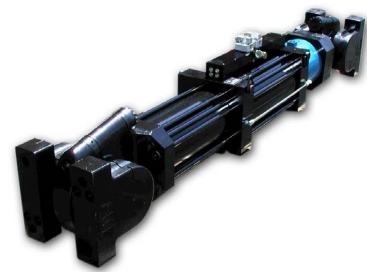


91 Series Dynamic Actuators



Double acting, double ended fatigue rated linear actuators for fatigue testing of structures and components.

BIA West's 91 Series actuators are our most popular; with their **proven design and performance** they are the choice of thousands of engineers worldwide. BIA West's 91 Series actuators feature a **single piece chrome plated alloy piston rod** and high integrity **polymer bearings.** They are also designed for ease of maintenance. Our actuators are the only ones in the industry with a **removable seal and bearing system**. Seals and bearings can easily be **replaced in the field**, with your own technicians, using our reasonably priced repair kit, **reducing the cost of maintenance, and minimizing downtime**.

91 series actuators can be sized to meet your specific needs, typically 6 inch (150 mm) or 10 inch (250 mm) stroke lengths and force ratings from 1.1 KIP (5 kN) to 330 KIP (1500 kN). Other sizes are available on request.

Features

• Non metallic bearings. BIA West utilizes non metallic bearing surfaces for all bearings to provide long life and resist bearing-to-rod galling failures.

 Ease of service. Innovative design permits the piston rod bearings and cylinder seals to be replaced easily. The bearing retainer assembly acts as a bearing puller when removing the gland assembly.

 Integral displacement transducer. All actuators have an internally mounted LVDT that provides repeatable and accurate displacement measurements.

 Hydraulic cushions. The end caps and piston of the actuator are protected from runaway conditions that can cause the actuator to rapidly extend or retract. To prevent



- the piston from striking the end caps, a cushion of oil is ported through an orifice to slow the it down as it approaches the end of its stroke.
- Large diameter rod. 91 Series Actuators use hollow, large diameter, one piece alloy piston rods made of 100,000 psi (700 MPa) yield material for infinite fatigue life, providing strength and maximum lateral stiffness. The chrome plated piston rod is micro ground and super-polished to minimize friction and extend seal and bearing life.
- Seals. 91 Series actuators feature high-pressure seals designed for low friction, long life, and outstanding performance
 in high-frequency/low-displacement applications. A low-pressure wiper/seal provides for both a hydraulic seal and a
 rod scraper to help eliminate external contamination of the bearings and internal seals.

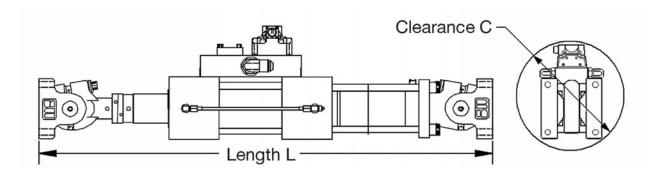
Manifolds

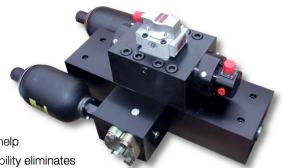
Servo valve manifolds with oversize ports for a variety of servo valves are available with the following options:

- Single, dual, or three-stage servo valve configurations
- Switchable high and low flow servo valves
- delta-P transducer
- Close coupled accumulation
- Fluid conditioning and low/high pressure control

Options

- Swivels. The 98 Series Rod End Swivels and 99 Series Base Ends can help reduce side loads and force alignment problems and their preload capability eliminates backlash.
- Load washers. Load washers preload the connections in the force train to avoid backlash and fatigue failure between attached components. Load washers let you quickly preload attached components.
- 91 Series Actuators may be adapted to test requirements not served by the standard strokes of 6 and 10 inches (100 and 250 mm). Custom stroke lengths are available upon request.
- Fatigue rated load cells and differential pressure sensors are available for every force rating





Model	Rating (KIP)	Rod Dia (in)	Area (in2)	Force at 3000psi (LbF)	Length L for 6in Stroke (in)	Length L for 10in Stroke (in)	Clearance C (in)
910	1.1	1.12	0.37	1111	34.9	44.9	7.3
910	2.2	1.12	0.77	2310	34.9	44.9	7.3
910	3.2	1.12	1.08	3240	34.9	44.9	7.3
911	3.3	1.75	1.14	3424	38.6	48.6	9.3
911	5.5	1.75	2.02	6075	38.6	48.6	9.3
911	7.5	1.75	2.5	7510	43.1	53.1	12.1
912	11	2.75	3.68	11045	43.1	53.1	12.1
912	15	2.75	5.11	15315	43.1	53.1	12.1
912	22	2.75	7.42	22273	47.9	57.9	13.1
912	35	2.75	11.78	35343	47.9	57.9	13.1
913	55	3.75	19.63	58905	55.8	65.8	15.
913	75	3.75	24.74	74220	55.8	65.8	15.5
914	110	5.25	38.48	115454	64.7	74.7	20.8
914	165	5.25	56.89	170677	68.5	78.5	23
915	220	6	75.59	226784	78.1	88.1	26
916	330	8	114.86	344593	85	95	28
Model	Rating (kN)	B 181					
	naulig (kiv)	Rod Dia (mm)	Area (mm2)	Force at 207 Bar (kN)	Length L for 150mm Stroke (mm)	Length L for 250mm Stroke (mm)	Clearance ((mm)
910	Flating (KIV)		Area (mm2)	207 Bar	150mm	250mm	(mm)
910 910		(mm)		207 Bar (kN)	150mm Stroke (mm)	250mm Stroke (mm)	(mm) 185
	5 10	(mm) 28.6	239	207 Bar (kN) 4.94	150mm Stroke (mm)	250mm Stroke (mm)	(mm) 189
910	5 10	(mm) 28.6 28.6	239 497	207 Bar (kN) 4.94 10.28	150mm Stroke (mm) 886 886	250mm Stroke (mm) 1140 1140	(mm) 188 188
910 910	5 10 14	(mm) 28.6 28.6 28.6	239 497 697	207 Bar (kN) 4.94 10.28 14.41	150mm Stroke (mm) 886 886 886	250mm Stroke (mm) 1140 1140 1140	(mm) 188 188 188
910 910 911	5 10 14 15	(mm) 28.6 28.6 28.6 44.5	239 497 697 735	207 Bar (kN) 4.94 10.28 14.41 15.23	150mm Stroke (mm) 886 886 886 980	250mm Stroke (mm) 1140 1140 1140 1234	(mm) 188 188 236
910 910 911 911	5 10 14 15 27 33	(mm) 28.6 28.6 28.6 44.5 44.5	239 497 697 735 1303	207 Bar (kN) 4.94 10.28 14.41 15.23 27.02	150mm Stroke (mm) 886 886 886 980 980	250mm Stroke (mm) 1140 1140 1140 1234 1234	(mm) 185 185 236 236
910 910 911 911 911	5 10 14 15 27 33 50	(mm) 28.6 28.6 28.6 44.5 44.5 44.6	239 497 697 735 1303 1613	207 Bar (kN) 4.94 10.28 14.41 15.23 27.02 33.41	150mm Stroke (mm) 886 886 886 980 980	250mm Stroke (mm) 1140 1140 1140 1234 1234 1349	(mm) 188 188 236 236 307
910 910 911 911 911 912	5 10 14 15 27 33 50 65	(mm) 28.6 28.6 28.6 44.5 44.5 44.6 69.9	239 497 697 735 1303 1613 2374	207 Bar (kN) 4.94 10.28 14.41 15.23 27.02 33.41 49.13	150mm Stroke (mm) 886 886 886 980 980 1095	250mm Stroke (mm) 1140 1140 1140 1234 1234 1349 1349	(mm) 185 185 185 236 236 307 307
910 910 911 911 911 912 912	5 10 14 15 27 33 50 65	(mm) 28.6 28.6 28.6 44.5 44.5 44.6 69.9 69.9	239 497 697 735 1303 1613 2374 3297	207 Bar (kN) 4.94 10.28 14.41 15.23 27.02 33.41 49.13 68.13	150mm Stroke (mm) 886 886 886 980 980 1095 1095	250mm Stroke (mm) 1140 1140 1140 1234 1234 1349 1349	(mm) 188 188 188 236 236 307 307 307
910 910 911 911 911 912 912	5 10 14 15 27 33 50 65 100	(mm) 28.6 28.6 28.6 44.5 44.5 44.6 69.9 69.9 69.9	239 497 697 735 1303 1613 2374 3297 4790	207 Bar (kN) 4.94 10.28 14.41 15.23 27.02 33.41 49.13 68.13 99.08	150mm Stroke (mm) 886 886 886 980 980 1095 1095 1095	250mm Stroke (mm) 1140 1140 1140 1234 1234 1349 1349 1349	(mm) 188 188 188 236 236 307 307 307 333
910 910 911 911 911 912 912 912	5 10 14 15 27 33 50 65 100 150 250	(mm) 28.6 28.6 28.6 44.5 44.5 44.6 69.9 69.9 69.9	239 497 697 735 1303 1613 2374 3297 4790 7600	207 Bar (kN) 4.94 10.28 14.41 15.23 27.02 33.41 49.13 68.13 99.08 157.22	150mm Stroke (mm) 886 886 886 980 980 1095 1095 1095 1217	250mm Stroke (mm) 1140 1140 1140 1234 1234 1349 1349 1349 1471	(mm) 188 188 188 236 236 307 307 333 333 394
910 910 911 911 912 912 912 912 913	5 10 14 15 27 33 50 65 100 150 250 330	(mm) 28.6 28.6 28.6 44.5 44.5 44.6 69.9 69.9 69.9 95.3	239 497 697 735 1303 1613 2374 3297 4790 7600 12664	207 Bar (kN) 4.94 10.28 14.41 15.23 27.02 33.41 49.13 68.13 99.08 157.22 262.03	150mm Stroke (mm) 886 886 886 980 980 1095 1095 1217 1217 1217	250mm Stroke (mm) 1140 1140 1140 1234 1234 1349 1349 1349 1471 1471 1671	(mm) 185 185 185 236 236 307 307 307 333 334 3394
910 910 911 911 912 912 912 913 913	5 10 14 15 27 33 50 65 100 150 250	(mm) 28.6 28.6 28.6 44.5 44.5 44.6 69.9 69.9 69.9 95.3 95.3	239 497 697 735 1303 1613 2374 3297 4790 7600 12664 15961	207 Bar (kN) 4.94 10.28 14.41 15.23 27.02 33.41 49.13 68.13 99.08 157.22 262.03 330.15	150mm Stroke (mm) 886 886 886 980 980 1095 1095 1095 1217 1217 1417	250mm Stroke (mm) 1140 1140 1140 1234 1234 1349 1349 1349 1471 1471 1671 1671	Clearance C (mm) 188 188 188 236 236 307 307 307 307 307 307 307 3
910 910 911 911 912 912 912 913 913	5 10 14 15 27 33 50 65 100 150 250 330 500 750	(mm) 28.6 28.6 28.6 44.5 44.5 44.6 69.9 69.9 69.9 95.3 95.3 133.4	239 497 697 735 1303 1613 2374 3297 4790 7600 12664 15961 24826	207 Bar (kN) 4.94 10.28 14.41 15.23 27.02 33.41 49.13 68.13 99.08 157.22 262.03 330.15 513.59	150mm Stroke (mm) 886 886 886 980 980 1095 1095 1095 1217 1217 1417 1417 1643 1740	250mm Stroke (mm) 1140 1140 1140 1234 1234 1349 1349 1349 1471 1471 1671 1671 1897	(mm) 185 185 185 236 236 307 307 307 333 334 3394 528