

## SERVO HYDRAULIC UNIVERSAL TESTING MACHINE

### Product Code

|          |                                                                                    |
|----------|------------------------------------------------------------------------------------|
| UTM-6000 | Hydraulic Universal Testing Machine, Servo Controlled, 600 kN,                     |
| UTM-6001 | Universal Testing Machine Frame, 600 kN, 380 V, 50-60 Hz, 3 Ph                     |
| UTM-7000 | Hydraulic Universal Testing Machine, Servo Controlled, 1000 kN,                    |
| UTM-7001 | Universal Testing Machine Frame, 1000 kN, 380 V, 50-60 Hz, 3Ph                     |
| UTM-8000 | Hydraulic Universal Testing Machine, Servo Controlled, 2000 kN,                    |
| UTM-8001 | Universal Testing Machine Frame, 2000 kN, 380 V, 50-60 Hz, 3 Ph                    |
| UTM-0500 | Extensometer for Universal Testing Machine, 50 mm Gauge Length (Accuracy 0.01 mm)  |
| UTM-0510 | Extensometer for Universal Testing Machine, 100 mm Gauge Length (Accuracy 0.01 mm) |
| UTM-0520 | Extensometer for Universal Testing Machine, 50 mm Gauge Length (Accuracy 0.001 mm) |

### Standards

EN ISO 6892-1, EN ISO 15630-1, EN ISO 7500-1

### GENERAL DESCRIPTION

UTM-6000, UTM-7000 and UTM-8000 computer controlled servo hydraulic universal testing machines are suitable to test various metallic and non-metallic materials and can carry out tension, compression, flexural and bending tests. The capacity of UTM-6000 is 600kN, of UTM-7000 is 1000kN and UTM-8000 is 2000kN. On all models load cell is used for load measurement to achieve best load accuracy during test. The load accuracy of the systems is  $\pm 1\%$  down to 2% of the full capacity. Strain measurements are done by the electronic displacement transducers built in the machine. Displacement or strain measurement can be also done external extensometer fitted to the specimen. The accuracy of the strain measurement on frame is 12.5 microns.

UTM-6000, UTM-7000 and UTM-8000 systems are guaranteed to meet EN ISO 6892-1, EN ISO 15630-1, EN ISO 7500-1, ISO 679, ISO 1920-4, ASTM E 290 and other international and national standards. Servo hydraulic universal testing systems can carry out tension test, compression test, bend test and flexure test by two pace rate type including load control and displacement control . Those two control parameters can be switched during the test. According to the preset condition, the systems can realize constant-rate loading, loading according to preset curve, testing with constant-rate displacement.

With powerful testing software , UTM-6000, UTM-7000 and UTM-8000 systems can acquire, dispose automatically testing data, display real-timely stress-strain curve, load-deformation curve, load-time curve and other related curves, at the same time, can save, output, print test report and data with customized format. With the help of advanced Material Testing Software the machine can be widely used in ultimate R&D department, Universities and Academies, Quality control and Inspection department, calibration centers/laboratories and industry.



UTM-7000

## LOAD FRAME

Load frames used on Hydraulic Universal Testing Machines has a motor driving system to set distance between grips for test set up has a rugged six column construction for exceptional load frame rigidity. All models feature two test spaces for tension test and compression/flexure and bending test. User can quickly change between tension and compression/flexure and bending testing without having to remove heavy fixtures. This flexible design also helps to ensure safety, reduces operator effort and improves productivity. The distance between the grips can be set by motor driven hand set system for different specimens. With an open front hydraulic wedge grips user can change jaw faces and load specimen easily.

All frames are supplied complete with jaw faces, compression platens and bending fixtures.

## POWER PACK

Servo controlled hydraulic power packs with proportional valve and advanced power packs used on UTM-6000, UTM-7000 and UTM-8000 to perform tests under load and displacement controls. The frequency of the P.I.D controller and data acquisition is 1000 Hz. Power packs are designed to supply the required oil to the load frames for loading, unloading or low cycle dynamic testing and also hydraulic grips.

All the operations of Data Acquisition and Controls System can be controlled from the touch screen front panel of a 240x320 LCD display or computer. There are extra two analogue channels for sensors such as Load Cells, Pressure Transducers, LVDT's, strain gauges, extensometers etc. built in the system, and one TTL displacement transducer input exists for frame displacement measurement. Additional two analogue channels can be configured optionally on the order stage for different type of applications.

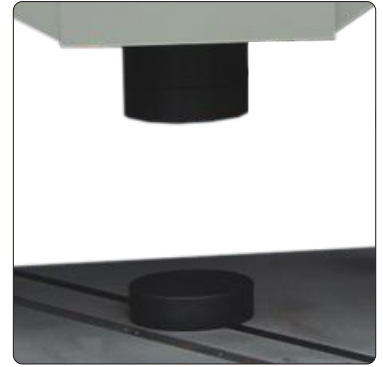
Power packs can be connected to the computer through Ethernet port for advanced test cycles, data acquisition and reporting. The modulus of elasticity, Poisson's Ratio and compressibility parameters is easily and properly evaluated by attaching extensometers or LVDTs on to the sample. All the calibration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

## FIRMWARE

- 2 extra analogue channels
- Instrumentation amplifiers for sensor excitation and amplification
- 65.000 resolution and 1.000 Hz control for each channel
- Ethernet port for connecting to computer
- 240x320 pixel LCD display
- Touchscreen operator panel
- Can execute load or displacement controlled tests
- Free of charge PC software for test control and advanced report printout
- Factory install English and Turkish languages



Testing Grips



Compression Platens

## Accessories

|                                 | UTM-6000                                                                      | UTM-7000<br>UTM-8000                                                                  |
|---------------------------------|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 1 Set of Tensile Grip           | Round jaws for dia. 13-26 and 26-40 mm<br><br>Flat jaws for 0-15 and 15-30 mm | Round jaws for dia. 20-40, 40-60 and 60-80 mm<br><br>Flat jaws for 10-40 and 40-70 mm |
| 1 Set of Compression Platen Dia | 128 mm                                                                        | 200 mm                                                                                |
| 1 Set of Bending Fixture        | 30-500 mm                                                                     | 50-720 mm                                                                             |



UTM-0520



UTM-0500

## EXTENSOMETER

Different types of extensometers with accuracy of  $\pm 0.1\%$  of indicated value are available depending on requirements. Extensometer can directly measure deformation of specimens. It either measures separately thermal expansion strain of specimens or eliminate thermal expansion to avoid effecting deformation of specimen.

All type of machines are supplied with;

- Jawfaces for round specimens (respect to machine capacity)
- Compression platens
- Bending Fixture

## Data Acquisition & PC Software

The Universal Testing machine can be controlled (Start, Stop commands) by a computer with the software (given free of charge by UTEST). 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.

Following tests can be done with the UTEST software.

| Standard Code                   | Description                                      |
|---------------------------------|--------------------------------------------------|
| EN 15630-1 and<br>EN ISO 6892-1 | Tensile Test of Reinforcing<br>Ribbed Steel Bars |
| EN ISO 6892-1                   | Tensile Test of Metallic Materials               |

Universal Test Software is developed for testing tensile strength of Reinforcing Ribbed 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 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**

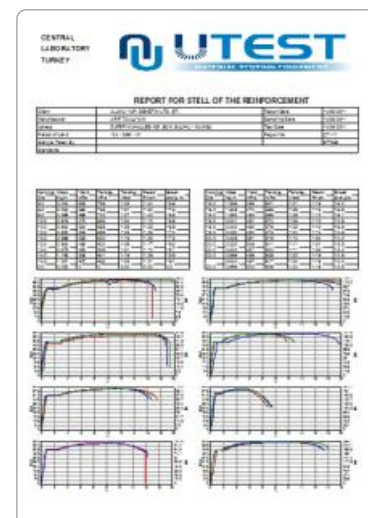
All contents of experimental data and additional information can be organized by user. Software can be performed in x different languages.

- **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 predefined 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 define 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.

## Technical Specifications

|                                         | UTM-6000                                                   | UTM-7000                                             | UTM-8000                                             |
|-----------------------------------------|------------------------------------------------------------|------------------------------------------------------|------------------------------------------------------|
| Maximum Load                            | 600kN                                                      | 1000kN                                               | 2000kN                                               |
| Load Measurement Accuracy               | 1% from 2% of max capacity                                 | 1% from 2% of max capacity                           | 1% from 2% of max capacity                           |
| Deformation Measurement Accuracy        | 12.5µm                                                     | 12.5µm                                               | 12.5µm                                               |
| Control Mode ( Pace Rate Type)          | Displacement Control, Load Control, Stress Control         | Displacement Control, Load Control, Stress Control   | Displacement Control, Load Control, Stress Control   |
| Max Vertical Test Space Between Grips   | 750 mm                                                     | 750mm                                                | 1000 mm                                              |
| Max Vertical Test Space Between Platens | 620 mm                                                     | 620 mm                                               | 850 mm                                               |
| Max Horizontal Test Space               | 475 mm                                                     | 565 mm                                               | 840 mm                                               |
| Piston Stroke                           | 250 mm                                                     | 250 mm                                               | 250 mm                                               |
| Testing Speed                           | 0-50 mm/min (Displacement )                                | 0-50 mm/min (Displacement )                          | 0-50 mm/min (Displacement)                           |
| Crosshead Speed                         | 200 mm/min                                                 | 200 mm/min                                           | 280 mm/min                                           |
| Grips for Flat Specimen (2 set)         | Thickness 0-30 mm                                          | Thickness 0-40 mm                                    | Thickness 10-70 mm                                   |
| Grips for Round Specimen (2 set)        | Diameter 13-40 mm                                          | Diameter 20-60 mm                                    | Diameter 20-80 mm                                    |
| Compression Platen Size                 | 128 mm diameter                                            | 148 mm diameter                                      | 200mm diameter                                       |
| Power Supply                            | 380 V AC, 50 Hz, 2.5 kW Frame<br>220 V AC 50 Hz Power pack | 380 V AC, 50 Hz, 3.5 kW<br>220 V AC 50 Hz Power pack | 380 V AC, 50 Hz, 3.5 kW<br>220 V AC 50 Hz Power pack |
| Load Frame Dimensions                   | 770x600x2150 mm                                            | 900x650x2400 mm                                      | 1300x900x3300 mm                                     |
| Power Pack Dimensions                   | 570x800x1020 mm                                            | 570x800x1020 mm                                      | 570x800x1020 mm                                      |
| Weight                                  | 2600 kg / 250 kg                                           | 3700 kg / 250 kg                                     | 8800 kg / 250 kg                                     |