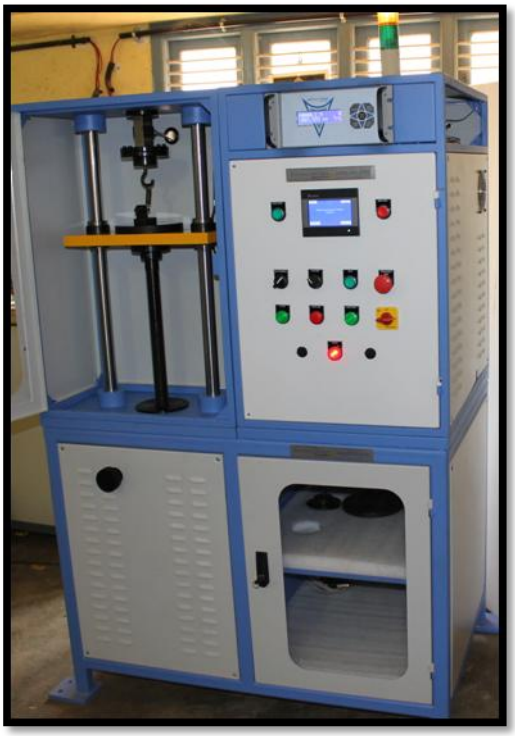
SPECIFICATION SHEET

Spring Testing System

(Computerized Version)

MODEL: QSTS – 04C

Quality Sense Technologies
Measuring Solutions
Torque, Force Sensors, Torque Wrench calibrator, Spring Testing Machines and custom Builds Equipment's.



Applications depending on the Configuration

- **Compression & Tension Springs**
- **Disc Springs**
- **Diaphragm Springs**
- **Belleville Washers**
- **Disc Washers**
- **Spring forms**
- **Shock absorber**
- **Rubber**
- **Gasket and seals**

And many more applications related to Load Vs Displacement Facility to control operations, to acquire, to store, analyze data and to create test report.

Importance of Spring Testing machine & its accuracy

- Springs are normally manufactured for a specific purpose.
  Spring reliability equals to product reliability. Hence, a spring manufacturer should ensure that the spring manufactured by him will meet his customer specification by testing with a suitable spring testing machine.
- Most spring tests require the measurement of a load at a specific height. This requires the testing machine to measure load and height simultaneously to achieve the accurate and meaningful result. The accuracy, precision, repeatability and reproducibility of test results depend on the features and performance of the load testing machine.
- The deflection of the load cell itself, deflection of the loading frame, calibration accuracy of load and deflection measuring system affects test results.
- we understand the challenges and have perfected the technology to manufacture high quality spring testing machines.

Features

- Computer controlled motorized version.
- High-stiffness loading frame with precision alignment through linear bearings and two column design for more accurate results.
- Designed to reduce the induced variations during the testing process. It improves the consistency of results by reducing variations that will occur naturally between different operators and even the same operator at different times.
- Designed for application of load with minimum physical effort and enhance safety of the operator during the test and assuring more accurate results.
- The system consists of a motorized loading frame with a provision to mount the load cell depending on the range of test, spring under test and the display unit.
- Control panel consists of computer, data acquisition unit, AC drive unit and ON/OFF switch.
- The System is provided with an enclosure to avoid dust.

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- The following operations are controlled through computer.
  - High speed control to approach testing point and low speed near the testing point to ensure fast. Accurate and efficient test.
  - Inching operation to set the position of the load cell and the test spring.
  - Automatic emergency stop to avoid overloading of the load cell.
  - Separate display to set the displacement value (say 98% of the target value) switchover from high speed to low speed for accurate measurement of target value.
  - Variable speed adjustment of cross head with an accuracy of 1mm/min.
  - Manual or automatic mode of operation.
  - Facility to set sampling mode or cycling mode.
  - Simultaneous display of load and displacement values using load cell and non contact optical scale.
  - Digital control electronics provides high accuracy and fast response.
  - Suitable for compression or tension springs either for performance or for production tests.
  - Mechanical and electronic over load protection for all range of load cells.
  - All digital electronics for reliability, durability, and measurement accuracy.
  - Different range of load cells enables testing of wide range of springs with sufficient accuracy.
  - Easy to remove load cell and indicator for recalibration.
  - Tare facility for load and displacement.
  - Software to test the spring and store data of:

    Load Vs displacement Test, Process capability Test, Repeatability & Reproducibility Test

Specifications

Customer has to choose the capacity of the machine, displacement range and resolution, No. of Loadcells required to cover the various sizes of springs to be tested from the below table.

Machine Capacities in N			1000, 2000, 5000, 10000, 20000		
Depth day light (depending on Max. length and deflection of spring) in mm			Either 200, 300, 400 500 or 1000 depending on the spring to be tested		
Crosshead travel (displacement range) in mm			Either 200, 300, 400 500 or 1000 depending on the spring to be tested		
Displacement resolution in mm			0.001 (1 micron), 0.005 (5 micron), 0.01 (10 micron)		
Load cell ranges in N	0.2 to 2	0.5 to 5, 1 to 10, 2 to 20	5 to 50, 10 to 100, 20 to 200	50 to 500, 100 to 1000, 200 to 2000	500 to 5000, 1000 to 10000 2000 to 20000
Load cell resolution in N	0.0001	0.001	0.01	0.1	1
Load cells Accuracy			0.5 of reading from 10-100% of capacity or 0.2% FS		
Parallelism between stationary platform and load cell plate.			<20 µmm		
Operating Voltage			5 or 10 ± 5% VDC		
Operating Temperature			+10 °C to +55°C		
Storage Temperature			+10 °C to +60°C		
Atmosphere			Designed for use under normal laboratory conditions. Protective measures may be required if excessive dust, corrosive fumes, Electromagnetic field or hazardous conditions are encountered.		
Dimensions & Approx. Weight			Depends on the capacity of the machine, will be provided on request.		

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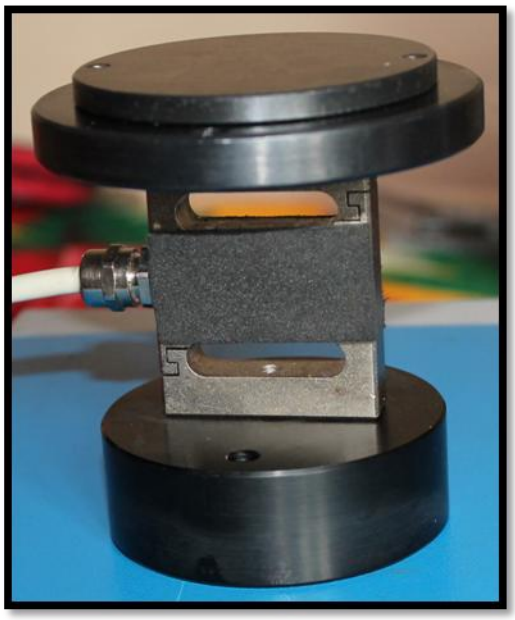
Digital Display Unit

- High resolution LCD Display unit with feather touch keys to read Torque in **Trace mode**, **Peak hold** & **First peak mode** with high sampling rate of 2400 Hz..
- Selectable unit of measurement, N, kgf & lbs.
- Operates on 230 V 50Hz A.C.
- Suitable for Compression and Tension operation.
- Combined accuracy of the Force sensor and the display unit (including measurement uncertainty) better than 1 % of the reading from 10% to 100 % of the range.
- Calibration facility
- RS-232 Output to log the data in the computer using suitable software.

Force Sensor



- Strain gauge based sensors
- Rated output (Sensitivity): 2 mV/V ± 10%
- Bridge resistance 350 ohms nominal.
- Cable length: 2.5 metres.
- Model No. QFS – 02S

Accuracy (Max Errors)

Non Linearity ..... ± 0. 1 % of rated output
Hysteresis..... 0. 25 % of rated output
Reproducibility..... 0. 2 % of rated output
Non – Repeatability..... 0.1 % of rated output
Zero Return..... ± 0.04 % of rated output

ENVIRONMENTAL

Compensated Temperature Range.. -10 °C to + 40 °C
Operating Temperature Range..... -20 °C to + 60 °C
Effect of temperature on output..... ± 0.005% of rated output/°C
Effect of temperature on zero..... ± 0.005% of rated output /°C

Electrical

Rated output (Sensitivity)..... 2 mV/V ± 10% of rated output
Zero Balance..... ± 2% of rated output
Bridge resistance..... 350 Ohms- nominal
Recommended Excitation Voltage... 10 VDC
Maximum Excitation Voltage..... 15 VDC
Insulation Resistance ..... 1000 Mega ohms or more

RATED CAPACITIES ...

Force in N	***1, 2, 5, 10, 20***	***50 , 100***	***200 , 500 , 1000***	***2000, 5000, 10000, 20000***

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Optional Features

- Display of Stiffness (spring rate or spring constant)
- Four column rod for higher range of machines
- Loadcell and Frame deflection compensation facility in microprocessor based display unit through soft ware correction- especially required for low deflection measurements.

Optional Accessories

- Compression adapters for testing each type of spring
- Tension adapter for testing each type of spring

Important Note

- In view of continuous improvement in Design and performance, specification is subject to Change without notice.
- Consult factory for more technical information

Factory Contact Details

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