ / ₄ NPT	5.19	1.44	0.25	10.13
6.00	2.000	2.38	¹ / ₂ -20	6.50	¹ / ₂ NPT	0.75	2.00	1.50	1 ¹ / ₄ -12	5.00	1.750	3.25	4.88	4.50	0.75	6.48	¹ / ₄ NPT	5.82	1.56	0.25	11.25

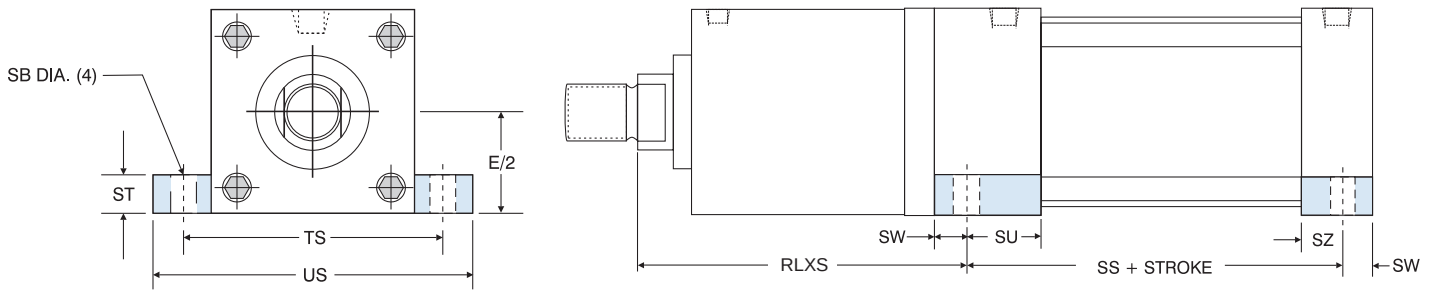
STANDARD ROD: 'MS2' (SIDE LUG) WITH ROD LOCK MOUNTED



'FM' SERIES 'MS2' SIDE LUG MOUNT DIMENSIONS											
BORE	ROD DIAMETER	SB	E/2	ST	SU	SW	SZ	TS	US	RLXS	ADD STROKE SS
1.50	0.625	0.44	1.00	0.50	1.13	0.38	0.63	2.75	3.50	4.00	2.88
2.00	0.625	0.44	1.25	0.50	1.13	0.38	0.63	3.25	4.00	4.00	2.88
2.50	0.625	0.44	1.50	0.50	1.13	0.38	0.63	3.75	4.50	4.25	3.00
3.25	1.000	0.56	1.88	0.75	1.25	0.50	0.75	4.75	5.75	5.25	3.25
4.00	1.000	0.56	2.25	0.75	1.25	0.50	0.75	5.50	6.50	5.25	3.25
5.00	1.000	0.81	2.75	1.00	1.06	0.69	0.56	6.88	8.25	5.44	3.13
6.00	1.375	0.81	3.25	1.00	1.31	0.69	0.81	7.88	9.25	6.07	3.63

For dimensions not shown, see pages 8

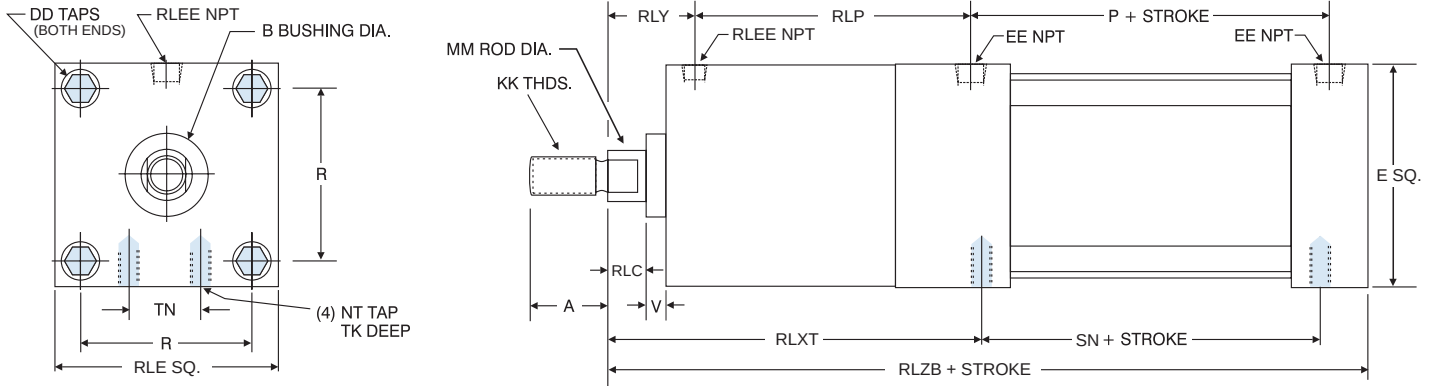
OVERSIZED ROD: 'MS2' (SIDE LUG) WITH ROD LOCK MOUNTED



'FM' SERIES 'MS2' SIDE LUG MOUNT DIMENSIONS											
BORE	ROD DIAMETER	SB	E/2	ST	SU	SW	SZ	TS	US	RLXS	ADD STROKE SS
2.00	1.000	0.44	1.25	0.50	1.13	0.38	0.63	3.25	4.00	5.25	2.88
2.50	1.000	0.44	1.50	0.50	1.13	0.38	0.63	3.75	4.50	5.25	3.00
3.25	1.375	0.56	1.88	0.75	1.25	0.50	0.75	4.75	5.75	6.00	3.25
4.00	1.375	0.56	2.25	0.75	1.25	0.50	0.75	5.50	6.50	6.00	3.25
5.00	1.375	0.81	2.75	1.00	1.06	0.69	0.56	6.88	8.25	6.32	3.13
6.00	1.750	0.81	3.25	1.00	1.31	0.69	0.81	7.88	9.25	6.94	3.63

For dimensions not shown, see pages 9

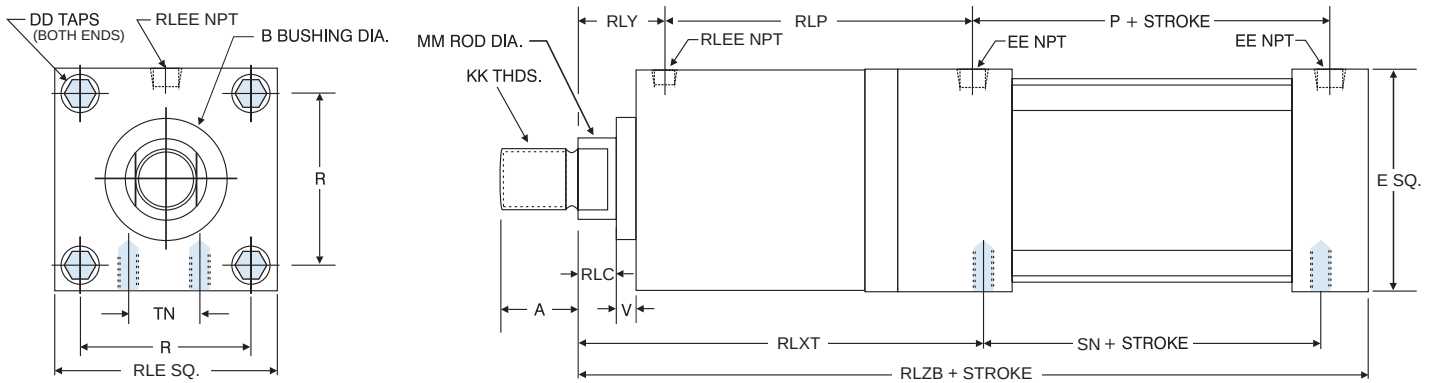
STANDARD ROD: 'MS4' (BOTTOM TAPPED HOLES) WITH ROD LOCK MOUNTED



'FM' SERIES 'MS4' FLUSH MOUNT DIMENSIONS														ROD LOCK BASIC DIMENSIONS									
BORE	A	B	DD	E	EE	KK	MM	NT	P	R	SN	TK	TN	RLC	RLE	RLEE	RLP	RLXT	RLY	RLZB	V		
1.50	0.750	1.13	1/4-28	2.00	1/4 NPT	7/16-20	0.625	1/4-20	2.38	1.43	2.25	0.38	0.63	0.38	1.98	1/8 NPT	3.56	4.57	0.94	7.25	0.25		
2.00	0.750	1.13	5/16-24	2.50	1/4 NPT	7/16-20	0.625	5/16-18	2.38	1.84	2.25	0.50	0.88	0.38	2.48	1/8 NPT	3.56	4.57	0.94	7.25	0.25		
2.50	0.750	1.13	5/16-24	3.00	1/4 NPT	7/16-20	0.625	3/8-16	2.50	2.19	2.38	0.63	1.25	0.38	2.98	1/8 NPT	3.75	4.82	1.00	7.63	0.25		
3.25	1.125	1.50	3/8-24	3.75	3/8 NPT	3/4-16	1.000	1/2-13	2.75	2.76	2.63	0.75	1.50	0.50	3.73	1/4 NPT	4.44	5.82	1.31	9.00	0.25		
4.00	1.125	1.50	3/8-24	4.50	3/8 NPT	3/4-16	1.000	1/2-13	2.75	3.32	2.63	0.75	2.06	0.50	4.48	1/4 NPT	4.44	5.82	1.31	9.00	0.25		
5.00	1.125	1.50	1/2-20	5.50	3/8 NPT	3/4-16	1.000	5/8-11	3.00	4.10	2.88	1.00	2.69	0.50	5.48	1/4 NPT	4.44	5.82	1.31	9.25	0.25		
6.00	1.625	2.00	1/2-20	6.50	1/2 NPT	1-14	1.375	3/4-10	3.25	4.88	3.13	1.13	3.25	0.63	6.48	1/4 NPT	5.06	6.56	1.44	10.38	0.25		

For dimensions not shown, see pages 8

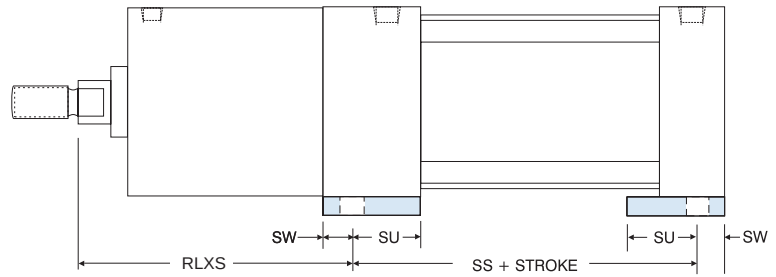
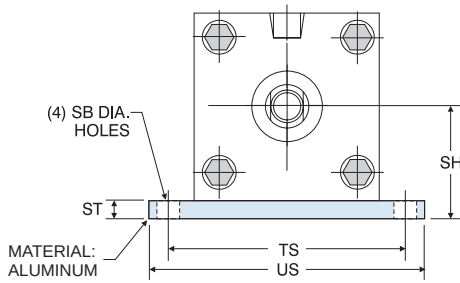
OVERSIZED ROD: 'MS4' (BOTTOM TAPPED HOLES) WITH ROD LOCK MOUNTED



'FM' SERIES OVERSIZE ROD 'MS4' FLUSH MOUNT DIMENSIONS														ROD LOCK BASIC DIMENSIONS								
BORE	A	B	DD	E	EE	KK	MM	NT	P	R	SN	TK	TN	RLC	RLE	RLEE	RLP	RLXT	RLY	RLZB	V	
2.00	1.125	1.50	⁵ / ₁₆ -24	2.50	¹ / ₄ NPT	³ / ₄ -16	1.000	⁵ / ₁₆ -18	2.38	1.84	2.25	0.50	0.88	0.50	2.48	¹ / ₈ NPT	4.50	5.81	1.25	8.50	0.25	
2.50	1.125	1.50	⁵ / ₁₆ -24	3.00	¹ / ₄ NPT	³ / ₄ -16	1.000	³ / ₈ -16	2.50	2.19	2.38	0.63	1.25	0.50	2.98	¹ / ₈ NPT	4.50	5.81	1.25	8.63	0.25	
3.25	1.625	2.00	³ / ₈ -24	3.75	³ / ₈ NPT	1-14	1.375	¹ / ₂ -13	2.75	2.76	2.63	0.75	1.50	0.63	3.73	¹ / ₄ NPT	5.06	6.57	1.44	9.75	0.25	
4.00	1.625	2.00	³ / ₈ -24	4.50	³ / ₈ NPT	1-14	1.375	¹ / ₂ -13	2.75	3.32	2.63	0.75	2.06	0.63	4.48	¹ / ₄ NPT	5.06	6.57	1.44	9.75	0.25	
5.00	1.625	2.00	¹ / ₂ -20	5.50	³ / ₈ NPT	1-14	1.375	⁵ / ₈ -11	3.00	4.10	2.88	1.00	2.69	0.63	5.48	¹ / ₄ NPT	5.19	6.69	1.44	10.13	0.25	
6.00	2.000	2.38	¹ / ₂ -20	6.50	¹ / ₂ NPT	1 ¹ / ₄ -12	1.750	³ / ₄ -10	3.25	4.88	3.13	1.13	3.25	0.75	6.48	¹ / ₄ NPT	5.82	7.44	1.56	11.25	0.25	

For dimensions not shown, see pages 9

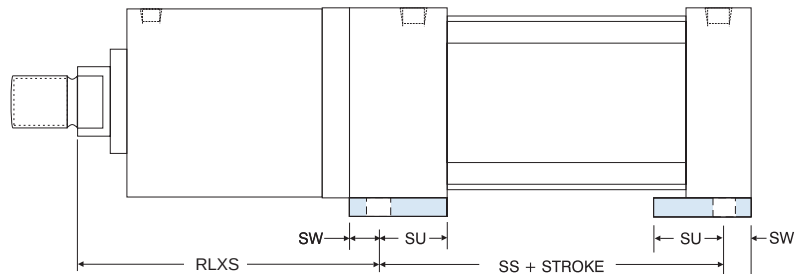
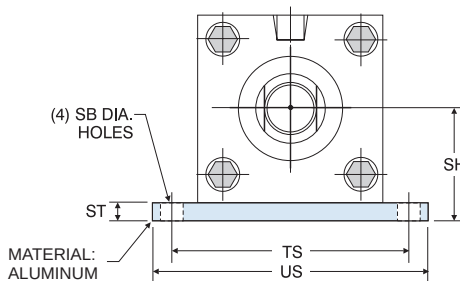
STANDARD ROD: 'BASEBAR' (NON-NFPA) WITH ROD LOCK MOUNTED



'FM' SERIES BASE BAR MOUNT (Non-NFPA) DIMENSIONS										
BORE	ROD DIAMETER	SB	SH	ST	SU	SW	TS	US	RLXS	ADD STROKE
										SS
1.50	0.625	0.44	1.25	0.25	1.13	0.38	2.75	3.50	4.00	2.88
2.00	0.625	0.44	1.50	0.25	1.13	0.38	3.25	4.00	4.00	2.88
2.50	0.625	0.44	1.88	0.38	1.13	0.38	3.75	4.50	4.25	3.00
3.25	1.000	0.56	2.38	0.50	1.25	0.50	4.75	5.75	5.25	3.25
4.00	1.000	0.56	2.75	0.50	1.25	0.50	5.50	6.50	5.25	3.25

For dimensions not shown, see pages 8

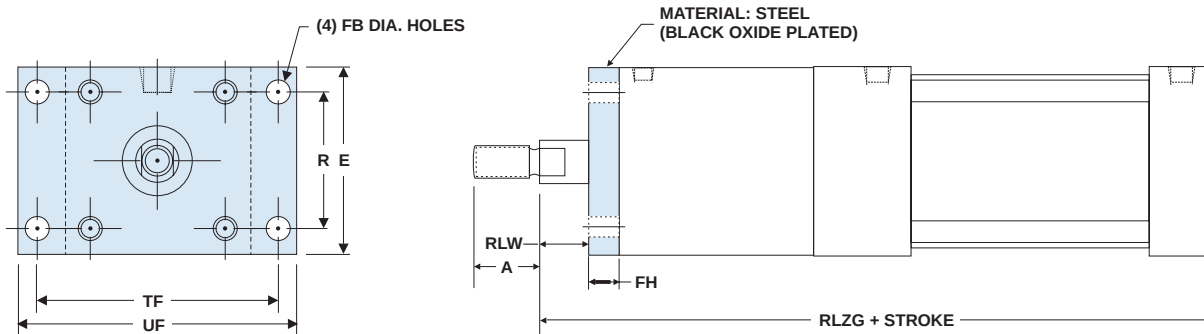
OVERSIZED ROD: 'BASEBAR' (NON-NFPA) WITH ROD LOCK MOUNTED



'FM' SERIES BASE BAR MOUNT (Non-NFPA) DIMENSIONS										
BORE	ROD DIAMETER	SB	SH	ST	SU	SW	TS	US	RLXS	ADD STROKE
										SS
2.00	1.000	0.44	1.50	0.25	1.13	0.38	3.25	4.00	5.25	2.88
2.50	1.000	0.44	1.88	0.38	1.13	0.38	3.75	4.50	5.25	3.00
3.25	1.375	0.56	2.38	0.50	1.25	0.50	4.75	5.75	6.00	3.25
4.00	1.375	0.56	2.75	0.50	1.25	0.50	5.50	6.50	6.00	3.25

For dimensions not shown, see pages 9

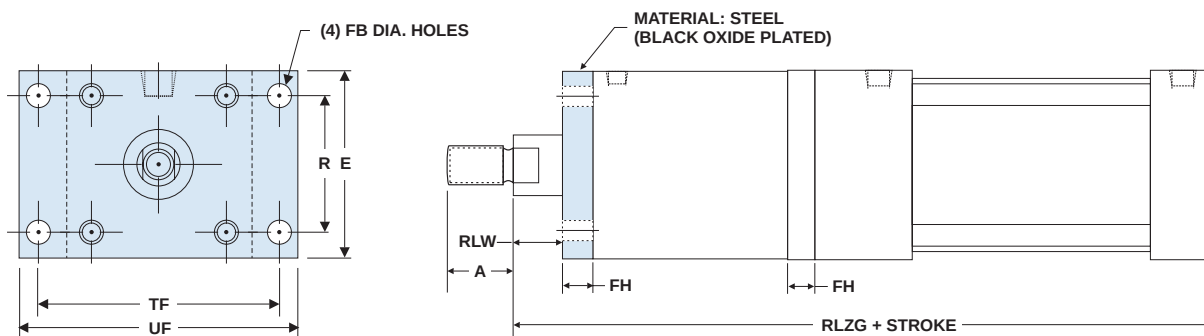
STANDARD ROD: 'MF1' (HEAD FLANGE) WITH ROD LOCK MOUNTED



'FM' SERIES 'MF1' FLANGE MOUNT DIMENSIONS										
BORE	ROD DIAMETER	A	E	FB	FH	R	RLW	TF	UF	RLZG
1.50	0.625	0.75	2.00	0.31	0.38	1.43	0.63	2.75	3.38	7.63
2.00	0.625	0.75	2.50	0.38	0.38	1.84	0.63	3.38	4.13	7.63
2.50	0.625	0.75	3.00	0.38	0.38	2.19	0.63	3.88	4.63	8.00
3.25	1.000	1.13	3.75	0.44	0.63	2.76	0.75	4.69	5.50	9.63
4.00	1.000	1.13	4.50	0.44	0.63	3.32	0.75	5.44	6.25	9.63
5.00	1.000	1.13	5.50	0.56	0.63	4.10	0.75	6.63	7.63	9.88
6.00	1.375	1.63	6.50	0.56	0.75	4.88	0.88	7.63	8.63	11.13

For dimensions not shown, see pages 8

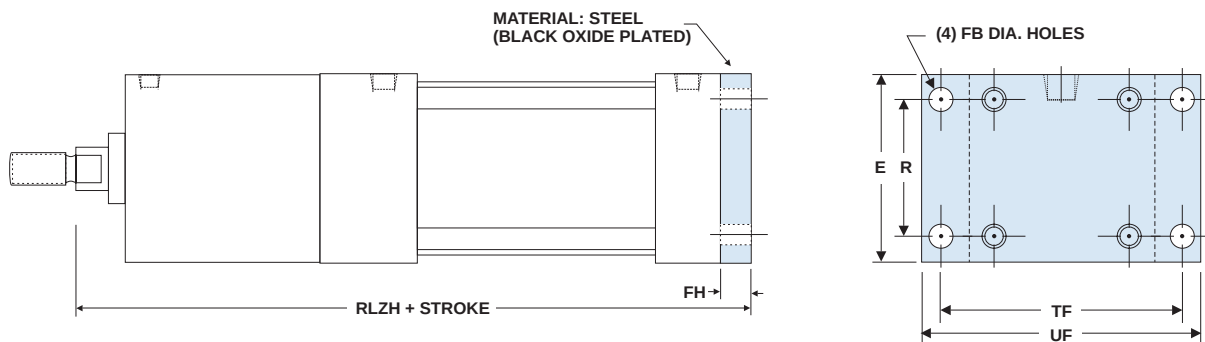
OVERSIZED ROD: 'MF1' (HEAD FLANGE) WITH ROD LOCK MOUNTED



'FM' SERIES 'MF2' FLANGE MOUNT DIMENSIONS										
BORE	ROD DIAMETER	A	E	FB	FH	R	RLW	TF	UF	RLZG
2.00	1.000	1.13	2.50	0.38	0.38	1.84	1.00	3.38	4.13	9.13
2.50	1.000	1.13	3.00	0.38	0.38	2.19	1.00	3.88	4.63	9.25
3.25	1.375	1.63	3.75	0.44	0.63	2.76	1.00	4.69	5.50	10.50
4.00	1.375	1.63	4.50	0.44	0.63	3.32	1.00	5.44	6.25	10.50
5.00	1.375	1.63	5.50	0.56	0.63	4.10	1.00	6.63	7.63	10.88
6.00	1.750	2.00	6.50	0.56	0.75	4.88	1.13	7.63	8.63	12.13

For dimensions not shown, see pages 9

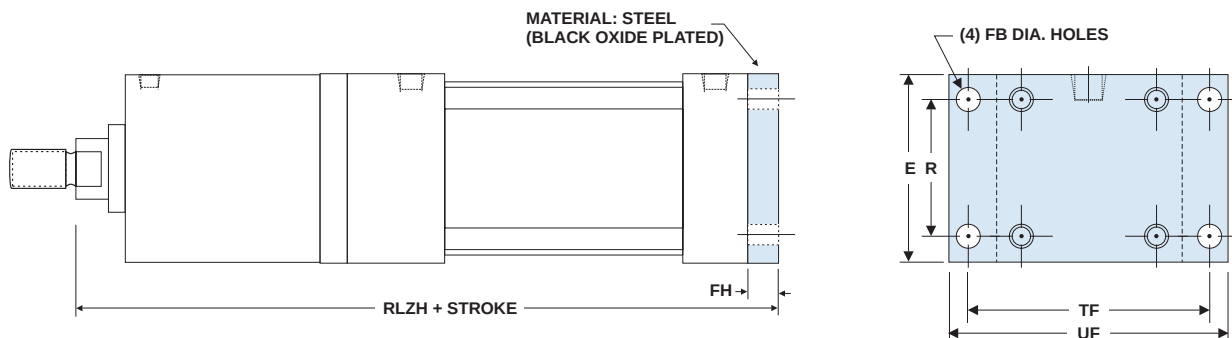
STANDARD ROD: 'MF2' (CAP FLANGE) WITH ROD LOCK MOUNTED



'FM' SERIES 'MF2' FLANGE MOUNT DIMENSIONS								
BORE	ROD DIAMETER	E	FB	FH	R	TF	UF	RLZH
1.50	0.625	2.00	0.31	0.38	1.43	2.75	3.38	7.63
2.00	0.625	2.50	0.38	0.38	1.84	3.38	4.13	7.63
2.50	0.625	3.00	0.38	0.38	2.19	3.88	4.63	8.00
3.25	1.000	3.75	0.44	0.63	2.76	4.69	5.50	9.63
4.00	1.000	4.50	0.44	0.63	3.32	5.44	6.25	9.63
5.00	1.000	5.50	0.56	0.63	4.10	6.63	7.63	9.88
6.00	1.375	6.50	0.56	0.75	4.88	7.63	8.63	11.13

For dimensions not shown, see pages 8

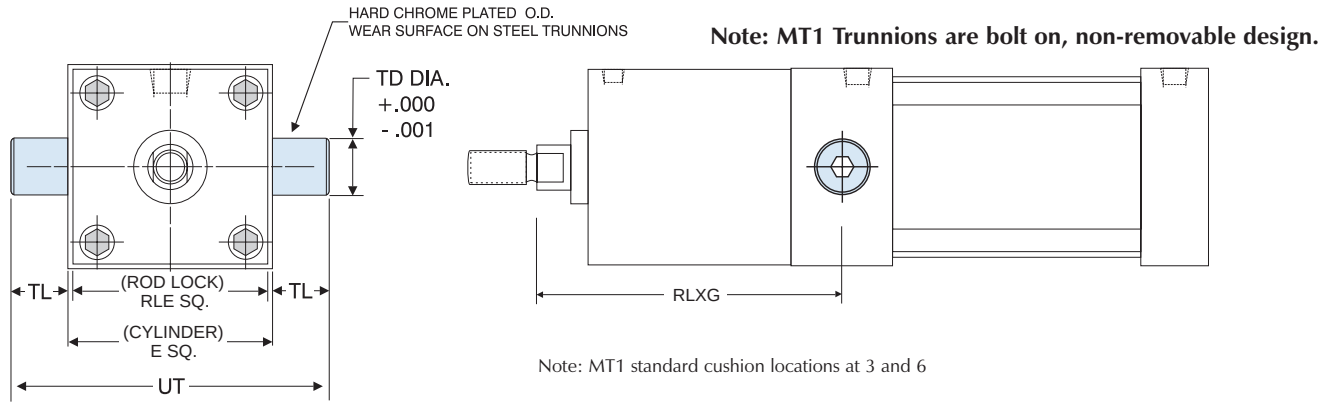
OVERSIZED ROD: 'MF2' (CAP FLANGE) WITH ROD LOCK MOUNTED



'FM' SERIES 'MF2' FLANGE MOUNT DIMENSIONS								
BORE	ROD DIAMETER	E	FB	FH	R	TF	UF	RLZH
2.00	1.000	2.50	0.38	0.38	1.84	3.38	4.13	8.88
2.50	1.000	3.00	0.38	0.38	2.19	3.88	4.63	9.00
3.25	1.375	3.75	0.44	0.63	2.76	4.69	5.50	10.38
4.00	1.375	4.50	0.44	0.63	3.32	5.44	6.25	10.38
5.00	1.375	5.50	0.56	0.63	4.10	6.63	7.63	10.75
6.00	1.750	6.50	0.56	0.75	4.88	7.63	8.63	12.00

For dimensions not shown, see pages 9

STANDARD ROD: 'MT1' (HEAD TRUNNION) WITH ROD LOCK MOUNTED

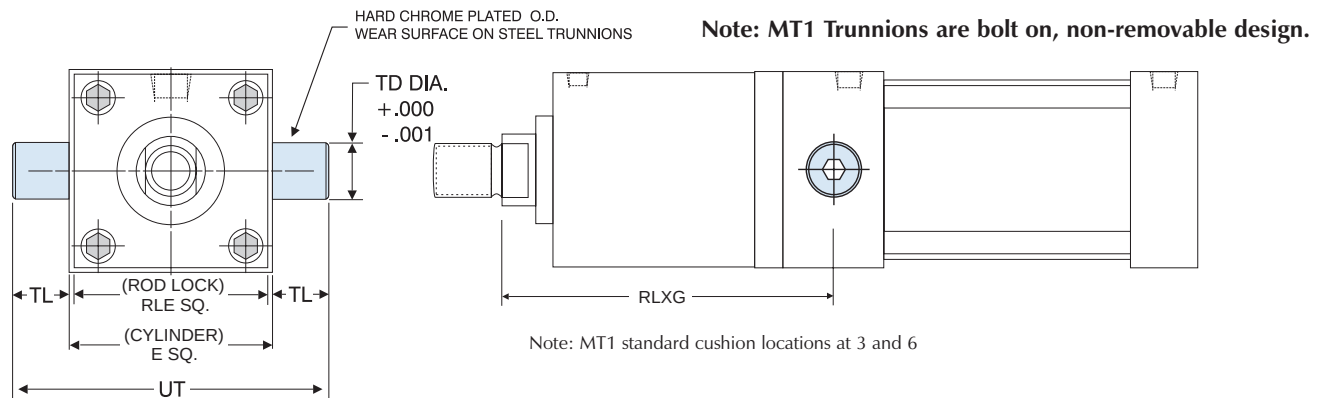


'FM' SERIES 'MT1' HEAD TRUNNION AND 'MT2' CAP TRUNNION MOUNT DIMENSIONS

BORE	ROD DIAMETER	E	RL-E	TD	TL	UT	RLXG
1.50	0.625	2.00	1.98	1.00	1.00	4.00	4.38
2.00	0.625	2.50	2.48	1.00	1.00	4.50	4.38
2.50	0.625	3.00	2.98	1.00	1.00	5.00	4.63
3.25	1.000	3.75	3.73	1.00	1.00	5.75	5.63
4.00	1.000	4.50	4.48	1.00	1.00	6.50	5.63
5.00	1.000	5.50	5.48	1.00	1.00	7.50	5.63
6.00	1.375	6.50	6.48	1.38	1.38	9.25	6.38

For dimensions not shown, see pages 8

OVERSIZED ROD: 'MT1' (HEAD TRUNNION) WITH ROD LOCK MOUNTED

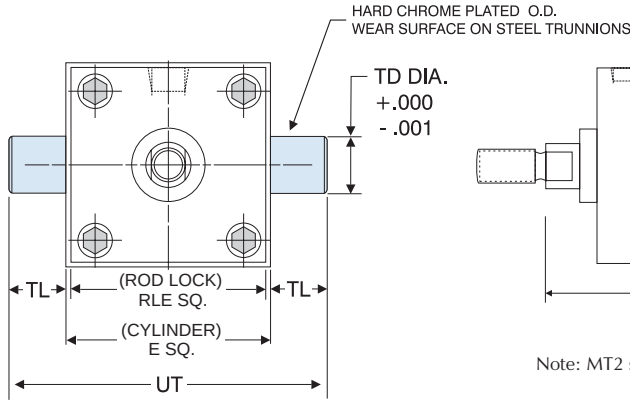


'FM' SERIES 'MT1' HEAD TRUNNION AND 'MT2' CAP TRUNNION MOUNT DIMENSIONS

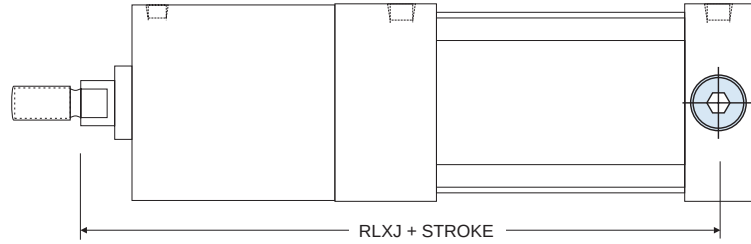
BORE	ROD DIAMETER	E	RLE	TD	TL	UT	RLXG
2.00	1.000	2.50	2.48	1.00	1.00	4.50	5.63
2.50	1.000	3.00	2.98	1.00	1.00	5.00	5.63
3.25	1.375	3.75	3.73	1.00	1.00	5.75	6.38
4.00	1.375	4.50	4.48	1.00	1.00	6.50	6.38
5.00	1.375	5.50	5.48	1.00	1.00	7.50	6.50
6.00	1.750	6.50	6.48	1.38	1.38	9.25	7.25

For dimensions not shown, see pages 9

STANDARD ROD: 'MT2' (CAP TRUNNION) WITH ROD LOCK MOUNTED



Note: MT2 Trunnions are bolt on, non-removable design.

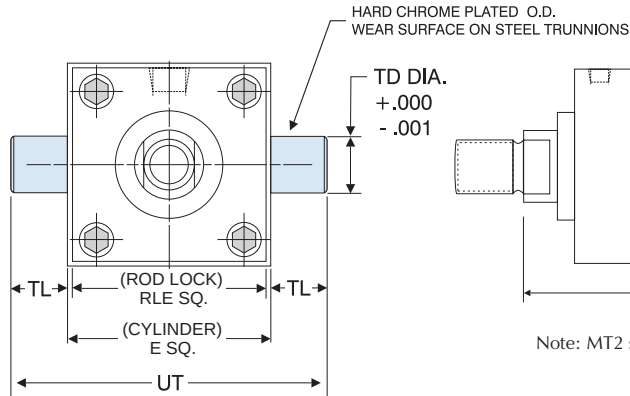


Note: MT2 standard cushion locations at 2 and 7

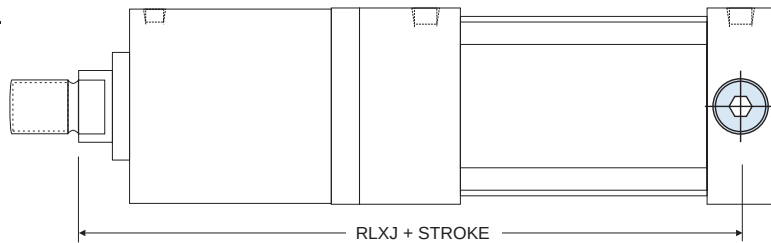
'FM' SERIES 'MT1' HEAD TRUNNION AND 'MT2' CAP TRUNNION MOUNT DIMENSIONS							
BORE	ROD DIAMETER	E	RLE	TD	TL	UT	ADD STROKE
							RLXJ
1.50	0.625	2.00	1.98	1.00	1.00	4.00	6.75
2.00	0.625	2.50	2.48	1.00	1.00	4.50	6.75
2.50	0.625	3.00	2.98	1.00	1.00	5.00	7.13
3.25	1.000	3.75	3.73	1.00	1.00	5.75	8.38
4.00	1.000	4.50	4.48	1.00	1.00	6.50	8.38
5.00	1.000	5.50	5.48	1.00	1.00	7.50	8.63
6.00	1.375	6.50	6.48	1.38	1.38	9.25	9.63

For dimensions not shown, see pages 8

OVERSIZED ROD: 'MT2' (CAP TRUNNION) WITH ROD LOCK MOUNTED



Note: MT2 Trunnions are bolt on, non-removable design.

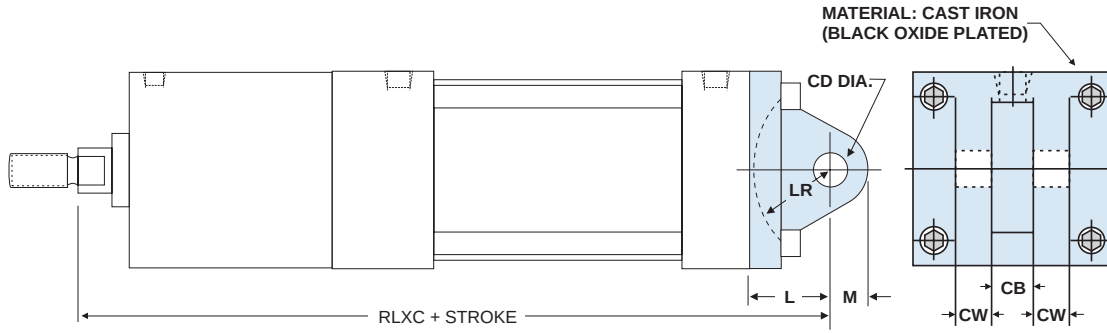


Note: MT2 standard cushion locations at 2 and 7

'FM' SERIES 'MT1' HEAD TRUNNION AND 'MT2' CAP TRUNNION MOUNT DIMENSIONS							
BORE	ROD DIAMETER	E	RLE	TD	TL	UT	ADD STROKE
							RLXJ
2.00	1.000	2.50	2.48	1.00	1.00	4.50	8.00
2.50	1.000	3.00	2.98	1.00	1.00	5.00	8.13
3.25	1.375	3.75	3.73	1.00	1.00	5.75	9.13
4.00	1.375	4.50	4.48	1.00	1.00	6.50	9.13
5.00	1.375	5.50	5.48	1.00	1.00	7.50	9.38
6.00	1.750	6.50	6.48	1.38	1.38	9.25	10.50

For dimensions not shown, see pages 9

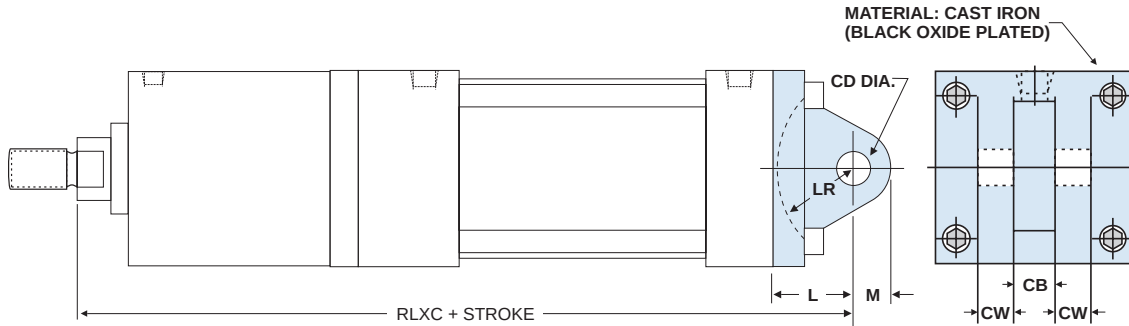
STANDARD ROD: 'MP1' (Detachable Cap Pivot Clevis) WITH ROD LOCK MOUNTED



'FM' SERIES 'MP1' CLEVIS MOUNT DIMENSIONS								
BORE	ROD DIAMETER	CB	CD	CW	L	LR	M	ADD STROKE RLXC
1.50	0.625	0.75	0.50	0.50	0.75	0.75	0.63	8.00
2.00	0.625	0.75	0.50	0.50	0.75	0.75	0.63	8.00
2.50	0.625	0.75	0.50	0.50	0.75	0.75	0.63	8.38
3.25	1.000	1.25	0.75	0.63	1.25	1.25	0.88	10.25
4.00	1.000	1.25	0.75	0.63	1.25	1.25	0.88	10.25
5.00	1.000	1.25	0.75	0.63	1.25	1.25	0.88	10.50
6.00	1.375	1.50	1.00	0.75	1.50	1.50	1.00	11.88

For dimensions not shown, see pages 8

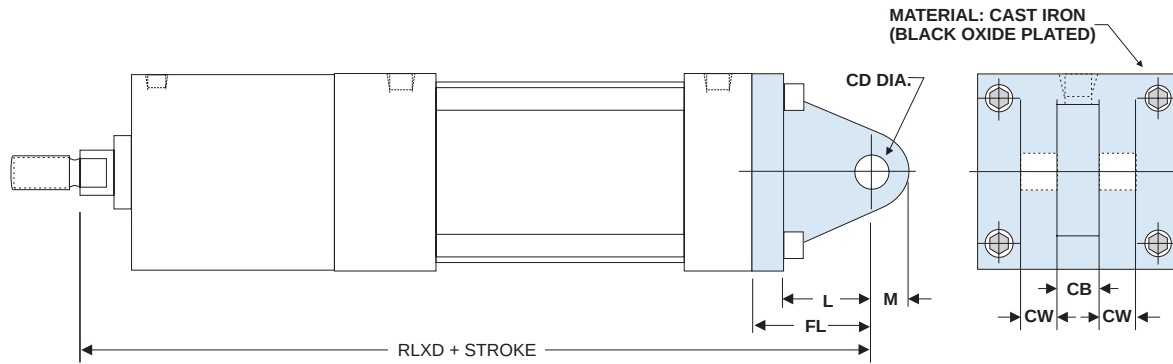
OVERSIZED ROD: 'MP1' (Detachable Cap Pivot Clevis) WITH ROD LOCK MOUNTED



'FM' SERIES 'MP1' CLEVIS MOUNT DIMENSIONS								
BORE	ROD DIAMETER	CB	CD	CW	L	LR	M	ADD STROKE RLXC
2.00	1.000	0.75	0.50	0.50	0.75	0.75	0.63	9.25
2.50	1.000	0.75	0.50	0.50	0.75	0.75	0.63	9.38
3.25	1.375	1.25	0.75	0.63	1.25	1.25	0.88	11.00
4.00	1.375	1.25	0.75	0.63	1.25	1.25	0.88	11.00
5.00	1.375	1.25	0.75	0.63	1.25	1.25	0.88	11.38
6.00	1.750	1.50	1.00	0.75	1.50	1.50	1.00	12.75

For dimensions not shown, see pages 9

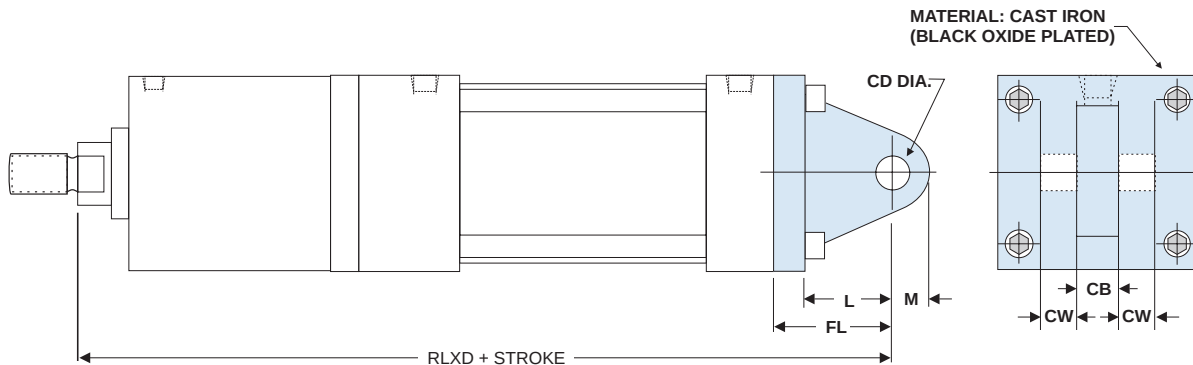
STANDARD ROD: 'MP2' (Detachable Cap Pivot Clevis) WITH ROD LOCK MOUNTED



'FM' SERIES 'MP2' CLEVIS MOUNT DIMENSIONS								
BORE	ROD DIAMETER	CB	CD	CW	FL	L	M	ADD STROKE RLXD
1.50	0.625	0.75	0.50	0.50	1.13	0.75	0.63	8.38
2.00	0.625	0.75	0.50	0.50	1.13	0.75	0.63	8.38
2.50	0.625	0.75	0.50	0.50	1.13	0.75	0.63	8.75
3.25	1.000	1.25	0.75	0.63	1.88	1.25	0.88	10.88
4.00	1.000	1.25	0.75	0.63	1.88	1.25	0.88	10.88
5.00	1.000	1.25	0.75	0.63	1.88	1.25	0.88	11.13
6.00	1.375	1.50	1.00	0.75	2.25	1.50	1.00	12.63

For dimensions not shown, see pages 8

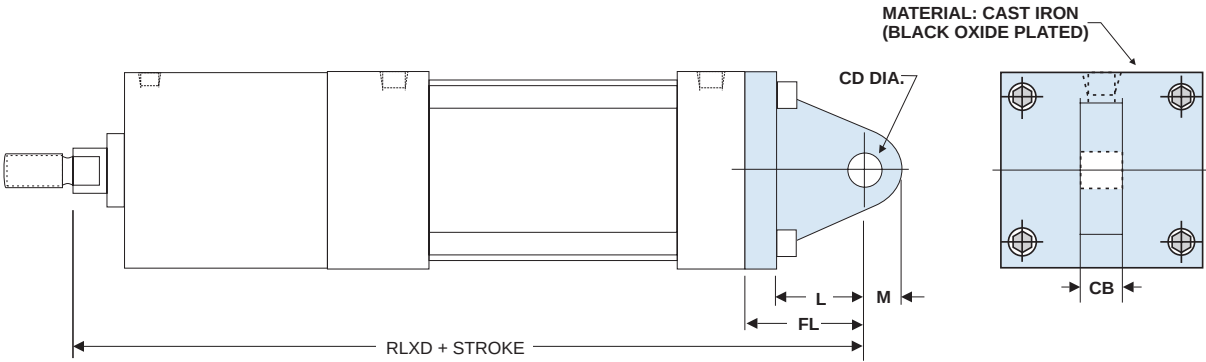
OVERSIZED ROD: 'MP2' (Detachable Cap Pivot Clevis) WITH ROD LOCK MOUNTED



'FM' SERIES 'MP2' CLEVIS MOUNT DIMENSIONS								
BORE	ROD DIAMETER	CB	CD	CW	FL	L	M	ADD STROKE RLXD
2.00	1.000	0.75	0.50	0.50	1.13	0.75	0.63	9.63
2.50	1.000	0.75	0.50	0.50	1.13	0.75	0.63	9.75
3.25	1.375	1.25	0.75	0.63	1.88	1.25	0.88	11.63
4.00	1.375	1.25	0.75	0.63	1.88	1.25	0.88	11.63
5.00	1.375	1.25	0.75	0.63	1.88	1.25	0.88	12.00
6.00	1.750	1.50	1.00	0.75	2.25	1.50	1.00	13.50

For dimensions not shown, see pages 9

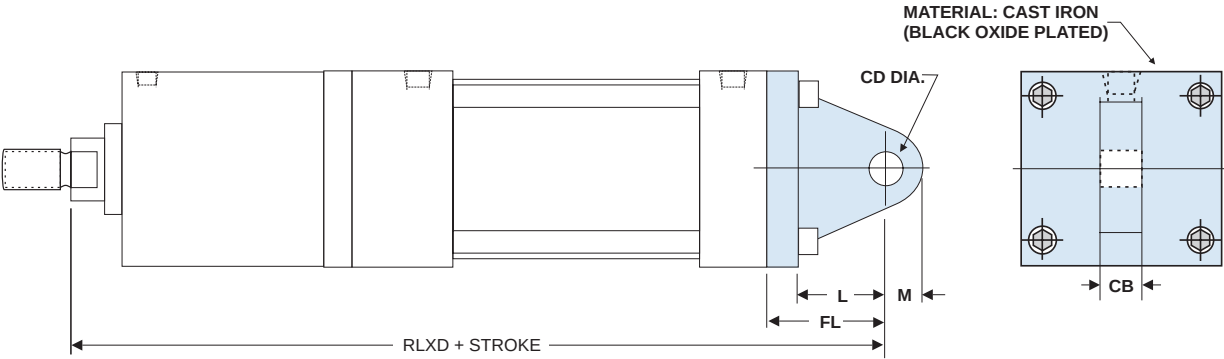
STANDARD ROD: ‘MP4’ (Detachable Cap Pivot Eye)
WITH ROD LOCK MOUNTED



‘FM’ SERIES ‘MP4’ ROD EYE MOUNT DIMENSIONS								
BORE	ROD DIAMETER	CB	CD	CW	FL	L	M	ADD STROKE RLXD
1.50	0.625	0.75	0.50	0.50	1.13	0.75	0.63	8.38
2.00	0.625	0.75	0.50	0.50	1.13	0.75	0.63	8.38
2.50	0.625	0.75	0.50	0.50	1.13	0.75	0.63	8.75
3.25	1.000	1.25	0.75	0.63	1.88	1.25	0.88	10.88
4.00	1.000	1.25	0.75	0.63	1.88	1.25	0.88	10.88

For dimensions not shown, see pages 8

OVERSIZED ROD: ‘MP4’ (Detachable Cap Pivot Eye)
WITH ROD LOCK MOUNTED



‘FM’ SERIES ‘MP4’ ROD EYE MOUNT DIMENSIONS								
BORE	ROD DIAMETER	CB	CD	CW	FL	L	M	ADD STROKE RLXD
2.00	1.000	0.75	0.50	0.50	1.13	0.75	0.63	9.63
2.50	1.000	0.75	0.50	0.50	1.13	0.75	0.63	9.75
3.25	1.375	1.25	0.75	0.63	1.88	1.25	0.88	11.63
4.00	1.375	1.25	0.75	0.63	1.88	1.25	0.88	11.63

For dimensions not shown, see pages 9

ACCESSORIES: CLEVIS, PINS & MOUNTS

Accessories Cross Reference Chart

CYLINDER MODEL				ACCESSORIES				
BORE	ROD SIZE	ROD STYLE (KK)	ROD THREAD	ROD CLEVIS	ROD EYE	CLEVIS PIN	CLEVIS BRACKET	EYE BRACKET
1.50 2.00 2.50	0.625	#1 (STANDARD) KK1	$\frac{7}{16}$ -20	RC437	RE437	CP500	CB500	EB500
		#2 KK2	$\frac{1}{2}$ -20	RC500	RE500	CP500		
	1.000	#1 (ST'D-OVERSIZE) KK1	$\frac{3}{4}$ -16	RC750	RE750	CP750		
		#4 KK4	1-14	RC1000	RE1000	CP1000		
3.25 4.00 5.00	1.000	#1 (STANDARD) KK1	$\frac{3}{4}$ -16	RC750	RE750	CP750	CB750	EB750
		#4 KK4	1-14	RC1000	RE1000	CP1000		
	1.375	#1 (ST'D-OVERSIZE) KK1	1-14	RC1000	RE1000	CP1000		
		#2 KK2	$1\frac{1}{4}$ -12	RC1250	N/A	CP1375		
6.00	1.375	#1 (STANDARD) KK1	1-14	RC1000	RE1000	CP1000	CB1000	EB1000
		#2 KK2	$1\frac{1}{4}$ -12	RC1250	N/A	CP1375		
	1.750	#1 (ST'D-OVERSIZE) KK1	$1\frac{1}{4}$ -12	RC1250	N/A	CP1375		
		#2 KK2	$1\frac{1}{2}$ -12	RC1500	N/A	CP1750		

ROD CLEVIS								
PART NO.	CB	CD	CE	CH	CW	ER	KK	L
RC437	0.75	0.50	1.50	1.00	0.50	0.50	$\frac{7}{16}$ -20	0.75
RC500							$\frac{1}{2}$ -20	
RC750	1.25	0.75	2.38	1.25	0.63	0.75	$\frac{3}{4}$ -16	1.25
RC1000	1.50	1.00	3.13	1.50	0.75	1.00	1-14	1.50
RC1250	2.00	1.38	4.13	2.00	1.00	1.38	$1\frac{1}{4}$ -12	2.13
RC1375	2.00	1.38	4.13	2.00	1.00	1.38	$1\frac{3}{8}$ -12	2.13
RC1500	2.50	1.75	4.50	2.38	1.25	1.75	$1\frac{1}{2}$ -12	2.25

ROD CLEVIS

MATERIAL: CAST STEEL
FINISH: BLACK OXIDE

(Clevis Pins sold separately from Rod Clevises)

ROD EYE						
PART NO.	A	CA	CB	CD	ER	KK
RE437	0.75	1.50	0.75	0.50	0.63	$\frac{7}{16}$ -20
RE500						$\frac{1}{2}$ -20
RE750	1.13	2.06	1.25	0.75	0.88	$\frac{3}{4}$ -16
RE1000	1.63	2.81	1.50	1.00	1.19	1-14

ROD EYE

MATERIAL: 1018 CRS
FINISH: BLACK OXIDE

(Clevis Pins sold separately from Rod Eyes)

CLEVIS BRACKET										
PART NO.	BA	CB	CD	CW	DD	E	F	FL	L	M
CB500	1.63	0.75	0.50	0.50	$\frac{3}{8}$ -24	2.50	0.38	1.13	0.75	0.50
CB750	2.56	1.25	0.75	0.63	$\frac{1}{2}$ -20	3.50	0.63	1.88	1.25	0.75
CB1000	3.25	1.50	1.00	0.75	$\frac{5}{8}$ -18	4.50	0.75	2.25	1.50	1.00

CLEVIS BRACKET

MATERIAL: CAST STEEL
FINISH: BLACK OXIDE

(Clevis Pins sold separately from Clevis Brackets)

EYE BRACKET									
PART NO.	BA	CB	CD	DD	E	F	FL	L	M
EB500	1.63	0.75	0.50	0.41	2.50	0.38	1.13	0.75	0.50
EB750	2.56	1.25	0.75	0.53	3.50	0.63	1.88	1.25	0.75
EB1000	3.25	1.50	1.00	0.66	4.50	0.75	2.25	1.50	1.00

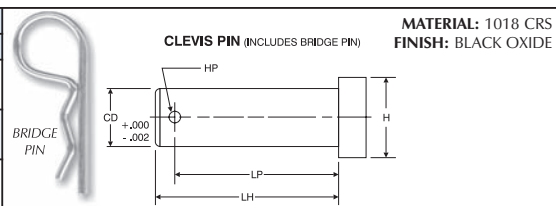
EYE BRACKET

MATERIAL: CAST STEEL
FINISH: BLACK OXIDE

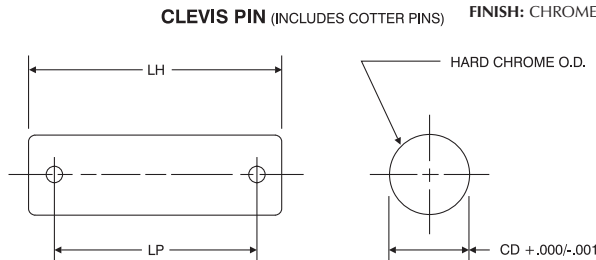
(Clevis Pins sold separately from Eye Brackets)

Accessories: Clevis, Pins & Mounts

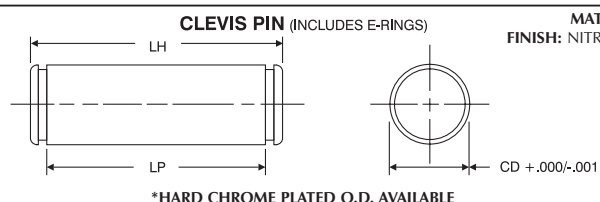
CLEVIS PIN (WITH BRIDGE PIN - STANDARD)					
PART NO.	CD	H	HP	LH	LP
CP500	0.50	0.63	0.16	2.25	2.09
CP750	0.75	0.94	0.16	3.00	2.84
CP1000	1.00	1.19	0.20	3.50	3.31



CLEVIS PIN (WITH COTTER PINS)				MATERIAL: 1045 CRS FINISH: CHROME PLATED O.D.	
PART NO.	CD	LH	LP		
CP500C	0.50	2.25	1.94		
CP750C	0.75	3.00	2.72		
CP1000C	1.00	3.50	3.22		
CP1375C	1.38	5.00	4.25		
CP1750C	1.75	6.00	5.50		



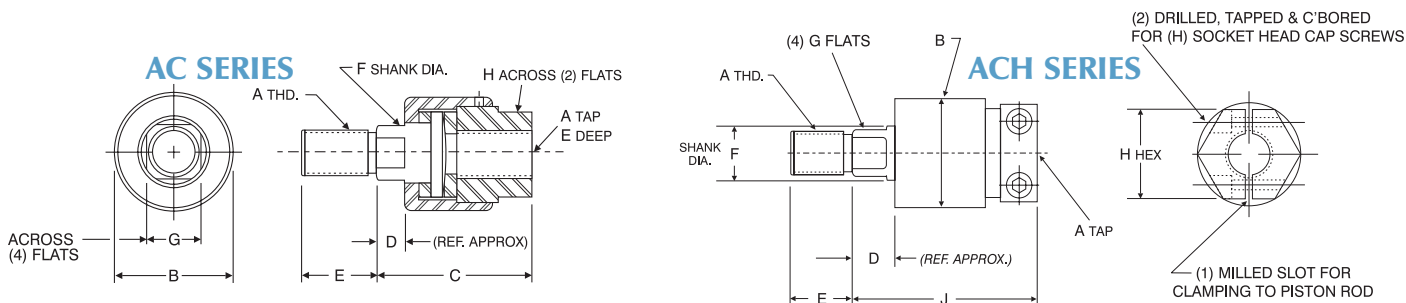
CLEVIS PIN (WITH E-RINGS)				MATERIAL: 1045 CRS FINISH: NITROTECH PLATED*	
PART NO.	CD	LH	LP		
CP500E	0.50	2.13	1.88		
CP750E	0.75	2.94	2.63		
CP1000E	1.00	3.44	3.13		



SMALL CLEVIS PIN (WITH BRIDGE PIN)					MATERIAL: 1018 CRS FINISH: BLACK OXIDE SMALL CLEVIS PIN (INCLUDES BRIDGE PIN)
PART NO.	CD	HP	LH	LP	
CP500CCS	0.50	0.16	1.38	1.25	
CP750CCS	0.75	0.16	2.00	1.88	

SMALL ROD CLEVIS										MATERIAL: 1018 CRS FINISH: BLACK OXIDE SMALL ROD CLEVIS
PART NO.	C	CB	CD	CE	CH	CW	KK1	KK2	L	
RC437CCS	1.875	.50	.50	1.38	1.00	.25	7/16-20	—	.75	
RC500CCS	1.875	.50	.50	1.38	1.00	.25	—	1/2-20	.75	
RC750CCS	2.500	.75	.75	1.75	1.50	.38	3/4-16	—	1	

Alignment Couplers: AC & ACH Series



ALIGNMENT COUPLER DIMENSIONS											
PART NO.	A	B	C	D	E	F	G	H	H HEX	J	MAX PULL AT YIELD
AC250	1/4-28	1.13	1.75	0.38	0.50	0.50	0.38	0.69	1.25	2.00	6,000
AC312	5/16-24	1.13	1.75	0.38	0.50	0.50	0.38	0.69	1.25	2.00	8,300
AC375	3/8-24	1.13	1.75	0.38	0.50	0.50	0.38	0.69	1.25	2.00	8,300
AC437	7/16-20	1.25	2.00	0.44	0.75	0.63	0.50	0.81	1.25	2.16	10,000
AC500	1/4-20	1.25	2.00	0.44	0.75	0.63	0.50	0.81	1.25	2.16	14,000
AC625	5/8-18	1.25	2.00	0.44	0.75	0.63	0.50	0.81	1.25	2.16	19,000
AC750	3/4-16	1.75	2.31	0.44	1.13	0.97	0.81	1.13	1.75	2.50	34,000
AC875	7/8-14	1.75	2.31	0.44	1.13	0.97	0.81	1.13	1.75	2.50	39,000
AC1000	1-14	2.50	2.94	0.44	1.63	1.34	1.16	1.63	2.50	2.94	64,000
AC1250	1 1/4-12	2.50	2.94	0.44	1.63	1.34	1.16	1.63	2.50	2.94	78,000
AC1375	1 3/8-12	2.50	2.94	0.44	1.63	1.34	1.16	1.63	—	—	78,000
AC1500	1 1/2-12	3.25	4.38	0.88	2.25	1.97	1.75	2.38	—	—	134,000
AC1750	1 3/4-12	3.25	4.38	0.88	2.25	1.97	1.75	2.38	—	—	134,000

*Please specify AC or ACH coupler when ordering:
i.e.: AC750 (Std. Coupler) or ACH750 (Hex Coupler)

How to Order:

AC		250		(Optional alternative size*)	
AC		250		- 312 FEMALE	
SERIES	SIZE	SERIES	SIZE	SERIES	SIZE
AC	250	AC	250	AC	250
ACH	312	ACH	312	ACH	312
	375		375		375
	437		437		437
	500		500		500
	625		625		625
	750		750		750
	875		875		875
	1000		1000		1000
	1250		1250		1250
	1375		1375		1375
	1500		1500		1500
	1750		1750		1750

Ordering Examples:

AC250 (AC with male & female .25-28 thread)
ACH500 (ACH with male & female .50-20 thread)
AC437-625 FEMALE (AC with .44-20 male and .63-18 female thread)

*You can order different thread sizes within the same size of coupler housing DIA. (Refer to "B" Diameter in dimension chart)

TECHNICAL DATA: ROD LOCK AIR CONTROLS

Rod Locks can be used in a wide range of general purpose applications. They are designed to mechanically lock the cylinder piston rod when the air supply (60 - 150 PSI) is removed. Rod Locks are designed for millions of trouble-free actuations if properly applied. Avoid designs or situations where the rod lock is frequently engaged while the piston rod is in motion. Since Rod Locks have a high degree of rigidity, they can be used in positioning systems. Total Rod Lock "play" (under loaded conditions) is very low (.000" to .008").

Cylinder Control - Use a 5/3 valve to extend and retract cylinder with rod lock. A 4-way valve or closed center valve can cause the cylinder to lunge before the rod lock is fully released, causing damage to the rod lock or piston rod.

Rod Lock Control - Use a 3-way NC valve to supply 60 - 150 PSI to engage and disengage the rod lock.

Check Valve - Can be used to isolate 3-way valve from drop in supply air during cylinder operation.

Air Regulator - Can be used in vertical applications to offset the cylinder displacement differential between the rod end and cap end. They can also be used to help balance or counter the effects of gravity on the load.

Quick Exhaust Valve - Can be used to accelerate the rod lock response time for maximum performance. Typical rod lock response time is 200ms.

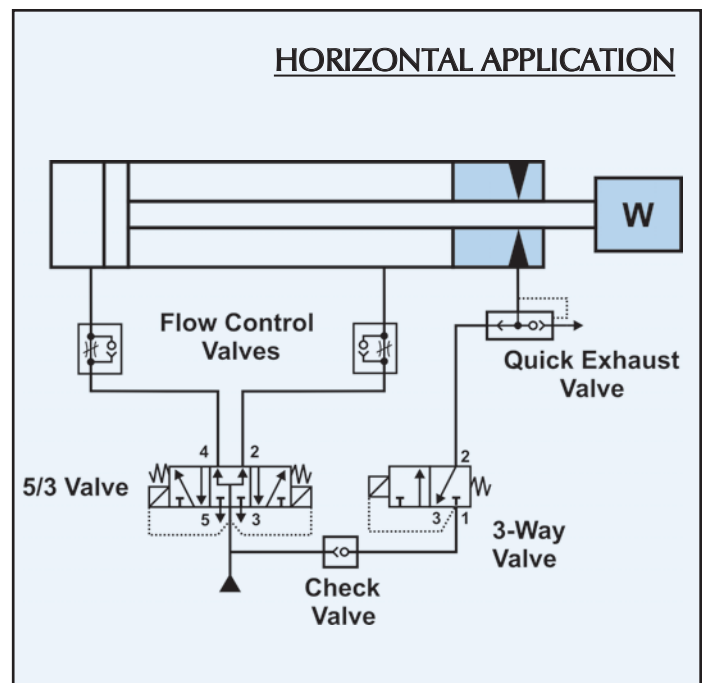
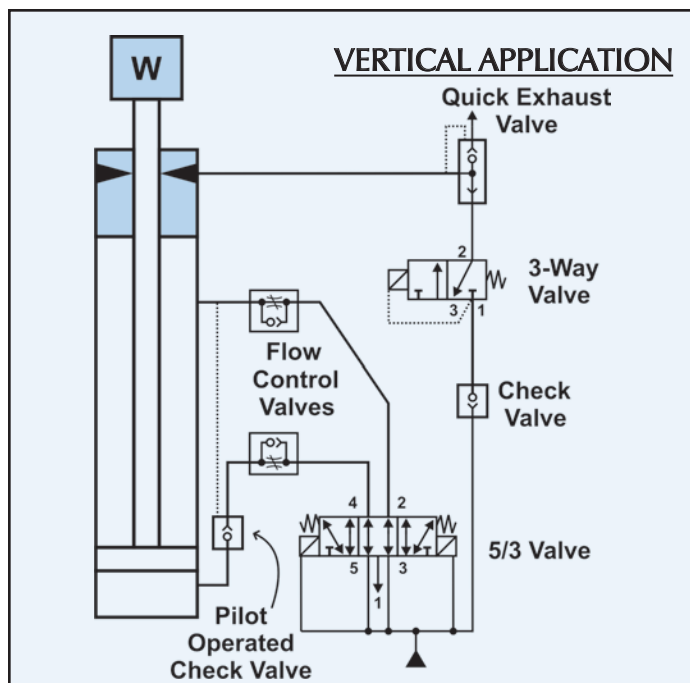
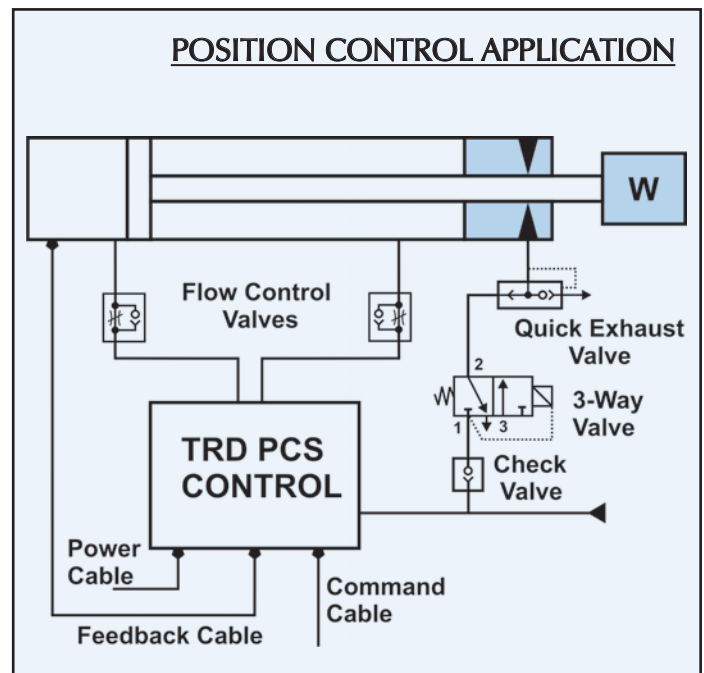
E-Stop - Rod Locks can be used in E-Stop applications provided the design calls for infrequent actuation of rod lock while the cylinder rods are in motion.

Manual Override - A 3-way valve can be added to the control circuits below to act as a manual override for tooling set-up or adjustments.

REFER TO PAGE 26 FOR SAFETY PRECAUTIONS BEFORE USING ROD LOCK.

Manual Override - A 3-way valve can be added to the control circuits below to act as a manual override for tooling set-up or adjustments.

CONSULT YOUR LOCAL DISTRIBUTOR (OR FLUID POWER SPECIALIST) FOR PROPER AIR CIRCUIT DESIGN. AVOID SITUATIONS WHERE THE CYLINDER CAN LUNGE ON POWER UP OR CYCLING.



TECHNICAL DATA: WEIGHTS CHARTS & SEAL KITS

CYLINDERS WITH ROD LOCK MOUNTED

WEIGHT IN POUNDS

CYLINDER WITH ROD LOCK											ROD LOCK UNIT ONLY
BORE	ROD DIA	MXO	MS1 MT1 MT2	MS4	MP1	MP2	MP4	MF1 MF2	MS2 BASEBAR	ADD PER IN. OF STROKE	
1.50	0.625	3.3	3.7	3.3	3.8	3.9	3.9	3.9	4.2	0.20	1.23
2.00	0.625	5.1	5.6	5.1	5.9	6.0	5.9	5.9	6.3	0.25	2.12
	1.000	6.3	6.8	6.8	7.5	7.6	7.5	7.5	7.9	0.28	2.40
2.50	0.625	7.0	7.6	7.0	8.0	8.2	8.2	8.2	8.4	0.27	3.04
	1.000	8.5	9.1	8.5	9.5	9.7	9.7	9.7	9.9	0.30	3.64
3.25	1.000	13.9	15.3	13.9	16.6	17.5	17.5	17.5	16.5	0.51	5.88
	1.375	15.4	16.8	15.4	18.1	19.0	19.0	19.0	18.0	0.56	5.81
4.00	1.000	19.6	21.3	19.6	22.9	24.1	24.0	24.0	21.9	0.55	9.28
	1.375	21.2	22.9	21.2	24.5	25.7	25.6	25.6	23.5	0.61	9.01
5.00	1.000	28.0	28.9	28.0	32.6	34.8	-	34.9	32.3	0.59	12.70
	1.375	31.2	32.1	31.2	35.8	38.0	-	38.1	35.5	0.65	13.86
6.00	1.375	45.6	49.3	45.6	53.8	56.3	-	56.3	51.3	0.84	20.83
	1.750	49.4	53.1	49.4	57.6	60.1	-	60.1	55.1	0.93	21.25

ACCESSORIES

WEIGHT IN POUNDS

ROD CLEVIS		ROD EYES		EYE BRACKETS		CLEVIS BRACKETS		CLEVIS PINS	
PART NO.	WEIGHT	PART NO.	WEIGHT	PART NO.	WEIGHT	PART NO.	WEIGHT	PART NO.	WEIGHT
RC437	0.40	RE750	1.10	EB500	0.86	CB500	0.90	CP500C	0.12
RC500	0.40	RE1000	2.40	EB750	3.00	CB750	3.10	CP750C	0.38
RC750	1.22	RE1375	5.58	EB1000	6.36	CB1000	6.20	CP1000C	0.80
RC1000	2.58	RE1500	10.52	EB1375	11.22	CB1375	9.70	CP1375C	1.22
RC1250	6.28	—	—	—	—	—	—	—	—
RC1500	11.60	—	—	—	—	—	—	—	—

ALIGNMENT COUPLERS

WEIGHT IN POUNDS

PART NO.	WEIGHT	PART NO.	WEIGHT	PART NO.	WEIGHT
AC250	0.30	AC625	0.40	AC1375	7.50
AC312	0.30	AC750	1.10	AC1500	7.60
AC375	0.30	AC875	1.10	AC1750	7.60
AC437	0.30	AC1000	2.90	—	—
AC500	0.30	AC1250	2.90	—	—

SEAL KITS

SERIES: FM

BORE	STANDARD SINGLE ROD END					STANDARD DOUBLE ROD END		
	PART NO.	WITH CUSHIONS			PART NO.	WITH CUSHIONS		
		H	C	HC		H	HC	
1.50	SK 625-150	SK 625-150H	SK 625-150C	SK 625-150HC	SKD 625-150	SKD 625-150H	SKD 625-150HC	
2	SK 625-200	SK 625-200H	SK 625-200C	SK 625-200HC	SKD 625-200	SKD 625-200H	SKD 625-200HC	
2.50	SK 625-250	SK 625-250H	SK 625-250C	SK 625-250HC	SKD 625-250	SKD 625-250H	SKD 625-250HC	
3.25	SK 100-325	SK 100-325H	SK 100-325C	SK 100-325HC	SKD 100-325	SKD 100-325H	SKD 100-325HC	
4	SK 100-400	SK 100-400H	SK 100-400C	SK 100-400HC	SKD 100-400	SKD 100-400H	SKD 100-400HC	
5	SK 100-500	SK 100-500H	SK 100-500C	SK 100-500HC	SKD 100-500	SKD 100-500H	SKD 100-500HC	
6	SK 137-600	SK 137-600H	SK 137-600C	SK 137-600HC	SKD 137-600	SKD 137-600H	SKD 137-600HC	

BORE	OVERSIZE SINGLE ROD END					OVERSIZE DOUBLE ROD END		
	PART NO.	WITH CUSHIONS			PART NO.	WITH CUSHIONS		
		H	C	HC		H	HC	
2	SK 100-200	SK 100-200H	SK 100-200C	SK 100-200HC	SKD 100-200	SKD 100-200H	SKD 100-200HC	
2.50	SK 100-250	SK 100-250H	SK 100-250C	SK 100-250HC	SKD 100-250	SKD 100-250H	SKD 100-250HC	
3.25	SK 137-325	SK 137-325H	SK 137-325C	SK 137-325HC	SKD 137-325	SKD 137-325H	SKD 137-325HC	
4	SK 137-400	SK 137-400H	SK 137-400C	SK 137-400HC	SKD 137-400	SKD 137-400H	SKD 137-400HC	
5	SK 137-500	SK 137-500H	SK 137-500C	SK 137-500HC	SKD 137-500	SKD 137-500H	SKD 137-500HC	
6	SK 175-600	SK 175-600H	SK 175-600C	SK 175-600HC	SKD 175-600	SKD 175-600H	SKD 175-600HC	

ROD LOCK INSTALLATION INSTRUCTIONS

- 1) Apply constant air supply to Rod Lock port (60 - 150 PSI)
- 2) Remove shipping arbor from inside Rod Lock. Save for future use.
- 3) Remove excess grease and dirt from cylinder piston rod. Slide Rod Lock onto piston rod, using care not to damage seals or bearings.
- 4) Align Rod Lock to cylinder so that unit is square and flush. Make sure that the cylinder is at least 1/2" extended.
- 5) Remove 60 - 150 PSI air supply to Rod Lock
- 6) Fasten Rod Lock to cylinder using (4) Sleeve Nuts & Rods. Tighten Sleeve Nuts a little at a time, in a clockwise rotation, finishing with the proper torque specification.
- 7) Cycle Rod Lock by applying 60 - 150 PSI to Rod Lock port, then removing 60 - 150 PSI pressure; cycle several times in this manner.
- 8) Apply constant 60 - 150 PSI air supply to Rod Lock, then hand-cycle the cylinder piston rod to check for proper alignment.
- 9) If cylinder piston rod does not move freely, remove Rod Lock and repeat Installation Instructions. If the piston rod still "drags" or is difficult to move, check the squareness of the Rod Lock to the cylinder.

Note: Faulty alignment will cause rod damage and may drastically reduce holding force.

WARNING - DO NOT DISASSEMBLE ROD LOCK - UNIT CONTAINS HIGH SPRING FORCE.
Return to TRD Mfg. for service.

CAUTION - DO NOT REMOVE 60 - 150 PSI AIR SUPPLY TO ROD LOCK UNIT WITHOUT SHIPPING ARBOR OR CYLINDER PISTON ROD IN PLACE - PERMANENT DAMAGE MAY OCCUR



Sleeve Nut Torque Specs	
Bore	Torque (Ft / Lbs)
1.50	5 - 7
2.00	12 - 14
2.50	12 - 14
3.25	30
4.00	35
5.00	45
6.00	50

WARNING

UNIT CONTAINS HIGH SPRING FORCE

DO NOT DISASSEMBLE - INJURY MAY OCCUR

Return to TRD Mfg. for service

Refer to Rod Lock Catalog or visit www.trdmfg.com for complete instructions on proper use of rod lock

DO NOT REMOVE 60 - 150 PSI AIR SUPPLY TO ROD LOCK WHEN DIS-ASSEMBLED FROM CYLINDER. PERMANENT DAMAGE MAY OCCUR.

SAFETY INFORMATION



DANGER

IF PERSONAL SAFETY IS REQUIRED, AN UNRELATED, REDUNDANT SAFETY SYSTEM IS REQUIRED TO PREVENT BODILY INJURY



WARNING

DO NOT DISASSEMBLE ROD LOCK - UNIT CONTAINS HIGH SPRING FORCE. Return to TRD Mfg. for service.



WARNING

Rod Locks should be installed, operated and maintained by qualified personnel only. Units should be checked periodically for proper holding force

GENERAL INFORMATION

One (or more rod locks) can be used on the same shaft or cylinder. Two units when combined will double the holding force. Steel cylinders should be considered in all high-load applications.



Rod Locks are designed for static applications (rod not moving while engaging rod lock) and are suitable for infrequent dynamic braking (E-Stop) when used with proper shafting materials. Repeated dynamic stops may cause rod and seal damage and / or rod lock wear resulting in reduced life or holding force.

Filtered and dry air is important for proper rod lock functioning. Debris or moisture inside the rod lock may inhibit performance and / or shorten the life of the unit. Rod locks are pre-lubricated for life, no additional air lubrication is required.

The rod which the rod lock engages (clamps) must be kept clean and dry for optimum holding force.

The rod lock requires a minimum of 60 PSI to fully release. A low PSI condition (below 60 PSI) may cause the rod lock to drag on the rod, causing damage to the rod. Care should be taken to eliminate low PSI conditions.

Rod Locks are intended for use with industrial compressed air systems within the operation specifications.

OPERATING PRESSURE	
Cylinder	0 TO 250 PSI AIR
Rod Lock	60 TO 150 PSI AIR

OPERATING TEMPERATURE	
Standard Seals	10° F to 180° F (-12° C to 82° C)
Fluorocarbon Seals	0° F to 400° F (-18° C to 204° C)

AXIAL MOVEMENT (CLAMPED) *	
Standard	.000" to .008"
Close Tol. (Optional)	.000" to .002" - .003"

ROD MATERIAL REQUIREMENTS	
Diameter	+.000" to -.002" Nominal Diameter
Hardened Shaft	.0005" Minimum hard chrome
Unhardened Shaft	.001" Minimum hard chrome
Finish	6 to 10 micro-inch

* Represents clearance within the rod lock unit, .000" movement due to actuation.

Worldwide Distribution means there is a Professional Distributor Representative nearby – wherever you are – ready to service your needs.

Ask Your Local Distributor About These Other Products:



NFPA Aluminum Cylinders
1.5" thru 12" Bores
Strokes up to 120 inches
Permanent Lubrication

Series:
FM, TA, TD, BTB, 3-P, MSE,
MSR, TM, TRA, AT

Request Catalog:
CAT-TRD1-0606



ISO 6431 Aluminum Cylinders
32mm thru 100mm Bores
Strokes up to 2800mm
Permanent Lubrication

Series: AB

Request Catalog:
CAT-ISO-1006



NFPA Stainless Steel Cylinders
1.5" thru 8" Bores
Strokes up to 120 inches
Permanent Lubrication

Series:
SS, SS-AT, SS-MSE, SS-MSR

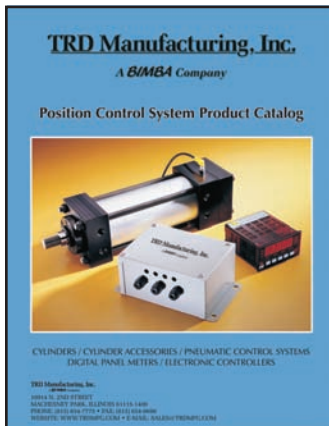
Request Catalog:
CAT-TRDSS-0507



Round Stainless Steel Cylinders
USDA-FDA approved
1.5" thru 8" Bores
Strokes up to 24 inches
NFPA interchangeable
Permanent Lubrication

Series: RS

Request Catalog:
TRD-RS-11-07



Cylinders with continuous piston rod position sensing
1.5" thru 8" Bores
Strokes up to 24 inches
Permanent Lubrication

Series: PFLF

Positioning Systems

Request Catalog:
PFLF-0601



Aluminum 2-Stage Telescoping Cylinders
0.75", 1.50", 2.50" effective bores
Strokes up to 60 inches
Permanent Lubrication

Series: TC

Request Catalog:
TRD-TC-1207



Steel Bench Top Press Frames and Cylinders
1.2 ton to 5 ton
Strokes up to 5 inches
Permanent Lubrication

Series: BTP

Request Catalog:
TRD-BTP-0905



TRD DELIVERIES (F.O.B. Factory)

<u>SERIES</u>	<u>DELIVERY SCHEDULE</u>
FM (ALUMINUM - FLUSH MOUNT) WITH ROD LOCK	2-3 DAYS
TA (ALUMINUM - 250 PSI AIR)	2-3 DAYS
TD (ALUMINUM - 250 PSI AIR)	2-3 DAYS
TRA (ALUMINUM - TRIPLE ROD)	2-3 DAYS
BACK-TO-BACK (ALUMINUM - 250 PSI AIR)	2-3 DAYS
3-POSITION (ALUMINUM - 250 PSI AIR)	2-3 DAYS
TANDEM (ALUMINUM - 250 PSI AIR OR 400 PSI HYD.)	2-3 DAYS
MSE/MSR (ALUMINUM - MULTI-STAGE)	2-3 DAYS
AIR BOOSTERS	2-3 DAYS
AIR/OIL TANKS	2-3 DAYS
TRD SWITCHES (R10, R10P, RAC, RHT, MSS)	1 DAY
BALLUFF STROKEMASTER / MICROPULSE	5-7 DAYS
ROD CLEVIS, PINS & MOUNTS	1 DAY
ALIGNMENT COUPLERS	1 DAY
SS (STAINLESS STEEL - ALL STANDARD MODELS)	3-5 DAYS
SS-MS (STAINLESS STEEL - MULTI-STAGE)	3-5 DAYS

STANDARD OPTIONS INCLUDED IN ABOVE DELIVERIES

OPTIONS WITH EXTENDED DELIVERY

ROD LOCK WITH 'EN', 'MS', 'VS', CLOSE TOLERANCE,
OR OTHER SPECIAL OPTIONS CONSULT FACTORY

RUSH SERVICE

RUSH SERVICES ARE AVAILABLE FOR ALL TRD PRODUCTS.
CONTACT YOUR LOCAL TRD DISTRIBUTOR FOR DETAILS.

YOUR LOCAL DISTRIBUTOR IS:



TRD Manufacturing, Inc.

A BIMBA Company

10914 N. 2ND STREET • MACHESNEY PARK, ILLINOIS 61115-1400

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