# 92E Series Actuators

## Cost effective double acting, single ended fatigue rated linear actuators for static testing of structures and components.

Shore Western has completely re-engineered our very popular 92 Series Actuators to provide you with a **value-engineered fatigue rated actuator that is ideally suited for static low-cycle structural testing**.

92E Series Actuators have an unequal area for tensile and compressive forces, and are typically **used in applications where the load is unidirectional** (does not span zero). They are more cost effective than equivalent double ended actuators, and their compact size means that they **can be easily built with long stroke lengths**.

Shore Western 92E Series Actuators are fatigue rated, with a **chrome plated heat treated alloy piston rod** and high integrity **polymer bearings.** They are also designed for ease of maintenance with a **removable seal and bearing system**. Seals and bearings can easily be **replaced in the field** by your own technicians, using our reasonably priced repair kit, **reducing the cost of maintenance, and minimizing downtime**.

92E Series Actuators can be sized to meet your specific needs, from 10 inch (250 mm) to 40 inch (1000 mm) stroke lengths, and force ratings from 10 kip (40 kN) to 760 kip (3,400 kN). Other stroke lengths and force ratings up to 2,000 kip (10,000 kN) are available on request.

## Standard Configuration

The 92E standard configuration includes the actuator with magnetostrictive displacement transducer, load cell, single servo valve, and swivel base and swivel rod end. Any element may be deleted and options may be added to match your application.

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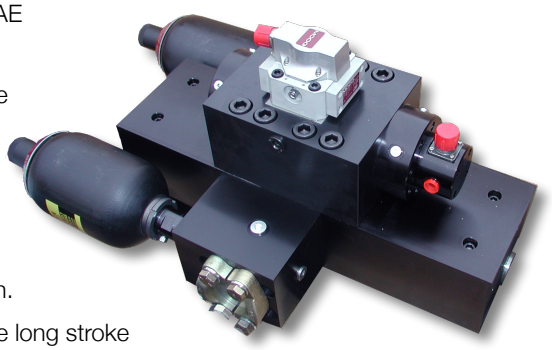
## Standard Features

- Construction: single ended with unequal areas and proportional force output in tension and compression. Fatigue rated connection between piston and rod. Oversized rod prevents buckling in compression.
- Bearings: replaceable non-metallic bearings on the piston and rod resist galling failures and provide long life. Rod bearings are field replaceable without actuator disassembly
- Seals: low friction piston seal, high pressure rod seal and compound low pressure rod seal/scraper. Drain-back between the seals provides bearing lubrication. The gland is field removable without actuator disassembly.
- Displacement Transducer: all actuators have an Integral displacement transducer that provides repeatable and accurate displacement measurements. This magnetostrictive LDT is concentrically mounted, eliminating anti rotation restrictions. Other transducer types are available on request.
- Load Cell: a precision single bridge shear web load cell sized for maximum compressive force with a safety factor is installed and preloaded with a high strength stud and preload washers. Large sizes include an integrated rod end swivel mount for bolt-on connection.
- Manifold and Servo Valve: a single valve manifold is included, with one Moog G761 series servo valve, which is sized to meet your needs. Ratings range from 1-20 gpm (3.8-75 l/min). Porting is ¾ inch (-12) SAE pressure and return.
- Swivel Rod End and Swivel Base: the 98 Series Rod End Swivels and 99 Series Base Ends help reduce side loads and force alignment problems. Swivels come with standard tilt angles. Pre-loadable bearings with backlash adjustment are optional.
- Lifting Kit: lifting rings are standard on the model 923 and larger. Tapped holes for attachment of lifting eyes are provided on the smaller actuators and on all swivels.

## Common Options

- Swivels:
    - 98 Series Rod End Swivels and 99 Series Base Ends have adjustable preload capability to eliminate backlash
- Servo Valve Manifolds
    - Dual valve manifold with two Moog G761 servo valves rated at 1-20 gpm (3.8-75 lpm) as required. Porting is 1 inch (-16) SAE pressure and return.
    - Single valve manifold with a larger two stage servo valve rated at 25-60 gpm (95-227 lpm) as required. Porting is 1 ¼ inch (-20) SAE pressure and return.
    - Single valve manifold with three stage servo valve rated at 100-200 gpm (378-757 lpm) as required. Porting is 2 inch (-32) SAE Code 61 pressure and return.
- Custom stroke lengths and rod stop tubes for highly compressive long stroke applications are also available



## Specifications

| Model # | Rating (kip) | Diameter (in.) | | Area (sq. in.) | | Overall length at standard mid stroke (in.) | | | | Weight (lb.) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ten/Comp | Rod | Bore | Rod End | Base End | 10 in. | 20 in. | 30 in. | 40 in. | 10 in. | increase per in. |
| 920 | 4.9/9.4 | 1.38 | 2.00 | 1.65 | 3.14 | 39.3 | 54.3 | 69.3 | 84.3 | 61 | 1.1 |
| 921 | 7.5/14 | 1.75 | 2.50 | 2.50 | 4.91 | 39.9 | 54.9 | 69.9 | 84.9 | 72 | 1.4 |
| 922 | 15/24 | 2.00 | 3.25 | 5.15 | 8.30 | 45.9 | 60.9 | 75.9 | 90.9 | 142 | 2.1 |
| 922.5 | 22/37 | 2.50 | 4.00 | 7.66 | 12.57 | 51.3 | 66.3 | 81.3 | 96.3 | 259 | 3.2 |
| 923 | 37/58 | 3.00 | 5.00 | 12.57 | 19.63 | 51.7 | 66.7 | 81.7 | 96.7 | 321 | 4.9 |
| 923.5 | 55/84 | 3.50 | 6.00 | 18.65 | 28.27 | 61.0 | 76.0 | 91.0 | 106.0 | 580 | 6.7 |
| 924 | 67/115 | 4.50 | 7.00 | 22.58 | 38.48 | 61.5 | 76.5 | 91.5 | 106.5 | 685 | 9.6 |
| 924.5 | 100/150 | 4.50 | 8.00 | 34.36 | 50.27 | 70.3 | 85.3 | 100.3 | 115.3 | 1311 | 11.6 |
| 926 | 150/235 | 6.00 | 10.00 | 50.27 | 78.54 | 76.4 | 92.4 | 107.4 | 122.4 | 2060 | 18.1 |
| 927 | 220/339 | 7.00 | 12.00 | 74.61 | 113.10 | 83.3 | 102.3 | 117.3 | 132.3 | 3173 | 25.1 |
| 928 | 310/460 | 8.00 | 14.00 | 103.67 | 153.94 | 96.5 | 111.5 | 126.5 | 141.5 | 4891 | 35.3 |
| 929 | 410/600 | 9.00 | 16.00 | 137.44 | 201.06 | 123.8 | 138.8 | 153.8 | 168.8 | 10247 | 46.4 |
| 929.5 | 570/760 | 9.00 | 18.00 | 190.85 | 254.47 | 126.8 | 141.8 | 156.8 | 171.8 | 11328 | 53.1 |

| Model # | Rating (kN) | Diameter (mm) | | Area (sq. cm) | | Overall length at standard mid stroke (mm) | | | | Weight (kg) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ten/Comp | Rod | Bore | Rod End | Base End | 254 mm | 508 mm | 762 mm | 1016 mm | 254 mm | increase per cm |
| 920 | 22/41.9 | 349.25 | 50.80 | 10.65 | 20.26 | 998 | 1379 | 1760 | 2141 | 28 | 0.20 |
| 921 | 30/65 | 44.45 | 63.50 | 16.13 | 31.68 | 1013 | 1394 | 1775 | 2156 | 33 | 0.25 |
| 922 | 68/110 | 50.80 | 82.55 | 33.23 | 53.55 | 1166 | 1547 | 1928 | 2309 | 65 | 0.38 |
| 922.5 | 102/167 | 63.50 | 101.60 | 49.42 | 81.10 | 1303 | 1684 | 2065 | 2446 | 118 | 0.57 |
| 923 | 167/262 | 76.20 | 127.00 | 81.10 | 126.64 | 1313 | 1694 | 2075 | 2456 | 146 | 0.88 |
| 923.5 | 248/377 | 88.90 | 152.40 | 120.32 | 182.39 | 1549 | 1930 | 2311 | 2692 | 264 | 1.20 |
| 924 | 300/510 | 114.30 | 177.80 | 145.68 | 248.26 | 1562 | 1943 | 2324 | 2705 | 311 | 1.72 |
| 924.5 | 458/670 | 114.30 | 203.20 | 221.68 | 324.32 | 1786 | 2167 | 2548 | 2929 | 596 | 2.08 |
| 926 | 670/1048 | 152.40 | 254.00 | 324.32 | 506.71 | 1941 | 2347 | 2728 | 3109 | 936 | 3.24 |
| 927 | 995/1500 | 177.80 | 304.80 | 481.35 | 729.68 | 2116 | 2598 | 2979 | 3360 | 1442 | 4.49 |
| 928 | 1380/2050 | 203.20 | 355.60 | 668.84 | 993.16 | 2451 | 2832 | 3213 | 3594 | 2223 | 6.32 |
| 929 | 1830/2680 | 228.60 | 406.40 | 886.71 | 1297.16 | 3145 | 3526 | 3907 | 4288 | 4658 | 8.30 |
| 929.5 | 2540/3395 | 228.60 | 457.20 | 1231.29 | 1641.74 | 3221 | 3602 | 3983 | 4364 | 5149 | 9.50 |

* Stroke limitation at maximum compressive force