2017

MICROTEST

EM0 Series Single Column Tabletop Model

Electromechanical Universal Testing Systems

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MICROTEST AT A GLANCE

MICROTEST, S.A. has over 25 years experience in design and manufacturing of high quality electromechanical and hydraulic testing systems with force capacities ranging from 500 N to 5000 kN. MICROTEST is especially well-known for its scientific and technical expertise, superior product and service quality, and reliability in materials testing solutions. Microtest testing systems are compliant with international standards and designed carefully to meet the requirements of all common materials testing standards, such as ISO, ASTM, DIN, TAPPI, GB, JIS, ANSI, NAS.

Microtest universal testing systems are fast and easy to operate. Providing an ideal balance between functionality and cost, these systems are suitable for performing diverse mechanical tests on a wide variety of materials and components, whether for routine quality control and product testing or research projects and activities. Microtest universal testing systems are extensively used worldwide in universities and research centers as well as a broad range of industries from metals, polymers and composites to concrete, textiles and fibers particularly in the manufacturing, automotive, aerospace, energy, biomedical and construction sectors.

OVERVIEW

Microtest EM0 Series universal testing systems are **single-column tabletop** electromechanical testing machines suitable for performing tensile, compression, flexure/bend, shear, friction, peel, tear and low-frequency cyclic testing where the maximum required force is less than **10 kN** and lab space is limited. A wide choice of load cells, extensometers, grips, specimen holders, fixtures and other testing accessories allow the EM0 Series testing frames to be used for accurate and repeatable mechanical testing of plastics, polymers, composites, rubber, textiles, fibers, wires, cords, yarns, threads, medical devices, small components, thin films, paper products, adhesives, foams and many more.

In EM0 Series testing frames, the upper moving crosshead is actuated by a high performance electromechanical drive system and a single lead ball screw. The preloaded ball screw along with a precisely-aligned, hard chrome plated guidance column provide superior stiffness and rigidity for these testing frames.

Microtest EM0 Series universal testing systems feature high resolution digital control electronics and powerful servo motor drives, both essential for precise and smooth mechanical testing. These testing systems integrate a digital closed-loop servo control system with a reliable electromechanical drive to perform tests in load, position (displacement) and strain control modes at force capacities ranging from **500 N** (112 lbf) to **10 kN** (2,250 lbf).

The EM0 Series universal testing systems provide a single-zone test space in which the test specimens can be loaded/unloaded with minimal effort. This feature is further enhanced by a programmable switch mechanism that allows operators to quickly set the upper and lower crosshead limits at any point within the vertical test space.

Microtest EM0 Series universal testing systems can be modified as required to suit the individual testing requirements and needs of our customers.

Microtest EM0 Series tabletop universal testing machines

FEATURES

- Single-column tabletop universal testing frames featuring superior stiffness and precision alignment for more accurate test results and reproducibility
- High speed, high precision electromechanical drive systems with a maintenance-free powerful servo motor and a single pre-loaded ball screw
- High resolution digital closed-loop servo controls to test in load, crosshead position (displacement) and strain control modes
- Full software control (cyclic capability optional)
- Convenient test setup
- Control handset or control panel for enhanced usability and productivity (optional)
- Ergonomic working height and design
- A low weight, small footprint and space-saving design allow the EM0 Series universal testing systems to fit easily on to any laboratory table
- Advanced load cell technology for faster testing and reduction of inertial errors
- Automatic recognition and calibration of load cells, extensometers and other transducers
- A complete selection of load cells, extensometers, grips, specimen holders, fixtures and other testing accessories
- Test cam for video recording (optional)
- T-slot base platen (optional)
- Compatible with various types of video extensometers, environmental chambers, high temperature furnaces and temperature-controlled fluid baths
- Design for both static and dynamic testing on a variety of materials and components
- Single phase electrical power supply of 120/220 VAC ± 10%, 50/60 Hz
- Totally pre-calibrated for the scope of testing performance, precision and accuracy
- Meets or exceeds requirements of all national and international standards for materials testing systems
- Full CE compliance

SAFETY

To ensure operator safety and compliance with the latest international safety directives, the design and engineering of Microtest electromechanical universal testing systems incorporate all the latest safety features, including:

- A bright red ISO-approved emergency stop button
- Operating-mode selector and drive off switches
- System status light indicating whether the load frame drive is energized and ready for working
- Automatic limit checking for crosshead over-travel, overload, over-voltage, etc.
- An auto frame standby mode that automatically stops the testing frame when the load/strain transducers, control electronics or computer system get disconnected or stop working properly
- Dual level mechanical limit switches to stop the moving crosshead at predetermined points
- Limit-setting and configurable alarms for load, crosshead position, strain or any other measured/calculated channel
- Test space transparent safety shield to protect the operator from flying specimen fragments or other hazards

ACCESSORIES

The utility of Microtest EM0 Series universal testing systems is further extended by a broad choice of system options, grips, fixtures and accessories:

- A complete range of load cells, extensometers (including axial, extended length and high temperature extensometers) and other transducers
- A wide variety of manual and pneumatic grips with various jaw inserts (faces), specimen holders and fixtures
- Compression platens
- Flexure / bend fixtures
- Grip control kits for increased productivity with pneumatic grips

Examples of the testing accessories compatible with the EM0 Series universal testing systems are shown below.

Furthermore, the EM0 Series universal testing systems are in full compatibility with the auxiliary testing equipment, such as video extensometers, environmental chambers, high temperature furnaces and temperature-controlled fluid baths. Using the proper testing configuration, these testing systems can be used to conduct a broad range of mechanical tests, including but not limited to:

- Tensile / compression
- Flexure / bend
- Shear / friction / tear / peel

If required, all of the mentioned testing accessories and auxiliary equipment can be tailored to suit the individual testing requirements and needs of our customers.

10 kN
Vise Action Grip

100 N
Screw Action Grip

1 kN
Pneumatic Grip

2.5 kN
Pneumatic Grip

96 mm
Compression Platen

50 kN
Flexure Fixture

2 kN
Pneumatic Cord and Yarn Grip

1 kN
Pneumatic Pincer Grip

SCM3000 DIGITAL CONTROL SYSTEM AND TESTING SOFTWARE

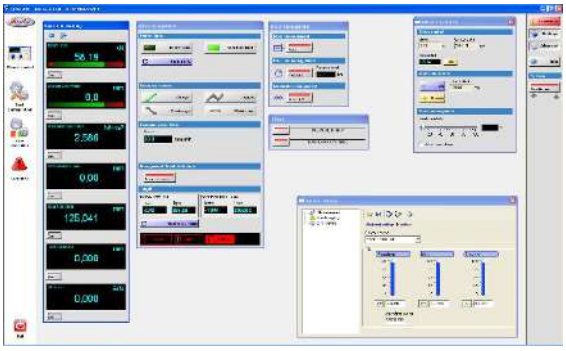
Microtest EM0, EM1 and EM2 Series electromechanical universal testing systems are controlled by **SCM3000 digital controllers**, designed and developed by Microtest specifically to meet the requirements of the most demanding materials testing applications. SCM3000 digital controllers deliver high precision closed-loop servo control and a fast 1000 Hz data acquisition and control loop rate. This capacity allows operators to generate high resolution test data for more meaningful analysis and achieve high accuracy across test runs. If required, the data acquisition rate can be increased by several hundred times (optional).

SCM3000 control and data acquisition electronics contain a high resolution 8-channel analog-to-digital (A/D) converter, a high performance 32-bit digital signal processor (DSP), and USB or Ethernet interface for PC communication. In addition to the 8 analog input channels (+/- 10V DC), there is a digital (pulse) input channel which is employed for precise position measurement and control. SCM3000 digital controllers include an integrated signal conditioner for the load channel. Some applications may also require direct strain measurement from the specimen or load/strain control. Sensor conditioner cards can be added to the SCM3000 electronics and these are directly compatible with extensometers and LVDTs, as well as load cells or other devices with +/- 10V DC output signal.

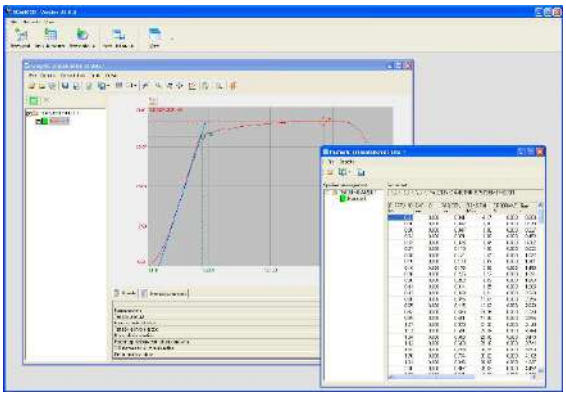
SCM3000 digital controllers can take up to two additional signal conditioner cards for the strain channel(s) as standard but this can considerably be increased using a Channel Expansion Module (optional). This provides signal conditioning and calibration for up to seven transducers which may be used for control and/or data acquisition. An analog output and digital I/O card is also available (optional), allowing connection of analog chart recorders and plotters.

When coupled with the SCM3000 digital control system, **SCM3000 modular software** enhances the capabilities and versatility of Microtest electromechanical universal testing systems for accurate and repeatable mechanical testing of materials, components and finished goods. SCM3000 is a powerful and versatile, yet easy-to-use interactive testing software with advanced configuration, control and safety features. This testing software includes a machine status bar presenting the current status/functions of the testing system and several configurable live displays/graphs for the raw data and measured values, as well as the test results and required calculations. SCM3000 software comprises a set of modules (applications), including **Configuration**, **Methods Editor**, **Test Control**, **Data Analysis** and **User Management**. Each designed for a specific purpose, these modules provide utmost flexibility to modify the preset standards-compliant test methods or create new ones, design complex test sequences, run tests, analyze data and report results using standard or custom-built templates containing test information, graphs, tables, lists, etc. Depending on your workflow needs you can setup automatic export options for the test data and results: ASCII, Excel, PDF, plain text, Word and image files. Moreover, the Data Analysis module provides an intuitive interface to recall and analyze the test data, display and modify the results and generate test reports over time.

SCM3000 software offers the optimum solution for any testing requirement. Using this software, operators can control all of the functions of the testing system, providing ultimate convenience of operation. Besides, external devices such as video extensometers and test cams can be connected to SCM3000 software and defined as external channels in the Configuration Module.



SCM3000 Test Control module



SCM3000 Data Analysis module

SPECIFICATIONS

MODEL		EM0 / 05 , 1 , 2 / FR			EM0 / 3 , 5 , 10 / FR		
Force capacity		500 N ; 1 kN ; 2 kN			3 kN ; 5 kN ; 10 kN		
Maximum test speed [mm/min]		500 - 2500			500 - 2500		
Minimum test speed [mm/min]		0.0005 - 0.005			0.0005 - 0.005		
Position control resolution [µm]		0.005			0.005		
Axial stiffness [kN/mm]		10			40		
Free distance [mm] (F) (*)		66 - 110			66 - 110		
Total vertical test space [mm] (**)		750 - 1000	1000 - 1250	1000 - 1250	1000 - 1250	1000 - 1250	1150 - 1300
Total crosshead travel [mm] (S)		510 - 760	760 - 1010	760 - 1010	760 - 1010	760 - 1010	910 - 1060
Approx. dimensions [mm]	Height (H) Width (W) Depth (D)	1010 - 1260 300 390	1260 - 1510 300 390	1260 - 1510 300 390	1260 - 1510 300 390	1260 - 1510 300 390	1410 - 1560 300 390
Motor		AC servo motor			AC servo motor		
Power requirements		Single phase, 120/220 VAC ± 10%, 50/60 Hz			Single phase, 120/220 VAC ± 10%, 50/60 Hz		
Accuracy class (meets or exceeds)		ISO 7500 Class 0.5 or ASTM E4			ISO 7500 Class 0.5 or ASTM E4		

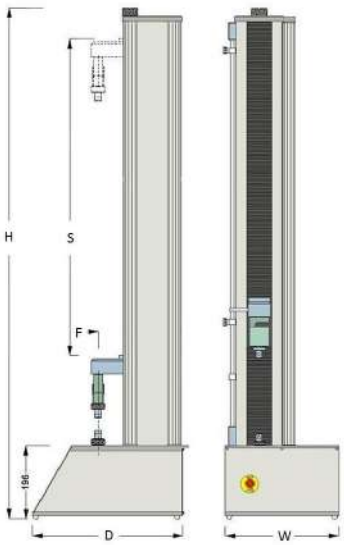
(*) The distance between grip center and column cover.

(**) The distance from the top surface of the base platen to the bottom surface of the upper moving crosshead, excluding load cell, grips and fixtures.

NOTE: The specifications listed can be modified within the ranges shown in the above table to suit the individual testing requirements and meet the exact specifications required by our clients. We would be glad to give information on Microtest's design and engineering capacities upon request.

NOTE: Universal testing systems with specifications other than stated above are also available upon request (**customized models**).

NOTE: Due to Microtest continuous product improvement policy the specifications listed are **subject to change without notice**.



Principle drawing of the EM0 Series tabletop universal testing frames

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