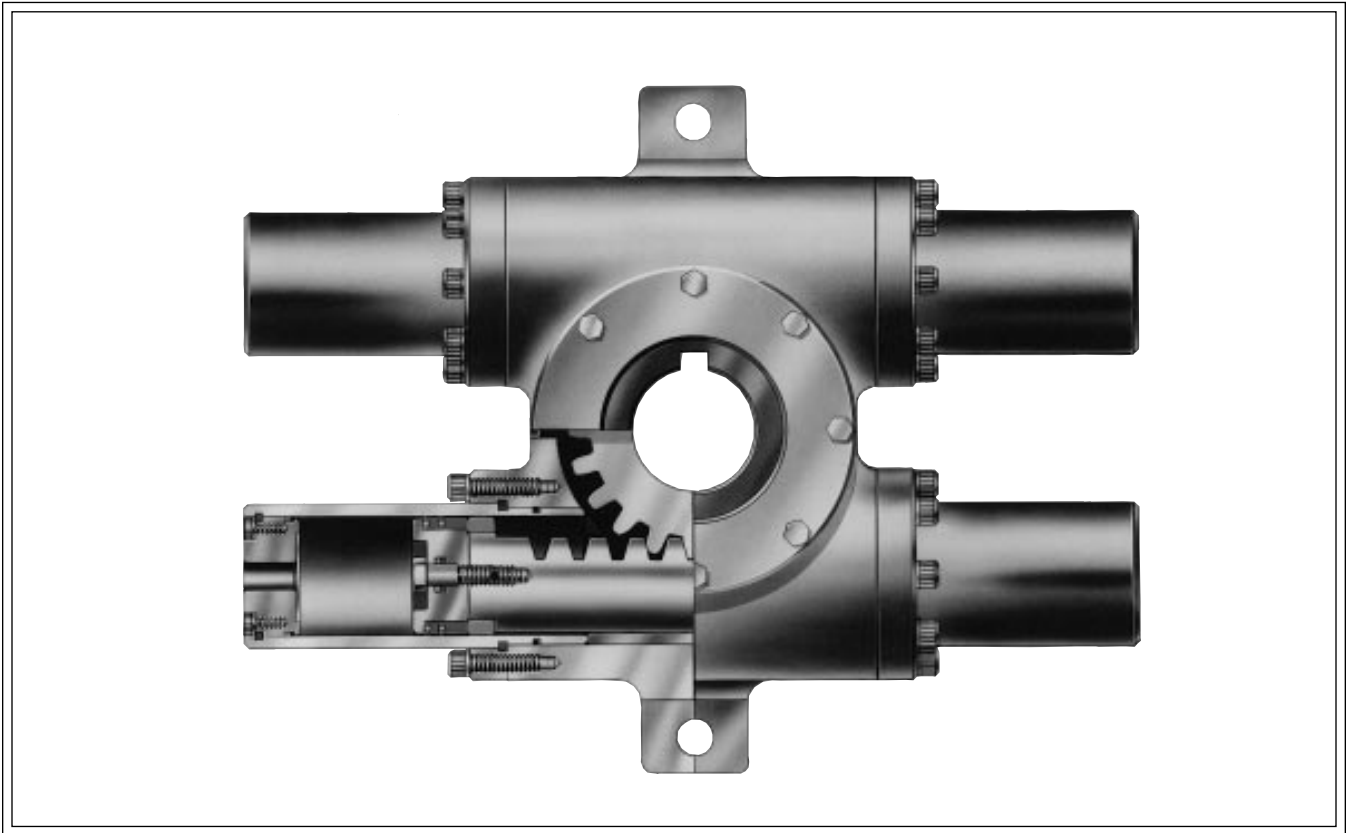


# M Series

## Heavy Duty Mill Series Rotary Actuator



### M Series Features

#### ■ HEAVY DUTY MILL CYLINDER CONSTRUCTION

Precision finished, thick-walled mill cylinder tubes and end caps for heavy duty mill service installations.

#### ■ TAPERED ROLLER BEARINGS

Large diameter, tapered roller bearings employed to support both the pinion shaft and large external radial and thrust loads. The actuator can be used as a motorized pillow block.

#### ■ SAE PORTS

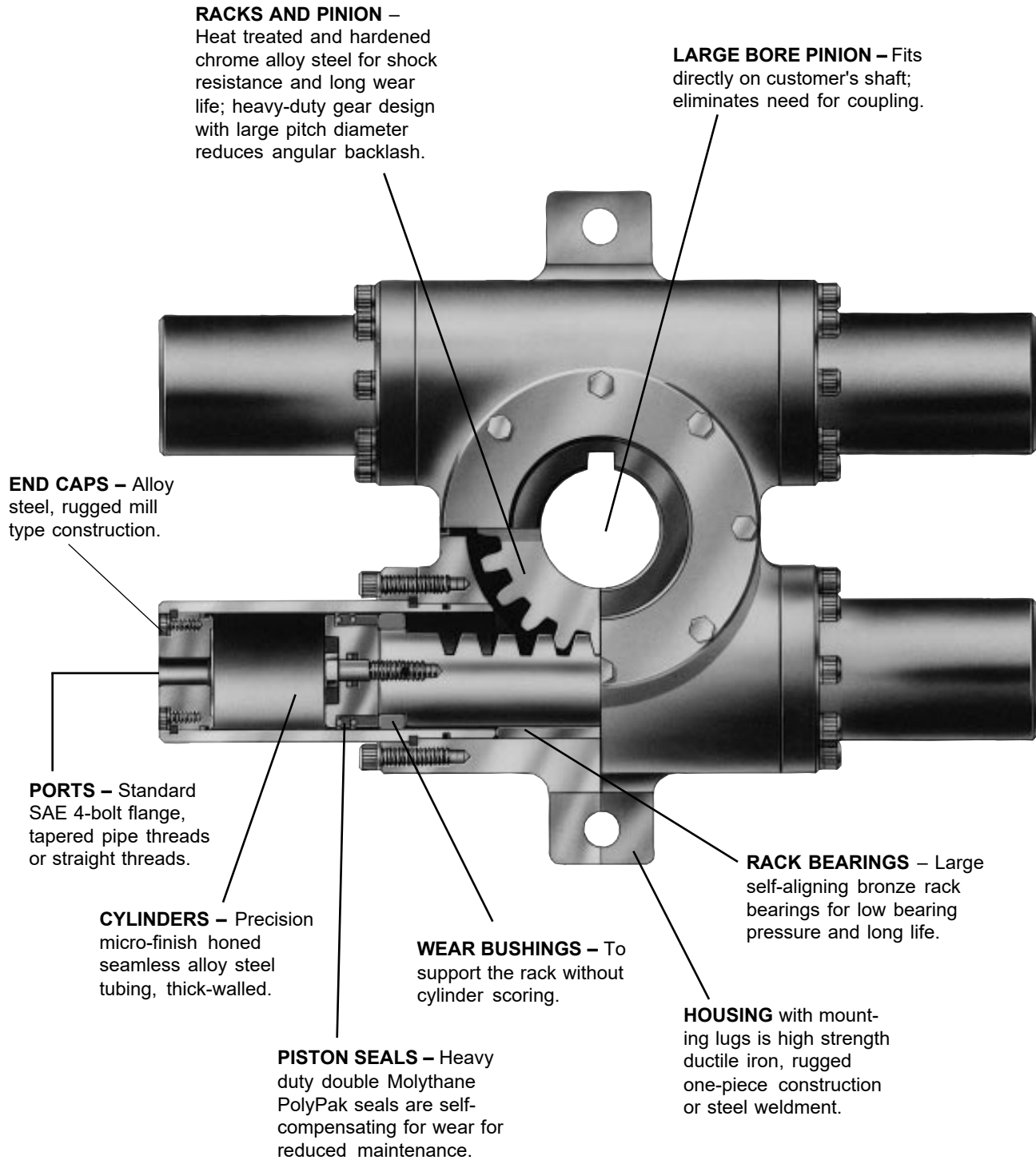
SAE (flange or o-ring) ports available for secure and leak free plumbing connections.

#### ■ BRONZE RACK BUSHINGS AND WEAR-PAK® PISTONS

We support the rack gear at both ends and in the middle with large bearings for smooth low speed rotation, cylinder tube protection and efficient torque generation.

#### ■ LARGE DIAMETER CHROME ALLOY STEEL PINION

The large diameter pinion gear provides superior service life and reduces back lash — all else being equal — when compared to smaller diameter pinion gears. The heat treated chromium alloy steel rack and pinion gear set is suitable for heavy duty service. The large diameter hollow bore pinion can be installed directly onto the customer's line shaft.



**NOTE:**  
All pressure-containing seals can be inspected or replaced without removing the actuator from customer's shaft.

## M Series Heavy Duty Mill Rotary Actuator

Designed to meet steel mill specifications. These non-tie rod units incorporate a range of features to provide heavy duty service dependability. The larger than normal heat treated pinions provide low tooth contact pressures and permit hollow shaft configurations with bore sizes capable of transmitting full operating torques, including shock loadings. In order to negate the chances of galling or scoring of the cylinder barrels, the Series M units are fitted with wear ring bushings that provide full support and eliminate the possibility of contact between cylinder and piston. The use of large diameter, tapered roller bearings on the pinion permit the actuator to absorb considerable thrust, radial and overhung loads. For ease of maintenance, all pressure seals on Series M can be inspected or replaced without removing the actuator from the customer's shaft. To ensure shipment of only the highest quality product, each actuator is fully tested and has an individual test sheet completed before final painting and shipment.

### SPECIFICATIONS

- Maximum operating pressure: 3000 psi (207 Bar) hydraulic
- Standard rotations: 90°, 180°, 360°
- Rotational tolerances: -0°, +2°
- Output torques @ 3000 psi (207 Bar): 75,000 lb-in to 50,000,000 lb-in
- Maximum breakaway pressure: 75 psi (5 Bar)
- Operating temperature: Standard nitrile seals -40° to 180°F (-40° to 82°C)  
Fluorocarbon seals -20° to 250°F (-29° to 121°C)
- Mounting orientation: Unrestricted
- Timing: Keyway located at 12:00 position at midstroke of actuator
- Housing: Heavy duty ductile iron (units up to 1000M),  
steel weldments (units larger than 1000M)

**SPECIFICATION TABLE**

| Model       |             | Maximum Pressure Rating, psi | Actual Output Torque, lb-in at Specified Pressure |                    |                    | Max. Angular Backlash (Minutes) | Standard Rotation Degrees | Displacement (Cubic Inches)       | Standard Unit Weight (lb) |
|-------------|-------------|------------------------------|---|--------------------|--------------------|---------------------------------|---------------------------|-----------------------------------|---------------------------|
| Single Rack | Double Rack |                              | 1000 psi (68 Bar)                                 | 2000 psi (136 Bar) | 3000 psi (204 Bar) |                                 |                           |                                   |                           |
| 75M         |             | 3,000                        | 25,000  | 50,000             | 75,000             | 15                              | 90<br>180<br>360          | 43.4<br>86.9<br>174.0             | 202<br>217<br>259         |
|             | 150M        | 3,000                        | 50,000  | 100,000            | 150,000            | 15                              | 90<br>180<br>360          | 86.9<br>174.0<br>347.0            | 301<br>331<br>415         |
| 300M        |             | 3,000                        | 100,000   | 200,000            | 300,000            | 10                              | 90<br>180<br>360          | 176.0<br>351.0<br>703.0           | 648<br>727<br>881         |
|             | 600M        | 3,000                        | 200,000   | 400,000            | 600,000            | 10                              | 90<br>180<br>360          | 351.0<br>703.0<br>1,405.0         | 1033<br>1191<br>1499      |
|             | 1,000M      | 3,000                        | 333,000   | 667,000            | 1,000,000          | 10                              | 90<br>180<br>360          | 556.0<br>1,112.0<br>2,224.0       | 1526<br>1774<br>2294      |
|             | 1,500M      | 3,000                        | 500,000   | 1,000,000          | 1,500,000          | 10                              | 90<br>180<br>360          | 833.0<br>1,666.0<br>3,332.0       | 2100<br>2500<br>3300      |
|             | 2,000M      | 3,000                        | 667,000   | 1,333,000          | 2,000,000          | 10                              | 90<br>180<br>360          | 1,248.0<br>2,496.0<br>4,992.0     | 3800<br>4480<br>5850      |
|             | 3,000M      | 3,000                        | 1,000,000   | 2,000,000          | 3,000,000          | 10                              | 90<br>180<br>360          | 1,727.0<br>3,454.0<br>6,908.0     | 4900<br>5700<br>7300      |
|             | 4,000M      | 3,000                        | 1,333,000   | 2,667,000          | 4,000,000          | 10                              | 90<br>180<br>360          | 2,389.0<br>4,778.0<br>9,556.0     | Consult<br>Factory        |
|             | 5,000M      | 3,000                        | 1,667,000   | 3,333,000          | 5,000,000          | 10                              | 90<br>180<br>360          | 2,937.0<br>5,874.0<br>11,748.0    | Consult<br>Factory        |
|             | 6,000M      | 3,000                        | 2,000,000   | 4,000,000          | 6,000,000          | 10                              | 90<br>180<br>360          | 3,552.0<br>7,104.0<br>14,208.0    | Consult<br>Factory        |
|             | 7,000M      | 3,000                        | 2,333,000   | 4,667,000          | 7,000,000          | 10                              | 90<br>180<br>360          | 3,910.0<br>7,820.0<br>15,640.0    | Consult<br>Factory        |
|             | 8,000M      | 3,000                        | 2,667,000   | 5,333,000          | 8,000,000          | 10                              | 90<br>180<br>360          | 4,640.0<br>9,280.0<br>18,560.0    | Consult<br>Factory        |
|             | 9,000M      | 3,000                        | 3,000,000   | 6,000,000          | 9,000,000          | 10                              | 90<br>180<br>360          | 5,020.0<br>10,040.0<br>20,080.0   | Consult<br>Factory        |
|             | 10,000M     | 3,000                        | 3,333,000   | 6,667,000          | 10,000,000         | 10                              | 90<br>180<br>360          | 5,840.0<br>11,680.0<br>23,360.0   | Consult<br>Factory        |
|             | 15,000M     | 3,000                        | 5,000,000   | 10,000,000         | 15,000,000         | 10                              | 90<br>180<br>360          | 8,710.0<br>17,420.0<br>34,840.0   | Consult<br>Factory        |
|             | 20,000M     | 3,000                        | 6,667,000   | 13,333,000         | 20,000,000         | 10                              | 90<br>180<br>360          | 11,476.0<br>22,952.0<br>45,904.0  | Consult<br>Factory        |
|             | 25,000M     | 3,000                        | 8,333,000   | 16,667,000         | 25,000,000         | 10                              | 90<br>180<br>360          | 14,262.0<br>28,524.0<br>57,048.0  | Consult<br>Factory        |
|             | 30,000M     | 3,000                        | 10,000,000  | 20,000,000         | 30,000,000         | 10                              | 90<br>180<br>360          | 17,815.0<br>35,630.0<br>71,260.0  | Consult<br>Factory        |
|             | 40,000M     | 3,000                        | 13,333,000  | 26,667,000         | 40,000,000         | 10                              | 90<br>180<br>360          | 23,687.0<br>47,374.0<br>94,748.0  | Consult<br>Factory        |
|             | 50,000M     | 3,000                        | 16,667,000  | 33,333,000         | 50,000,000         | 10                              | 90<br>180<br>360          | 27,369.0<br>54,738.0<br>109,476.0 | Consult<br>Factory        |

Note: All dimensions in inches unless otherwise specified.

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