

# UNIVERSAL TESTING MACHINE



Front Open Electronic Universal Testing Machine

## FEATURES

- ❖ Loading accuracy as high as  $\pm 1\%$ .
- ❖ Straining at variable speeds to suit wide range of materials.
- ❖ Printer & PC graphs enable study the behavior of the material.
- ❖ Motor Driven threaded columns for quick effortless adjustment rapid fixing of test specimen.
- ❖ Simply in reading because of digital readouts.
- ❖ Wide range of standard and special accessories, including load stabilizer.
- ❖ Easy change from plain to threaded and screwed specimens.
- ❖ Large effective clearance between columns enables testing of standard specimens as well as structures.
- ❖ RS 232 serial port to transfer data to computer for analysis/storage evaluation etc.
- ❖ Manual Control & release valve Operation.
- ❖ Safe operation ensured by means of safety devices.

## APPLICATIONS

Universal Testing Machine is designed for testing metals and other materials under Tension, Compression, Bending, Transverse and shear loads.

Hardness test on metals can also be conducted

## ACCURACY & CALIBRATION

All Universal Testing Machines are closely controlled for sensitivity, accuracy and calibration during every stage of manufacture. Every Machine is then calibrated over each of its measuring ranges in accordance with the procedure laid down in British Standards 1610: 1964 and IS: 1828-1975. Universal Testing Machines Comply with grade "A" of BS: 1610: 1964 and grade 1.0 of IS -1828-1975 An accuracy of + 1 % is guaranteed from 20% of the load range selected to full load. Bellow 20% of the selected range, the Maximum permissible error is 0.2% of the full reading.



**COMPRESSION TEST**



**TRANSVERSE / BEND TEST**



**ATTACHMENT FOR  
SHOULDERED & THREADED SPECIMENS**



**TENSION TEST**



**ATTACHMENT FOR WIRE ROPE TEST**

## PRINCIPLE OF OPERATION

Operation of the machine is by hydraulic transmission of load from the test specimen to a separately housed load indicator. The system is ideal since it replaces transmission of load: through levers and knife edges, which are prone to wear and damage due to shock on rupture of test pieces. Load is applied by a hydrostatically lubricated ram. Main cylinder pressure is transmitted to the cylinder of the pendulum dynamometer system housed in the control panel. The cylinder of the dynamometer is also of self - lubricating design. The load transmitted to the cylinder of the dynamometer is transferred through leverage to the pendulum. Displacement of the pendulum actuates the rack and pinion mechanism which operates the load indicator pointer and the autographic recorder. The deflection of the pendulum represent the absolute load applied on the test specimen. Return movement of the pendulum is effectively damped to absorb energy in the event of sudden breakage of the specimen.

## MACHINE CONSISTS OF

- Straining Unit

This consists of a hydraulic cylinder motor with chain and sprocket drive and a table coupled with the ram of the hydraulic cylinder, mounted on to a robust base. The cylinder and the ram are individually lapped to eliminate friction. The upper cross-head is connected to two screwed columns which are driven by a motor. Axial loading of the ram is ensured by leveling the cylinder and ram of any possible side loading by the provision of ball seating.

Tension test is conducted by gripping the test specimen between the upper and lower cross-heads, Compression, transverse, bending, shear and hardness tests are conducted between the lower cross head and the table.

The lower cross-head can be raised or lowered rapidly by operating the screwed columns thus facilitating ease of fixing of the test specimen

- Control Panel

The control Panel consists of a power pack complete with drive motor and an oil tank, control valves. A pressure transducers is connected for load indicator and a rotary encoder for elongation with resolution of 0.1 mm, is provided to measure the deformation of the specimen

- Power Pack

The power pack generates the maximum pressure of 200 kgf/cm<sup>2</sup> the hydraulic pump Provides continuously non-pulsating oil flow. Hence the load application is very smooth.

- Hydraulic Controls

Hand operated wheels are used to control the flow to and from the hydraulic cylinder. The regulation of oil flow is infinitely variable incorporated in the hydraulic system is a regulating valve which maintains a practically constant rate of piston movement. Control by this valve allows extensometer readings to be taken.

- Load Deflection Indicator

It is microprocessor based electronic control panel connected with machine using Pressure Transducer, Rotary Encoder and Electronic Extensometer. Using RS-232 serial communication port our s/w communicates with machine and get real time Load, Deflection and Extension and shows on computer.

Electronic digital displays Load Elongation and extension. Facility to hold peak - load and tare facility to make load zero. Elongation display can be set to zero. Optional printer facility. All other facilities maintained under Model UTN. Printer and PC interface.

### Electronic Control Panel

The electronic control panel is built using 8085 microprocessor which incorporates state of the art technology with following features

- Front panel membrane type key board for test setup.
- Seven segment digital display of load displacement/extension.
- Serial Port for communication with PC.
- Optional add-on facility for electronic extensometer & electronic load pacer.

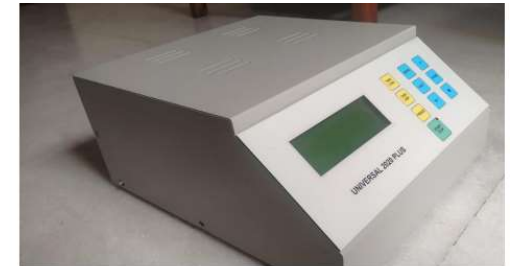
### Software Package on PC

The control panel can be hooked to any PC using RS-232 communication port.

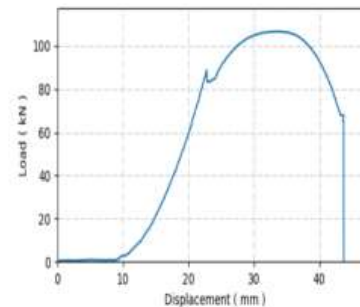
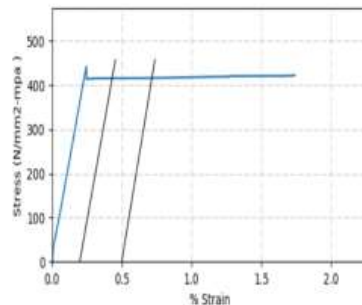
Offers different exhaustive application. Windows based software packages with real time graph

On PC to enable the user to effectively evaluated different parameters the features include:

- Real time graph, user friendly software.
- Extensive graphics on screen for curve plotting, magnification and zooming.
- Software Features includes graph comparison, point tracing facility.
- Different units selection for load & Displacement.
- Statistical evolution with water fall digs. Mean deviation, frequency distribution, Skew digs Histogram. Also calculates Max. Value, Min. value, Mean Value, variance, Standard deviation. Selectable batch & statistical printouts.
- Evolution of wide range of user selectable parameters such as % elongation, % reduction in area, young's modulus, yield stress, proof stress etc.
- Software packages for shear, Bend, Torsion, Rubber, Tensile testing etc.



**NEW Electronic Control Panel**



Model		SE UTE (10T)	SE UTE (20T)	SE UTE (40T)	SE UTE (60T)	SE UTE (100T)
Maximum Capacity		100 kN	200kN	400kN	600kN	1000kN
Clearance for tensile at fully descended working piston	mm	50-700	50-700	50-700	50-800	50-850
Clearance between columns	mm	500	500	500	600	750
Ram stroke	mm	150	200	200	250	250
Straining/piston speeds (at no load)	mm/min	0-300	0-150	0-150	0-100	0-80
HP		1.3	1.3	2.3	2.5	3.5
V		440-440	440-440	440-440	440-440	440-440
Æ		3	3	3	3	3
Weight approx. Dimensions	kg	1500	1500	2500	3500	5500
L x W x H (approx.)	mm	2032 x 750 x 1960	2032 x 750 x 1960	2060 x 750 x 2180	2065 x 750 x 2534	2415 x 815 x 2900
Clamping Jaws for Round Specimen	mm	10-20, 20x30	10-20, 20-30	10-25 25-40	10-25, 25-40, 40-55	10-25, 25-45, 45-70
Clamping jaws for Flat specimens Thickness	mm	0-10, 10-20 50	0-10, 10-20 50	0-15, 15-30 65	0-15, 15-30 70	0-22, 22-44, 44-65 70
<b>FOR COMPRESSION TEST</b>						
Pair of compression plates of Diameter	mm	120	120	120	120	160
<b>FOR TRANSVERSE TEST</b>						
Table with adjustable rollers width of rollers	mm	160	160	160	160	160
Diameter of rollers	mm	30	30	30	50	50
Maximum clearance between supports	mm	500	500	500	600	800
Radius of Punch	mm	6, 12	6, 12	12, 16	16, 22	16, 22

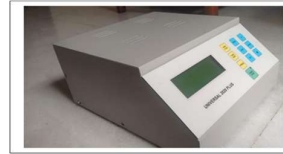
Special Optional Accessories: Load Stabilizer, Brinell Test Attachment, Bend Test Attachment, Shear Test Attachment



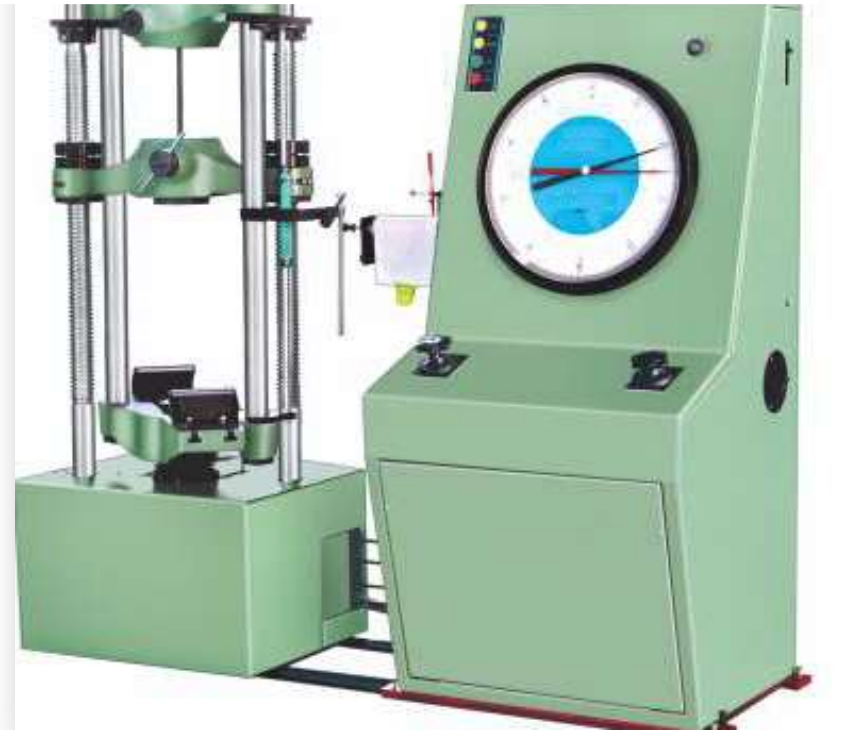
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## ELECTRONIC UNIVERSL TESTING MACHINE



NEW ELECTRONIC PANEL



Mechanical Universal Testing Machine

**ELECTROMECH**  
ENGINEERS

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