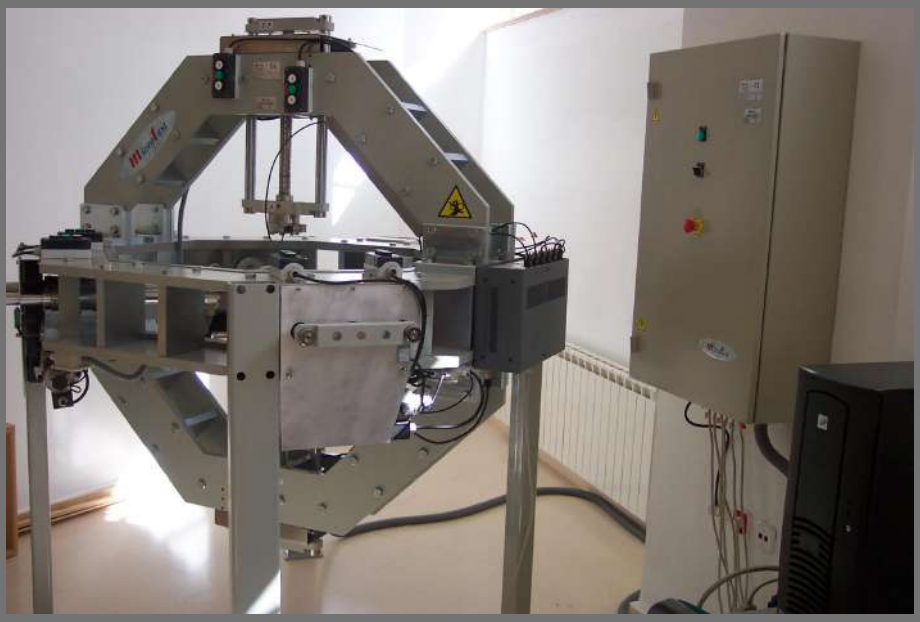
2017

MICROTEST

MAEFH Series

Servo Hydraulic Biaxial and Triaxial Testing Machines



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OVERVIEW

MICROTEST MAEFH Series servo hydraulic multiaxial (biaxial and triaxial) testing machines suitable for testing different type of materials: steel, aluminum alloys, fiber reinforced composites such as plastics, glass fiber reinforced epoxy, graphite fiber reinforced epoxy etc. These testing machines includes a rigid loading frame for maximum stiffness and precision in testing. Load frame size depends on the application and sample size.

Loading Capacities: from **5 kN to 500 kN** along each axis (synchronized tensile/compressive loading along perpendicular directions).

Load Capacity	Frame stiffness
5 kN	50k N/mm
20 kN	100 kN/mm
50 kN	250 kN/mm
100 kN	600 kN/mm
200 kN	800 kN/mm
500 kN	1200 kN/mm

MICROTEST **MAEFH** Series multiaxial testing machines are servo controlled hydraulic testing systems with complete set of elements for individual axial tests or combined multi-axial tests. This system features a High Stiffness multi axis Testing Frame with 4 servo-hydraulic actuators in the case of biaxial testing machines and 6 fatigue rated servo-hydraulic actuators for tri-axial systems. The actuators are working in pairs in two orthogonal axis. The actuators can be individually controlled and programmed for independent or synchronized control load, position or strain.

Each servo-actuator has its own set of load cells, integrated displacement transducer, manifold and servo valve (typically MOOG), hydraulic or mechanical grips and fixtures, rubber isolation mounts. The whole system includes the MICROTEST Hydraulic Power Unit with centralized control. The controller unit DMC4000/N is able to control these set of N servo actuators and generate high precision states of stress along several axis: XY plane in a biaxial mode or XYZ in a tri axial system. Tension, compression tests can be performed at constant speed, constant load rate static tests, high speed, and high frequency load controlled fatigue tests. The microprocessor control system DMC4000 allows fully automatic test cycle with high-speed closed loop control, data acquisition, function generation, and transducer conditioning for at least 3 channels per test station or actuator for High performance and long term reliability. The actuator force rating, type and quantity are configured to application requirements. The same system can be used to perform single axis tests using two of the actuators. The unit is completed with Personal Computer, printer, licensed SCM4000/4 software and spares.

TECHNICAL SPECIFICATIONS

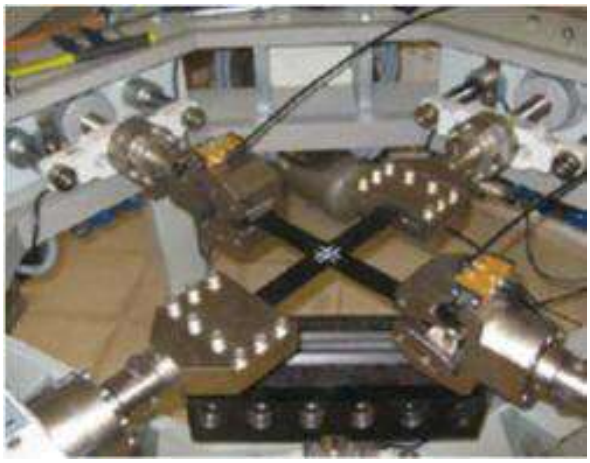
- Specimen Loading Control: Options for both displacement and load control loading independently along each axis.
- Load Cells: From 5 kN to 500 kN dynamic capacity, according to customer requirements, along each axis, accuracy: 0.5% or 1% readout or better, Resolution: 0.05% of full range or better.
- Displacement Transducers: Ranges according to customer requirements, along each axis, accuracy: better than 1% of readout. Resolution: 0.05 % of full range or better.
- Dynamic range and loading rate are defined according to customers requirement: selection of Hydraulic Power Unit, Servovalves, etc.
- Sampling Rate for Load cell and displacement transducers: Minimum 10 kHz.
- Data acquisition and analysis, signal conditioning and control hardware and software. Programmable Frequency, amplitude, phase difference and waveform of loading along each axis with standard waveforms – Sine, Triangular, Square and Ramp Signal. Graphical output of load versus displacement, stress versus strain curves etc.
- Loading along each axis could be in same phase, out of phase or may other phase difference set before starting the test. It is programmable.
- Grips for Tension/Compression are provided according to sample size and user requirements.
- The grips are according to Material Testing Standards such as ISO, EN, ASTM. The grips are capable of transferring tensile as well as compressive load e.g. dynamic testing with zero mean wherein the specimen will undergo tensile and compressive loading both in one loading cycle.
- Programmable Frequency, amplitude, phase difference and waveform of loading along each axis with standard waveforms – Sine, Triangular, Square and Ramp Signal.

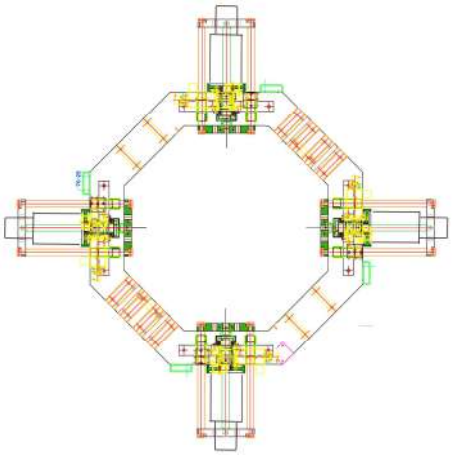
BIAXIAL AND TRIAXIAL LOAD FRAMES

High rigidity Loading structure floor mounted consisting of two orthogonally intersecting test frames, each with two opposing actuators systems.

The main frame, for biaxial tests allows testing of cruciform type specimens or square. This structure comprising two horizontal actuators is reinforced to form an octagonal assembly that confers more stiffness to withstand the possible lateral loads that may occur and to prevent deformation of the test frame.

Optionally another vertical frame, located orthogonally with respect to these two sets can also be added giving another octagonal structure for **3 axis tests**.





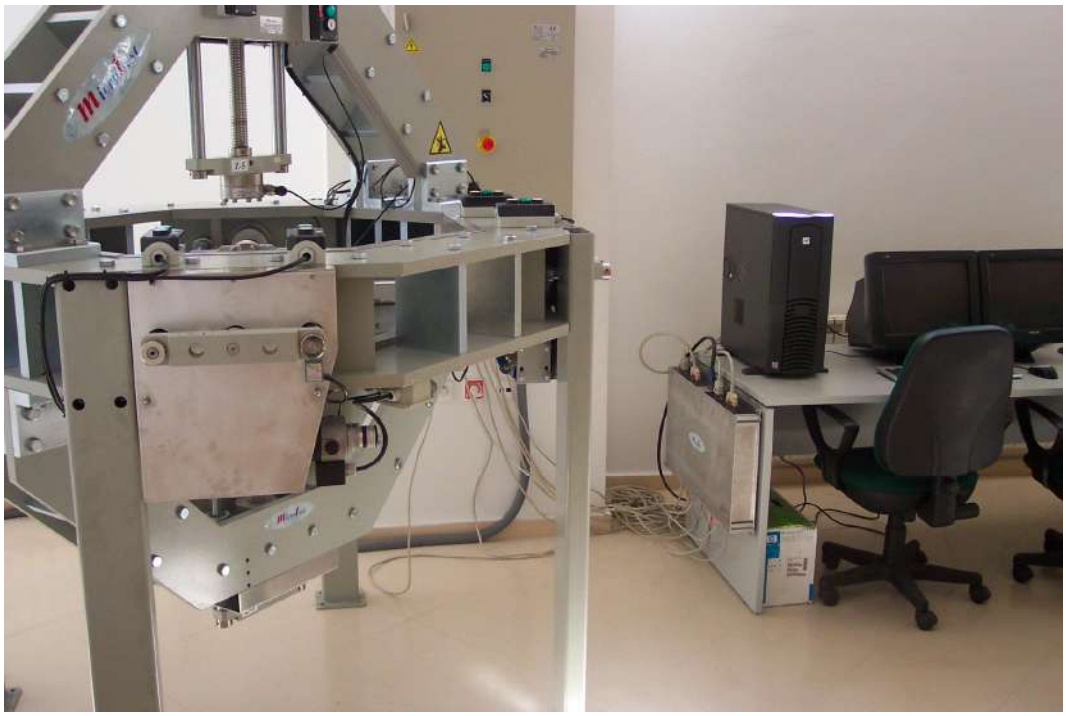
SERVO HYDRAULIC DYNAMIC ACTUATOR

- Axial Hydraulic Servo Dynamic Actuator for maximum dynamic force capacity
- Stroke length defined according to customers' requirements
- Double acting with equal area on both sides.
- High side load resistance and accurate axial alignment of the actuator.
- Maximum operating pressure of the actuators: 210 bar.
- Designed for testing speed, loading rate or frequency according to customer requirements.
- Displacement transducer (Magnetostrictive type)is in-built (coaxially mounted within the actuator) with electrical connector mounted on the body of each actuator.
- The servo valve manifold is mounted close to or on the body of the actuator.
- The ports on the mounting face of the servo valve manifold matches the servo valve supplied
- Actuator are suitable for Servo System 46 or equivalent mineral based hydraulic fluid: Mobil DTE 25, Shell Tellus 46 AW

Note

DMC 4000/N is the expansion of DMC4000 system for N actuators (with at least 3 control and measurement channel per actuator: force, displacement, strain).

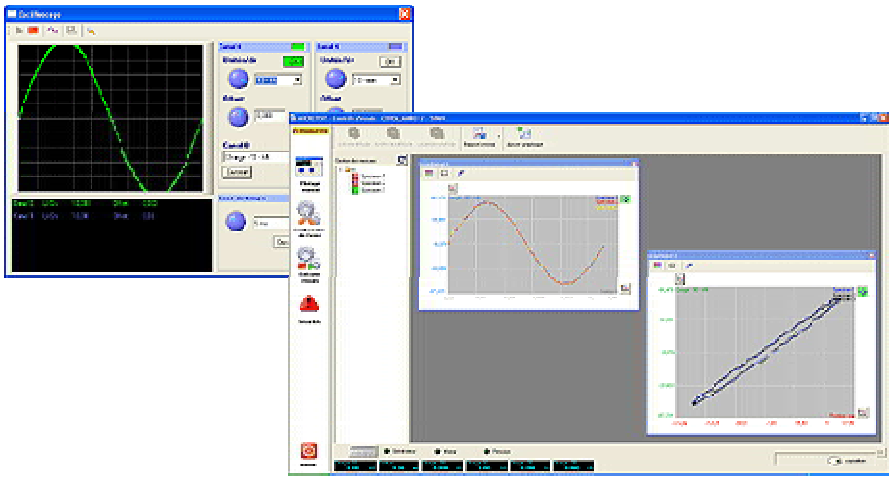
SCM4000/N is the combined version of SCM4000 software to be used with N actuators simultaneously, including synchronization and common acquisition features.



SCM4000 TESTING SOFTWARE

The main features and characteristics of SCM4000 testing software are as follows:

- Set-up and configuration of the display screen and control panel
- Set-up of limits and gain controls
- Security with user passwords
- Automatic calibration and balancing of transducers
- User calculation creator for defining custom calculations
- Prompted Test Sequence Creator
- Live runtime test plots with automatic scaling and zoom-in/out
- Report generation with basic report templates included
- Monitoring of system and system service histories
- On-line help and reference guide
- API (Advanced Programming Interface) for data access or automation
- Automatic grip control
- Saving and retrieval of test methods and data
- Example test methods included for easy test creation
- Interactive User Learning CD



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