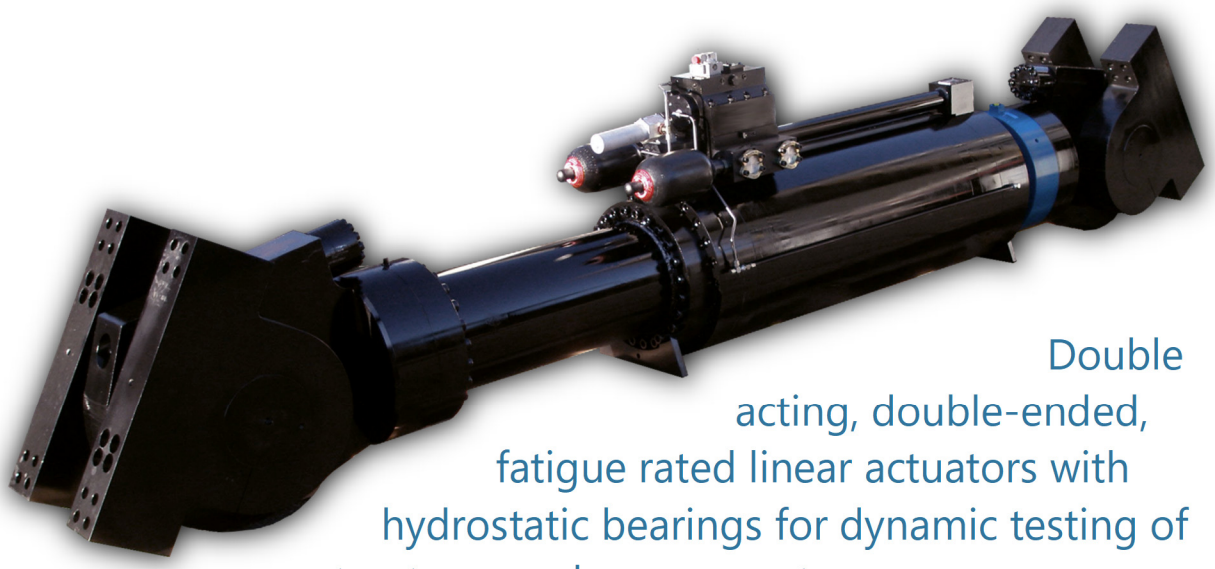
94 Series Actuators



Double acting, double-ended, fatigue rated linear actuators with hydrostatic bearings for dynamic testing of structures and components.

The 94 Series double-ended actuators have equal areas for tensile and compressive loading, making them **linear as the dynamic test load transitions through zero**.

These Actuators feature **hydrostatic bearings** in their endcaps, which support the piston rod with very low friction, and prevent the rod from galling under high side loads. The 94 Series Actuators also feature **polymer back-up bearings** to protect the rod if the hydraulic bearing fails for any reason.

94 Series Actuators are typically **used in structural test applications where the load is bi-directional, dynamic, and where the actuator is subjected to side load, or where low distortion due to friction is important**. These actuators are the most expensive in our product line, and the most versatile.

BIA West 94 Series Actuators are fatigue rated, with a **chrome plated one piece heat treated alloy piston rod**. Hydraulic cushions in the endcaps prevent damage in the event of a runaway condition.

94 Series Actuators can be sized to meet your specific needs, with standard stroke lengths from 6 inch (150 mm) to 20 inch (500 mm), and force ratings from 5.5 kip (25 kN) to 1,000 kip (4,500 kN). Other stroke lengths and force ratings up to 2,000 kip (10,000 kN) are available on request.

Standard Configuration

The 94 standard configuration includes the actuator with LVDT (displacement transducer), load cell, servo valve, and swivel base and swivel rod end. Any element may be deleted, and options may be added to match your application.

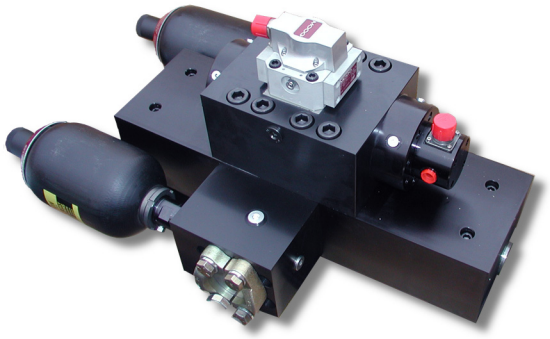
Standard Features

- Construction: double ended with equal areas and balanced force output through zero. Fatigue rated piston and rod. Oversized rod and thick-walled cylinder for bending strength. End caps include hydraulic dashpot cushions to prevent damage in runaway conditions.
- Bearings: four pocket self-aligning hydrostatic end-cap bearings for high side loads and low friction. Non-metallic back-up bearings prevent galling failures in the event of pressure loss.
- Seals: high pressure labyrinth sealing and low-pressure rod seal/scraper with bearing drain.
- Displacement Transducer: integral displacement transducer that provides repeatable and accurate displacement measurements. This LVDT is concentrically mounted, eliminating anti rotation restrictions. Other transducer types are available on request.
- Load Cell: a fatigue-rated single bridge shear web load cell sized for maximum 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 close coupled bolt-on connections.
- Swivel Rod End and Swivel Base: Pre-loadable 98 Series Rod End Swivels and 99 Series Base Ends help reduce side loads and force alignment problems.
- Load washers. Load washers let you quickly preload connections in the force train to avoid backlash and fatigue failure between attached components.
- Lifting Kit: lifting rings are standard on the model 944 and larger. Tapped holes for attachment of lifting eyes are provided on the smaller actuators and on all swivels.

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
- External pilot input with fluid conditioning
- Differential pressure transducer
- Close coupled accumulators
- Pressure on/off control
- Switchable high and low flow servo valves



Common Options

- Custom stroke lengths
- Custom cylinder bore for optimized rod diameter/force output
- High pressure input up to 5000 psi (345 bar)
- Mounting including:
    - front face bolt pattern
    - flange
    - pedestal
    - trunnion

Specifications

Model	Rating (Kip)	Rod Dia (In)	Area (sq In)	Force @ 3000 psi	Overall length at mid stroke (in)		
	(kip)	(in)	(sq in)	(lb)	6 in	10 in	20 in
941-4	5.5	1.75	2.02	6,060	46.6	56.6	-
942-4	11	2.75	3.68	11,040	47.1	57.1	82.1
942-5	15	2.75	5.11	15,330	47.1	57.1	82.1
942-7	22	2.75	7.42	22,260	51.8	61.8	86.8
943-2	38	3.75	12.76	38,280	55.3	65.3	90.3
943-3	55	3.75	19.63	58,890	61.6	71.6	96.6
944-2	110	5.25	38.48	115,440	74.2	84.2	109.2
944-4	170	5.25	56.89	170,670	82.4	92.4	117.4
945-7	220	6.00	75.59	226,770	88.7	98.7	123.7
946-2	330	8.00	114.90	344,700	110.0	120.0	145.0
947-2	550	10.00	190.26	570,780	142.7	152.7	177.7
948-2	750	12.00	250.00	750,000	163.0	173.0	198.0
948-3	1000	12.00	333.29	999,870	163.0	173.0	198.0

Model	Rating	Rod Dia	Area	Force @210 bar	Overall length at mid stroke (cm)		
	(kN)	(mm)	(sq cm)	(kN)	15 cm	25 cm	50 cm
941-4	25	44.45	13.03	26.96	118	144	-
942-4	50	69.85	23.74	49.11	120	145	208
942-5	66	69.85	32.97	68.19	120	145	208
942-7	100	69.85	47.87	99.02	132	157	221
943-2	170	95.25	82.33	170.28	141	166	229
943-3	250	95.25	126.65	261.97	156	182	245
944-2	500	133.35	248.27	513.52	188	214	277
944-4	750	133.35	367.05	759.21	209	235	298
945-7	1000	152.40	487.71	1008.76	225	251	314
946-2	1500	203.20	741.33	1533.36	279	305	368
947-2	2500	254.00	1227.56	2539.06	362	388	451
948-2	3333	304.80	1613.00	3336.30	414	439	503
948-3	4500	304.80	2150.39	4447.82	414	439	503