TC Series NFPA 2-STAGE TELESCOPING Aluminum Cylinders 1.50” to 2.50” Effective Bore

.750” Effective Bore   Page 108

1.500” Effective Bore   Page 111

2.500” Effective Bore   Page 114

95% OF OUR CYLINDERS SHIP IN 2-3 DAYS! ONE DAY RUSH SERVICE AVAILABLE ON ALL CATALOGED CYLINDER MODELS!
FEATURES

- 3 Bore Sizes: 0.75”, 1.50” and 2.50”
- Strokes up to 60”
- 2-Stage Telescoping
- Space Saving Design
- 100% Double Action
- Heavy-Duty Construction
- Rated for Non-Lube Service
- Standard NFPA Mounting
- Internal Bumpers at Each Stage

SPACE SAVING DESIGN

STROKE EXAMPLES FOR 1.50” BORE

NOTE: CYLINDERS ARE MADE TO ANY STROKE

<table>
<thead>
<tr>
<th>CYLINDER STROKE</th>
<th>STANDARD NFPA CYLINDER</th>
<th>TELESCOPING CYLINDER</th>
<th>SPACE SAVINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>12”</td>
<td>16.625”</td>
<td>10.750”</td>
<td>35.34%</td>
</tr>
<tr>
<td>18”</td>
<td>22.625”</td>
<td>13.750”</td>
<td>39.23%</td>
</tr>
<tr>
<td>24”</td>
<td>28.625”</td>
<td>16.750”</td>
<td>41.48%</td>
</tr>
<tr>
<td>30”</td>
<td>34.625”</td>
<td>19.750”</td>
<td>42.96%</td>
</tr>
<tr>
<td>36”</td>
<td>40.625”</td>
<td>22.750”</td>
<td>44.00%</td>
</tr>
<tr>
<td>42”</td>
<td>46.625”</td>
<td>25.750”</td>
<td>44.77%</td>
</tr>
<tr>
<td>48”</td>
<td>52.625”</td>
<td>28.750”</td>
<td>45.37%</td>
</tr>
<tr>
<td>54”</td>
<td>58.625”</td>
<td>31.750”</td>
<td>45.84%</td>
</tr>
<tr>
<td>60”</td>
<td>64.625”</td>
<td>34.750”</td>
<td>46.23%</td>
</tr>
</tbody>
</table>
**SERIES ‘TC’: HOW TO ORDER**

TC - MS4 - 1.50 x 10 x 2S - KK2 - SSA

**NFPA MOUNTS**
- BASE BAR SIDE LUG MOUNT (NON-NFPA)
- MF1 FRONT FLANGE
- MF2 REAR FLANGE
- MP1 REAR PIVOT CLEVIS
- MP2 REAR PIVOT CLEVIS
- MP4 REAR PIVOT EYE
- MS1 FRONT & REAR ANGLES
- MS4 BOTTOM TAPPED HOLES
- MT2 REAR TRUNNION
- MX0 NO MOUNT

**TC - How to Order**

**OPERATING PRESSURE**
125 PSI AIR

**OPERATING TEMPERATURE**
-20°F to 200°F (-29°C to 93°C)

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**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!

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<table>
<thead>
<tr>
<th>BORE</th>
<th>MM ROD DIAMETER</th>
<th>STANDARD</th>
<th>OPTIONAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>STYLE 1 - MALE</td>
<td>STYLE 2 - MALE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>KK1 A</td>
<td>KK2 A</td>
</tr>
<tr>
<td>0.75</td>
<td>0.375</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>1.50 &amp; 2.50</td>
<td>0.625</td>
<td>7/16-20</td>
<td>0.750</td>
</tr>
<tr>
<td>2.50</td>
<td>1.000</td>
<td>3/4-16</td>
<td>1.125</td>
</tr>
</tbody>
</table>

*Style 4 (KK4) is standard thread on 0.75" bore.

**Design Tips:**

- Cylinders are designed to support the unit’s weight only, and not intended for side-load applications. All loads should be guided and supported.
- For proper speed control, use “meter-in” type flow control devices.
- In high cycle speed applications, external shock absorbers should be used at end of strokes.

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**TC- .75" Bore**

**TC - 1.50" Bore**

**TC - 2.50" Bore**

**Dimensions**

**Accessories**

**Switches**

**Technical Data**

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**SERIES ‘TC’ 0.750” BORE: CONSTRUCTION**

- 0.375” ROD PISTON
- ROD SEAL
- ROD BUSHING
- 0.750” I.D. TUBE
- ROD SEAL
- ALUMINUM HEAD
- PTFE WEAR BANDS (2)
- 1.500” TUBE SEALS (2)
- 1.500” TUBE
- 1.500” HEAD BUMPER
- 1.500” PISTON
- 1.500” PISTON SEAL (2)
- PTFE WEAR BAND
- 1.500” CAP BUMPER
- TIE ROD (4)
- ALUMINUM CAP
- 0.750” HEAD BUMPER
- 0.750” PISTON SEAL (2)
- PTFE WEAR BAND
- 0.750” PISTON
- 0.750” CAP BUMPER
- SLEEVE NUT (4)

**CYLINDER FORCE COMPARISON CHART (AT 100 PSI)**

<table>
<thead>
<tr>
<th>TYPE</th>
<th>STROKE</th>
<th>1ST STAGE</th>
<th>2ND STAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Stage</td>
<td>Push</td>
<td>176 lbs</td>
<td>44 lbs</td>
</tr>
<tr>
<td>Telescoping</td>
<td>Pull</td>
<td>98 lbs</td>
<td>33 lbs</td>
</tr>
<tr>
<td>Standard 0.75” Bore</td>
<td>Push</td>
<td>44 lbs</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Pull</td>
<td>33 lbs</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**MS4 MOUNT**

- (4) 1/4-20 TAPS X 3/8 DEEP
- 1.43
- 0.63
- 2.00 SQ.
- (2) 1/8” NPT
- 1.90
- 3.23 + 1/2 TOTAL STROKE
- 103 (1ST STAGE ROD)
- 3/8-24 THD
- 0.38 (2ND STAGE ROD)
- 3.12 + 1/2 TOTAL STROKE
- 3.50 + 1/2 STROKE
SERIES ‘TC’ DIMENSIONS: PIVOT MOUNTS (STROKES 0” to 24”)

MT2 MOUNT

MP1 MOUNT

MP2 & MP4 (CAST BOLT ON) MOUNT
SERIES 'TC' 1.500" BORE: CONSTRUCTION

1. 0.625" PISTON ROD
2. ROD WIPER
3. ROD SEAL
4. ROD BUSHING
5. BUMPER RETAINER
6. 1.750" O.D. TUBE
7. ROD WIPER/SEAL
8. ALUMINUM HEAD
9. PTFE WEAR BAND (2)
10. 1.500" BUMPER PISTON SEAL (2)
11. 1.500" O.D. PISTON
12. PTFE WEAR BAND
13. 2.500" O.D. PISTON
14. PTFE WEAR BAND
15. 2.500" PISTON SEAL (2)
16. 2.500" TUBE
17. TUBE SEALS (2)
18. ALUMINUM CAP
19. TIE RODS (4)
20. SLEEVE NUT (4)
21. 2.500" CAP BUMPER
22. 2.500" HEAD BUMPER

**CYLINDER FORCE COMPARISON CHART (AT 100 PSI)**

<table>
<thead>
<tr>
<th>TYPE</th>
<th>STROKE</th>
<th>1ST STAGE</th>
<th>2ND STAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Stage Telescoping</td>
<td>Push</td>
<td>490 lbs</td>
<td>176 lbs</td>
</tr>
<tr>
<td></td>
<td>Pull</td>
<td>250 lbs</td>
<td>146 lbs</td>
</tr>
<tr>
<td>Standard 1.50&quot; Bore</td>
<td>Push</td>
<td>176 lbs</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Pull</td>
<td>146 lbs</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**MS4 MOUNT**

- (3) 5/16 TAPS (BOTH ENDS)
- 1.75" B (1ST STAGE ROD)
- (4) 3/8-16 TAPS X 1/2 DEEP
- 625" B (2ND STAGE ROD)
- 7/16-20 THD
SERIES ‘TC’ DIMENSIONS: BASE MOUNTS (STROKES 0” to 60”)

MF1 MOUNT

(4) .380 HOLES
1.750 (1ST STAGE ROD)

-2.00 HOLES THRU FLANGE

2.19

3.88

4.63

4.75 + 1/2 TOTAL STROKE
FULLY RETRACTED POSITION

MF2 MOUNT

(4) .380 HOLES

4.75 + 1/2 TOTAL STROKE
FULLY RETRACTED POSITION

3.88

3.00

2.19

MS1 MOUNT

5.75 + 1/2 TOTAL STROKE

1.63

1.03

1.30

(6) .446 HOLES

60 + 1/2 TOTAL STROKE

BASEBAR MOUNT

(4) .446 HOLES

3.75

4.50

1.88

.36

325 + 1/2 TOTAL STROKE
SERIES ‘TC’ DIMENSIONS: PIVOT MOUNTS (STROKES 0” to 36”)

MT2 MOUNT

MP1 (CAST BOLT ON) MOUNT

MP2 & MP4 (CAST BOLT ON) MOUNT

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SERIES 'TC' 2.500" BORE: CONSTRUCTION

1. 0.625" PISTON ROD
2. ROD WIPER
3. ROD SEAL
4. ROD BUSHING
5. 2.500" O.D. TUBE
6. ROD WIPER/SEAL
7. ALUMINUM HEAD
8. PTFE WEAR BAND (2)
9. 2.500" BUMPER PISTON SEALS (2)
10. 2.500" PISTON
11. PTFE WEAR BAND
12. 4.00" PISTON
13. PTFE WEAR BAND
14. 4.00" PISTON SEAL (2)
15. 4.00" O.D. TUBE
16. 4.00" TUBE SEALS (2)
17. ALUMINUM CAP
18. TIE RODS (4)
19. SLEEVE NUT (4)
20. BUMPER PISTON SEAL
21. BUMPER PISTON SEAL
22. BUMPER RETAINER

CYLINDER FORCE COMPARISON CHART (AT 100 PSI)

<table>
<thead>
<tr>
<th>TYPE</th>
<th>STROKE</th>
<th>1ST STAGE</th>
<th>2ND STAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Stage Telescoping</td>
<td>Push</td>
<td>1256 lbs</td>
<td>490 lbs</td>
</tr>
<tr>
<td></td>
<td>Pull (0.625&quot; rod)</td>
<td>662 lbs</td>
<td>460 lbs</td>
</tr>
<tr>
<td></td>
<td>Pull (1.000&quot; rod)</td>
<td>662 lbs</td>
<td>412 lbs</td>
</tr>
<tr>
<td>Standard</td>
<td>Push</td>
<td>490 lbs</td>
<td>N/A</td>
</tr>
<tr>
<td>2.50&quot; Bore</td>
<td>Pull</td>
<td>460 lbs</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Other Models in Development
Stainless Steel for Food Applications
(Note: Rod Orifices are replaced with NPT Port for sealed system—Contact TRD with your application).

MS4 MOUNT
SERIES 'TC' DIMENSIONS: BASE MOUNTS (STROKES 0” to 60”)

MF1 MOUNT

MF2 MOUNT

MS1 MOUNT

BASEBAR MOUNT
SERIES 'TC' DIMENSIONS: PIVOT MOUNTS (STROKES 0” to 36”)

MT2 MOUNT

MP1 MOUNT

MP2 & MP4 (CAST BOLT ON) MOUNT