

**Model 312Q
Electromechanical Test Machine
With Standalone Controller
Force Capacity 25 kN (5,500 lb)**

Overview

The 312 Series dual column electromechanical test machine is ideal for tension and compression tests at forces to 25 kN (5,500 lb).

- Standalone QS Controller (PC optional) – optional strain channel
- Load frame choices include wide width and extended travel versions
- High accuracy and high measurement resolution
- High data capture speed - to 1000 samples per second
- Closed loop servo control of load, position, and strain channels
- Ideal for repetitive standard test applications and cyclic tests.
- Customizable for production testing applications
- Optional machine control, data plotting and exporting software.



Featuring QS Servocontroller with Optional Xy Software

QS controller's serve applications needing one or two segments of machine control and data acquisition and for cyclic tests.

With the QS, you can ramp at a controlled constant rate to a load, position or strain and hold it. Stress relaxation and creep tests are now possible with this very affordable standalone controller. Also, users may perform long term sawtooth mode cycling tests in position or load control. Materials characterization tests often require data gathering as the loading cycle increases and then decreases in load and the QS can gather data in both directions.

The QS performs standard tensile (pull) and compression (push) testing applications where the testing application requires an adjustable constant test speed (e.g. in/min) or controlled loading rate (e.g. lb/sec). The controller produces a constant speed ramp or monotonic waveform that proceeds until the termination of the test or reaches desired position, load or time limits. It then returns the moving test head to home position. It is ideal for situations where a few tests are setup and run repetitively. The controller serves production testing environments where ease of use, reliability and operation without a PC is needed. The data measurement and control quality matches the needs of high precision test lab applications and the software option makes it easy to capture the curve and to perform calculated analyses. If test requirements change often, we recommend our R Series software based controller.

The QS controller is a powerful standalone controller that performs most mechanical tests.

QS controllers are servo controlled to so speed is constant, regardless of the sample load. QS controllers measure crosshead position using the test machine's position encoder, and sample force from the load cell. An optional strain channel is available for use with an extensometer or an external mounted LVDT. A high resolution 24 bit A/D converter provides high quality load and stain data. The encoder measures position change. The controller includes firmware with an LCD display to enable tests to be setup, stored, executed and data to be displayed. Resulting test data is stored or available as data for use by a PC equipped with Xy software. In addition, the QS controller includes calculated analyses that help improve operator efficiency.

QS controllers features:

- Operator can set up the machine or the test using a keypad or optional Xy software.
- Performs single ramp tests of constant speed or constant load rate
- Displays data during the test - including load, position, and position rate. Chosen results displayed after test.
- Calculates high, low, mean and standard deviation for a group of tests.

- Stores up to 200 results to memory – including date, time, specimen ID plus all calculated parameters.
- User settable data acquisition rate from 0.03 to 1,000 samples per second.
- English, Metric and SI engineering units (Lb, N, kgf, gf, ozf, kN, mN, in, cm, or mm)
- One pre-test control segment can be used as a pre-load or jog function.
- End channel mode may be set for load, position, time or sample break.
- Use with self identifying (or standard) load cells.
- Sample geometries for stress calculations include Round, Flat, Beam, custom area and width.
- Supervisor mode locks down changes to parameters.
- Load calibrations exceed ASTM E4, BS EN ISO 7500-1:2004, DIN 51221 and JIS B7721 standards.
- Performs dual segment ramp tests (ramp and hold, cycling, tension/compression)
- Internally saves up to 6 different test setups – optional Xy software enables that to increase.
- Stores up to four multipoint load cell calibrations.

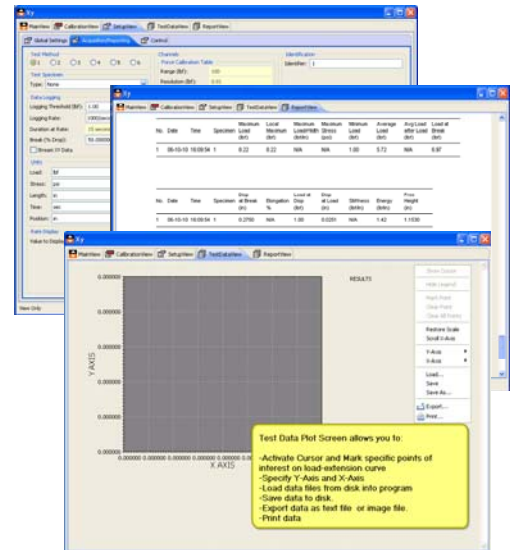
XY Software Option for QS Controllers

Xy Software is available at three different levels of functionality. All three packages enable test operators to set up, store, run test and plot data using a separate PC with a USB port. Printing results is also then possible.

XyPort is the entry level configuration that imports and exports test and machine data between a PC and the controller. It allows the operator to edit, store, upload and download test methods, calibrations, calculated test results, and raw test data captured by the controller. The ASCII data can be transferred, stored and analyzed by programs such as Microsoft Excel.

XyPlot extends XyPort by enabling it to create Curve Plots, such as load-extension curve plotting for viewing, printing or exporting after the test concludes. Like XyPort, the data is archived automatically at the conclusion of each test.

XyLive extends overall capabilities even further. It is used for applications that require live data plots, expanded data storage capabilities or for users who want to develop their own analysis packages. XyLive enables live data streaming which removes the 15000 sample buffer limitation of the controller. This is essential in cyclic testing applications and applications where large amounts of captured data are anticipated.



QS Calculated Analyses	Analyses extract values from or calculate values using the test data collected when a test procedure executes. The calculated values are saved as test results.
Load/Deflection/Position	Average load from load threshold to end position Average load from position 1 and position 2 Position measured at user settable load value Position measured at peak load value Position1 measured at Load1 Position2 measured at Load2 Position3 measured at Load3 Position measured at sample break point Load measured at sample break point Load measured at user settable position value. Load1 measured at position1 Load2 measured at position2 Load3 measured at position3 Percent elongation of sample as per cent of gage length
Maximum/Minimum	Maximum load during the test Maximum stress (peak load divided by specimen area) Maximum load divided by user settable sample width Minimum load during the test
Modulus/Strain Ratio	Modulus of elasticity Offset yield Shear modulus
Miscellaneous	Energy or area under force-position curve – between position A and B Static & kinetic coefficients of friction analysis Sample stiffness and load frame compliance based on user settable position values Head movement at user settable load threshold – for Free Height – employs absolute zero function – for springs, shock absorbers, bottle tops, push-on/pull-off, insertion and extraction of connectors. Analyses – made to order

312Q Specifications

Model	312Q	312QE	312Q-W
Total Vertical Test Space	1090 mm (42.9")	1430 mm (56.3")	1090 mm (42.9")
Crosshead Travel	900 mm (35.4")	1240 mm (48.8")	900 mm (35.4")
Space between columns	426 mm (16.8")	426 mm (16.8")	Made to order
Height	1440 mm (56.7")	1780 mm (70.1")	1440 mm (56.7")
Width	852 mm (33.5")	852 mm (33.5")	Made to order
Depth	572 mm (22.5")	572 mm (22.5")	572 mm (22.5")

Control & Measurement Channels	Load, Position, Strain (optional)
Max data acquisition & Control	1000 samples per sec
Max Load Rating	25 kN 2500 kgf 5,500 lb
Speed Range at full capacity load	0.005 - 1000 mm/min 0.0002 - 40 in/min
Load Measurement Accuracy	±0.5% of reading to 1/100th of load cell full scale rating. Meets or exceeds ASTM E 4, BS 1610, DIN 51221, ISO 7500/1, EN 10002-2 standards.
Strain Measurement Accuracy	±0.5% of reading to 1/50 of full scale with ASTM E83 class B or ISO 9513 class 0.5 extensometers. Meets or exceeds ASTM E83, BS 3846, ISO 9513, and EN 10002-4 standards.
Crosshead Speed Accuracy	±0.2% of set speed at zero load
Operating Temperature:	+10 °C to +38 °C (+50 °F to +100 °F)