Compact Hydraulic Cylinders

For a Variety of Market Applications

- Hi Pressure - 5000 PSI
- Small Bore 1/2” and Larger
- Small Rod 1/4” and Larger
- Position Feedback Cylinders 1/2” and Larger
- 100% Tested

Custom Actuator Products, Inc.
Specialists in Compact Fluid Power

2500 Niagara Lane • Plymouth, MN 55447
Phone: (763) 525-0844   Fax: (763) 525-0845
"Smart" Mini Cylinders With .001" Repeatability

BORE SIZES FROM 3/4 TO 4". UP TO 5000 PSI Hydraulic or Pneumatic types

CAP "Smart" cylinders are ideal for situations where space constraints would otherwise limit design flexibility. Because of their small size, our cylinders fit nearly anywhere, allowing unlimited potential for their application. The big difference in the CAP cylinder is our innovative use of mini linear resistance transducers (MLRTs) and linear resistance transducers (LRTs). These linear feedback devices do not control the rod position. They sense the position of the cylinder and send an analog output of its position through a miniature resistance element to the associated electronics. These compact transducers enable us to build the smallest position feedback cylinders available today.

Our cylinders feature:
- 0.001" repeatability, depending on your system’s electronic package.
- 500 million inches of travel life
- Pressures up to 5000 psi
- Temperature range to 185° F

We offer three basic types of control devices: a simple two-position controller which can sense the beginning and end of the stroke or any position in-between, a closed-loop signal tracking controller with a PID control loop, and a scaled analog output device to give a ratiometric output to a host controller. CAP is a leader in manufacturing small bore, high-pressure cylinders using the latest technologies to better serve companies like yours. Call today and find out how we can help with your design problems.

Typical Smart Cylinder Configuration

The CAP smart cylinder completely encloses the position sensing unit in the cylinder body. This provides a small profile and protects the sensor from external damage. Wire leads are sealed with a non-conducting material that withstands the internal fluid pressure. Several types of electronic interface connectors can be specified. The connector can be positioned at 90° or 180° from the fluid ports to fit your specific design requirements.
CUSTOM ACTUATOR PRODUCTS, INC.

LRT/MLRT – INTERNAL CYLINDER POSITION FEEDBACK DEVICES

7500 LRT/7316 MLRT

Ordering Information
Specify the following for a complete internal position feedback package:
• LRT model and stroke
• EPC model
• Cable interface

The CAP “Smart” Cylinder can be ordered in 3 Models:
• Small Bore/Small Rod Industrial
• NFPA
• Special

7500 LRT MODEL CODES

<table>
<thead>
<tr>
<th>Order Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7500-XXX-A</td>
<td>LRT with no cap-end flange – non-slide-off wiper</td>
</tr>
<tr>
<td>7500-XXY-B1SW</td>
<td>Standard LRT – slide-off wiper – high pressure</td>
</tr>
<tr>
<td>7500-XXY-B2SW</td>
<td>(See below for bore sizes)</td>
</tr>
<tr>
<td>7500-XXY-B3SW</td>
<td>High Temperature LRT – slide-off wiper – high pressure</td>
</tr>
<tr>
<td>7500-XXY-B1SWT</td>
<td>(300°F)</td>
</tr>
<tr>
<td>7500-XXY-B2SWT</td>
<td></td>
</tr>
<tr>
<td>7500-XXY-B3SWT</td>
<td></td>
</tr>
<tr>
<td>7500-XXY-MSH</td>
<td>MSLRT unit that installs in identical cap-end cylinder envelope modification as the magnetostrictive model transducers. Includes slide-off wiper carriage.</td>
</tr>
</tbody>
</table>

7500 LRT SPECS

- Fluids: Hydraulic or Pneumatic
- Note: Cannot be water-based fluid
- Repeatability: 001" Depending on Electronics
- Life: 500 Million Inches of Wiper Travel
- Non-linearity: 0.1% (48" Max.), 1% (72" Max.)
- Max. Stroke: 72" (call CAP for others)
- Pressure Rating: 5000 psi
- Temp: Std. 160° F, H-Temp 300° F
- Min. Rod Size: 7/8" dia.
- Piston Rod Drill: 1/2" dia.
- Velocity: H = 30" per sec., P = 50" per sec.
- Signal Output: Ratiometric Analog Output
- Signal Input: DC Voltage 5 Min. 50 Max.

Note: MUST HAVE HI-IMPEDENCE INTERFACE OF >500K TO LIMIT SENSOR CURRENT.

Bore Sizes for LRT Flange
- B1: PH 1-1/2", 2", 2-1/2", HH 1-1/2"
- B3: HH 6" and greater

7316 MLRT SPECS

- Fluids: Hydraulic or Pneumatic
- Note: Cannot be water-based fluid
- Repeatability: 001" Depending on Electronics
- Life: 500 Million Inches of Wiper Travel
- Non-linearity: 0.1% (18" Max.)
- Max. Stroke: 18"
- Pressure Rating: 5000 psi
- Temp: Std. 160° F, H-Temp 300° F
- Min. Rod Size: 5/16" dia.
- Piston Rod Drill: 3/16" dia.
- Velocity: H = 30" per sec., P = 50" per sec.
- Signal Output: Ratiometric Analog Output
- Signal Input: DC Voltage 5 Min. 50 Max.

Note: MUST HAVE HI-IMPEDENCE INTERFACE OF 1 MEGAOHM TO LIMIT SENSOR CURRENT.

XXY
- XX = Stroke in whole inches
- Y = Additional stroke in 1/8" increments
1/2" BORE CYLINDER

The Cylinder Model Code Will Appear As Follows:

<table>
<thead>
<tr>
<th>AA</th>
<th>1/2</th>
<th>X</th>
<th>6</th>
<th>3</th>
<th>2</th>
<th>-4</th>
<th>M</th>
<th>3</th>
<th>6</th>
<th>-2H</th>
</tr>
</thead>
<tbody>
<tr>
<td>STYLE</td>
<td>bore</td>
<td>stroke</td>
<td>mounting</td>
<td>rod</td>
<td>ports</td>
<td>electrical</td>
<td>connector</td>
<td>position</td>
<td>cable direction</td>
<td>(blank if non-feedback)</td>
</tr>
<tr>
<td>OPTIONAL O-RING BACKED TEFLOYN ROD SEALS ARE AVAILABLE. USE CODE A OR B.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**ROD ENDS**

- **STYLE 1**: STANDARD ROD-MALE
  - 1/4-28 UNF-2
  - 3/16 WRENCH FLAT
  - 1/8 WIDTH FLAT
  - 1/4 DIA

- **STYLE 2**: 2:1 ROD-MALE
  - 3/16 WRENCH FLAT
  - 1/8 WIDTH FLAT
  - 5/16 DIA

- **STYLE 3**: STANDARD ROD-FEMALE
  - 8-Hole UNC-2 x 3/8 DP
  - 3/16 WRENCH FLAT
  - 1/8 WIDTH FLAT

- **STYLE 4**: 2:1 ROD-FEMALE
  - 8-Hole UNC-2 x 3/8 DP
  - 3/16 WRENCH FLAT
  - 1/8 WIDTH FLAT

**END MOUNT – STYLE 1**

- LENGTH = STROKE + 1/4
- MIN. LENGTH = 3-1/4
- MIN. LENGTH = 3-3/32
- STANDARD ROD
- 2:1 ROD

**FOOT MOUNT (BOTH ENDS) – STYLE 3**

- 1/4 DIA
- 1-3/8 DIA
- 15/16
- 3/8 DIA
- 13/16 DIA
- 7/16-20 37° FLARE FITTINGS

**PLATE MOUNT (EITHER END) – STYLE 4 STYLE 5**

- 1/4 DIA
- 3/8 DIA
- 1-3/8 DIA
- 15/16
- 3/8 DIA
- 1-3/4 DIA
- 15/16
- 3/8 DIA
- 1-3/4 DIA
- 15/16

**PORT STYLE BB**

- FOR POSITION FEEDBACK CYLINDERS
  - ADD 1.565 TO BODY LENGTH OF CYLINDER

**Specifications**

| Diameter of bore, inches | 0.500 | 0.500 |
| Diameter of piston rod, inches | 0.250 | 0.312 |
| Effective area, rod side, sq. ins. | 0.150 | 0.120 |
| Effective area, piston side, sq. ins. | 0.200 | 0.200 |

**Note**

- LOCATION DESIRED FOR EPC
- 3, 6, 9 or 12 O’CLOCK
3/4" BORE CYLINDER

The Cylinder Model Code Will Appear As Follows:

<table>
<thead>
<tr>
<th>Style Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA 3/4 X 6 - 3 - 2 M 3 6 - 2H</td>
<td>Standard Rod-Male</td>
</tr>
</tbody>
</table>

END MOUNT – STYLE 1

FOOT MOUNT (BOTH ENDS) – STYLE 3

PLATE MOUNT (EITHER END) – STYLE 4

PORT STYLE BB

Specifications

<table>
<thead>
<tr>
<th>Specifications</th>
<th>STD. ROD 2:1 ROD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter of bore, inches</td>
<td>0.750</td>
</tr>
<tr>
<td>Diameter of piston rod, inches</td>
<td>0.375</td>
</tr>
<tr>
<td>Effective area, rod side, sq. ins.</td>
<td>0.330</td>
</tr>
<tr>
<td>Effective area, piston side, sq. ins.</td>
<td>0.440</td>
</tr>
</tbody>
</table>
**1" BORE CYLINDER**

The Cylinder Model Code Will Appear As Follows:

```
AA  1  X  6 - 3 - 2  M  6 - 2H
```

**END MOUNT – STYLE 1**

**FOOT MOUNT (BOTH ENDS) – STYLE 3**

**PLATE MOUNT (EITHER END) – STYLE 4 STYLE 5**

**PORT STYLE BB**

<table>
<thead>
<tr>
<th>Specifications</th>
<th>STD. ROD</th>
<th>2:1 ROD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter of bore, inches</td>
<td>1.250</td>
<td>1.250</td>
</tr>
<tr>
<td>Diameter of piston rod, inches</td>
<td>0.438</td>
<td>0.688</td>
</tr>
<tr>
<td>Effective area, rod side, sq. ins.</td>
<td>0.640</td>
<td>0.420</td>
</tr>
<tr>
<td>Effective area, piston side, sq. ins.</td>
<td>0.790</td>
<td>0.790</td>
</tr>
</tbody>
</table>

**Specifications**

- **Diameter of bore, inches:** 1.250
- **Diameter of piston rod, inches:** 0.438
- **Effective area, rod side, sq. ins.:** 0.640
- **Effective area, piston side, sq. ins.:** 0.790
1-1/4" BORE CYLINDER

The Cylinder Model Code Will Appear As Follows:

<table>
<thead>
<tr>
<th>Specifications</th>
<th>STD. ROD</th>
<th>2:1 ROD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter of bore, inches</td>
<td>1.250</td>
<td>1.250</td>
</tr>
<tr>
<td>Diameter of piston rod, inches</td>
<td>0.562</td>
<td>0.875</td>
</tr>
<tr>
<td>Effective area, rod side, sq. ins.</td>
<td>0.980</td>
<td>0.830</td>
</tr>
<tr>
<td>Effective area, piston side, sq. ins.</td>
<td>1.230</td>
<td>1.230</td>
</tr>
</tbody>
</table>

END MOUNT – STYLE 1

FOOT MOUNT (BOTH ENDS) – STYLE 3

PLATE MOUNT (EITHER END) – STYLE 4

PORT STYLE BB

FOR POSITION FEEDBACK CYLINDERS
ADD 1.025 TO BODY LENGTH OF CYLINDER

NOTE LOCATION DESIRED FOR EPC
3, 6, 9 or 12 O’CLOCK

标准活塞杆

非反馈

Electrical Connector (EPC) Location

Hydraulic Port

1.650
2.650

9/16-18 UNF-2
37 Flared Fitting

1.560
380

3.8
5
9
8
# 1-1/2" BORE CYLINDER

The Cylinder Model Code Will Appear As Follows:

<table>
<thead>
<tr>
<th>AA</th>
<th>1-1/2</th>
<th>X</th>
<th>6</th>
<th>-</th>
<th>3/2</th>
<th>2</th>
<th>M</th>
<th>3</th>
<th>6</th>
<th>2H</th>
</tr>
</thead>
<tbody>
<tr>
<td>STYLE</td>
<td>BORE</td>
<td>STROKE</td>
<td>MOUNTING</td>
<td>ROD</td>
<td>ELECTRICAL</td>
<td>CONNECTOR</td>
<td>POSITION</td>
<td>MIN</td>
<td>PNEUMATIC</td>
<td>HYDRAULIC</td>
</tr>
</tbody>
</table>

## END MOUNT – STYLE 1

![Diagram of End Mount Style 1](image)

## FOOT MOUNT (BOTH ENDS) – STYLE 3

![Diagram of Foot Mount Style 3](image)

## PLATE MOUNT (EITHER END) – STYLE 4

![Diagram of Plate Mount Style 4](image)

## PLATE MOUNT (EITHER END) – STYLE 5

![Diagram of Plate Mount Style 5](image)

## ROD ENDS

- **STYLE 1**: STANDARD ROD-MALE
  - 1-1/8
  - 5/8-18 UNF-2
  - 1/2 WRENCH FLAT
  - 9/32 WIDTH FLAT
  - 5/8 DIA

- **STYLE 2**: 2:1 ROD-MALE
  - 2-1/16 DIA
  - 17/64 WIDTH FLAT
  - 1/4 WIDTH FLAT

- **STYLE 3**: STANDARD ROD-FEMALE
  - 3/8-24 UNF-2
  - 1/4-28 NF-2 X 21/64 DP
  - 4 HOLES EA. END

- **STYLE 4**: 2:1 ROD-FEMALE
  - 1-1/16 DIA
  - 11/64 DP
  - 1/4 WIDTH FLAT

## PIVOT MOUNT

**STYLE 2**

- 1-13/16
- 1.250
- .010

## ROD CLEVIS

**(ATTACHMENT 2)**

- TAP 5/8-18 NF
- 1.025
- +.010
- -.001

## PORT STYLE BB

- **CAP END**
  - 3/4
  - 1.312R
  - .335 DIA
  - 4 HOLES

- **ROD END**
  - 1-3/8
  - 1-15/32
  - 2-5/32

## Specifications

<table>
<thead>
<tr>
<th>Specifications</th>
<th>STD. ROD</th>
<th>2:1 ROD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter of bore, inches</td>
<td>1.500</td>
<td>1.500</td>
</tr>
<tr>
<td>Diameter of piston rod, inches</td>
<td>0.625</td>
<td>1.063</td>
</tr>
<tr>
<td>Effective area, rod side, sq. ins.</td>
<td>1.460</td>
<td>0.880</td>
</tr>
<tr>
<td>Effective area, piston side, sq. ins.</td>
<td>1.770</td>
<td>1.770</td>
</tr>
</tbody>
</table>

For Position Feedback Cylinders, add 1.025 to body length of cylinder.
2" BORE CYLINDER

The Cylinder Model Code Will Appear As Follows:

```
AA 2 X 6 - 3 - 2 - M 3 6 - 2H
STYLE  BORE  STROKE  MOUNTING  ROD  ELECTRICAL  PORTS  MINI EPC  HYDRAULIC OR  PNEUMATIC
       4 M 3 6 - 2H  MINI EPC  RIGHT ANGLE  CABLE DIRECTION  (BLANK IF NON-FEEDBACK)
```

END MOUNT – STYLE 1

PORTS SEE MATRIX

FOOT MOUNT (BOTH ENDS) – STYLE 3

PLATE MOUNT (EITHER END) – STYLE 4

PORTS SEE MATRIX

Specifications

<table>
<thead>
<tr>
<th></th>
<th>STD. ROD</th>
<th>2:1 ROD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter of bore, inches</td>
<td>2.000</td>
<td>2.000</td>
</tr>
<tr>
<td>Diameter of piston rod, inches</td>
<td>0.875</td>
<td>1.438</td>
</tr>
<tr>
<td>Effective area, rod side, sq. ins.</td>
<td>2.540</td>
<td>1.520</td>
</tr>
<tr>
<td>Effective area, piston side, sq. ins.</td>
<td>3.140</td>
<td>3.140</td>
</tr>
</tbody>
</table>
CUSTOM ACTUATOR PRODUCTS, INC.

2-1/2" BORE CYLINDER

The Cylinder Model Code Will Appear As Follows:

<table>
<thead>
<tr>
<th>AA</th>
<th>2-1/2</th>
<th>X</th>
<th>6</th>
<th>3</th>
<th>2</th>
<th>M</th>
<th>3</th>
<th>6</th>
<th>2H</th>
</tr>
</thead>
<tbody>
<tr>
<td>STYLE</td>
<td>BORE</td>
<td>STROKE</td>
<td>MOUNTING</td>
<td>ROD</td>
<td>PORTS</td>
<td>ELECTRICAL CONNECTOR POSITION</td>
<td>MIN EPC</td>
<td>RIGHT ANGLE CABLE DIRECTION (BLANK IF NON-FEEDBACK)</td>
<td>HYDRAULIC OR PNEUMATIC ATTACHMENTS</td>
</tr>
</tbody>
</table>

END MOUNT – STYLE 1

PORTS SEE MATRIX

FOOT MOUNT (BOTH ENDS) – STYLE 3

PLATE MOUNT (EITHER END) – STYLE 4

PORT STYLE

| J | 7/16-20 straight thread female for 1/4 tubing |
| 5J | 1/2-20 straight thread female for 5/16 tubing |
| 6J | 9/16-18 straight thread female for 3/8 tubing |
| 8J | 5/8-18 straight thread female for 1/2 tubing, 2-1/2" and 3" Bores – Std. Rod. |
| 10J | 7/8-14 straight thread female for 3/4 tubing, 3" Bore – Std. Rod. |
| 1P | 1/8 female (NPSF) |
| 2P | 1/4 female (NPSF) |
| 3P | 3/8 female (NPSF) |
| 4P | 1/2 female (NPSF), 3" Bore – Std. Rod. |

FOR POSITION FEEDBACK CYLINDERS

ADD 1.281 TO BODY LENGTH OF CYLINDER

Specifications

<table>
<thead>
<tr>
<th></th>
<th>STD. ROD</th>
<th>2:1 ROD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter of bore, inches</td>
<td>2.500</td>
<td>2.500</td>
</tr>
<tr>
<td>Diameter of piston rod, inches</td>
<td>1.063</td>
<td>1.750</td>
</tr>
<tr>
<td>Effective area, rod side, sq. ins.</td>
<td>4.020</td>
<td>2.500</td>
</tr>
<tr>
<td>Effective area, piston side, sq. ins.</td>
<td>4.910</td>
<td>4.910</td>
</tr>
</tbody>
</table>

NOTE:

All “J” types are used with “O” ring type fittings.

All “P” types are not recommended where leak-free connections are required for high pressure service.

CA7058 Brochure 11/10/99 8:50 PM Page 10
3" BORE CYLINDER

The Cylinder Model Code Will Appear As Follows:

<table>
<thead>
<tr>
<th>Style</th>
<th>Bore</th>
<th>Stroke</th>
<th>Mounting</th>
<th>Rod</th>
<th>Ports</th>
<th>Electrical Connector Position</th>
<th>Min. Stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA</td>
<td>3 X</td>
<td>6 -</td>
<td>3 - 2</td>
<td>4 M</td>
<td>3 6</td>
<td>2H</td>
<td></td>
</tr>
</tbody>
</table>

END MOUNT – STYLE 1

FOOT MOUNT (BOTH ENDS) – STYLE 3

PLATE MOUNT (EITHER END) – STYLE 4

PORT STYLE

Specifications

<table>
<thead>
<tr>
<th>Standard Rod</th>
<th>2:1 Rod</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter of bore, inches</td>
<td>3.000 3.000</td>
</tr>
<tr>
<td>Diameter of piston rod, inches</td>
<td>1.438 2.125</td>
</tr>
<tr>
<td>Effective area, rod side, sq. ins.</td>
<td>5.450 3.520</td>
</tr>
<tr>
<td>Effective area, piston side, sq. ins.</td>
<td>7.070 7.070</td>
</tr>
</tbody>
</table>
### BASE PIVOT BRACKET

#### BASE PIVOT BRACKET WITH ROD CLEVIS AND ROD PIVOT

(ATTACHMENT 7)

#### BASE PIVOT BRACKET WITH ROD CLEVIS

(ATTACHMENT 5)

#### BASE PIVOT BRACKET

(ATTACHMENT 4)

---

### BASE PIVOT BRACKET

**DIM.**

<table>
<thead>
<tr>
<th>CYLINDER BORE SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2</td>
</tr>
<tr>
<td>-----</td>
</tr>
<tr>
<td>A</td>
</tr>
<tr>
<td>B</td>
</tr>
<tr>
<td>C</td>
</tr>
<tr>
<td>D</td>
</tr>
<tr>
<td>E</td>
</tr>
<tr>
<td>F</td>
</tr>
<tr>
<td>G</td>
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<td>H</td>
</tr>
<tr>
<td>I</td>
</tr>
<tr>
<td>J</td>
</tr>
<tr>
<td>K</td>
</tr>
<tr>
<td>L</td>
</tr>
</tbody>
</table>

**ORDER NO.**

- 704259
- 704260
- 704261
- 704262
- 704263
- 704264
- 704265
- 704266
ROD CLEVIS

<table>
<thead>
<tr>
<th>DIM.</th>
<th>CYLINDER BORE SIZE</th>
<th>1/2</th>
<th>3/4</th>
<th>1</th>
<th>1-1/4</th>
<th>1-1/2</th>
<th>2</th>
<th>2-1/2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td>.641</td>
<td>.719</td>
<td>.781</td>
<td>.969</td>
<td>1.250</td>
<td>1.625</td>
<td>2.062</td>
<td>2.625</td>
</tr>
<tr>
<td>B</td>
<td></td>
<td>.878</td>
<td>.949</td>
<td>1.024</td>
<td>1.250</td>
<td>1.625</td>
<td>2.062</td>
<td>2.625</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>.188</td>
<td>.251</td>
<td>.376</td>
<td>.439</td>
<td>.501</td>
<td>.626</td>
<td>.751</td>
<td>1.001</td>
</tr>
<tr>
<td>D</td>
<td></td>
<td>.186</td>
<td>.248</td>
<td>.373</td>
<td>.498</td>
<td>.623</td>
<td>.748</td>
<td>.98</td>
<td>1.373</td>
</tr>
<tr>
<td>E</td>
<td></td>
<td>.508</td>
<td>.619</td>
<td>.774</td>
<td>.948</td>
<td>1.193</td>
<td>1.612</td>
<td>1.945</td>
<td>2.232</td>
</tr>
<tr>
<td>F</td>
<td></td>
<td>1</td>
<td>1.1-1/2</td>
<td>1-1/16</td>
<td>2-3/32</td>
<td>2-9/32</td>
<td>2-13/32</td>
<td>3-5/8</td>
<td></td>
</tr>
</tbody>
</table>

ORDER NO. 358676 358677 358678 358679 358680 358681 358682 358683 358684 358685 358686 358687 358688 358689 358690 205135 205136 205137

PIVOT MOUNT

<table>
<thead>
<tr>
<th>DIM.</th>
<th>CYLINDER BORE SIZE</th>
<th>1/2</th>
<th>3/4</th>
<th>1</th>
<th>1-1/4</th>
<th>1-1/2</th>
<th>2</th>
<th>2-1/2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td></td>
<td>3/8</td>
<td>35/64</td>
<td>37/64</td>
<td>39/64</td>
<td>3/4</td>
<td>3/4</td>
<td>3/4</td>
<td>—</td>
</tr>
</tbody>
</table>

ORDER NO. 704185 704186 704187 704188 704190 704192 704194 704196 704198 704199 704197 704199 205135 205136 205137

DRY ROD CYLINDER OPTION

Dry Rods are used to trap and drain off excess oil which may leak past cylinder seals due to severe cylinder duty, extreme environmental conditions or use of thin fluids.

<table>
<thead>
<tr>
<th>DIM.</th>
<th>CYLINDER BORE SIZE</th>
<th>1/2</th>
<th>3/4</th>
<th>1</th>
<th>1-1/4</th>
<th>1-1/2</th>
<th>2</th>
<th>2-1/2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td></td>
<td>3/8</td>
<td>35/64</td>
<td>37/64</td>
<td>39/64</td>
<td>3/4</td>
<td>3/4</td>
<td>3/4</td>
<td>—</td>
</tr>
</tbody>
</table>

ORDER NO. 704185 704186 704187 704188 704190 704192 704194 704196 704198 704199 704197 704199 205135 205136 205137

NOTE: Cylinders ordered with Dry Rod(s) are provided with dimension A of extra rod so the rod extension from the cylinder face is as shown in standard cylinder dimensional information.
DOUBLE ROD END CYLINDER

DIMENSIONAL INFORMATION

<table>
<thead>
<tr>
<th>BORE</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2</td>
<td>2-1/4</td>
<td>5/8</td>
<td>15/16</td>
<td>2-11/16</td>
</tr>
<tr>
<td>3/4</td>
<td>2-1/4</td>
<td>3/4</td>
<td>15/16</td>
<td>2-11/16</td>
</tr>
<tr>
<td>1</td>
<td>2-11/16</td>
<td>7/8</td>
<td>1-3/32</td>
<td>3</td>
</tr>
<tr>
<td>1-1/4</td>
<td>2-15/16</td>
<td>1</td>
<td>1-3/16</td>
<td>3-1/4</td>
</tr>
<tr>
<td>1-1/2</td>
<td>3-1/2</td>
<td>1-1/8</td>
<td>1-3/8</td>
<td>3-7/8</td>
</tr>
<tr>
<td>2</td>
<td>4-5/8</td>
<td>1-5/8</td>
<td>15/16</td>
<td>6-13/16</td>
</tr>
<tr>
<td>2-1/2</td>
<td>4-7/8</td>
<td>2</td>
<td>15/16</td>
<td>6-3/16</td>
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<tr>
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<td>5-1/16</td>
<td>2-1/2</td>
<td>1-1/8</td>
<td>7-1/8</td>
</tr>
</tbody>
</table>

STANDARD ROD 2:1 ROD

BORE Teflon V-Lip Teflon V-Lip Rod Seal Rod Seal Rod Seal Rod Seal

1/2" 357441 359713 N.A. 365292
3/4" 357442 359717 357443 359823
1" 357444 359799 357445 359855
1-1/4" 357446 359794 357447 360202
1-1/2" 357448 359722 357449 360607
2" 357450 359519 357452 364273
2-1/2" 357454 359800 357455 N.A.
3" 358520 N.A. 359627 N.A.
4" 358520 N.A. 359627 N.A.

STYLE “A,” “B,” & “C” SEAL KITS
WITH TFEFLON ROD SEAL

<table>
<thead>
<tr>
<th>BORE</th>
<th>BUNA-N</th>
<th>Double End Cycl.</th>
<th>EPR</th>
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</thead>
<tbody>
<tr>
<td>1/2&quot;</td>
<td>626443</td>
<td>N.A. 626450</td>
<td>N.A.</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>626451</td>
<td>626501 626515</td>
<td>626548 626558 626564</td>
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<tr>
<td>1&quot;</td>
<td>626555</td>
<td>626570 626581</td>
<td>626581</td>
</tr>
<tr>
<td>1-1/4&quot;</td>
<td>626592</td>
<td>626662 626670</td>
<td>626672</td>
</tr>
<tr>
<td>1-1/2&quot;</td>
<td>626666</td>
<td>626684 626701</td>
<td>626699</td>
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<tr>
<td>2&quot;</td>
<td>626703</td>
<td>626720 626724</td>
<td>626717</td>
</tr>
<tr>
<td>2-1/2&quot;</td>
<td>626397</td>
<td>626398 626399</td>
<td>626891</td>
</tr>
<tr>
<td>3&quot;</td>
<td>626397</td>
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<td>626891</td>
</tr>
<tr>
<td>4&quot;</td>
<td>626397</td>
<td>626398 626399</td>
<td>626891</td>
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</table>

ROD BUSHINGS

<table>
<thead>
<tr>
<th>BORE</th>
<th>STANDARD ROD</th>
<th>2:1 ROD</th>
</tr>
</thead>
<tbody>
<tr>
<td>2&quot;</td>
<td>357450 359519</td>
<td>364273 364266</td>
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<tr>
<td>2-1/2&quot;</td>
<td>357452 359614</td>
<td>357453 N.A.</td>
</tr>
<tr>
<td>3&quot;</td>
<td>357454 359800</td>
<td>357455 N.A.</td>
</tr>
<tr>
<td>4&quot;</td>
<td>358520 N.A.</td>
<td>359627 N.A.</td>
</tr>
</tbody>
</table>

SEAL KIT CONTENTS: All O-Rings, all Teflon seals or “V-Lip” seals, rod wiper(s), back-up ring(s), and installation instructions.
“Smart” Cylinder With Integral Valve Pad

CYLINDER FEATURES:
- Internal LRT or MLRT position feedback device
- Stroke lengths in 1/8” increments
- NG3 Mini or NG6(DO3) Valve Pad
- NG3 Mini or NG6(DO3) Proportional Valve
- Bore sizes as small as 3/4”
- Pressures to 5000 psi
- 3-Pin quick disconnect position output port

Designed to operate with CAP Series 5030 Closed Loop Signal Tracking Control Unit

System Integration Information MM Series Cylinder

3⁄4”, 1”, 1 1⁄4” BORE:
- Uses NG3 Mini Valve
- Internal MLRT Position Device
- Maximum Stroke 16”
- Use NH Series Cable

1 1⁄2”, 2”, 2 1⁄2” BORE:
- Uses NG6(DO3) Proportional Valve
- Internal LRT Position Device
- Maximum Stroke 72”
- Use BH Series Cable

NH SERIES CABLES:
- Specify 6’, 15’, 20’
- 24 AWG PVC Insulated
- 3 Conductor

BH SERIES CABLES:
- Specify 6’, 12’, 20’
- 22 AWG PVC Insulated
- 3 Conductor

5030 Ordering Information

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Input Power</th>
<th>Input Signal</th>
<th>Output Signal</th>
<th>Hyd./Pneu.</th>
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</thead>
<tbody>
<tr>
<td>5030</td>
<td>9 to 36Vdc</td>
<td>0 to 10Vdc</td>
<td>0 to 10Vdc</td>
<td>H</td>
</tr>
<tr>
<td>5031</td>
<td>115vac</td>
<td>0 to 10Vdc</td>
<td>0 to 10Vdc</td>
<td>H</td>
</tr>
<tr>
<td>5032</td>
<td>9 to 36Vdc</td>
<td>4 to 20mA</td>
<td>4 to 20mA</td>
<td>H</td>
</tr>
<tr>
<td>5033</td>
<td>115vac</td>
<td>4 to 20mA</td>
<td>4 to 20mA</td>
<td>H</td>
</tr>
<tr>
<td>5034</td>
<td>9 to 36Vdc</td>
<td>0 to 10Vdc</td>
<td>0 to 10Vdc</td>
<td>P</td>
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<tr>
<td>5035</td>
<td>115vac</td>
<td>0 to 10Vdc</td>
<td>0 to 10Vdc</td>
<td>P</td>
</tr>
<tr>
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<td>9 to 36Vdc</td>
<td>4 to 20mA</td>
<td>4 to 20mA</td>
<td>P</td>
</tr>
<tr>
<td>5037</td>
<td>115vac</td>
<td>4 to 20mA</td>
<td>4 to 20mA</td>
<td>P</td>
</tr>
</tbody>
</table>
CYLINDER ORDERING INFORMATION

HOW TO ORDER:
EXAMPLE MODEL CODE:

AA 1 X 8—2—1—4M**—1—D—D.E.

STANDARD STYLES
AA – Male Ports
BB – Female Ports
CC – Female Ports
MM – Valve Pad Option

STANDARD MOUNTING OPTIONS
1 — Plain end mount, front and rear
2 — Rear pivot mount (not available on double end rod cylinders)
3 — Foot mount both ends
4 — Rear plate end mount
5 — Front plate end mount

STANDARD ROD STYLES
1 — Standard rod, male end
2 — 2:1 rod, male end
3 — Standard rod, female end
4 — 2:1 rod, female end

OPTIMAL O-RING BACKED TEFLOON ROD SEALS ARE AVAILABLE for this option the single letter A, B, or C is used in the code.

Buna N Seals are standard on all cylinders. Modification options can be made by consulting the factory. Modifications available are:
- Rod Extension
- Extra Rod Thread
- Non-Standard Thread Sizes
- Rotated Ports
- Viton Seals

EPR Seals
Stainless Steel Rods
Stainless Steel Bodies
Non-Standard Mounting Styles
 Aluminum Bodies
 Electro-Nickel Plating

PORT STYLE
2M 5/16-24 thread flared male Specify with Style A only
4M 7/16-20 thread flared male for 1/4 tubing Specify with Style A only
3J 3/8-24 straight thread female Specify with Style B only for 3/16 tubing
4J 7/16-20 straight thread female Specify with Styles B & C only for 1/4 tubing
5J 1/2-20 straight thread female Specify with Styles B & C only for 5/16 tubing
6J 9/16-18 straight thread female Specify with Style C only for 3/8 tubing
8J 3/4-16 straight thread female Specify with Style C only — 2-1/2” and 3” Bore — Std. Rod for 1/2 tubing
10J 7/8-14 straight thread female Specify with Style C only — 3” Bore — Std. Rod for 5/8 tubing
1P 1/8 female (NPSF) Specify with Styles B & C only
2P 1/4 female (NPSF) Specify with Styles B & C only
3P 3/8 female (NPSF) Specify with Style C only
4P 1/2 female (NPSF) Specify with Style C only — 3” Bore Std. Rod

CYLINDER TYPE
(Blank) — Std. Single Rod End
D.E. — Double Rod End
(Blank) — No Dry Rod
D — Dry Rod

Buna N Seals are standard on all cylinders.