SERIES M MINI PNEUMATIC CYLINDERS
STAINLESS STEEL BODY

Pneumatics
It's that easy
The inside story on why AVENTICS Series M is your best choice in light duty air cylinders...

Quality cost saving features include:

1. **Cylinder Tube** - Type 304 stainless steel, polished to a micro-finish on the I.D. to provide for low friction and long life. A matte finish on the O.D. provides for smudge resistance.

2. **Heads and Caps** - Aluminum construction with precision machining to provide a smooth break away. The tube-to-head connection is a strong, double-rolled construction.

3. **Stainless Steel Piston Rods** - Corrosion resistant 303 stainless steel is the standard piston rod material for all bore sizes up to and including 1.50 inch bore at no additional cost. The only exception to the stainless steel standard is when the non-rotating piston rod option is specified for bore sizes 3/4” and up. Stainless steel is also the standard material for all cylinders with adjustable cushions; all block and trunnion mounted, plus KDX and KDH styles.

4. **Piston Body** - Pistons are precision machined aluminum construction. Piston rod connections are threaded and loctited to provide for leak-proof and durable service.

5. **Seals** - All piston and rod seals are of a lip seal construction. Buna-N material is a standard on all models (Viton seals are available as an option).

6. **Rod Bushings** - Oil impregnated bronze reamed to a close tolerance provides for a smooth operation and long life.

7. **Unitized Construction** - Precision double-rolled, unitized construction for durable, leak-proof service and long life.

- **Pre-Lubrication** - All Series M cylinders are factory pre-lubricated for use with or without added lubrication.
- **Twelve bore sizes** - 5/16” through 3”, Series M cylinders are designed to be dimensionally interchangeable with other major brands.

**Bumpers** - are standard on select bore sizes. See bumper information for details.

**Springs** - shot peened music wire for high cycle life. Spring spacers are provided for every one inch of stroke (1/2” for 5/16” and 7/16” bores) to insure uniform spring rate and prevent spring failure.

Many styles and sizes of the Series M Mini Cylinders are included in the AVENTICS Quick Ship focused delivery program. For details on the program and the part numbers included, visit: www.aventics.com/us/QuickShipMseries
## Series M and MM Mini Cylinders Index

### Series M Mini Cylinders

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### Series MM Mini Cylinders (piston sensing)

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**Right Angle Flow Controls**                         | 73 |
## Series M Mini Pneumatic Cylinders

### Standard Specifications / Available Mounting Styles

#### Series M Standard Specifications
- 304 stainless steel cylinder body
- Aluminum heads and caps
- 303 stainless steel piston rods - standard for all bore sizes up to and including 1.50 inch bore. The only exception to the stainless steel standard is when the non-rotating piston rod option is specified for bore sizes 3/4” and up. Stainless steel is also the standard for all cylinders with adjustable cushions; all block and trunnion mounted, plus KDX and KDH styles.
- Nominal pressure rating 250 psi

In line with our policy of continuing product improvement, the specifications in this catalog are subject to change without notice.

#### Series M Available Mounting Styles

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Bore Size</th>
<th>Recommended Max. Stroke (in.)</th>
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<tbody>
<tr>
<td>N</td>
<td>Nose mount, spring return</td>
<td>5/16” 7/16” 9/16” 3/4” 7/8” 1-1/16” 1-1/4” 1-1/2” 1-3/4” 2” 2-1/2” 3”</td>
<td>6”</td>
</tr>
<tr>
<td>NR</td>
<td>Nose mount, spring return, hexrod (non-rotating)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NRP</td>
<td>Pivot and nose mount, spring return, hexrod (non-rotating)</td>
<td></td>
<td>6”</td>
</tr>
<tr>
<td>P</td>
<td>Pivot mount, spring return</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>Nose mount, spring extended</td>
<td></td>
<td>6”</td>
</tr>
<tr>
<td>RP</td>
<td>Pivot and nose mount, spring extend</td>
<td></td>
<td>6”</td>
</tr>
<tr>
<td>D</td>
<td>Nose mount, double acting</td>
<td></td>
<td>12”</td>
</tr>
<tr>
<td>DP</td>
<td>Pivot and nose mount, double acting, pivot pin</td>
<td></td>
<td>12” (under 3/4” bore) 32” (3/4” &amp; up)</td>
</tr>
<tr>
<td>DXP</td>
<td>Pivot and nose mount, double acting, no pivot pin</td>
<td></td>
<td>12” (under 3/4” bore) 32” (3/4” &amp; up)</td>
</tr>
<tr>
<td>DX</td>
<td>Threaded both ends, double acting</td>
<td></td>
<td>32”</td>
</tr>
<tr>
<td>KDX</td>
<td>Threaded both ends, double acting, double rod</td>
<td></td>
<td>6” (under 3/4” bore) 12” (3/4” &amp; up)</td>
</tr>
<tr>
<td>KDH</td>
<td>Threaded both ends, double rod, hollow rod</td>
<td></td>
<td>12”</td>
</tr>
<tr>
<td>A</td>
<td>Nose mount, spring return, head adjustable stroke</td>
<td></td>
<td>6”</td>
</tr>
<tr>
<td>RA</td>
<td>Nose mount, spring extended, cap adjustable stroke</td>
<td></td>
<td>6”</td>
</tr>
<tr>
<td>AP</td>
<td>Pivot mount, spring return, head adjustable stroke</td>
<td></td>
<td>6”</td>
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<tr>
<td>AR</td>
<td>Air reservoirs</td>
<td></td>
<td>12”</td>
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<tr>
<td>BRN</td>
<td>Rear block mount, single acting, spring return</td>
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<td>6”</td>
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<tr>
<td>BRR</td>
<td>Rear block mount, single acting spring extend</td>
<td></td>
<td>6”</td>
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<tr>
<td>BFD</td>
<td>Front block mount, double acting</td>
<td></td>
<td>12”</td>
</tr>
<tr>
<td>BRD</td>
<td>Rear block mount, double acting</td>
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<td>12”</td>
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<tr>
<td>BFN</td>
<td>Front block mount, single acting spring return</td>
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<td>6”</td>
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<td>Front block mount, single acting spring extend</td>
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<td>TRN</td>
<td>Rear trunnion mount, single acting, spring return</td>
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<tr>
<td>TFD</td>
<td>Front trunnion mount, double acting</td>
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<td>12”</td>
</tr>
<tr>
<td>TRD</td>
<td>Rear trunnion mount, double acting</td>
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<td>12”</td>
</tr>
<tr>
<td>TFN</td>
<td>Front trunnion mount, single acting spring return</td>
<td></td>
<td>6”</td>
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†† Recommended maximum stroke is 4”.
▲ Recommended maximum stroke is 4” in models N, P, R & RP.
Series M Mini Pneumatic Cylinders

Series M Mini Cylinders
5/16” Bore Size / Single Acting

Mounting Style N
Single Acting
Spring Return
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2”, 1”, 1 1/2”, 2”
2 1/2”, 3”, 4”
Maximum Stroke 4”

Optional Accessory:
R432007828 Foot Bracket

Mounting Style P
Single Acting
Spring Return
Double End or Rear Pivot Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2”, 1”, 1 1/2”, 2”
2 1/2”, 3”, 4”
Maximum Stroke 4”

Optional Accessories:
R432007828 Foot Bracket
R432007815 Pivot Bracket
R432007805 Rod Clevis

Mounting Style R
Single Acting
Spring Extend
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2”, 1”, 1 1/2”, 2”
2 1/2”, 3”
Maximum Stroke 4”

Optional Accessory:
R432007829 Foot Bracket

Mounting Style RP
Single Acting
Spring Extend
Rear Pivot Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2”, 1”, 1 1/2”, 2”
2 1/2”, 3”
Maximum Stroke 4”

Optional Accessories:
R432007829 Foot Bracket
R432007815 Pivot Bracket
R432007805 Rod Clevis
Series M Mini Pneumatic Cylinders

5/16” Bore Size / Double Acting

Mounting Style D
Double Acting
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2”, 1”, 1 1/2”, 2”
2 1/2”, 3”, 4”
Maximum Stroke 4”

Optional Accessory:
R432007829 Foot Bracket

Mounting Style DXP
Double Acting
Double End or Rear Pivot Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2”, 1”, 1 1/2”, 2”
2 1/2”, 3”, 4”
Maximum Stroke 4”

Optional Accessories:
R432007829 Foot Bracket
R432007815 Pivot Bracket
R432007805 Rod Clevis

Mounting Style BFD
Double Acting
Front Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2”, 1”, 1 1/2”, 2”
2 1/2”, 3”, 4”
Maximum Stroke 4”

1.64 PLUS STROKE
125 DIA

2.19 PLUS STROKE
125 DIA

1.72 PLUS STROKE
125 DIA
Series M Mini Pneumatic Cylinders
AVENTICS Corporation

Series M Mini Cylinders
7/16” Bore Size / Single Acting

Mounting Style N
Single Acting
Spring Return
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2" 2 1/2", 3", 4"
Maximum Stroke 6"

Optional Accessory:
R432007830 Foot Bracket

Mounting Style NR
Single Acting
Spring Return
Non-Rotating Hex Rod
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3", 4"
Maximum Stroke 6"

Optional Accessory:
R432007830 Foot Bracket

Mounting Style NRP
Single Acting
Spring Return
Non-Rotating Hex Rod
Rear Pivot Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3", 4"
Maximum Stroke 6"
Optional Accessory:
R432007812 Pivot Bracket
R432007806 Rod Clevis

Mounting Style P
Single Acting
Spring Return
Rear Pivot Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3", 4"
Maximum Stroke 6"

Optional Accessory:
R432007812 Pivot Bracket
R432007806 Rod Clevis

Mounting Style R
Single Acting
Spring Extend
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3"
Maximum Stroke 6"

Optional Accessory:
R432007831 Foot Bracket
Series M Mini Pneumatic Cylinders

Mounting Style RP
Single Acting
Spring Extend
Rear Pivot Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3"
Maximum Stroke 6"

Optional Accessories:
R432007812 Pivot Bracket
R432007806 Rod Clevis

Mounting Style D
Double Acting
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3", 4"
Maximum Stroke 12"

Optional Accessory:
R432007831 Foot Bracket

Mounting Style DP
Double Acting
Rear Pivot Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3", 4"
Maximum Stroke 12"

Optional Accessories:
R432007812 Pivot Bracket
R432007806S Rod Clevis

Mounting Style DXP
Double Acting
Double End or Rear Pivot Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3", 4"
Maximum Stroke 12"

Optional Accessories:
R432007831 Foot Bracket
R432007806 Rod Clevis
R432007816 Pivot Bracket with Pin

Mounting Style KDK
Double Acting
Double Rod
Double End Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3", 4"
Maximum Stroke 6"

Optional Accessory:
R432007831 Foot Bracket
Series M Mini Pneumatic Cylinders
AVENTICS Corporation

Series M Mini Cylinders - Block Mounted
7/16” Bore Size / Single and Double Acting

**Mounting Style BFN**
*Single Acting*
Spring Return
Front Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2”, 1”, 1 1/2”, 2”, 3”
Maximum Stroke 6”

**Mounting Style BRN**
*Single Acting*
Spring Return
Rear Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2”, 1”, 2”, 3”, 4”
Maximum Stroke 6”

**Mounting Style BFD**
*Double Acting*
Front Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2”, 1”, 1 1/2”, 2”, 3”, 4”
Maximum Stroke 12”

**Mounting Style BRD**
*Double Acting*
Rear Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2”, 1”, 2”, 3”, 4”
Maximum Stroke 12”
### Mounting Style TFN
- **Single Acting**
- Spring Return
- Front Trunnion Mounting
- Stainless Steel Rod Standard
- Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3"
- Maximum Stroke 6"

### Mounting Style TRN
- **Single Acting**
- Spring Return
- Rear Trunnion Mounting
- Stainless Steel Rod Standard
- Standard Stroke Lengths: 1/2", 1", 2", 3", 4"
- Maximum Stroke 6"

### Mounting Style TFD
- **Double Acting**
- Front Trunnion Mounting
- Stainless Steel Rod Standard
- Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3", 4"
- Maximum Stroke 12"

### Mounting Style TRD
- **Double Acting**
- Rear Trunnion Mounting
- Stainless Steel Rod Standard
- Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3", 4"
- Maximum Stroke 12"
Series M Mini Pneumatic Cylinders
AVENTICS Corporation

Series M Mini Cylinders
9/16" Bore Size / Single Acting

Mounting Style N
Single Acting
Spring Return
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3", 4"
Maximum Stroke 6"

Optional Accessory:
R432007831 Foot Bracket

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one inch.

Mounting Style NR
Single Acting
Spring Return
Non-Rotating Hex Rod
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3", 4"
Maximum Stroke 6"

Optional Accessory:
R432007831 Foot Bracket

Mounting Style NRP
Single Acting
Spring Return
Non-Rotating Hex Rod
Rear Pivot Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3", 4"
Maximum Stroke 6"

Optional Accessories:
R432007816 Pivot Bracket with Pin
R432007806 Rod Clevis

Mounting Style P
Single Acting
Spring Return
Rear Pivot Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3", 4"
Maximum Stroke 6"

Optional Accessories:
R432007816 Pivot Bracket with Pin
R432007806 Rod Clevis

Mounting Style R
Single Acting
Spring Extend
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3"
Maximum Stroke 6"

Optional Accessory:
R432007831 Foot Bracket
Series M Mini Cylinders
9/16" Bore Size / Single and Double Acting

Mounting Style RP
Single Acting
Spring Extend
Rear Pivot Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3"
Maximum Stroke 6"

Optional Accessories:
R432007816 Pivot Bracket with Pin
P432007806 Rod Clevis

Mounting Style D
Double Acting
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3", 4"
Maximum Stroke 12"

Optional Accessory:
R432007831 Foot Bracket

Mounting Style DXP
Double Acting
Double End or Rear Pivot Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3", 4"
Maximum Stroke 12"

Optional Accessories:
R432007806 Rod Clevis
R432007831 Foot Bracket
R432007841 Hex Mounting Nut

Mounting Style KDX
Double Acting
Double Rod
Double End Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3", 4"
Maximum Stroke 6"

Optional Accessory:
R432007831 Foot Bracket
Series M Mini Pneumatic Cylinders
AVENTICS Corporation

Series M Mini Cylinders
3/4" Bore Size / Single Acting

Mounting Style N
Single Acting
Spring Return
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3", 4"
Maximum Stroke 6"

Optional Accessory:
R432007832 Foot Bracket

Mounting Style NR
Single Acting
Spring Return
Non-Rotating Hex Rod
Front Nose Mounting
Stainless Steel Rod Optional
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3", 4"
Maximum Stroke 6"

Optional Accessory:
R432007832 Foot Bracket

Mounting Style NRP
Single Acting
Spring Return
Non-Rotating Hex Rod -- Rear Pivot Mounting
Stainless Steel Rod Optional
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"

Optional Accessories:
R432007813 Pivot Bracket
R432007807 Rod Clevis

Mounting Style P
Single Acting
Spring Return
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3", 4"
Maximum Stroke 6"

Optional Accessories:
R432007813 Pivot Bracket
R432007807 Rod Clevis

Mounting Style R
Single Acting
Spring Extend
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 2", 3", 4"
Maximum Stroke 6"

Optional Accessory:
R432007833 Foot Bracket
Series M Mini Pneumatic Cylinders

Mounting Style RP
Single Acting
Spring Extend
Rear Pivot Mounting
Stainless Steel Rod Standard
Maximum Stroke 6"

Optional Accessories:
R432007813 Pivot Bracket
R432007807 Rod Clevis

Mounting Style D
Double Acting
Front Nose Mounting
Stainless Steel Rod Standard
Maximum Stroke 12"

Optional Accessory:
R432007833 Foot Bracket

Mounting Style DP
Double Acting
Rear Pivot Mounting
Stainless Steel Rod Standard
Maximum Stroke 12"

Optional Accessories:
R432007813 Pivot Bracket
R432007807 Rod Clevis

Mounting Style DXP
Double Acting
Double End or Rear Pivot Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4", 5", 6", 8", 10" Strokes over 12" must be supported at both ends
Maximum Stroke 32"

Optional Accessories:
R432007833 Foot Bracket
R432007807 Rod Clevis
R432007817 Pivot Bracket with Pin
Series M Mini Cylinders
3/4" Bore Size / Double Acting and Adjustable Stroke Single Acting

Mounting Style KDX
Double Acting
Double Rod - Double End Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4", 5", 6"
Maximum Stroke 12"

Optional Accessory:
R432007833 Foot Bracket

Mounting Style A
Adjustable Stroke - Single Acting
Spring Return - Double End Mounting
Stainless Steel Rod Standard
Stroke adjustment in 1" increments to 3"
1" Stroke adjusts 0" - 1", 2" Stroke 1" -2" and 3" Stroke 2" -3"
Mounting Brackets are included
Maximum Stroke 6"

Optional Accessory:
R432007833 Foot Bracket

Mounting Style RA
Adjustable Stroke - Single Acting
Spring Extend - Nose Mounting
Stainless Steel Rod Standard
Stroke adjustment in 1" increments to 3"
1" Stroke adjusts 0" - 1", 2" Stroke 1" -2", and 3" Stroke 2" -3"
Maximum Stroke 6"

Optional Accessory:
R432007833 Foot Bracket

Mounting Style AP
Adjustable Stroke - Single Acting
Spring Return - Rear Pivot Mounting
Stainless Steel Rod Standard
Stroke adjustment in 1" increments to 3"
1" Stroke adjusts 0" - 1", 2" Stroke 1" -2", and 3" Stroke 2" -3"
Maximum Stroke 6"

Optional Accessories:
R432007813 Pivot Bracket
R432007807 Rod Clevis
Series M Mini Cylinders - Block Mounted
3/4” Bore Size / Single and Double Acting

Mounting Style BRN
Single Acting
Spring Return
Rear Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1”, 2”, 3”, 4”
Maximum Stroke 6”

Mounting Style BRR
Single Acting
Spring Extend
Rear Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1”, 2”, 3”, 4”
Maximum Stroke 6”

Mounting Style BFD
Double Acting
Front Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2”, 1”, 2”, 3”, 4”, 5”, 6”
Maximum Stroke 12”

Mounting Style BRD
Double Acting
Rear Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1”, 2”, 3”, 4”, 5”, 6”
Maximum Stroke 12”

Mounting Style BFN
Single Acting
Spring Return
Front Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2”, 1”, 2”, 3”, 4”
Maximum Stroke 6”

Mounting Style BFR
Single Acting
Spring Extend
Front Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1”, 2”, 3”, 4”
Maximum Stroke 6”
Series M Mini Pneumatic Cylinders

AVENTICS Corporation

Series M Mini Cylinders - Trunnion Mounted
3/4” Bore Size / Single and Double Acting

Mounting Style TRN
Single Acting
Spring Return
Rear Trunnion Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1”, 2”, 3”, 4”
Maximum Stroke 6”

Mounting Style TFD
Double Acting
Front Trunnion Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1”, 2”, 3”, 4”, 5”, 6”
Maximum Stroke 12”

Mounting Style TRD
Double Acting
Rear Trunnion Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1”, 2”, 3”, 4”, 5”, 6”
Maximum Stroke 12”

Mounting Style TFN
Single Acting
Spring Return
Front Trunnion Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2”, 1”, 2”, 3”, 4”
Maximum Stroke 6”
Series M Mini Pneumatic Cylinders

Mounting Style N
Single Acting
Spring Return
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3", 4"
Maximum Stroke 6"

Optional Accessory:
R432007833 Foot Bracket

Mounting Style NR
Single Acting
Spring Return
Non-Rotating Hex Rod
Front Nose Mounting
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3", 4"
Maximum Stroke 6"

Optional Accessory:
R432007833 Foot Bracket

Mounting Style NRP
Single Acting
Spring Return
Non-Rotating Hex Rod (Stainless Steel Optional)
Rear Pivot Mounting
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"

Optional Accessories:
R432007813 Pivot Bracket
R432007807 Rod Clevis

Mounting Style P
Single Acting
Spring Return
Rear Pivot Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3", 4"
Maximum Stroke 6"

Optional Accessories:
R432007813 Pivot Bracket
R432007807 Rod Clevis

Mounting Style R
Single Acting
Spring Extend
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 2", 3", 4"
Maximum Stroke 6"

Optional Accessory:
R432007833 Foot Bracket
Series M Mini Pneumatic Cylinders

Series M Mini Cylinders
7/8” Bore Size / Single and Double Acting

Mounting Style RP
Single Acting
Spring Extend
Rear Pivot Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2”, 1”, 2”, 3”, 4”, 6”
Maximum Stroke 6”

Optional Accessories:
R432007813 Pivot Bracket
R432007807 Rod Clevis

Mounting Style D
Double Acting
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2”, 1”, 2”, 3”, 4”, 5”, 6”
Maximum Stroke 12”

Optional Accessory:
R432007834 Foot Bracket

Mounting Style DXP
Double Acting
Double End or Rear Pivot Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1”, 2”, 3”, 4”, 5”, 6”, 10”
(Stroke over 12” must be supported at both ends)
Maximum Stroke 32”

Optional Accessories:
R432007807 Rod Clevis
R432007817 Pivot Bracket with Pin
R432007833 Foot Bracket

Mounting Style KDX
Double Acting
Double End Mounting
Double Rod
Stainless Steel Rod Standard
Standard Stroke Lengths: 1”, 2”, 3”, 4”, 6”
Maximum Stroke 12”

Optional Accessory:
R432007833 Foot Bracket
Mounting Style N
Single Acting
Spring Return
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3", 4"
Maximum Stroke 6"

Optional Accessory:
R432007833 Foot Bracket

NOTE: Piston rod is available w/o wrench flat (at no extra charge). Specify when ordering.

Mounting Style NR
Single Acting
Spring Return
Front Nose Mounting
Non-Rotating Hex Rod (Stainless Steel Optional)
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3", 4"
Maximum Stroke 6"

Optional Accessory:
R432007833 Foot Bracket

Mounting Style NRP
Single Acting
Spring Return
Rear Pivot Mounting
Non-Rotating Hex Rod (Stainless Steel Optional)
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"

Optional Accessories:
R432007813 Pivot Bracket
R432007808 Rod Clevis

Mounting Style P
Single Acting
Spring Return
Rear Pivot Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3", 4"
Maximum Stroke 6"

Optional Accessories:
R432007813 Pivot Bracket
R432007808 Rod Clevis

Mounting Style R
Single Acting
Spring Extend
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3", 4"
Maximum Stroke 6"

Optional Accessory:
R432007833 Foot Bracket

NOTE: Piston rod is available w/o wrench flat (at no extra charge). Specify when ordering.
Series M Mini Cylinders
1-1/16" Bore Size / Single and Double Acting

Mounting Style RP
Single Acting
Spring Extend
Stainless Steel Rod Standard
Maximum Stroke 6"

Optional Accessories:
R432007813 Pivot Bracket
R432007808 Rod Clevis

NOTE: Piston rod is available w/o wrench flat (at no extra charge). Specify when ordering.

Mounting Style D
Double Acting
Front Nose Mounting
Stainless Steel Rod Standard
Maximum Stroke 12"

Optional Accessory:
R432007833 Foot Bracket

Mounting Style DP
Double Acting
Rear Pivot Mounting
Stainless Steel Rod Standard
Maximum Stroke 32"

Optional Accessories:
R432007813 Pivot Bracket
R432007808 Rod Clevis

Mounting Style DXP
Double Acting
Double End or Rear Pivot Mounting
Stainless Steel Rod Standard
Maximum Stroke 32"

Optional Accessories:
R432007833 Foot Bracket
R432007808 Rod Clevis
R432007817 Pivot Bracket with Pin

Mounting Style KDX
Double Acting
Double End Mounting - Double Rod
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4", 5", 6"
Maximum Stroke 12"

Optional Accessory:
R432007833 Foot Bracket
Series M Mini Cylinders
1-1/16" Bore Size / Double Acting and Adjustable Stroke Single Acting

### Mounting Style KDH

**Double Acting**
- Double End Mounting
- Double Hollow Rod
- Stainless Steel Rod Standard
- Standard Stroke Lengths: 1", 2", 3", 4", 5", 6"
- Maximum Stroke 12"

**Optional Accessory:**
- R432007833 Foot Bracket

### Mounting Style A

**Adjustable Stroke - Single Acting**
- Spring Return - Double End Mounting
- Stainless Steel Rod Standard
- Stroke Adjustment in 1" Increments to 3"
  - 1" Stroke Adjusts 0"-1", 2"
  - 2" Stroke Adjusts 1"-2", 3" Stroke 2"-3"
- Maximum Stroke 6"
- Includes Mtg. Brackets

**Optional Accessory:**
- R432007833 Foot Bracket

**NOTE:** Piston rod is available w/o wrench flat (at no extra charge). Specify when ordering.

### Mounting Style RA

**Adjustable Stroke - Single Acting**
- Spring Extend - Nose Mounting
- Stainless Steel Rod Standard
- Stroke Adjustment in 1" Increments to 3"
  - 1" Stroke Adjusts 0"-1", 2"
  - 2" Stroke Adjusts 1"-2", 3" Stroke 2"-3"
- Maximum Stroke 6"
- Spring Load Normal 3 lbs.
- Spring Load Retracted 6 lbs.

**Optional Accessory:**
- R432007833 Foot Bracket

**NOTE:** Piston rod is available w/o wrench flat (at no extra charge). Specify when ordering.

### Mounting Style AP

**Adjustable Stroke - Single Acting**
- Spring Return - Rear Pivot Mounting
- Stainless Steel Rod Standard
- Stroke Adjustment in 1" Increments to 3"
  - 1" Stroke Adjusts 0"-1", 2"
  - 2" Stroke Adjusts 1"-2", 3" Stroke 2"-3"
- Maximum Stroke 6"

**Optional Accessories:**
- R432007813 Pivot Bracket
- R432007808 Rod Clevis

**NOTE:** Piston rod is available w/o wrench flat (at no extra charge). Specify when ordering.
Series M Mini Pneumatic Cylinders

AVENTICS Corporation

Series M Mini Cylinders - Block Mounted
1-1/16” Bore Size / Single and Double Acting

Mounting Style BRN
Single Acting
Spring Return
Rear Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1”, 2”, 3”, 4”
Maximum Stroke 6”

Mounting Style BRR
Single Acting
Spring Extend
Rear Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1”, 2”, 3”, 4”
Maximum Stroke 6”

Mounting Style BFD
Double Acting
Front Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1”, 2”, 3”, 4”, 5”, 6”
Maximum Stroke 12”

Mounting Style BRD
Double Acting
Rear Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1”, 2”, 3”, 4”
Maximum Stroke 12”

Mounting Style BFN
Single Acting
Spring Return
Front Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1”, 2”, 3”, 4”
Maximum Stroke 6”

Mounting Style BFR
Single Acting
Spring Extend
Front Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1”, 2”, 3”, 4”
Maximum Stroke 6”
### Series M Mini Cylinders - Trunnion Mounted

**1-1/16” Bore Size / Single and Double Acting**

#### Mounting Style TRN
**Single Acting**
- Spring Return
- Rear Trunnion Mounting
- Stainless Steel Rod Standard
- Standard Stroke Lengths: 1", 2", 3", 4"
- Maximum Stroke 6”

#### Mounting Style TRR
**Single Acting**
- Spring Extend
- Rear Trunnion Mounting
- Stainless Steel Rod Standard
- Standard Stroke Lengths: 1", 2", 3", 4"
- Maximum Stroke 6”

#### Mounting Style TFD
**Double Acting**
- Front Trunnion Mounting
- Stainless Steel Rod Standard
- Standard Stroke Lengths: 1", 2", 3", 4", 5", 6"
- Maximum Stroke 12”

#### Mounting Style TRD
**Double Acting**
- Rear Trunnion Mounting
- Stainless Steel Rod Standard
- Standard Stroke Lengths: 1", 2", 3", 4"
- Maximum Stroke 12”

#### Mounting Style TFN
**Single Acting**
- Spring Return
- Front Trunnion Mounting
- Stainless Steel Rod Standard
- Standard Stroke Lengths: 1", 2", 3", 4"
- Maximum Stroke 6”

#### Mounting Style TFR
**Single Acting**
- Spring Extend
- Front Trunnion Mounting
- Stainless Steel Rod Standard
- Standard Stroke Lengths: 1", 2", 3", 4"
- Maximum Stroke 6”
Series M Mini Pneumatic Cylinders

Mounting Style N
Single Acting
Spring Return
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 2", 3", 4"
Maximum Stroke 6"

Optional Accessory:
R432007834 Foot Bracket

Mounting Style NR
Single Acting
Spring Return
Front Nose Mounting
Non-Rotating Hex Rod (Stainless Steel Optional)
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"

Optional Accessory:
R432007834 Foot Bracket

Mounting Style NRP
Single Acting
Spring Return
Double End or Rear Pivot Mounting
Non-Rotating Hex Rod (Stainless Optional)
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"
Optional Accessories:
R432007834 Foot Bracket
R432007809 Rod Clevis
R432007818 Pivot Bracket with Pin

Mounting Style P
Single Acting
Spring Return
Double End or Rear Pivot Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"
Optional Accessories:
R432007834 Foot Bracket
R432007809 Rod Clevis
R432007818 Pivot Bracket with Pin

Mounting Style R
Single Acting
Spring Extend
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"

Optional Accessory:
R432007834 Foot Bracket
Series M Mini Pneumatic Cylinders

Mounting Style RP
Single Acting
Spring Extend
Rear Pivot Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"

Optional Accessories:
R432007834 Foot Bracket
R432007809 Rod Clevis
R432007818 Pivot Bracket with Pin

Mounting Style D
Double Acting
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4", 5", 6"
Maximum Stroke 12"

Optional Accessory:
R432007834 Foot Bracket

Mounting Style DXP
Double Acting
Double End or Rear Pivot Mounting
Stainless Steel Rod Standard
Stroke over 12" must be supported at both ends
Maximum Stroke 32"

Optional Accessories:
R432007834 Foot Bracket
R432007809 Rod Clevis
R432007818 Pivot Bracket with Pin

Mounting Style KDX
Double Acting
Double End Mounting
Double Rod
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4", 5", 6"
Maximum Stroke 12"

Optional Accessory:
R432007834 Foot Bracket

Mounting Style KDH
Double Acting
Double End Mounting
Double Hollow Rod
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4", 5", 6"
Maximum Stroke 12"

Optional Accessory:
R432007834 Foot Bracket

* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one inch.
Series M Mini Cylinders
1-1/2” Bore Size / Single Acting

Mounting Style N
Single Acting
Spring Return
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2”, 1”, 2”, 3”, 4”
Maximum Stroke 6”
Optional Accessory:
R432007834 Foot Bracket

Mounting Style NR
Single Acting
Spring Return
Front Nose Mounting
Non-Rotating Hex Rod (Stainless Steel Optional)
Standard Stroke Lengths: 1/2”, 1”, 2”, 3”, 4”
Maximum Stroke 6”
Optional Accessory:
R432007834 Foot Bracket

Mounting Style NRP
Single Acting
Spring Return
Rear Pivot Mounting
Non-Rotating Hex Rod (Stainless Steel Optional)
Standard Stroke Lengths: 1”, 2”, 3”, 4”
Maximum Stroke 6”
Optional Accessory:
R432007809 Rod Clevis

Mounting Style P
Single Acting
Spring Return
Rear Pivot Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2”, 1”, 2”, 3”, 4”
Maximum Stroke 6”
Optional Accessories:
R432007814 Pivot Bracket
R432007809 Rod Clevis

Mounting Style R
Single Acting
Spring Extend
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1”, 2”, 3”, 4”
Maximum Stroke 6”
Optional Accessory:
R432007834 Foot Bracket

Mounting Style RP
Single Acting
Spring Extend
Rear Pivot Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1”, 2”, 3”, 4”
Maximum Stroke 6”
Optional Accessories:
R432007814 Pivot Bracket
R432007809 Rod Clevis
Series M Mini Pneumatic Cylinders
1-1/2" Bore Size / Double Acting

Mounting Style D
Double Acting
Front Nose Mounting
Stainless Steel Rod Standard
Maximum Stroke 12"
Optional Accessory:
R432007834 Foot Bracket

Mounting Style DP
Double Acting
Rear Pivot Mounting
Stainless Steel Rod Standard
Maximum Stroke 12"
Optional Accessories:
R432007814 Pivot Bracket
R432007809 Rod Clevis

Mounting Style DX
Double Acting
Double End Mounting
Stainless Steel Rod Standard
Stroke over 12" must be supported at both ends
Maximum Stroke 32"
Optional Accessory:
R432007834 Foot Bracket

Mounting Style KDX
Double Acting
Double End Mounting
Double Rod
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4", 5", 6"
Maximum Stroke 12"
Optional Accessory:
R432007834 Foot Bracket

Mounting Style KDH
Double Acting
Double End Mounting
Double Hollow Rod
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4", 5", 6"
Maximum Stroke 12"
Optional Accessory:
R432007834 Foot Bracket
Series M Mini Cylinders
1-1/2" Bore Size / Single Acting Adjustable Stroke

**Mounting Style A**
**Adjustable Stroke - Single Acting**
Spring Return
Double End Mounting
Stainless Steel Rod Standard
Stroke Adjustment in 1" increments to 3"
1" Stroke Adjusts 0"-1", 2"
Stroke 1", 2", and 3" Stroke 2", 3"
Maximum Stroke 6"
Includes Mtg. Brackets
Spring Load Normal 9 lbs.
Spring Load Extended 18 lbs.

**Mounting Style RA**
**Adjustable Stroke - Single Acting**
Spring Extend
Nose Mount
Stainless Steel Rod Standard
Stroke Adjustment in 1" increments to 3"
1" Stroke Adjusts 0", 1", 2"
Stroke 1", 2", and 3" Stroke 2", 3"
Maximum Stroke 6"

Optional Accessory:
R432007834 Foot Bracket

**Mounting Style AP**
**Adjustable Stroke - Single Acting**
Spring Return
Rear Pivot Mounting
Stainless Steel Rod Standard
Stroke Adjustment in 1" increments to 3"
1" Stroke Adjusts 0", 1", 2"
Stroke 1", 2", and 3" Stroke 2", 3"
Maximum Stroke 6"
Includes Mtg. Brackets
Spring Load Normal 9 lbs.
Spring Load Extended 18 lbs.
**Optional Accessories:**
R432007834 Pivot Bracket
R432007809 Rod Clevis

**Notes:**
Series M Mini Pneumatic Cylinders - Block Mounted

1-1/2" Bore Size / Single and Double Acting

Mounting Style BRN
Single Acting
Spring Return
Rear Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"

Mounting Style BRR
Single Acting
Spring Return
Rear Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"

Mounting Style BFD
Double Acting
Front Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4", 5", 6"
Maximum Stroke 12"

Mounting Style BRD
Double Acting
Rear Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4", 5", 6"
Maximum Stroke 12"

Mounting Style BFN
Single Acting
Spring Return
Front Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"

Mounting Style BFR
Single Acting
Spring Extend
Front Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"
Series M Mini Pneumatic Cylinders

AVENTICS Corporation

Series M Mini Cylinders - Trunnion Mounted
1-1/2" Bore Size / Single and Double Acting

Mounting Style TRN
Single Acting
Spring Return
Rear Trunnion Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"

Mounting Style TFD
Double Acting
Front Trunnion Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4", 5", 6"
Maximum Stroke 12"

Mounting Style TRD
Double Acting
Rear Trunnion Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4", 5", 6"
Maximum Stroke 12"

Mounting Style TFN
Single Acting
Spring Return
Front Trunnion Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"
Series M Mini Cylinders
1-3/4" Bore Size / Single Acting

Mounting Style N
Single Acting
Spring Return
Front Nose Mounting
Stainless Steel Rod Optional
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 2 1/2", 3", 4"
Maximum Stroke 6"
Optional Accessory:
R432007835 Foot Bracket

Mounting Style NR
Single Acting
Spring Return
Front Nose Mounting
Non-Rotating Hex Rod (Stainless Steel Optional)
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 2 1/2", 3", 4"
Maximum Stroke 6"
Optional Accessory:
R432007835 Foot Bracket

Mounting Style NRP
Single Acting
Spring Return
Rear Pivot or Double End Mounting
Non-Rotating Hex Rod (Stainless Steel Optional)
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 2 1/2", 3", 4"
Maximum Stroke 6"
Optional Accessories:
R432007835 Foot Bracket
R432007810 Rod Clevis
R432007819 Pivot Bracket with Pin

Mounting Style P
Single Acting
Spring Return
Double End or Rear Pivot Mounting
Stainless Steel Rod Optional
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 2 1/2", 3", 4"
Maximum Stroke 6"
Optional Accessories:
R432007835 Foot Bracket
R432007810 Rod Clevis
R432007819 Pivot Bracket with Pin

Mounting Style R
Single Acting
Spring Extend
Front Nose Mounting
Stainless Steel Rod Optional
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 2 1/2", 3", 4"
Maximum Stroke 6"
Optional Accessory:
R432007835 Foot Bracket
Series M Mini Cylinders
1-3/4" Bore Size / Double Acting

Mounting Style D
Double Acting
Front Nose Mounting
Stainless Steel Rod Optional
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 2 1/2", 3", 4", 5", 6", 7"
Maximum Stroke 12"

Optional Accessory:
R432007835 Foot Bracket

Mounting Style DXP
Double Acting
Double End Mounting
Stainless Steel Rod Optional
Strokes over 12" must be supported at both ends
Maximum Stroke 32"

Optional Accessories:
R432007835 Foot Bracket
R432007819 Pivot Bracket with Pin
R432007809 Rod Clevis

Mounting Style KDX
Double Acting
Double End Mounting
Double Rod
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4", 5", 6"
Maximum Stroke 12"

Optional Accessory:
R432007835 Foot Bracket

Mounting Style KDH
Double Acting
Double End Mounting
Double Hollow Rod
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4", 5", 6"
Maximum Stroke 12"

Optional Accessory:
R432007835 Foot Bracket
Series M Mini Pneumatic Cylinders
2" Bore Size / Single Acting

Mounting Style N
Single Acting
Spring Return
Front Nose Mounting
Stainless Steel Rod Optional
Maximum Stroke 4"

Optional Accessories:
R432007836 Foot Bracket
R432007846 Mounting Nut

Mounting Style P
Single Acting
Spring Return
Double End or Rear Pivot Mounting
Stainless Steel Rod Optional
Maximum Stroke 4"

Optional Accessories:
R432007836 Foot Bracket
R432007810 Rod Clevis
R432007820 Pivot Bracket with Pin
R432007846 Mounting Nut

Mounting Style R
Single Acting
Spring Extend
Front Nose Mounting
Stainless Steel Rod Optional
Maximum Stroke 4"

Optional Accessories:
R432007836 Foot Bracket
R432007846 Mounting Nut

Mounting Style RP
Single Acting
Spring Extend
Rear Pivot Mounting
Stainless Steel Rod Optional
Maximum Stroke 4"

Optional Accessories:
R432007836 Foot Bracket
R432007810 Rod Clevis
R432007818 Pivot Bracket with Pin
R432007846 Mounting Nut
Series M Mini Pneumatic Cylinders
AVENTICS Corporation

Series M Mini Cylinders
2" Bore Size / Double Acting

**Mounting Style D**
**Double Acting**
Front Nose Mounting
Stainless Steel Rod Optional
Maximum Stroke 12"

Optional Accessories:
R432007836 Foot Bracket
R432007846 Mounting Nut

**Mounting Style DXP**
**Double Acting**
Double End or Rear Pivot Mounting
Stainless Steel Rod Standard
Strokes over 12" must be supported at both ends
Maximum Stroke 32"

Optional Accessories:
R432007836 Foot Bracket
R432007819 Pivot Bracket with Pin
R432007810 Rod Clevis
R432007846 Mounting Nut

**Mounting Style KDX**
**Double Acting**
Double End Mounting
Double Rod
Stainless Steel Rod Standard
Maximum Stroke 12"

Optional Accessories:
R432007836 Foot Bracket
R432007846 Mounting Nut
Series M Mini Pneumatic Cylinders

Mounting Style D
Double Acting
Front Nose Mounting
Stainless Steel Rod Optional
Maximum Stroke 12"

Optional Accessories:
R432007837 Foot Bracket
R432007847 Mounting Nut

Mounting Style DXP
Double Acting
Double End or Rear Pivot Mounting
Stainless Steel Rod Standard
Strokes over 12" must be supported
at both ends
Maximum Stroke 32"

Optional Accessories:
R432007837 Foot Bracket
R432007820 Pivot Bracket with Pin
R432007810 Rod Clevis

Mounting Style KDX
Double Acting
Double End Mounting
Double Rod
Stainless Steel Rod Standard
Maximum Stroke 12"

Optional Accessories:
R432007837 Foot Bracket
R432007847 Mounting Nut
Series M Mini Pneumatic Cylinders
AVENTICS Corporation

Series M Mini Cylinders
3" Bore Size / Double Acting

Mounting Style D
Double Acting
Front Nose Mounting
Stainless Steel Rod Optional
Maximum Stroke 12"

Optional Accessories:
R432007838 Foot Bracket
R432007848 Mounting Nut

Mounting Style DXP
Double Acting
Double End or Rear Pivot Mounting
Stainless Steel Rod Standard
Strokes over 12" must be supported at both ends
Maximum Stroke 32"

Optional Accessories:
R432007838 Foot Bracket
R432007821 Pivot Bracket with Pin
R432007811 Rod Clevis
R432007848 Mounting Nut

Mounting Style KDX
Double Acting
Double End Mounting
Double Rod
Stainless Steel Rod Standard
Maximum Stroke 12"

Optional Accessories:
R432007838 Foot Bracket
R432007848 Mounting Nut
## Series M Mini Cylinders

Standard Accessories with Dimensions
(plated steel)

### Standard Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Bore Used On</th>
<th>Dimensional Data</th>
</tr>
</thead>
</table>

### Assembly includes pin and (2) Retainer Rings and (1) Jam Nut.

#### Piston Rod Clevis

![Piston Rod Clevis Diagram](image)

#### Pivot Brackets

Assembly includes pin and (2) Retainer Rings.

![Pivot Brackets Diagram](image)

#### Foot Brackets

![Foot Brackets Diagram](image)

#### Mounting Nut

![Mounting Nut Diagram](image)

### Series M Trunnion Brackets

Select brackets for Series M Trunnion Mount Cylinders from the table below.

(Nota: Trunnion Brackets are ordered as a separate item from the cylinder.)

<table>
<thead>
<tr>
<th>Assembly No.</th>
<th>Bore Sizes</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>R432029604</td>
<td>7/16&quot;</td>
<td>1.75</td>
<td>1.38</td>
<td>1.50</td>
<td>1</td>
<td>.25</td>
<td>.25</td>
<td>.27</td>
<td>.38</td>
<td>.375</td>
<td>.69</td>
<td>1.12</td>
<td>.37</td>
</tr>
<tr>
<td>R432007849</td>
<td>3/4&quot;, 11/16&quot;, 11/2&quot;</td>
<td>1.75</td>
<td>1.38</td>
<td>1.50</td>
<td>1</td>
<td>.25</td>
<td>.25</td>
<td>.27</td>
<td>.38</td>
<td>.500</td>
<td>.69</td>
<td>1.12</td>
<td>.37</td>
</tr>
</tbody>
</table>

---

AVENTICS Corporation

AVENTICS Corporation

---
## Port Size - Rod Diameter - Spring Force Data

<table>
<thead>
<tr>
<th>Bore Size</th>
<th>Port Size</th>
<th>Rod Diameter (Or Hex)</th>
<th>Force Factor</th>
<th>Spring Return (lbs.)</th>
<th>Spring Extend (lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>.31 (.5/16&quot;)</td>
<td>#10-32</td>
<td>1/8&quot;</td>
<td>.08</td>
<td>.06</td>
<td>.5</td>
</tr>
<tr>
<td>.44 (.7/16&quot;)</td>
<td>#10-32</td>
<td>3/16&quot;</td>
<td>.15</td>
<td>.12</td>
<td>1</td>
</tr>
<tr>
<td>.56 (.9/16&quot;)</td>
<td>#10-32</td>
<td>3/16&quot;</td>
<td>.25</td>
<td>.22</td>
<td>2</td>
</tr>
<tr>
<td>.75 (3/4&quot;)</td>
<td>1/8 NPTF</td>
<td>1/4&quot;</td>
<td>.44</td>
<td>.39</td>
<td>3</td>
</tr>
<tr>
<td>.88 (7/8&quot;)</td>
<td>1/8 NPTF</td>
<td>1/4&quot;</td>
<td>.60</td>
<td>.55</td>
<td>3</td>
</tr>
<tr>
<td>1.06 (1 1/16&quot;)</td>
<td>1/8 NPTF</td>
<td>5/16&quot;</td>
<td>.89</td>
<td>.81</td>
<td>3†</td>
</tr>
<tr>
<td>1.25 (1 1/4&quot;)</td>
<td>1/8 NPTF</td>
<td>7/16&quot;</td>
<td>1.23</td>
<td>1.08</td>
<td>7.5</td>
</tr>
<tr>
<td>1.50 (1 1/2&quot;)</td>
<td>1/8 NPTF</td>
<td>7/16&quot;</td>
<td>1.77</td>
<td>1.62</td>
<td>7†</td>
</tr>
<tr>
<td>1.75 (1 3/4&quot;)</td>
<td>1/4 NPTF</td>
<td>1/2&quot;</td>
<td>2.40</td>
<td>2.21</td>
<td>11</td>
</tr>
<tr>
<td>2.00 (2&quot;)</td>
<td>1/4 NPTF</td>
<td>5/8&quot;</td>
<td>3.14</td>
<td>2.84</td>
<td>15</td>
</tr>
<tr>
<td>2.50 (2 1/2&quot;)</td>
<td>1/4 NPTF</td>
<td>5/8&quot;</td>
<td>4.91</td>
<td>4.60</td>
<td>N/A</td>
</tr>
<tr>
<td>3.00 (3&quot;)</td>
<td>3/8 NPTF</td>
<td>3/4&quot;</td>
<td>7.07</td>
<td>6.63</td>
<td>N/A</td>
</tr>
</tbody>
</table>

*Non-rotating version uses 3/8" hex.
†Block mount and trunion mount spring return lbs. equals spring extend lbs.

### Mounting Style

<table>
<thead>
<tr>
<th>Mounting Style</th>
<th>Standard Head Port Location</th>
<th>Standard Cap Port Location</th>
<th>Standard Vent Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>AR</td>
<td>Face</td>
<td>Face</td>
<td>None</td>
</tr>
<tr>
<td>BFR</td>
<td>2</td>
<td>None</td>
<td>2</td>
</tr>
<tr>
<td>BFN</td>
<td>None</td>
<td>Face</td>
<td>2</td>
</tr>
<tr>
<td>BRD</td>
<td>2</td>
<td>2</td>
<td>None</td>
</tr>
<tr>
<td>BFD</td>
<td>2</td>
<td>Face</td>
<td>None</td>
</tr>
<tr>
<td>BRR</td>
<td>2</td>
<td>None</td>
<td>2</td>
</tr>
<tr>
<td>BRN</td>
<td>None</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>TFN</td>
<td>None</td>
<td>Face</td>
<td>1</td>
</tr>
<tr>
<td>TRD</td>
<td>1</td>
<td>1</td>
<td>None</td>
</tr>
<tr>
<td>TFD</td>
<td>1</td>
<td>Face</td>
<td>None</td>
</tr>
<tr>
<td>TRN</td>
<td>None</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>AP</td>
<td>None</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>RA</td>
<td>2</td>
<td>None</td>
<td>2</td>
</tr>
<tr>
<td>A</td>
<td>None</td>
<td>Face</td>
<td>2</td>
</tr>
<tr>
<td>KDH</td>
<td>2</td>
<td>2</td>
<td>None</td>
</tr>
<tr>
<td>KDX</td>
<td>2</td>
<td>2</td>
<td>None</td>
</tr>
<tr>
<td>DX</td>
<td>2</td>
<td>2</td>
<td>None</td>
</tr>
<tr>
<td>DXP</td>
<td>2</td>
<td>2</td>
<td>None</td>
</tr>
<tr>
<td>DP</td>
<td>2</td>
<td>2</td>
<td>None</td>
</tr>
<tr>
<td>D</td>
<td>2</td>
<td>Face</td>
<td>None</td>
</tr>
<tr>
<td>RP</td>
<td>2</td>
<td>None</td>
<td>2</td>
</tr>
<tr>
<td>R</td>
<td>2</td>
<td>None</td>
<td>2</td>
</tr>
<tr>
<td>P</td>
<td>None</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>NRP</td>
<td>None</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>NR</td>
<td>None</td>
<td>Face</td>
<td>2</td>
</tr>
</tbody>
</table>

Cylinders will be with ports at these locations unless otherwise specified.
**Series M Mini Pneumatic Cylinders**

**Series M Mini Cylinders**

**Standard Options**

### Bumpers

Bumpers are available at extra cost, add the following dimensions to the overall cylinder length by bore

<table>
<thead>
<tr>
<th>Bore Size Type</th>
<th>5/16&quot;</th>
<th>7/16&quot;</th>
<th>9/16&quot;</th>
<th>3/4&quot;</th>
<th>7/8&quot;</th>
<th>1 1/16&quot;</th>
<th>1 1/4&quot;</th>
<th>1 1/2&quot;</th>
<th>1 3/4&quot;</th>
<th>2&quot;</th>
<th>2 1/2&quot;</th>
<th>3&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring Return</td>
<td>*</td>
<td>.062&quot;</td>
<td>.062&quot;</td>
<td>.125&quot;*</td>
<td>.125&quot;*</td>
<td>.125&quot;*</td>
<td>.125&quot;*</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spring Extend</td>
<td>*</td>
<td>.125&quot;</td>
<td>.062&quot;</td>
<td>.125&quot;*</td>
<td>.125&quot;*</td>
<td>.125&quot;*</td>
<td>.125&quot;*</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Double Acting</td>
<td>*</td>
<td>.188&quot;</td>
<td>.125&quot;</td>
<td>.125&quot;*</td>
<td>.125&quot;*</td>
<td>.125&quot;*</td>
<td>.250&quot;*</td>
<td>.250&quot;*</td>
<td>.250&quot;*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K-type</td>
<td>*</td>
<td>.250&quot;</td>
<td>.125&quot;</td>
<td>.125&quot;*</td>
<td>.500&quot;*</td>
<td>.125&quot;*</td>
<td>.250&quot;*</td>
<td>.250&quot;*</td>
<td>.250&quot;*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Bumpers are furnished as standard and do not affect overall length.

**Fluorocarbon Seals**

Available on all bore sizes at extra cost.

**Stainless Steel Piston Rods**

Corrosion resistant 303 stainless steel is the standard piston rod material for all bore sizes up to and including 1.50 inch bore at no additional cost. The only exception to the stainless steel standard is when a non-rotating piston rod option is specified for bore sizes 3/4" and up. Stainless steel is also the standard material on cylinders with adjustable cushions; all block and trunnion mounted, plus KDX and KDH styles. Stainless steel is available on other sizes for an additional charge.

**Rod Wiper**

Double acting styles of Series M/MM cylinders can be fitted with a rod wiper that is specially designed to prevent contaminants from clinging to the piston rod and damaging the piston rod seal. Rod wipers are not available in standard single acting styles.

**Adjustable Cushion Option**

Cushions can be selected on six bore sizes, ranging from .75" bore to 3.0" bore with mounting styles D, front nose mount, and DXP, rear pivot mount. Adjustable cushions are optional at either end or both ends of Series M/MM cylinders.

Cylinders with air cushions are quieter and reduce end of stroke impact. The air cushion traps exhaust air at the end of stroke and provides an air pocket that decelerates the load. This reduces the possible detrimental energy that is transmitted to the cylinder and other components in the application. The following describes how to determine the energy level of your application:

Step 1: Determine the load to be stopped by the cylinder.

Step 2: Determine the velocity at which the load impacts the cylinder end cap.

Step 3. Calculate the energy the cylinder generates using the following equation:

\[ E = \left( \frac{W}{2} \times V^2 \right) + (P \times K) \]

- \( w \) = weight of the load (lbs.)
- \( v \) = Velocity of the cylinder as the piston impacts the end cap (feet per second)
- \( p \) = working pressure (psi)
- \( k \) = bore constant (see chart on next page for value per bore size)

Example: 2" bore, double acting, cushioned cylinder at 80 psi, total load of 8 lbs., with a maximum velocity of 6 feet per second

Weight of the load (w) = 8 lbs.
Velocity (v) = 6 ft. per second
Working pressure (p) = 80 psi
Bore constant (k)

\[ = \left( \frac{8}{2} \times 6^2 \right) + (80 \times .24) = 23.7 \text{ ft. lbs.} \]
Series M Mini Cylinders
Adjustable Cushion Option

Adjustable Cushions (cont.)
Maximum Energy Calculation Data

(see cushioning information and formula on previous page)

<table>
<thead>
<tr>
<th>Bore</th>
<th>Max. Energy Ft. Lbs.</th>
<th>k</th>
<th>Cushion Lengths</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4&quot;</td>
<td>4.47</td>
<td>0.03</td>
<td>0.75&quot;</td>
</tr>
<tr>
<td>1 1/16&quot;</td>
<td>10.40</td>
<td>0.05</td>
<td>0.75&quot;</td>
</tr>
<tr>
<td>1 1/2&quot;</td>
<td>18.80</td>
<td>0.11</td>
<td>0.75&quot;</td>
</tr>
<tr>
<td>2&quot;</td>
<td>27.60</td>
<td>0.24</td>
<td>0.90&quot;</td>
</tr>
<tr>
<td>2 1/2&quot;</td>
<td>40.11</td>
<td>0.37</td>
<td>0.90&quot;</td>
</tr>
<tr>
<td>3&quot;</td>
<td>77.72</td>
<td>0.58</td>
<td>0.99&quot;</td>
</tr>
</tbody>
</table>

Critical Mounting Dimensions for Series M and MM Cylinders with Adjustable Cushions

In most cases, cylinder mounting dimensions are not affected when cushions are specified. Standard catalog dimensions apply when cushions are specified at either end of a DXP mount and when specified at the head end only of a D mount. The only exception to standard catalog dimensions is when a cushion is specified on the cap end or both ends of a D mount. Please consult Table A for the critical mounting dimensions on D mount M and MM cylinders with cushions both ends or cushions cap end only. (Cushion lengths are shown in table above.)

Table A: Critical Mounting Dimensions for D Mount M and MM Cylinders with Cushions Both Ends or Cushions Cap End Only.

<table>
<thead>
<tr>
<th>Bore Size</th>
<th>M Dimensions</th>
<th>MM Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A + Stroke</td>
<td>B</td>
</tr>
<tr>
<td>.75</td>
<td>3.41</td>
<td>0.28</td>
</tr>
<tr>
<td>1.06</td>
<td>3.50</td>
<td>0.28</td>
</tr>
<tr>
<td>1.50</td>
<td>3.88</td>
<td>0.31</td>
</tr>
<tr>
<td>2.00</td>
<td>5.06</td>
<td>0.47</td>
</tr>
<tr>
<td>2.50</td>
<td>5.06</td>
<td>0.47</td>
</tr>
<tr>
<td>3.00</td>
<td>5.69</td>
<td>0.53</td>
</tr>
</tbody>
</table>
# How To Order Series M Air Reservoirs

<table>
<thead>
<tr>
<th>Bore Diameter</th>
<th>Vol. - Cu. In.</th>
<th>Length Unit</th>
<th>Part Number</th>
<th>Length Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4&quot; Bore</td>
<td>.39 in³ plus .44 in³ per inch of length</td>
<td>Length in inches</td>
<td>#M-7AR-_________(length)</td>
<td>Length in inches</td>
</tr>
<tr>
<td>Standard Length</td>
<td>1&quot; increments to 4&quot; Maximum Length 32&quot;</td>
<td>1/8&quot; NPT (Both Ends)</td>
<td>.19 .19 .813 .625</td>
<td>1/8&quot; NPT (Both Ends)</td>
</tr>
<tr>
<td>1-1/16&quot; Bore</td>
<td>.99 in³ plus .89 in³ per inch of length</td>
<td>Length in inches</td>
<td>#M-10AR-________(length)</td>
<td>Length in inches</td>
</tr>
<tr>
<td>Standard Length</td>
<td>1&quot; increments to 8&quot; Maximum Length 32&quot;</td>
<td>1/8&quot; NPT (Both Ends)</td>
<td>.19 .19 .125 .88</td>
<td>1/8&quot; NPT (Both Ends)</td>
</tr>
<tr>
<td>2&quot; Bore</td>
<td>4.22 in³ plus 3.14 in³ per inch of length</td>
<td>Length in inches</td>
<td>#M-20AR-________(length)</td>
<td>Length in inches</td>
</tr>
<tr>
<td>Standard Length</td>
<td>1&quot; increments to 16&quot; Maximum Length 32&quot;</td>
<td>1/4&quot; NPT (Both Ends)</td>
<td>.312 .312 .208 .125</td>
<td>1/4&quot; NPT (Both Ends)</td>
</tr>
</tbody>
</table>

Delrin® is a registered trademark of Dupont.

- = Available Option
S = Available as Special
X = Not Available
How To Order Series M Air Cylinders

<table>
<thead>
<tr>
<th>Series</th>
<th>Bore</th>
<th>Mount Style</th>
<th>Options</th>
<th>Special</th>
<th>Non-std. Rod</th>
<th>Non-std. Rod Dims.</th>
<th>Stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>-7</td>
<td>N-</td>
<td>V</td>
<td>S</td>
<td>Y</td>
<td>3</td>
<td>15</td>
</tr>
</tbody>
</table>

**Series Bore Mount Style Options Special Non-std. Rod Non-std. Rod Dims. Stroke**

<table>
<thead>
<tr>
<th>Series</th>
<th>Bore</th>
<th>Mount Style</th>
<th>Options</th>
<th>Special</th>
<th>Non-std. Rod**</th>
<th>Non-std. Rod Dims.</th>
<th>Stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>5/16&quot;</td>
<td>3</td>
<td>V</td>
<td>S</td>
<td>Y = Stainless Steel Rod</td>
<td>3- indicates special Rod End</td>
<td>(in tenths of an inch)</td>
</tr>
<tr>
<td></td>
<td>7/16&quot;</td>
<td>4</td>
<td>V</td>
<td>S</td>
<td>Y = Stainless Steel Rod</td>
<td>3- indicates special Rod End</td>
<td>(in tenths of an inch)</td>
</tr>
<tr>
<td></td>
<td>9/16&quot;</td>
<td>5</td>
<td>V</td>
<td>S</td>
<td>Y = Stainless Steel Rod</td>
<td>3- indicates special Rod End</td>
<td>(in tenths of an inch)</td>
</tr>
<tr>
<td></td>
<td>3/4&quot;</td>
<td>7</td>
<td>V</td>
<td>S</td>
<td>Y = Stainless Steel Rod</td>
<td>3- indicates special Rod End</td>
<td>(in tenths of an inch)</td>
</tr>
<tr>
<td></td>
<td>7/8&quot;</td>
<td>8</td>
<td>V</td>
<td>S</td>
<td>Y = Stainless Steel Rod</td>
<td>3- indicates special Rod End</td>
<td>(in tenths of an inch)</td>
</tr>
<tr>
<td></td>
<td>1-1/16&quot;</td>
<td>10</td>
<td>V</td>
<td>S</td>
<td>Y = Stainless Steel Rod</td>
<td>3- indicates special Rod End</td>
<td>(in tenths of an inch)</td>
</tr>
<tr>
<td></td>
<td>1-1/4&quot;</td>
<td>12</td>
<td>V</td>
<td>S</td>
<td>Y = Stainless Steel Rod</td>
<td>3- indicates special Rod End</td>
<td>(in tenths of an inch)</td>
</tr>
<tr>
<td></td>
<td>1-1/2&quot;</td>
<td>15</td>
<td>V</td>
<td>S</td>
<td>Y = Stainless Steel Rod</td>
<td>3- indicates special Rod End</td>
<td>(in tenths of an inch)</td>
</tr>
<tr>
<td></td>
<td>1-3/4&quot;</td>
<td>17</td>
<td>V</td>
<td>S</td>
<td>Y = Stainless Steel Rod</td>
<td>3- indicates special Rod End</td>
<td>(in tenths of an inch)</td>
</tr>
<tr>
<td></td>
<td>2&quot;</td>
<td>20</td>
<td>V</td>
<td>S</td>
<td>Y = Stainless Steel Rod</td>
<td>3- indicates special Rod End</td>
<td>(in tenths of an inch)</td>
</tr>
<tr>
<td></td>
<td>2-1/2&quot;</td>
<td>25</td>
<td>V</td>
<td>S</td>
<td>Y = Stainless Steel Rod</td>
<td>3- indicates special Rod End</td>
<td>(in tenths of an inch)</td>
</tr>
<tr>
<td></td>
<td>3&quot;</td>
<td>30</td>
<td>V</td>
<td>S</td>
<td>Y = Stainless Steel Rod</td>
<td>3- indicates special Rod End</td>
<td>(in tenths of an inch)</td>
</tr>
</tbody>
</table>

Examples:

M-7N-15 is 3/4" bore, nose mount, spring return, 1-1/2" stroke.

*Bumpers are standard on some models, see Bumpers section for details.

**303 stainless steel is the standard piston rod material for all bore sizes up to and including 1.50 inch bore at no additional cost. The only exception to the stainless steel standard is when a non-rotating piston rod option is specified for bore sizes 3/4” and up. Stainless steel is also the standard material on cylinders with adjustable cushions; all block and trunnion mounted, plus KDX and KDH styles.

Non-Standard Rods

For non-standard rod dimensions, or undersized rod end threads, put a "3" in model number and describe the rod using the letters shown in the drawing. It is necessary to specify only those dimensions that are non-standard.

*Requires an S designation in model number.

Notes:

- #10-32 to 1/8"-27 NPT Port Adapter
  - Part no. R432032573
- 1/4" O.D. Hose Barbed Fittings (Package of 10)
  - Part no R432007804
- Note: Due to insufficient port depth, port adapter fitting cannot be used for head end ports of 9/16" bore cylinders. Use barbed fitting.
### Series M Mini Cylinders

**Competitor Interchange Chart**

<table>
<thead>
<tr>
<th>Mounting Description</th>
<th>AVENTICS</th>
<th>Birba</th>
<th>Bimba</th>
<th>Clipper</th>
<th>Humphrey</th>
<th>Hydromax</th>
<th>Numatics</th>
<th>Oregon</th>
<th>Norwegian</th>
<th>Norgren</th>
<th>Norgren</th>
<th>Numatics</th>
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</table>

This interchange chart is to be used as a reference guide only. Verify customer ordering. For further information, consult factory.
### Series M Mini Cylinders

#### AVENTICS

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
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<tbody>
<tr>
<td>M-2</td>
<td>Stroke Options</td>
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<tr>
<td>M-3</td>
<td>B - bumper</td>
</tr>
<tr>
<td>M-4</td>
<td>X - bumper</td>
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<tr>
<td>M-5</td>
<td>Y - high temp</td>
</tr>
<tr>
<td>M-6</td>
<td>W - safety</td>
</tr>
<tr>
<td>M-7</td>
<td>Q - stainless steel</td>
</tr>
<tr>
<td>M-8</td>
<td>Red</td>
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<tr>
<td>M-9</td>
<td>Special</td>
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#### BIMBA

<table>
<thead>
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<th>Model</th>
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<tr>
<td>M10</td>
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<td>M20</td>
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<td>M30</td>
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<td>M40</td>
<td>Y - high temp</td>
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<tr>
<td>M50</td>
<td>W - safety</td>
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<tr>
<td>M60</td>
<td>Q - stainless steel</td>
</tr>
<tr>
<td>M70</td>
<td>Red</td>
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<tr>
<td>M80</td>
<td>Special</td>
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#### HUMPHREY

<table>
<thead>
<tr>
<th>Model</th>
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<tr>
<td>H20</td>
<td>Stroke Options</td>
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<tr>
<td>H30</td>
<td>B - bumper</td>
</tr>
<tr>
<td>H40</td>
<td>X - bumper</td>
</tr>
<tr>
<td>H50</td>
<td>Y - high temp</td>
</tr>
<tr>
<td>H60</td>
<td>W - safety</td>
</tr>
<tr>
<td>H70</td>
<td>Q - stainless steel</td>
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<tr>
<td>H80</td>
<td>Red</td>
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<tr>
<td>H90</td>
<td>Special</td>
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#### CLIPPARD

<table>
<thead>
<tr>
<th>Model</th>
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<tr>
<td>C20</td>
<td>Stroke Options</td>
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<td>C30</td>
<td>B - bumper</td>
</tr>
<tr>
<td>C40</td>
<td>X - bumper</td>
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<tr>
<td>C50</td>
<td>Y - high temp</td>
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<tr>
<td>C60</td>
<td>W - safety</td>
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<tr>
<td>C70</td>
<td>Q - stainless steel</td>
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<tr>
<td>C80</td>
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<td>C90</td>
<td>Special</td>
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</table>

#### AMERICAN

<table>
<thead>
<tr>
<th>Model</th>
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<tbody>
<tr>
<td>A10</td>
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<td>B - bumper</td>
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<tr>
<td>A30</td>
<td>X - bumper</td>
</tr>
<tr>
<td>A40</td>
<td>Y - high temp</td>
</tr>
<tr>
<td>A50</td>
<td>W - safety</td>
</tr>
<tr>
<td>A60</td>
<td>Q - stainless steel</td>
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<tr>
<td>A70</td>
<td>Red</td>
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<tr>
<td>A80</td>
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#### NUMATICS

<table>
<thead>
<tr>
<th>Model</th>
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<td>D02</td>
<td>B - bumper</td>
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<tr>
<td>D03</td>
<td>X - bumper</td>
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<td>D04</td>
<td>Y - high temp</td>
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<td>D05</td>
<td>W - safety</td>
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<td>D06</td>
<td>Q - stainless steel</td>
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<tr>
<td>D07</td>
<td>Special</td>
</tr>
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---

**Air Reservoirs (Volume Chambers)**

<table>
<thead>
<tr>
<th>Size</th>
<th>AVENTICS</th>
<th>Bimba</th>
<th>Humphrey</th>
<th>Clippar</th>
<th>American</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4&quot;</td>
<td>M-7AR</td>
<td>D-1022-A</td>
<td>7-C</td>
<td>AVT-12</td>
<td>750 VCS</td>
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<tr>
<td>1-1/16&quot;</td>
<td>M-10AR</td>
<td>D-1500-A</td>
<td>6-C</td>
<td>AVT-17</td>
<td>1062 VCS</td>
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<td>1-1/4&quot;</td>
<td>M-12AR</td>
<td>D-27715-A</td>
<td>5-C</td>
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<td>1-1/2&quot;</td>
<td>M-15AR</td>
<td>D-6596-A</td>
<td>5-C</td>
<td>AVT-24</td>
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<td>2&quot;</td>
<td>M-20AR</td>
<td>D-2485-</td>
<td>4-C</td>
<td>AVT-32</td>
<td>-</td>
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</table>

**Notes:**
- B: Bore sizes for block mounts.
- M: Bore sizes for internal magnets.
- * Consult factory for MM dimensional interchange
- T: Bore sizes for trunnion mounts.
- X: Standard mount only.

---

**Summary of Optional/Mounts Offered**

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<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
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<td>X</td>
<td>X</td>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>1/4&quot;</td>
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<td>X</td>
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<td>X</td>
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<td>5/32&quot;</td>
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<td>X</td>
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<td>1/8&quot;</td>
<td>X</td>
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</table>

**Standard Options**

<table>
<thead>
<tr>
<th>Bumpers</th>
<th>Viton Seals</th>
<th>Stainless Steel Rods</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVENTICS</td>
<td>Standard on 5/16&quot;, 7/16&quot;, and 1-1/2&quot; bore models except 2&quot; bore single-acting *</td>
<td>Optioned on all bore sizes and models</td>
</tr>
<tr>
<td>Bimba</td>
<td>Standard on 5/16&quot;, 7/16&quot;, and 1-1/2&quot; bore models except 2&quot; bore single-acting *</td>
<td>Optioned on all bore sizes and models</td>
</tr>
<tr>
<td>Clippar</td>
<td>Standard on most bore sizes and models *</td>
<td>Optioned on all bore sizes and models</td>
</tr>
<tr>
<td>Humphrey</td>
<td>Standard on model D2YE all bore sizes *</td>
<td>Optioned on all bore sizes and models</td>
</tr>
<tr>
<td>American</td>
<td>Standard on all bore sizes and models *</td>
<td>Optioned on all bore sizes and models</td>
</tr>
<tr>
<td>Norgren</td>
<td>Optioned on all bore sizes and models *</td>
<td>Optioned on all bore sizes and models</td>
</tr>
<tr>
<td>Numatics</td>
<td>Standard all on bore sizes and models *</td>
<td>Optioned on all bore sizes and models</td>
</tr>
</tbody>
</table>

\*Bumpers may affect OAL. Consult factory for details.
Here’s why the low cost MM Series light duty air cylinder with Piston Sensing capability is your best choice...

Quality cost saving features include:

1. **Cylinder Tube** — Type 304 stainless steel, polished to a micro-inch finish on the I.D. provides low friction and long life. A matte finish on the O.D. provides smudge resistance.

2. **Heads and Caps** — Aluminum construction with precision machining provides a smooth breakaway. The tube-to-head connection is a strong double rolled construction.

3. **Piston Rods** — Type 303 Stainless steel rod material is standard on cataloged Series MM cylinders.

4. **Piston Body** — Pistons are precision machined aluminum construction. Piston rod connections are threaded and anaerobic adhesive applied to provide for durable leakproof service.

5. **Seals** — All piston and rod seals are of a lipseal construction. Buna-N is a standard on all models.

6. **Rod Bushings** — Oil impregnated bronze reamed to a close tolerance provides for smooth operation and long life.

7. **Unitized Construction** — Precision double-rolled unitized construction provides durable, leakproof service and long life.

8. **Piston Magnet** — Nitrile-Barium particle composite surrounds entire diameter for dependable service and long life.

9. **Adjustable Reed Switch** — Capable of either AC or DC operation. Available standard with LED indicator for easy on/off indication.

10. **Adjustable Solid State Switch** — NPN Sinking or PNP Sourcing available standard with LED indicator for easy on/off indication.

**Standard Specifications - Series MM**

- 304 stainless steel cylinder body.
- Aluminum heads and caps.
- Stainless steel piston rods standard.
- Nominal pressure rating 250 psi.
- Standard temperature –20°F to +185°F
- Mounting styles - 22 standard.
- Adjustable cushions are available.
- Rod Wipers available for double acting versions. For additional mounting styles please consult factory
## Series MM Available Mounting Styles

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Bore Size</th>
<th>Recommended Max. Stroke (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Nose mount, spring return</td>
<td>9/16&quot;</td>
<td>6&quot;</td>
</tr>
<tr>
<td>NR</td>
<td>Nose mount, spring return, hexrod (non-rotating)</td>
<td>3/4&quot;</td>
<td>6&quot;</td>
</tr>
<tr>
<td>NRP</td>
<td>Pivot and nose mount, spring return, hex rod</td>
<td>1-1/16&quot;</td>
<td>6&quot;</td>
</tr>
<tr>
<td>P</td>
<td>Pivot mount, spring return</td>
<td>1-1/4&quot;</td>
<td>6&quot;</td>
</tr>
<tr>
<td>R</td>
<td>Nose mount, spring extended</td>
<td>1-1/2&quot;</td>
<td>6&quot;</td>
</tr>
<tr>
<td>DP</td>
<td>Pivot and nose mount, double acting, pivot pin</td>
<td>2&quot;</td>
<td>12&quot; (under 3/4&quot; bore)</td>
</tr>
<tr>
<td>DXP</td>
<td>Pivot and nose mount, double acting, pivot pin</td>
<td>2-1/2&quot;</td>
<td>12&quot; (under 3/4&quot; bore)</td>
</tr>
<tr>
<td>DX</td>
<td>Threaded both ends, double acting</td>
<td></td>
<td>32&quot; (3/4&quot; &amp; up)</td>
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<tr>
<td>KDX</td>
<td>Threaded both ends, double acting, double rod</td>
<td></td>
<td>6&quot; (under 3/4&quot; bore)</td>
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<tr>
<td>KDH</td>
<td>Threaded both ends, double rod</td>
<td></td>
<td>12&quot; (3/4&quot; &amp; up)</td>
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<tr>
<td>BRN</td>
<td>Rear block mount, single acting, spring return</td>
<td></td>
<td>6&quot;</td>
</tr>
<tr>
<td>BRR</td>
<td>Rear block mount, single acting, spring extend</td>
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<td>6&quot;</td>
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<tr>
<td>BFD</td>
<td>Front block mount, double acting</td>
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<td>12&quot;</td>
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<tr>
<td>BRD</td>
<td>Rear block mount, double acting</td>
<td></td>
<td>12&quot;</td>
</tr>
<tr>
<td>BFN</td>
<td>Front block mount, single acting, spring return</td>
<td></td>
<td>6&quot;</td>
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<tr>
<td>BFR</td>
<td>Front block mount, single acting, spring extend</td>
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<td>6&quot;</td>
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<td>TRN</td>
<td>Rear trunnion mount, single acting, spring return</td>
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<td>TFD</td>
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<td>TRD</td>
<td>Rear trunnion mount, double acting</td>
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<td>12&quot;</td>
</tr>
<tr>
<td>TFN</td>
<td>Front trunnion mount, single acting, spring return</td>
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<td>6&quot;</td>
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</table>

▲ Recommended maximum stroke is 4" in models N, P, R & RP.
For longer stroke lengths - consult factory.
Switch Specifications

<table>
<thead>
<tr>
<th>Reed Switch Assembly</th>
<th>Solid State Switch Assembly</th>
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<tbody>
<tr>
<td>R432008144*</td>
<td>R432008145* NPN Sinking</td>
</tr>
<tr>
<td>R432008146* PNP Sourcing</td>
<td>R432008145* NPN Sinking</td>
</tr>
</tbody>
</table>

Switching Logic: Normally open, SPST (Form A)
Supply Voltage Range: 85 to 125 VAC or 5-30 VDC
On-State Voltage Drop: 1.7 V Maximum
Current Output Range: ---
Burden Current: ---
Power Rating: 10 Watts (Resistive), 5 Watts (Capacitive)
Switching Current Range: 30mA to 200mA (Resistive), 30mA to 100mA (Capacitive)
Leakage Current: Red, Target Present
Minimum Current to Light LED: 18 mA

Burden Current: ---
Current Output Range: ---
On: Supply Voltage Range: See Circuits Below
Switching Logic: Normally open, SPST (Form A)
Supply Voltage Range: 10-30 VDC
On-State Voltage Drop: 0.56V Maximum
Recommended for longer life 125 VAC

Circuit for Switching Contact Protection (Inductive Loads)

(Required for proper operation 24V DC)
Put Diode parallel to loads following polarity as shown below

![Circuit Diagram](image)

D: Diode: select a Diode with the breakdown voltage and current rating according to the load.

Typical Example - 100 Volt, 1 Amp Diode
CR: Relay coil (under 2W coil rating)
R: Resistor 1KΩ - 5KΩ, 1/4W
C: Capacitor 0.1 μF, 600V

**Caution**
- Use an ammeter to test red switch current. Testing devices such as incandescent light bulbs may subject to reed switch to high in-rush loads.
- NOTE: When checking an unpowered reed switch for continuity with a digital ohmmeter the resistance reading will change from infinity to a very large resistance (2M ohm) when the switch is activated. This is due to the presence of the diode in the reed switch.
- Anti-magnetic shielding is recommended for reed switches exposed to high external RF or magnetic fields.
- The magnetic field strength of the piston magnet is designed to operate with our switches. Other manufacturers’ switches or sensors may not operate correctly in conjunction with these magnets.
- Current capabilities are relative to operational temperatures.
- Use relay coils for reed switch contact protection.
- The operation of some 120 VAC PLC’s (especially some older Allen-Bradley PLC’s) can overload the reed switch. The switch may fail to release after the piston magnet has passed. This problem may be corrected by the placement of a 700 to 1K OHM resistor between the switch and the PLC input terminal. Consult the manufacturer of the PLC for appropriate circuit.
- Switches with long wire leads (greater than 15 feet) can cause capacitance built-up and sticking will result. Attach a resistor in series with the reed switch (the resistor should be installed as close as possible to the switch). The resistor should be selected such that R (ohms)>E/0.3

* Stainless steel worm gear type clamps must be ordered separately.

<table>
<thead>
<tr>
<th>Bore Size</th>
<th>Clamp Assembly</th>
<th>Bore Size</th>
<th>Clamp Assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td>9/16&quot;</td>
<td>R432007822</td>
<td>1-1/2&quot;</td>
<td>R432007825</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>R432007823</td>
<td>1-3/4&quot;, 2&quot;</td>
<td>R432007826</td>
</tr>
<tr>
<td>1-1/16&quot;</td>
<td>R432007824</td>
<td>2-1/2&quot;</td>
<td>R432007827</td>
</tr>
<tr>
<td>1-1/4&quot;</td>
<td>R432007824</td>
<td>1-1/4&quot;</td>
<td>1-1/4&quot;</td>
</tr>
</tbody>
</table>

* Polarity is restricted to DC operation: (+) to Brown (White*) (-) to Blue (Black*)
If these connections are reversed the contacts will close, but the LED will not light.
Note: For switches with connectors and cordsets, See Complementary Product Section.
Series MM Mini Cylinders
9/16” Bore Single Acting

Mounting Style N
Single Acting
Spring Return
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2”, 1”, 1 1/2”, 2”, 3”, 4”
Maximum Stroke 6”

Optional Accessory:
R432007831 Foot Bracket

Mounting Style NR
Single Acting
Spring Return
Front Nose Mounting
Non-Rotating Hex Rod
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2”, 1”, 1 1/2”, 2”, 3”, 4”
Maximum Stroke 6”

Optional Accessory:
R432007831 Foot Bracket

Mounting Style NRP
Single Acting
Spring Return
Rear Pivot Mounting
Non-Rotating Hex Rod
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2”, 1”, 1 1/2”, 2”, 3”, 4”
Maximum Stroke 6”

Optional Accessories:
R432007806 Rod Clevis
R432007816 Pivot Bracket with Pin

Mounting Style P
Single Acting
Spring Return
Rear Pivot Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2”, 1”, 1 1/2”, 2”, 3”, 4”
Maximum Stroke 6”

Optional Accessories:
R432007806 Rod Clevis
R432007816 Pivot Bracket with Pin

Mounting Style R
Single Acting
Spring Extend
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2”, 1”, 1 1/2”, 2”, 3”
Maximum Stroke 6”

Optional Accessory:
R432007831 Foot Bracket
Series M Mini Pneumatic Cylinders
AVENTICS Corporation

Mounting Style RP
Single Acting
Spring Extend
Rear Pivot Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3"
Maximum Stroke 6"

Optional Accessories:
R432007816 Pivot Bracket with Pin
R432007806 Rod Clevis

Mounting Style D
Double Acting
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3", 4"
Maximum Stroke 12"

Optional Accessory:
R432007831 Foot Bracket

Mounting Style DXP
Double Acting
Double End or Rear Pivot Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3", 4"
Maximum Stroke 12"

Optional Accessories:
R432007831 Foot Bracket
R432007841 Hex Mounting Nut
R432007806 Rod Clevis

Mounting Style KDX
Double Acting
Double End Mounting
Double Rod
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3", 4"
Maximum Stroke 6"

Optional Accessory:
R432007831 Foot Bracket
Series MM Mini Cylinders
3/4” Bore Single Acting

Mounting Style N
Single Acting
Spring Return
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3", 4"
Maximum Stroke 6”

Optional Accessory:
R432007832 Foot Bracket

Mounting Style NR
Single Acting
Spring Return
Front Nose Mounting
Non-Rotating Hex Rod (Stainless Steel Standard)
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3", 4"
Maximum Stroke 6”

Optional Accessory:
R432007832 Foot Bracket

Mounting Style NRP
Single Acting
Spring Return
Rear Pivot Mounting
Non-Rotating Hex Rod (Stainless Steel Standard)
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6”

Optional Accessories:
R432007807 Rod Clevis
R432007813 Pivot Bracket

Mounting Style P
Single Acting
Spring Return
Rear Pivot Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3", 4"
Maximum Stroke 6”

Optional Accessories:
R432007807 Rod Clevis
R432007813 Pivot Bracket

Mounting Style R
Single Acting
Spring Extend
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2", 3"
Maximum Stroke 6”

Optional Accessory:
R432007833 Foot Bracket
Series MM Mini Cylinders
3/4" Bore Single and Double Acting

Mounting Style RP
Single Acting
Spring Extend
Rear Pivot Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 2", 3", 4"
Maximum Stroke 6"
Optional Accessories:
R432007813 Pivot Bracket
R432007807 Rod Clevis

Mounting Style D
Double Acting
Front Nose Mounting
Stainless Steel Rod Standard
Maximum Stroke 12"
Optional Accessory:
R432007833 Foot Bracket

Mounting Style DP
Double Acting
Rear Pivot Mounting
Stainless Steel Rod Standard
Maximum Stroke 12"
Optional Accessories:
R432007813 Pivot Bracket
R432007807 Rod Clevis

Mounting Style DXP
Double Acting
Double End or Rear Pivot Mounting
Stainless Steel Rod Standard
Strokes over 12" must be supported at both ends
Maximum Stroke 32"
Optional Accessories:
R432007833 Foot Bracket
R432007817 Pivot Bracket with Pin
R432007807 Rod Clevis

Mounting Style KDX
Double Acting
Double End Mounting
Double Rod
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4", 5", 6"
Maximum Stroke 12"
Optional Accessory:
R432007833 Foot Bracket
Series MM Mini Cylinders - Block Mounted
3/4” Bore Single and Double Acting

Mounting Style BRN
Single Acting
Spring Return
Rear Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1”, 2”, 3”, 4”
Maximum Stroke 6”

Mounting Style BRR
Single Acting
Spring Extend
Rear Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1”, 2”, 3”, 4”
Maximum Stroke 6”

Mounting Style BFD
Double Acting
Front Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2”, 1”, 2”, 3”, 4”, 5”, 6”
Maximum Stroke 12”

Mounting Style BRD
Double Acting
Rear Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1”, 2”, 3”, 4”, 5”, 6”
Maximum Stroke 12”

Mounting Style BFN
Single Acting
Spring Return
Front Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2”, 1”, 2”, 3”, 4”
Maximum Stroke 6”

Mounting Style BFR
Single Acting
Spring Extend
Front Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1”, 2”, 3”, 4”
Maximum Stroke 6”
Series MM Mini Cylinders - Trunnion Mounted
3/4" Bore Single and Double Acting

Mounting Style TRN
Single Acting
Spring Return
Rear Trunnion Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"

Mounting Style TFD
Double Acting
Front Trunnion Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 2", 3", 4", 5", 6"
Maximum Stroke 12"

Mounting Style TRD
Double Acting
Rear Trunnion Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4", 5", 6"
Maximum Stroke 12"

Mounting Style TFN
Single Acting
Spring Return
Front Trunnion Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 2", 3", 4"
Maximum Stroke 6"
Series MM Mini Cylinders
1-1/16" Bore Single Acting

Mounting Style N
Single Acting
Spring Return
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1 1/2", 2", 3", 4"
Maximum Stroke 6"  
**Optional Accessory:**
R432007833 Foot Bracket

Mounting Style NR
Single Acting
Spring Return
Front Nose Mounting
Non-Rotating Hex Rod (Stainless Rod Standard)
Standard Stroke Lengths: 1/2", 1 1/2", 2", 3", 4"
Maximum Stroke 6"  
**Optional Accessory:**
R432007833 Foot Bracket

Mounting Style NRP
Single Acting
Spring Return
Rear Pivot Mounting
Non-Rotating Hex Rod (Stainless Rod Standard)
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"  
**Optional Accessories:**
R432007808 Rod Clevis
R432007813 Pivot Bracket

Mounting Style P
Single Acting
Spring Return
Double End or Rear Pivot Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1 1/2", 2", 3", 4"
Maximum Stroke 6"  
**Optional Accessories:**
R432007808 Rod Clevis
R432007813 Pivot Bracket

Mounting Style R
Single Acting
Spring Extend
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1 1/2", 2", 3", 4"
Maximum Stroke 6"  
**Optional Accessory:**
R432007833 Foot Bracket

Mounting Style RP
Single Acting
Spring Extend
Rear Pivot Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1 1/2", 2", 3", 4"
Maximum Stroke 6"  
**Optional Accessories:**
R432007813 Pivot Bracket
R432007808 Rod Clevis

**NOTE:** Piston rod is available w/o wrench flat (at no extra charge). Specify when ordering.
Series M Mini Pneumatic Cylinders
AVENTICS Corporation

Series MM Mini Cylinders
1-1/16" Bore Double Acting

Mounting Style D
Double Acting
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2",
2 1/2", 3", 4", 5", 6", 8", 10", 12"
Maximum Stroke 12"
Optional Accessory:
R432007833 Foot Bracket

Mounting Style DP
Double Acting
Rear Pivot Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2",
2 1/2", 3", 4", 5", 6", 7", 8", 10", 12"
Maximum Stroke 32"
Optional Accessories:
R432007813 Pivot Bracket
R432007808 Rod Clevis

Mounting Style DXP
Double Acting
Double End or Rear Pivot Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 1 1/2", 2",
2 1/2", 3", 4", 5", 6", 7", 8", 10", 12"
Strokes over 12" must be supported at both ends
Maximum Stroke 32"
Optional Accessories:
R432007833 Foot Bracket
R432007817 Pivot Bracket with Pin
R432007808 Rod Clevis

Mounting Style KDX
Double Acting
Double End Mounting - Double Rod
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4", 5", 6"
Maximum Stroke 12"
Optional Accessory:
R432007833 Foot Bracket

Mounting Style KDH
Double Acting
Double End Mounting
Double Hollow Rod
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4", 5", 6"
Maximum Stroke 12"
Optional Accessory:
R432007833 Foot Bracket
Series MM Mini Cylinders - Block Mounted
1-1/16” Bore Single and Double Acting

Mounting Style BRN
Single Acting
Spring Return
Rear Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"

Mounting Style BRR
Single Acting
Spring Extend
Rear Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"

Mounting Style BFD
Double Acting
Front Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4", 5", 6"
Maximum Stroke 12"

Mounting Style BRD
Double Acting
Rear Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 12"

Mounting Style BFN
Single Acting
Spring Return
Front Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"

Mounting Style BFR
Single Acting
Spring Extend
Front Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"
Series MM Mini Cylinders - Trunnion Mounted
1-1/16" Bore Single and Double Acting

Mounting Style TRN
Single Acting
Spring Return
Rear Trunnion Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"

Mounting Style TFD
Double Acting
Front Trunnion Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4", 5", 6"
Maximum Stroke 12"

Mounting Style TRD
Double Acting
Rear Trunnion Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 12"

Mounting Style TFN
Single Acting
Spring Return
Front Trunnion Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"
Mounting Style N
Single Acting
Spring Return
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 2", 3", 4"
Maximum Stroke 6"
Optional Accessory:
R432007834 Foot Bracket

Mounting Style NR
Single Acting
Spring Return
Front Nose Mounting
Non-Rotating Hex Rod (Stainless Steel Standard)
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"
Optional Accessory:
R432007834 Foot Bracket

Mounting Style NRP
Single Acting
Spring Return
Double End or Rear Pivot Mounting
Non-Rotating Hex Rod (Stainless Steel Standard)
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"
Optional Accessories:
R432007834 Foot Bracket
R432007809 Rod Clevis
R432007818 Pivot Bracket with Pin

Mounting Style P
Single Acting
Spring Return
Double End or Rear Pivot Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"
Optional Accessories:
R432007834 Foot Bracket
R432007809 Rod Clevis
R432007818 Pivot Bracket with Pin

Mounting Style R
Single Acting
Spring Extend
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"
Optional Accessory:
R432007834 Foot Bracket
Series MM Mini Cylinders
1-1/4” Bore Single and Double Acting

Mounting Style RP
Single Acting
Spring Extend
Rear Pivot Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1”, 2”, 3”, 4”, 5”, 6”
Maximum Stroke 6”

Optional Accessories:
R432007834 Foot Bracket
R432007818 Pivot Bracket with Pin

Mounting Style D
Double Acting
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1”, 2”, 3”, 4”, 5”, 6”
Maximum Stroke 12”

Optional Accessory:
R432007834 Foot Bracket

Mounting Style DXP
Double Acting
Double End or Rear Pivot Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1”, 2”, 3”, 4”, 5”, 6”, 7”, 8”, 10”, 12”
Strokes over 12” must be supported at both ends
Maximum Stroke 32”

Optional Accessories:
R432007834 Foot Bracket
R432007818 Pivot Bracket with Pin
R432007809 Rod Clevis

Mounting Style KDX
Double Acting
Double End Mounting
Double Rod
Stainless Steel Rod Standard
Standard Stroke Lengths: 1”, 2”, 3”, 4”, 5”, 6”
Maximum Stroke 12”

Optional Accessory:
R432007834 Foot Bracket

Mounting Style KDH
Double Acting
Double End Mounting
Double Hollow Rod
Stainless Steel Rod Standard
Standard Stroke Lengths: 1”, 2”, 3”, 4”, 5”, 6”
Maximum Stroke 12”

Optional Accessory:
R432007834 Foot Bracket
Series MM Mini Cylinders
1-1/2" Bore Single Acting

Mounting Style N
Single Acting
Spring Return
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 2", 3", 4"
Maximum Stroke 6"
Optional Accessory:
R432007834 Foot Bracket

Mounting Style NR
Single Acting
Spring Return
Front Nose Mounting
Non-Rotating Hex Rod (Stainless Steel Standard)
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"
Optional Accessory:
R432007834 Foot Bracket

Mounting Style NRP
Single Acting
Spring Return
Rear Pivot Mounting
Non-Rotating Hex Rod (Stainless Steel Standard)
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"
Optional Accessories:
R432007809 Rod Clevis
R432007814 Pivot Bracket

Mounting Style P
Single Acting
Spring Return
Rear Pivot Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2", 1", 2", 3", 4"
Maximum Stroke 6"
Optional Accessories:
R432007809 Rod Clevis
R432007814 Pivot Bracket

Mounting Style R
Single Acting
Spring Extend
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"
Optional Accessory:
R432007834 Foot Bracket

Mounting Style RP
Single Acting
Spring Extend
Rear Pivot Mounting (Stainless Rod Standard)
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"
Optional Accessories:
R432007814 Pivot Bracket
R432007809 Rod Clevis
Series MM Mini Cylinders
1-1/2" Bore Double Acting

Mounting Style D
Double Acting
Front Nose Mounting (Stainless Rod Standard)
Maximum Stroke 12"
Optional Accessory:
R432007834 Foot Bracket

Mounting Style DP
Double Acting
Rear Pivot Mounting
Stainless Steel Rod Standard
Maximum Stroke 12"
Optional Accessories:
R432007814 Pivot Bracket
R432007809 Rod Clevis

Mounting Style DX
Double Acting
Double End Mounting (Stainless Rod Standard)
Standard Stroke Lengths: 1", 2", 3", 4", 5", 6" Strokes over 12" must be supported at both ends
Maximum Stroke 32"
Optional Accessory:
R432007834 Foot Bracket

Mounting Style KDX
Double Acting
Double End Mounting - Double Rod
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4", 5", 6"
Maximum Stroke 12"
Optional Accessory:
R432007834 Foot Bracket

Mounting Style KDH
Double Acting
Double End Mounting
Double Hollow Rod (Stainless Steel Standard)
Standard Stroke Lengths: 1", 2", 3", 4", 5", 6"
Maximum Stroke 12"
Optional Accessory:
R432007834 Foot Bracket
Series MM Mini Cylinders - Block Mounted
1-1/2" Bore Single and Double Acting

Mounting Style BRN
Single Acting
Spring Return
Rear Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"

Mounting Style BRR
Single Acting
Spring Extend
Rear Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"

Mounting Style BFD
Double Acting
Front Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4", 5", 6"
Maximum Stroke 12"

Mounting Style BRD
Double Acting
Rear Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4", 5", 6"
Maximum Stroke 12"

Mounting Style BFN
Single Acting
Spring Return
Front Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"

Mounting Style BFR
Single Acting
Spring Extend
Front Block Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"
Series MM Mini Cylinders - Trunnion Mounted
1-1/2" Bore Single and Double Acting

Mounting Style TRN
Single Acting
Spring Return
Rear Trunnion Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"

Mounting Style TFD
Double Acting
Front Trunnion Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4", 5", 6"
Maximum Stroke 12"

Mounting Style TRD
Double Acting
Rear Trunnion Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4", 5", 6"
Maximum Stroke 12"

Mounting Style TFN
Single Acting
Spring Return
Front Trunnion Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1", 2", 3", 4"
Maximum Stroke 6"
Series MM Mini Cylinders
1-3/4” Bore Single Acting

Mounting Style N
Single Acting
Spring Return
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2”, 1”, 1 1/2”, 2”, 2 1/2”, 3”, 4”
Maximum Stroke 6”
Optional Accessory:
R432007835 Foot Bracket

Mounting Style NR
Single Acting
Spring Return
Front Nose Mounting
Non-Rotating Hex Rod (Stainless Steel Standard)
Standard Stroke Lengths: 1/2”, 1”, 1 1/2”-2”, 2 1/2”, 3”, 4”
Maximum Stroke 6”
Optional Accessory:
R432007835 Foot Bracket

Mounting Style NRP
Single Acting
Spring Return
Rear Pivot or Double End Mounting
Non-Rotating Hex Rod (Stainless Steel Standard)
Standard Stroke Lengths: 1/2”, 1”, 1 1/2”, 2”, 2 1/2”, 3”, 4”
Maximum Stroke 6”
Optional Accessories:
R432007835 Foot Bracket
R432007810 Rod Clevis
R432007819 Pivot Bracket with Pin

Mounting Style P
Single Acting
Spring Return
Double End or Rear Pivot Mounting
Stainless Steel Standard
Standard Stroke Lengths: 1/2”, 1”, 1 1/2”, 2”, 2 1/2”, 3”, 4”
Maximum Stroke 6”
Optional Accessories:
R432007835 Foot Bracket
R432007810 Rod Clevis
R432007819 Pivot Bracket with Pin

Mounting Style R
Single Acting
Spring Extend
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2”, 1”, 1 1/2”, 2”, 2 1/2”, 3”, 4”
Maximum Stroke 6”
Optional Accessory:
R432007835 Foot Bracket
Series MM Mini Cylinders
1-3/4” Bore Double Acting

Mounting Style D
Double Acting
Front Nose Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1/2”, 1”, 1 1/2”, 2”, 2 1/2”, 3”, 4”, 5”, 6”
Maximum Stroke 12”

Optional Accessory:
R432007835 Foot Bracket

Mounting Style DXP
Double Acting
Double End Mounting
Stainless Steel Rod Standard
Standard Stroke Lengths: 1”, 2”, 3”, 4”, 5”, 6”, 8”, 10”, 12”
Maximum Stroke 32”
Strokes over 12” must be supported at both ends

Optional Accessories:
R432007835 Foot Bracket
R432007819 Pivot Bracket with Pin
R432007810 Rod Clevis

Mounting Style KDX
Double Acting
Double End Mounting
Double Rod
Stainless Steel Rod Standard
Standard Stroke Lengths: 1”, 2”, 3”, 4”, 5”, 6”
Maximum Stroke 12”

Optional Accessory:
R432007835 Foot Bracket

Mounting Style KDH
Double Acting
Double End Mounting
Double Hollow Rod
Stainless Steel Rod Standard
Standard Stroke Lengths: 1”, 2”, 3”, 4”, 5”, 6”
Maximum Stroke 12”

Optional Accessory:
R432007835 Foot Bracket
**Series M Mini Pneumatic Cylinders**

AVENTICS Corporation

**Series MM Mini Cylinders**

2” Bore Single Acting

**Mounting Style N**

Single Acting
Spring Return
Stainless Steel Rod Standard
Front Nose Mounting
Maximum Stroke 4”

Optional Accessories:
R432007836 Foot Bracket
R432007846 Mounting Nut

**Mounting Style P**

Single Acting
Spring Return
Double End or Rear Pivot Mounting
Stainless Steel Rod Standard
Maximum Stroke 4”

Optional Accessories:
R432007836 Foot Bracket
R432007810 Rod Clevis
R432007820 Pivot Bracket with Pin
R432007846 Mounting Nut

**Mounting Style R**

Single Acting
Spring Extend
Front Nose Mounting
Stainless Steel Rod Standard
Maximum Stroke 4”

Optional Accessories:
R432007836 Foot Bracket
R432007846 Mounting Nut

**Mounting Style RP**

Single Acting
Spring Extend
Rear Pivot Mounting
Stainless Steel Rod Standard
Maximum Stroke 4”

Optional Accessories:
R432007836 Foot Bracket
R432007810 Rod Clevis
R432007820 Pivot Bracket with Pin
R432007846 Mounting Nut
Series MM Mini Cylinders
2" Bore Double Acting

Mounting Style D
Double Acting
Front Nose Mounting
Stainless Steel Rod Standard
Maximum Stroke 12"

Optional Accessories:
R432007836 Foot Bracket
R432007846 Mounting Nut

Mounting Style DXP
Double Acting
Double End or Rear Pivot Mounting
Stainless Steel Rod Standard
Strokes over 12" must be supported at both ends
Maximum Stroke 32"

Optional Accessories:
R432007836 Foot Bracket
R432007810 Rod Clevis
R432007820 Pivot Bracket with Pin
R432007846 Mounting Nut

Mounting Style KDX
Double Acting
Double End Mounting
Double Rod
Stainless Steel Rod Standard
Maximum Stroke 12"

Optional Accessories:
R432007836 Foot Bracket
R432007846 Mounting Nut
Series M Mini Pneumatic Cylinders
AVENTICS Corporation

Series MM Mini Cylinders
2-1/2" Bore Double Acting

Mounting Style D
Double Acting
Front Nose Mounting
Stainless Steel Rod Standard
Maximum Stroke 12"

Optional Accessories:
R432007837 Foot Bracket
R432007847 Mounting Nut

Mounting Style DXP
Double Acting
Double End or Rear Pivot Mounting
Stainless Steel Rod Standard
Strokes over 12" must be supported at both ends
Maximum Stroke 32"

Optional Accessories:
R432007837 Foot Bracket
R432007810 Rod Clevis
R432007820 Pivot Bracket with Pin
R432007847 Mounting Nut

Mounting Style KDX
Double Acting
Double End Mounting
Double Rod
Stainless Steel Rod Standard
Maximum Stroke 18"

Optional Accessories:
R432007837 Foot Bracket
R432007847 Mounting Nut
### Standard Accessories with Dimensions (plated steel)

#### Standard Accessories

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#### Series MM Trunnion Brackets

Select brackets for Series MM Trunnion Mount Cylinders from the table below. (Note: Trunnion Brackets are ordered as a separate item from the cylinders.)

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<th>Assembly No.</th>
<th>Bore Sizes</th>
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<th>J</th>
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**Series MM Mini Cylinders**

**Standard Accessories with Dimensions**

AVENTICS Corporation

---

**D I M E N S I O N A L  D A T A**

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<tr>
<th>Dimensional Data</th>
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Series MM Mini Cylinders
Standard Options

Bumpers - Series MM
Bumpers are available at extra cost. Add the following dimensions to the overall cylinder length by bore size.

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<th>Bore Size Type</th>
<th>9/16&quot;</th>
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<th>1 1/16&quot;</th>
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<td>.125&quot;</td>
<td>*</td>
<td>.125&quot;</td>
<td>*</td>
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<td>.250&quot;</td>
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</table>

*Bumpers are furnished as standard and do not affect overall length.
**Bumpers do not affect overall length.

Stainless Steel Piston Rods
Corrosion resistant stainless steel is the standard piston rod material for all Series MM cylinder styles in this catalog.

Rod Wiper
Double acting styles of Series M/MM cylinders can be fitted with a rod wiper that is specially designed to prevent contaminants from clinging to the piston rod and damaging the piston rod seal. Rod wipers are not available in standard single acting styles.

Adjustable Cushion Option
Cushions can be selected on six bore sizes, ranging from .75" bore to 3.0" bore with mounting styles D, front nose mount, and DXP, rear pivot mount. Adjustable cushions are optional at either end or both ends of Series M/MM cylinders.

Cylinders with air cushions are quieter and reduce end of stroke impact. The air cushion traps exhaust air at the end of stroke and provides an air pocket that decelerates the load. This reduces the possible detrimental energy that is transmitted to the cylinder and other components in the application. The following describes how to determine the energy level of your application:

Step 1: Determine the load to be stopped by the cylinder.
Step 2: Determine the velocity at which the load impacts the cylinder end cap.
Step 3. Calculate the energy the cylinder generates using the following equation:

\[ \text{Energy (e)} = \left( \frac{w}{64} \right) \times v^2 + (p \times k) \]

where:
- \( w \) = weight of the load (lbs.)
- \( v \) = Velocity of the cylinder as the piston impacts the end cap (feet per second)
- \( p \) = working pressure (psi)
- \( k \) = bore constant (see chart on page 41 for value per bore size)

Example: 2" bore, double acting, cushioned cylinder at 80 psi, total load of 8 lbs., with a maximum velocity of 6 feet per second

Weight of the load \( w = 8 \) lbs.
Velocity \( v = 6 \) ft. per second
Working pressure \( p = 80 \) psi
Bore constant \( k \)

\[ = \left( \frac{8}{64} \right) \times (6^2) + (80 \times .24) = 23.7 \text{ ft. lbs.} \]

See Series M section page 41 for additional cushioning information.
How To Order Series MM Air Cylinders

How to Order Code

<table>
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<tr>
<th>Series</th>
<th>Bore</th>
<th>Mount Style</th>
<th>Options</th>
<th>Special</th>
<th>Non-std. Rod</th>
<th>Non-std. Rod Dims.</th>
<th>Stroke</th>
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<td>B</td>
<td>S</td>
<td>Y</td>
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</table>

Example:
MM-10D-05 is a magnetic piston 1-1/16" bore, nose mount, double acting, 1/2" stroke.

*Bumpers are standard in 1 3/4" bore cylinders.

**Stainless rod standard on all bore sizes of standard Series MM cylinders.

Non-Standard Rods

For non-standard rod dimensions, or undersized rod end threads, put a "3" in model number and describe the rod using the letters shown in drawing. Specify CC, LE and A dimensions.

*Requires an S designation in model number
Flow Control Valve
Inch Series, right angle

Right angle flow control valve

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<th>Part Number Slot Adjust</th>
<th>Part Number Knob Adjust</th>
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<tr>
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<td>R432027186</td>
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Push-in Fitting Style

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<td>R432027193</td>
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<td>R432027191</td>
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</tr>
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<td>3/8” NPTF x 3/8” tube</td>
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</table>

* Push-in fitting not available in 1/2” NPTF size.

Tubing tolerances for push-in fittings are:
+/- 0.2mm (0.008”) except for 1/4” OD tubing, +0.15/-0.35mm (+0.0059/-0.0137”)

Push-in fittings suitable for use with nylon, polyethylene, and soft copper tubing;
not for use with polyurethane or PVC tubing.

Flow Characteristics

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### Flow Control Valve
Inch Series, right angle

![Diagram of Flow Control Valve]

#### Dimensions (in./mm)

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*Slotted Adjust shown with Push-In Fittings.
Push-in fittings not available in 1/2" NPTF size.
NOTICE TO PRODUCT USERS

1. WARNING: FLUID MEDIA
AVENTICS pneumatic devices are designed and tested for use with filtered, clean, dry, chemical free air at pressures and temperatures within the specified limits of the device. For use with media other than air or for human life support systems, AVENTICS must be consulted. Hydraulic cylinders are designed for operation with filtered, clean, petroleum based hydraulic fluid; operation using fire-resistant or other special types of fluids may require special packing and seals. Consult the factory.

2. WARNING: MATERIAL COMPATIBILITY
Damage to product seals or other parts caused by the use of non-compatible lubricants, oil additives or synthetic lubricants in the air system compressor or line lubrication devices voids the AVENTICS warranty and can result in product failure or other malfunction. See lubrication recommendations below.

AIR LINE LUBRICANTS! In service higher than 18 cycles per minute or with continuous flow of air through the device, an air line lubricator is recommended.* (Do not use line lubrication with vacuum products.) However, the lubricator must be maintained since the oil will wash out the grease, and lack of lubrication will greatly shorten the life expectancy. The oils used in the lubricator must be compatible with the elastomers in the device. The elastomers are normally BUNA-N, NEOPRENE, VITON, SILICONE and HYTREL. AVENTICS recommends the use of only petroleum based oils without synthetic additives, and with an aniline point between 180° F and 210° F.

COMPRESSOR LUBRICANTS! All compressors (with the exception of special "oil free" units) pass oil mist or vapor from the internal crankcase lubricating system through to the compressed air. Since even small amounts of non-compatible lubricants can cause severe seal deterioration (which could result in component and system failure) special care should be taken in selecting compatible compressor lubricants.

3. WARNING: INSTALLATION AND MOUNTING
The user of these devices must conform to all applicable electrical, mechanical, piping and other codes in the installation, operation or repair of these devices.

INSTALLATION! Do not attempt to install, operate or repair these devices without proper training in the technique of working on pneumatic or hydraulic systems and devices, unless under trained supervision. Compressed air and hydraulic systems contain high levels of stored energy. Do not attempt to connect, disconnect or repair these products when a system is under pressure. Always exhaust or drain the pressure from a system before performing any service work. Failure to do so can result in serious personal injury.

MOUNTING! Devices should be mounted and positioned in such a manner that they cannot be accidentally operated.

4. WARNING: APPLICATION AND USE OF PRODUCTS
The possibility does exist for any device or accessory to fail to operate properly through misuse, wear or malfunction. The user must consider these possibilities and should provide appropriate safe guards in the application or system design to prevent personal injury or property damage in the event of a malfunction.

5. WARNING: CONVERSION, MAINTENANCE AND REPAIR
When a device is disassembled for conversion to a different configuration, maintenance or repair, the device must be tested for leakage and proper operation after being reassembled and prior to installation.

MAINTENANCE AND REPAIR! Maintenance periods should be scheduled in accordance with frequency of use and working conditions. All AVENTICS products should provide a minimum of 1,000,000 cycles of maintenance free service when used and lubricated as recommended. However, these products should be visually inspected for defects and given an "in system" operating performance and leakage test once a year. Where devices require a major repair as a result of the one million cycles, one year, or routine inspection, the device must be disassembled, cleaned, inspected, parts replaced as required, rebuilt and tested for leakage and proper operation prior to installation. See individual catalogs for specific cycle life estimates.

6. PRODUCT CHANGES
Product changes including specifications, features, designs and availability are subject to change at any time without notice. For critical dimensions or specifications, contact factory.

*Many AVENTICS pneumatic valves and cylinders can operate with or without air line lubrication; see individual sales catalogs for details.

-Refer to the appropriate service manual for parts and service information, most are available for download from www.aventics.com/us/downloads

WARRANTIES

7.1 Emerson warrants that:
   a) Emerson will transfer title to the Goods (excluding Software and Firmware) to Customer under Clause 4 of our Terms and Conditions of Sale*;
   b) Goods, Documentation and Services will conform with the Specification;
   c) Goods made by Emerson or its Affiliates will, under normal use and care, be free from defects in materials or workmanship; and
   d) Emerson and its Affiliates’ Personnel delivering Services are trained and will use reasonable skill and care.

7.2 Warranty Periods. Unless otherwise specified by Emerson, the warranties in Clause 7.1 apply as follows:
   a) Goods: until the earlier of 12 months from the first installation or 18 months from delivery (90 days from delivery in the case of consumables);
   b) Services: for 90 days from completion of the Services;
   c) Goods repaired, replacement items and Services re-performed: from delivery of the replacement or completion of the repair or re-performance, for 90 days or until the end of the original warranty period (if later).

7.3 Warranty Procedure. Clause 7.3 applies if, within the warranty period, Customer discovers any non-conformity with a warranty in Clause 7.1, tells Emerson in writing and, in the case of Goods, returns the non-conforming items at Customer’s cost, freight and insurance pre-paid, to the repair facility chosen by Emerson. Where this Clause applies, Emerson will, at its sole option, either:
   a) correct any non-conforming Documents and Services; or
   b) repair or replace non-conforming Goods FCA (Incoterms® 2010) at the repair location; or
   c) instead refund the price of the non-conforming item.

7.4 Exclusions from Warranty.
   a) The warranties in Clause 7.1(b), (c) and (d) exclude and Customer will pay the cost of all repairs and replacements caused by any of the following: normal wear and use; inadequate maintenance; unsuitable power sources or environmental conditions; improper handling, storage, installation, or operation; misuse or accident caused by anybody except Emerson; a modification or repair not approved by Emerson in writing; materials or workmanship made, provided or specified by Customer; contamination; the use of unapproved parts, firmware or software; Cyber Attack; any other cause not the fault of Emerson.
   b) Emerson will not pay any costs relating to non-compliance with a warranty in Clause 7.1, except where agreed in writing in advance. Unless accepted in writing by Emerson, Customer will pay:
      i) all costs of dismantling, freight, reinstallation and the time and expenses of Emerson Personnel for travel under Clause 7; and
      ii) all costs incurred by Emerson in correcting nonconformities for which Emerson is not responsible under Clause 7 and in examining items that comply with the warranties in Clause 7.1.
   c) If Emerson relies on wrong or incomplete information supplied by Customer, all warranties are void unless Emerson agrees otherwise in writing.
   d) Customer alone is responsible for the selection, maintenance and use of the Goods.
   e) Resale Products carry only the warranty given by the original manufacturer. Emerson has no liability for Resale Products beyond making a reasonable commercial effort to arrange procurement and shipping of the Resale Products.

7.5 Disclaimer. The limited warranties set out in this Clause 7 are the only warranties made by Emerson and can be changed only with Emerson’s signed written agreement. THE WARRANTIES AND REMEDIES IN CLAUSE 7 ARE EXCLUSIVE. THERE ARE NO REPRESENTATIONS OR WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, ABOUT MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE OR ANYTHING ELSE FOR ANY OF THE GOODS, DOCUMENTATION OR SERVICES.

*Additional conditions apply - for full details, visit our website to download our Terms and Conditions of Sale:
For U.S.: www.aventics.com/us/downloads  |  For Canada: www.aventics.com/ca  |  (AVENTICS Corporation is owned by Emerson Electric Co.)
Further contacts:
www.aventics.com/en/contact

The data specified only serve to describe the product. No statements concerning a certain condition or suitability for a certain application can be derived from our information. The information given does not release the user from the obligation of own judgment and verification. It must be remembered that our products are subject to a natural process of wear and aging.