



**UNIVERSAL TEST
SYSTEMS**

**SERVO HYDRAULIC
UNIVERSAL TENSILE
TEST MACHINE**

6500



PRODUCT MODEL

U6500/1000	Servo-Hydraulic Universal Tensile Test Machine 1000 kN, 220-240V 50/60 Hz
U6500/1500	Servo-Hydraulic Universal Tensile Test Machine 1500 kN, 220-240V 50/60 Hz
U6500/2000	Servo-Hydraulic Universal Tensile Test Machine 2000 kN, 220-240V 50/60 Hz
U6500/3000	Servo-Hydraulic Universal Tensile Test Machine 3000 kN, 220-240V 50/60 Hz

PRODUCT STANDARDS

Standards	EN 10002-1 ASTM A370, ASTM D695, ASTM E23, ASTM E139, ASTM E290 ISO 6892, ISO 1608 NADCAP GE-S400, CREEP
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DESCRIPTION

1000, 1500, 2000 and 3000 kN Capacity Universal Tensile Testing Machine is high capacity systems with single test space and suitable for tensile, compression, flexure tests on a wide range of different materials such as round, flat and profile specimens for quality control, product development, research or process development. Testing systems for brittle materials such steel or fasteners requires high stiffness load frames that minimize the amount of deformation energy that is stored in the frame.

Servo-Hydraulic Universal Tensile Testing Machines can be controlled via. Multifunctional Remote Control Hand Set that is located on the frame, Digital Control Unit or TMC304 software that installed on the PC connected to the Control Unit. Servo-Hydraulic Universal Testing Machine can carry out tensile and yield, compression, flexure tests with load and displacement controls.

The machines can be switched between load and displacement control during the test.

The Main Characteristics;

- Rigid 4 columns construction providing superior axial and lateral stiffness and precision alignment,
- Closed-loop servo controlled hydraulic power pack for accurate test control,
- High speed electronic control and data acquisition unit for accurate test results,
- Multifunctional Remote Control Hand Set for fast test setup and testing,
- Single test space design with convenient vertical testing clearance,
- Double acting servo-actuator mounted on top of the crossbeam
- Actuator with anti-rotation system to prevent the natural tendency of the actuator to rotate.





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- Long piston stroke for the most convenient and easy adjustment and testing of different sample lengths,
- Digital displacement transducer for the best positioning and measuring accuracy
- Easy calibration procedure,
- TMC304 Software,
- Chrome plated columns
- Hydraulic Wedge Actions Grips
- Grip control system mounted on the frame
- Compression platens or bending devices may be fixed directly into wedge grips,
- Limit switch on the piston as well as the safety limit valves on the hydraulic system,

Servo-Hydraulic Universal Testing Machine is consisting of Load Frame, Advanced servo controlled automatic power pack, Electronic Control Unit and Material Testing Software as standard.

Frame

Servo-Hydraulic Universal Testing Machines are manufactured 1000, 1500 and 2000 kN capacities. The double acting servo actuator, which is integrated on the upper crosshead, has a long piston stroke which makes vertical testing space accessible for easy and efficient testing of different samples lengths. Load cell for measuring the load is mounted between lower grip and base plate.

Displacement transducers that mounted in the piston are used for displacement measuring. External Extensometers (Video extensometers, Long Travel Extensometers, Automatic Extensometers or Clip-On Extensometers) can be synchronously used for displacement measurements if required.

Mono block Wedge Actions Hydraulic Grips are located between end point of piston and load cell that mounted on the base platen. Not any disassembly or tools needed for changing the jaws. The jaws that can be used for 0-60 mm thickness flat specimens and 6-60 mm diameter for round specimens are provided as standard depend on capacity of the machine.

SERVO CONTROLLED AUTOMATIC POWER PACK WITH SERVO VALVE

The Automatic Power Packs with Servo Valve, are advanced power packs can be used on any testing system ideal for R&D laboratories and Universities for advanced tests with P.I.D. Closed loop control. It can perform tests under load and displacement controls. The frequency of the P.I.D controller and data acquisition is 1000 Hz. automatic power packs are designed to supply the required oil to the load frames for loading, unloading or low cycle dynamic testing. All the operations of Data Acquisition and Controls System can be controlled from the touch screen front panel of a 7 inch LCD display or computer.

The power packs can control up to 4 different. For each frame there is one load cell (or pressure transducer) input and one displacement transducer input for control. There are an extra three analogue channels for other sensors such as





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load cells, pressure transducers, displacement transducers etc. built in the system.

The power pack automatically controls and supplies oil to the frame which is chosen by the user via the touch screen LCD digital control unit or by choosing the test type from the computer software.

The type of displacement transducer can be TTL or analogue (It must be same type for all frames).

The main specifications of the power packs are;

Up to 5 litre/minute pump delivery (max) 280 bar 3 kW motor rate

Loading-unloading with $\pm 0,5\%$ rate accuracy

Staying at constant load within 0,005% accuracy of the maximum load

The control of the load starts from 0,3 % of the maximum load capacity of the system.

All power packs can be connected to the computer through USB port for advanced test cycles, data acquisition and reporting. The modulus of elasticity, Poisson's Ratio and compressibility parameters is easily and properly evaluated by attaching LVDT or extensometers on to the sample. All the calibration values of the transducers and also all the test parameters for the last test is automatically stored on the control unit. All power packs incorporate a pressure safety valve for each frame separately and a cooling unit.

MULTIFUNCTIONAL REMOTE CONTROL HAND SET

Multifunctional Remote Control Hand Set designed for more practical process than Electronic Control Unit and PC. Piston can be moved up-down, can be adjusted test speed, can be adjusted position of grips and the jaws can be open/close by Multifunctional Remote Control Hand Set. Able to stop at maximum upper and lower position and automatically suspend when can be reached to maximum deformation of capacity should been with Remote Control Head Set.

Multifunctional Remote Control Hand Set that connected with a connection cable to Electronic Control Unit has LCD display can be seen values of load & deformation of the test.

The Universal Testing machine can be controlled (Start, Stop commands) by a computer with the software (given free of charge by TESTMAK). This software provides data acquisition and management for compression, tensile and splitting tensile test throughout the test execution. The advanced functions for data base management provide an easy navigation of all saved data. The test results certificate includes all descriptive information. Therefore, test parameters can be set and details about the test carried out such as client details, test type, specimen type, user info and other information required can be entered and printed out as well as test report and graph.

TCM304 Software is developed for testing tensile strength of Reinforcing Rubbed Steel Bars and Welded fabric for the Reinforcement and Prestressing of Concrete. The software includes control of machine, data acquisition, saving them and preparing reports. The user can prepare his own report and also can send the results to Microsoft Excel environment. The software accepts sample's weight, length, diameter and gauge length as input, and then the user can give start test command to the machine. The samples calculated diameter gives user a perspective about the density of rebar prior to the test.

The software continuously updates load, stress and elongation percentage till the break point. When the test is completed





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the yield point is calculated and indicated on the graph. Each report is a group of 42 samples where 14 different diameters had been entered. The software is prepared as making at least 3 samples for each diameter. This gives user a total report about all the batch. The report includes all standart limits and one can easily check whether the sample can be acceptable. These limits are minimum yield, minimum tensile, minimum break elongation value, Tensile per yield ratio etc. The user can zoom on the graph for further inspection Break elongation value can be synchronized with the manual measurement after the test has been completed for the users that do not use extensometer.

- Foreign Language Support and Customizable User Interface

All contents of experimental data and additional information can be organized by user. Software can be performed in x different languages.

- Capability to Save 24 test results of different specimens in one test folder

Test results, graphics and properties of 24 different specimens can be saved in one folder. Old test folders can be reviewed and be edited easily. Advanced

Graphic User Interface Software.

- Graphical data on the screen is refreshed simultaneously during test procedure

Load values can be monitored in high resolution graphics at every 100 milliseconds. User can highlight all 24 different specimen curves or preferred ones in different colors on the graphics. Zooming in–out and dragging can be done easily by mouse. Peak values of curves can be marked on the graphics and user can get load value of any point on the graph via high resolution.

- Able to save frequently used texts in memory and recall them when necessary

Frequently used information like name and location of the laboratory, type and dimensions of mostly used specimens are held in memory and can be written automatically by right clicking on information boxes and selecting frequently used text in menu.

- Capable to Access and use previously done test data

User can access any data of previously completed tests and use in his/ her new report since most of the tests have same structure and properties.

- Able to edit test parameters of the testing equipment through Software

All test parameters supported by testing equipment can be changed remotely via software. All test parameters specified by user are downloaded to the device before initialing the test procedure. By this way predefi ned device parameters will not cause errors in test results

- Graphical outputs and reports can be saved as a MS Excel worksheet

Test result parameters and graphics are transferred to MS Excel worksheet properly to give user a chance to edit any data and graph easily.

- Maximum Flexibility to edit report and graph templates

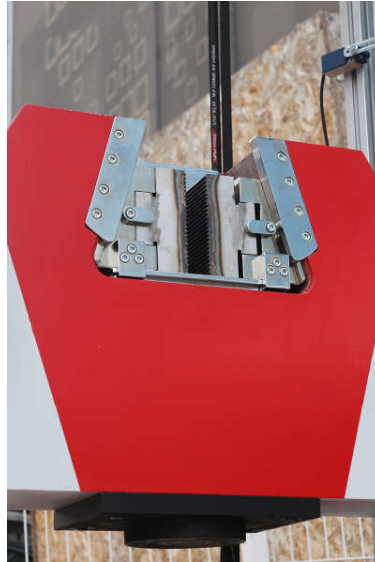
User can design his/her custom report template and graphic scheme in MS Excel. In software part, user will defi ne which data will be screened in which cell on the worksheet. Therefore , he/she will be able to monitor test results in his/ her specific design.



Performing the Test

The test is performed through the computer using TESTMAK's state-of-the-art software designed specially to ease the test and perform all the required calculations automatically.

When testing deformed reinforcement bars, it is usually difficult to measure the correct and effective diameter of the bar. To overcome this problem, TESTMAK is providing the diameter correction factor option within its software to automatically calculate the effective diameter by using the weight and the length of the tested bar.





Servo-Hydraulic Universal Tensile Test Machine

TECHNICAL SPECIFICATIONS

Product code	U6500/1000	U6500/1500	U6500/2000	U6500/3000
Capacity	1000 kN	1500 kN	2000 kN	3000 kN
Accuracy Class according to ISO 7500-1	Class 0.5	Class 0.5	Class 0.5	Class 0.5
Measurement of Strength	Universal load cell (traction-compression) for strain gauges			
Measurement range	From 1% to 100% of load cell nominal capacity			
Load Cell Repeatability	Better than or equal to $\pm 0.5\%$			
Force Resolution	5 digits with floating point			
Minimum / Maximum Test Speed at Full Load	0,5 to 50 mm/min	0,5 to 50 mm/min	0,5 to 50 mm/min	0,5 to 50 mm/min
Maximum Crossbar Travel Speed	350 mm	200 mm	200 mm	200 mm
Number of Columns	4 qty	4 qty	4 qty	4 qty
Column Diameter	100 mm	105 mm	110 mm	120 mm
No of Spindles	2 qty	2 qty	2 qty	2 qty
Spindle Diameter	120 mm	120 mm	120 mm	140 mm
Free distance between columns	540 mm	840 mm	750 mm	700 mm
Maximum Distance Between Traction Heads	780 mm	1000 mm	1000 mm	800 mm
Maximum Distance Between Compression Heads	780 mm	850 mm	850 mm	800 mm
Piston race	250 mm	250 mm	250 mm	250 mm
Piston Travel Speed	150 mm	100 mm	100 mm	100 mm
Displacement Resolution	0.001 mm	0.001 mm	0.001 mm	0.001 mm
Maximum Grip Load Pressure	280 bar	280 bar	280 bar	280 bar
Frame Dimensions	1000x800x2700 mm	1250x950x3300 mm	1300x1100x3750 mm	1400x1200x3850 mm
Approximate Frame Weight	3200 kg	7800 kg	9750 kg	10500 kg
Dimensions of the Hydraulic Group	1250x900x1200 mm			
Approximate Weight of the Hydraulic Group	275 kg			
Electrical power supply	380 V 50 Hz 3 phase	380 V 50 Hz 3 phase	380 V 50 Hz 3 phase	380 V 50 Hz 3 phase



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THANK YOU

FOR CHOOSE US

Dear business partners, thank you very much for believing in us and recommending our products to your customers; We sincerely believe that our company will grow even more thanks to you, our esteemed business partners.

You can reach us than our phones or e mail address 24 hours a day.

CONTACT US



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