

## Electrodynamic Axial Torsion Test Systems

### Static, Fatigue, Dynamic Testing

Maximum Force to 25 kN (5500 lb)  
Maximum Torque to 300 Nm (2700 in-lb)  
Maximum Frequency to 75 Hz

### Applications include

- Orthopedic research and medical device implants for the spine, hip, knee, shoulder, finger, ankle – including osteosynthesis.
- Dental research and medical implants
- Materials characterization of polymers, metals, ceramics, bone cement, Nitinol, adhesives, and coatings.
- Product and component testing
- Micromechanical research and development

### Overview

**Modular Design Approach** – enables each 830 to be configured as a single biaxial test station or as two separate and independent test machines.

**High Force and Torque Ratings** – enables the 830 to compete with the range of forces traditionally served by servohydraulic test machines. Electrodynamic test machines are more reliable, feature higher resolution control of load and position, are quieter, and more affordable.

**Configurable** – the modular system design encourages application engineered solutions that do a better job of serving our customers. Our solution space is both broad and more affordable because we draw on a large number of actuators and controller options.

**Customer Support** – is improved over traditional support and service approaches. Given the high product reliability, the most significant support demand is for software training and updates. With the advent of online remote access, we can respond quickly and effectively to customer application and product needs – at virtually no charge.



Consider our low force 570L Series – compact tabletop models for low force dynamic testing – vertical & horizontal.

## Advanced Control System

### Expandable and Powerful Lab Control Hardware

The 830L includes a 2360 Lab Automation Controller in a 19" rack mountable enclosure. The 2360 features the latest in electronic performance, functionality and affordability. This advanced high speed high resolution control system is capable of multichannel test control and measurement. It is a modular controller that expands to handle large multi-axis test systems, full lab automation of multiple test machines, or combinations of either.

#### 2360 Expansion Capabilities

- 1 to 16 actuators or test stations
- 4 to 96 channels high resolution (24 bit) Data Acquisition
- 4 to 80 channels of analog transducer signal conditioning (LVDT, Load or torque cells, extensometer, etc)
- 2 to 8 digital position encoders (angle or linear)

#### High Performance Capabilities

- High Speed (300 MIPS) Digital Signal Processor
- 24 bit Analog Data Conversion
- 32 bit Digital Data acquisition
- 40 bit Servo-Loop Calculations



2360 – Configurable control - 16 test stations and channels



2370 small box

The 2360 offers 24 bit hardware resolution which delivers 256 times better resolution than competing 16 bit control systems. High resolution means higher accuracy and increased sensor bandwidth, so that fewer load cells and transducers are needed. Each 830 is configured to requirements using plug in cards and software. The two actuators may be controlled dependently (most biaxial tests) or independently (e.g. two test stations). The 2360 is compatible with electromechanical, servohydraulic and electrodynamic actuators. The 2370 is a fixed and limited version of the 2360.

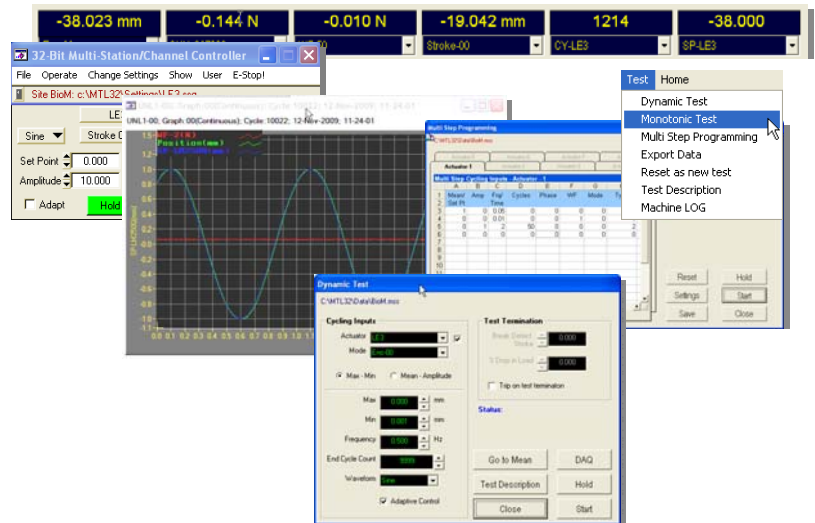
### Flexible Test Software

The 830 includes **TestBuilder** and **MachineBuilder** software products which are compatible with our Global Data Sharing (GDS) software technology. GDS is an open architecture software system that enables rapid development of new applications using common software development tools (VB, C++). GDS enables real time data made simultaneously "visible" to unlimited tasks or applications for test control and data acquisition without software performance degradation. A Microsoft Office interface permits real time data transfer into Word, Excel, PowerPoint, Outlook and Access.

#### TestBuilder enables users to

- create and store test setups
- produce standard and custom static or dynamic wave-shapes
- switch control modes
- calibrate transducers
- collect and store real time data
- set limit conditions
- tune actuators
- generate test reports

**MachineBuilder** enables the lab administrator to configure physical hardware (actuators and sensors) to software configurations compatible with the needs of TestBuilder.



### Axial Torsion Load Frames

The 830 load frame is a dual column floor mounted load frame with 16 inch (400 mm) or 22 inch (550 mm) column spacing. The frame is rated to 5500 pounds (25 kN) and 2700 in-lb (300 Nm). The 570 load frame (axial torsion) features a small tabletop load frame with 8 inch (200 mm) column spacing. The 570 frame is rated to 550 lb (2.5 kN) and 88 in-lb (10 Nm).

### Linear Actuators

830 systems are configured by selecting a linear actuator to match long term force, speed and stroke requirements. Electrodynamic actuators include a digital position encoder with 1 micron or better resolution. The table shown below highlights select configurations.

Linear Actuators	E316	E426	E526	Product Limits
Force Capacity (Static)	± 6000 N (1350 lb)	± 9000 N (2000 lb)	± 25000 N (5500 lb)	± 55000 N (12500 lb)
Fatigue Rating	± 3000 N (675 lb)	± 9000 N (2000 lb)	± 20000 N (4500 lb)	± 40000 N (9000 lb)
Velocity Max	125 mm/s (5 in/s)	250 mm/s (10 in/s)	200 mm/s (8 in/s)	5 m/s (200 in/s)
Stroke	±75 mm (± 3 in)	±75 mm (± 3 in)	±75 mm (± 3 in)	±450 mm (± 9 in)
Resolution	0.1 micron	0.2 micron	0.2 micron	-
Cyclic Range	0.00001 to 15 Hz	0.00001 to 15 Hz	0.00001 to 75 Hz	-

### Torsion Actuators

830 systems may be configured with either an electrodynamic or electromechanical (static) torsion motors. For quasistatic applications where cycling torque levels and speeds are low, a TG Series actuator is very cost effective. For fatigue tests or higher speeds, the T Series is recommended. All actuators include a digital high resolution position encoder.

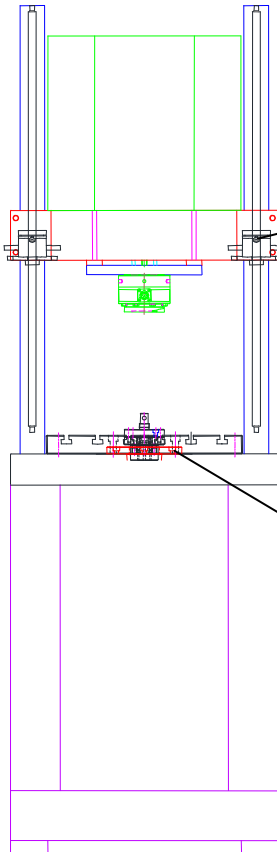
Torsion Actuators	TG80	T30	T70
Torque Capacity (Static)	± 80 Nm (700 in-lb)	± 28.5 Nm (252 in-lb)	± 70 Nm (620 in-lb)
Fatigue Rating	Below 30 Nm	± 40 Nm (354 in-lb)	± 98 Nm (870 in-lb)
Velocity Max	180 deg/s	18000 deg/s	9000 deg/s
Stroke	Continuous	Continuous	Continuous
Resolution	-	1.5 arc min	1.5 arc min
Cyclic Range	Below 1 Hz	0.00001 to 30 Hz*	0.00001 to 30 Hz*

### Sampler -- System Configurations

Systems	Col Space	Force	Force (Fatigue)	Torsion	Torsion (Fatigue)
830L-E31-T20	16 in	± 1350 lb	± 675 lb	± 165 in-lb	± 232 in-lb
830L-E42-T30	16 in	± 2000 lb	± 2000 lb	± 252 in-lb	± 354 in-lb
831L-E52-T70	22 in	± 5500 lb	± 4500 lb	± 620 in-lb	± 870 in-lb
830L-E31-TG80	16 in	± 1350 lb	± 675 lb	± 700 in-lb	± 70 in-lb

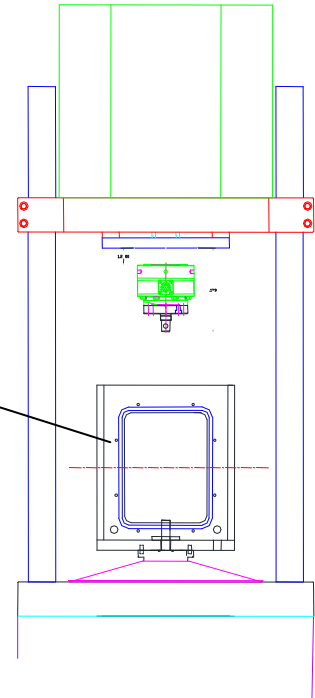
## Accessories

TestResources offers a wide range of accessories for mechanical testing including grips, extensometers, fixtures, ovens, biomedical baths, furnaces and single purpose (e.g. ASTM test) fixtures. Our product line includes 500 to 1000 test grips and fixtures. This product line has been developed by continuously supporting customer applications. 830 accessories that have been designed for customers are shown below.

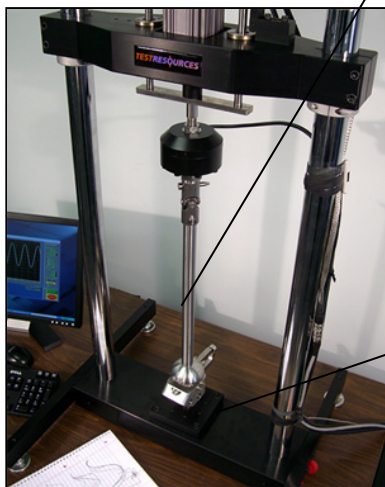


**Crosshead lift option** - when E4 and E5 actuators are used, the load frame crosshead weighs approximately 100 pounds.

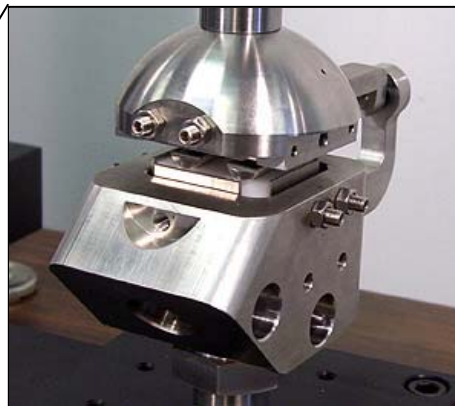
**T slotted baseplate option** - with an adapter for combined axial and torsion loading.



**Multiple Biobath options** - with an adapter for combined axial and torsion loading.



800LE3 Test System fatigue testing spinal disc implants



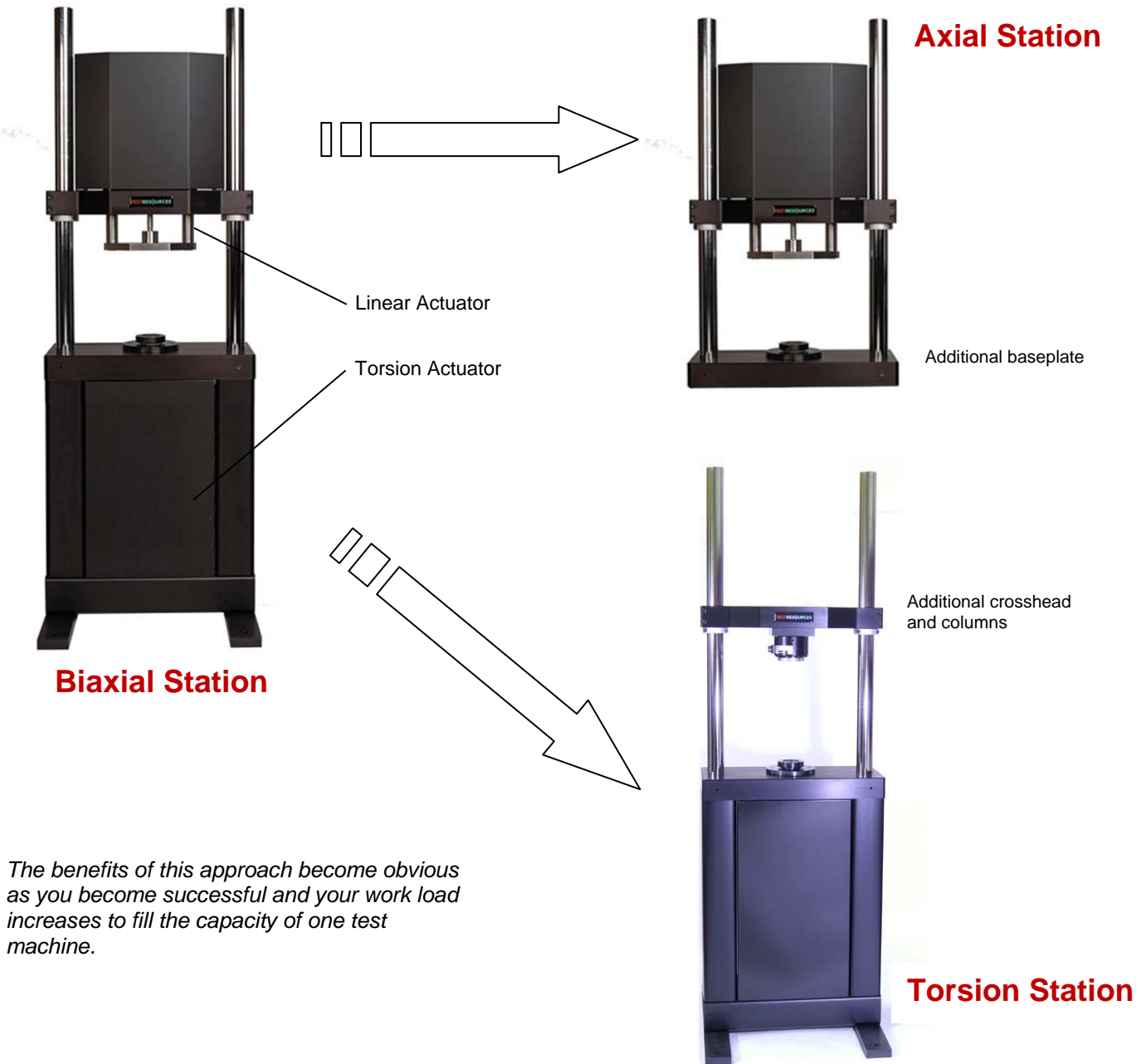
**Test Fixtures** to match ASTM and ISO Test Standards:

- ASTM F2346 Spinal Discs
- ASTM F543 Bone Screws
- ASTM F2118 Bone Cement
- ASTM F382 Bone Plates
- ISO 14801 Dental Implants
- ISO 7206 - Hip joint prostheses

We design and manufacture custom fixtures as a service to our customers.

## Modular Approach brings you two machines for the price of one

The modular design of the 830 load frame makes it possible, with the addition of inexpensive parts, to reconfigure a one station axial – torsion(biaxial) test station into two independent single station test frames – an axial station and torsional station.



The benefits of this approach become obvious as you become successful and your work load increases to fill the capacity of one test machine.

Contact TestResources at 800.430.6536  
or email us at [sales@testresources.com](mailto:sales@testresources.com)