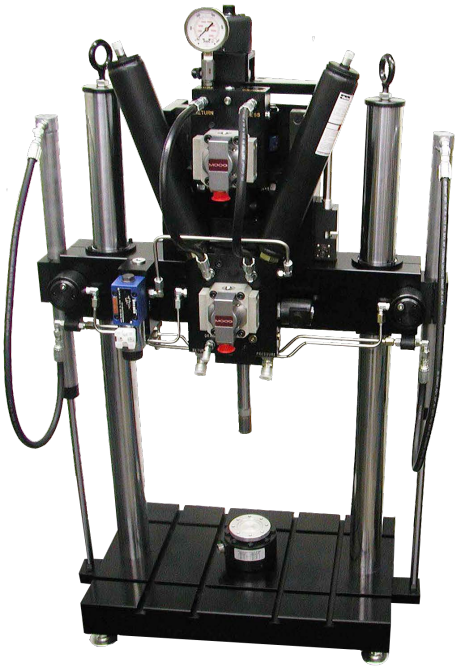
306 Series Biaxial Load Frames

Rigid two-column fatigue-rated tension/torsion load frames for biaxial material characterization.

BIA West 306 load frames are versatile test systems used for a variety of applications, **from simple monotonic proof tests, to highly complex Thermo Mechanical Fatigue (TMF) experiments**. The system can be configured to run standard ASTM tests as well as your unique custom protocols. The load frames are paired with our industry leading controller, hydraulic actuators, manifold, servo valves, and Whisperpak® pump to create a highly accurate and durable test instrument.

The load frame structure is specifically designed to provide **maximum rigidity for axial/torsional applications**. The Series 306 features a 2-column symmetrical construction with a fixed-platen and moveable crosshead on **hydraulic lifts**. On our free standing units, both actuators are mounted below the platen with the load cell affixed to the crosshead. In the case of the table-top machine, the actuators are mounted on the crosshead and the load cell is below. Note that **larger 4-column biaxial frames are also available**, we also build large frames with crosshead mounted actuators and floor-level T-Slotted bases.



The 306 Series load frames come in standard configurations (below) with **other force/torque combinations and configurations available on request**. All units are delivered fully equipped including linear and rotary actuators, servo valves, service manifold, biaxial load cell, RDT and LVDT.

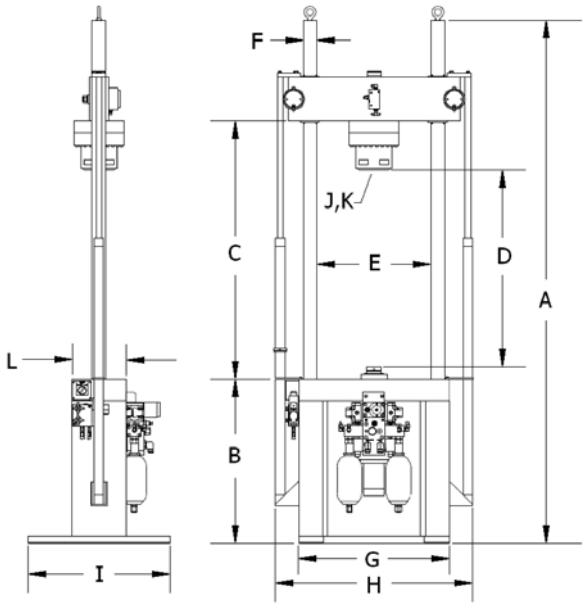
The 306 Series Load Frame can be supplied with a **variety of accessories** such as hydraulic crosshead locks, load cells, grips, furnaces, environmental chambers, and extensometers to meet your specific testing needs.

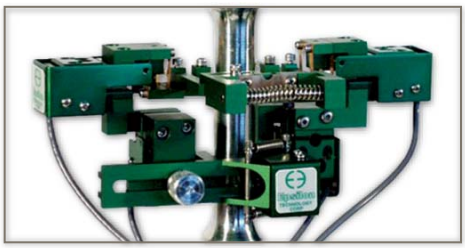
Features

- Chrome plated columns. The 306 utilizes two smooth, chrome plated precision ground columns to provide long life and low friction crosshead position changes with high alignment accuracy.
- Hydraulic Crosshead controls. The crosshead is vertically adjustable with infinite resolution using hydraulic lifts via a simple control panel. Position of the crosshead is maintained backlash free by torque wrench tightened bolts or optional hydraulic locks. The failsafe design ensures a sudden loss of hydraulic power will not result in any unwanted crosshead motion, and the crosshead will remain locked.
- Accurate alignment. The actuator rod and load cell are concentric within .0015 in (0.038mm) @ 15 inches (380mm) and .002in/ft (0.05mm per 300mm) thereafter.
- Accurate angular and displacement measurement. The linear actuator includes a co-axially mounted LVDT in the piston rod, while the rotary actuator has an external RDT.
- Rigid construction. No intermediate threaded joints or compression joints are utilized and the load is transmitted directly into the crosshead during testing.
- High quality servohydraulic components. The system is designed using BIA West hydraulics, renowned for providing years of trouble-free operation, and the result of over 40 years of experience.

Options

- Hydraulic crosshead locks. Hydraulically operated crosshead locks are available on all models
- Vibration isolation mounts. Dynamic testing can produce unwanted vibration that can be transmitted to the laboratory floor. Isolation pads under the load frame help reduce noise and dampen vibrations.
- Safety enclosure. A safety enclosure can be fitted around the test area to protect the operator during destructive testing.
- Actuator sizing. Different actuator displacements and valves are available, as well as custom force ratings. Service Manifolds, servo-valves and hydraulic power supplies are sized based on your application.
- Accessories. Choose from a wide variety of grips, fixtures, extensometers, furnaces, environmental chambers, larger power supplies and various load cell force ratings.





Free Standing Frame Specifications

	Ref	Model 306.2[4]		Model 306.3		Model 306.4	
Column Diameter	F	3.0 in	7.62 cm	4.0 in	10.16 cm	6.0 in	15.24 cm
Column Spacing	E	21.0 in	53.3 cm	25.0 in	63.5 cm	30.0 in	76.2 cm
Height (overall) [1]	A	112.0 in	284.5 cm	135.0 in	342.9 cm	163.0 in	414.0 cm
Max Clearance [1]	C	54.0 in	137.2 cm	73.0 in	185.4 cm	91.0 in	231.1 cm
Specimen Length [2]	D	41.0 in	104.1 cm	57.0 in	144.8 cm	71.0 in	180.3 cm
Platen Height	B	41.0 in	104.1 cm	45.0 in	114.3 cm	54.0 in	137.2 cm
Platen Depth	L	10.0 in	25.4 cm	12.0 in	30.5 cm	15.0 in	38.1 cm
Base Width	G	28.0 in	71.1 cm	34.0 in	86.4 cm	44.0 in	111.8 cm
Width (with lifts)	H	35.8 in	90.8 cm	41.8 in	106.0 cm	52.0 in	132.1 cm
Base Depth	I	24.0 in	61.0 cm	30.0 in	76.2 cm	36.0 in	91.4 cm
Bolt Circle Diameter	K	8.0 in	20.3 cm	10.0 in	25.4 cm	13.0 in	33.0 cm
Bolt Holes (6 each)	J	1/2-13 UNC		5/8-11 UNC		3/4-10 UNC	
Axial Force Capacity		20 Kip[4]	89 kN	50 Kip	222 kN	100 Kip	445 kN
Axial Displacement		6.0 in	15 cm	6.0 in	15 cm	6.0 in	15 cm
Deflection (max. cum.) [3]		0.008 in	0.2 mm	0.012 in	0.3 mm	0.013 in	0.33 mm
Axial Stiffness [3]		$2.5x10^6$ lb/in	$44x10^7$ N/m	$4.2x10^6$ lb/in	$73x10^7$ N/m	$7.7x10^6$ lb/in	$13x10^8$ N/m
Torque Capacity		10,000 in-lb	1130 N-m	20,000 in-lb	2260 N-m	50,000 in-lb	5650 N-m
Rotation		+/- 50°		+/- 50°		+/- 50°	
Angular Deflection [3]		0.092°		0.055°		0.028°	
Torsional Stiffness [3]		$11x10^4$ inlb/°	$12x10^3$ Nm/°	$36x10^4$ inlb/°	$41x10^3$ Nm/°	$18x10^5$ inlb/°	$20x10^4$ Nm/°
Approximate Weight		1350 lb	613 Kg	2750 lb	1250 Kg	4750 lb	2160 Kg

[1]Based on standard column length, additional length available as an option.

[2]Specimen length based on standard column length, standard load cell, actuator fully retracted, and no allowance for grips

[3]At rated load with an exposed column length of 50 in (127 cm)

[4] Model 306.2 also available with 10 kip (45 kN) axial, 5,000 in-lb (565 N-m) torsional actuators as a standard option.

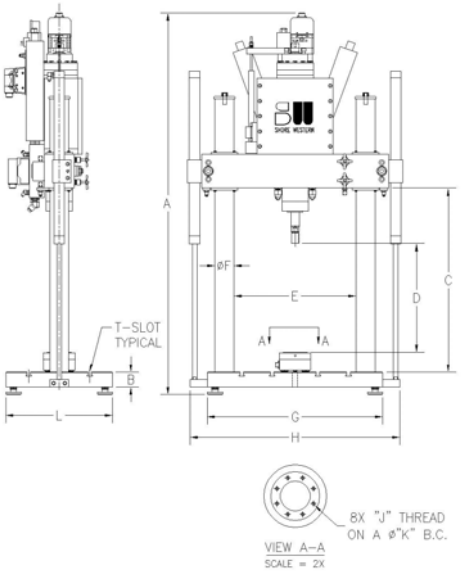
The actuator rod and load cell are concentric within 0.0015 in (0.038 mm) @ 15 in (38.1 cm) of separation and 0.002 in/ft (0.164 mm/m) thereafter.

Note: Service manifolds, servo valves and hydraulic power supplies are sized and selected based upon application.

Specifications subject to change without notice.

Table Top Frame Specifications

	Ref	Model 306.05	
Column Diameter	F	2.50 in	6.35 cm
Column Spacing	E	16.0 in	40.6 cm
Max Height (overall) [1,3]	A	59.0 in	150.0 cm
Max Crosshead to Platen Clearance [1]	C	29.1 in	73.9 cm
Specimen Length [2]	D	22.9 in	58.2 cm
Platen Height [3]	B	2.0 in	5.1 cm
Platen Depth	L	14.0 in	35.6 cm
Base Width	G	23.0 in	58.4 cm
Width (with lifts)	H	27.5 in	70.0 cm
Bolt Circle Diameter	K	2.600 in	66.0 mm
Bolt Holes (8 each)	J	¼-28 UNF-2B	
Deflection @ 3.2 kip [5,6]		0.0038 in	0.0965 mm
Stiffness [5,6]		0.84 x 10^6 lb/in	147 x 10^6 N/m
Axial Force		3.2 kip	14.2 kN
Stroke (maximum)		4 in	10.2 cm
Torsional Force		2,200 in-lb	250 N-m
Rotation (degrees)		±140°	
Approximate Weight [4]		450 lb	205 kg



[1] Based on standard column length of 36 in (91 cm), additional length available as an option.

[2] Specimen length based on standard column length, standard load cell, actuator fully retracted, and no allowance for grips.

[3] With steel platen, add 1 in (25.4 mm) for aluminum version.

[4] With steel platen, subtract 85 lb (38 kg) for aluminum version.

[5] Exposed column length = 24 in (61 cm)

[6] With steel platen

The load cell can be mounted to the actuator piston rod or the platen

The actuator rod and load cell are concentric within 0.0015 in (0.038 mm) @ 15 in (38.1 cm) of separation and 0.002 in/ft (0.164 mm/m) thereafter.

Specifications subject to change without notice.