Universal Testing Machine

Universal Testing Machines have a wide range of applications and a number of materials, and metals in different forms and shapes can be tested for a variety of tests like Tension, Compression, Transverse, Bend, Shear, Brinell Hardness etc. Special attachments are also available for testing of Flat Belts, Chain Links, Wire Ropes etc.

Features

- **Loading Frame:** The base has a hydraulic cylinder at its center and two main screws at both ends. The middle cross head is mounted on screws through main nuts. The middle cross head can be moved up or down through chain transmission and geared motor to adjust the initial tensile/compression clearance. Inside base of machine, a hydraulic cylinder is tested in which piston is placed, and rests an assembly of an upper, and lower cross head and two columns. The individually lapped cylinder piston assembly ensures smooth axial force with minimum friction.
- **Control Panel:** Hydraulic circuit it consists of a hydraulic power pack that has a directly driven radial plunger pump that gives a continuous non-pulsating flow of oil pressure up to 250 bar a pressure compensated needle-type flow control valve is obtained with help of valves. Optionally this can be controlled from electronic system.
- **Loading Rate / Straining Rate Control:** This is the superfine controlling system that controls the loading rate / straining rate as per commands from electronic machine control system. UTM Software can send the loading rate / straining rate to electronic system for fully automatic testing.
- **Load Measurement System:** The oil pressure in the main cylinder is also transferred to an electronic pressure transducer which gives the proportionate signal to electronic unit. Both the motors for hydraulic operation and cross-head motion are controlled by buttons on electronic control system and they have interlocked to prevent simultaneous working of motors. The electrical panel is housed in control panel. Displacement measurement is carried out by means of a rack and pinion on the rotary encoder. The encoder signal is fed to electronic system to get displacement.
- **Operation:** Tension test is conducted by gripping the test specimen in the upper and middle crosshead. Compression, Bending, Transverse, Shear and Hardness tests are conducted between the middle and lower crosshead by using appropriate fixtures. The rapid adjustment of middle crosshead facilitates easy fixing of tensile / Compression specimens of different lengths.
- **Accuracy & Calibration:** Every machine is calibrated in accordance with the procedure laid down in BS-1610-1964 IS 1828-1991. 'FMI' Computerized Universal Testing Machines comply with gradeAof BS 1610-1964 and Grade 1.0 of IS 1828-1991. An accuracy of ± 1% guaranteed from 2% to 100% of capacity of the machine. In the computerized UTM, the computer is an integral part of the entire system and not just on ADD ON feature. This puts a lot of power and versatility into the hands of the operator and makes the system much more self-contained than usual, as it includes many functions usually only available as additional (often expensive) optional features Hydraulic controls are through hand-operated valve, ergonomically placed for ease of control. Optionally valves can be controlled from electronic control system. Adequate safeties for overload and overtravel are incorporated and emergency switch is provided.

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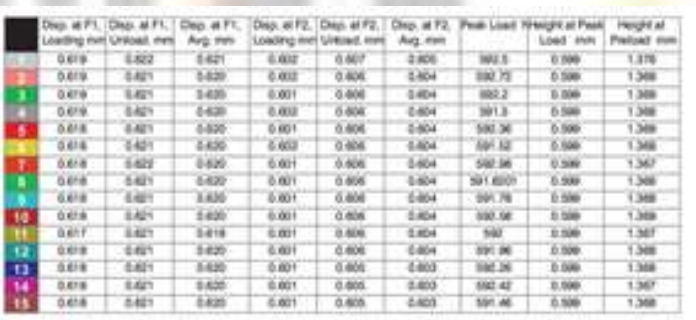
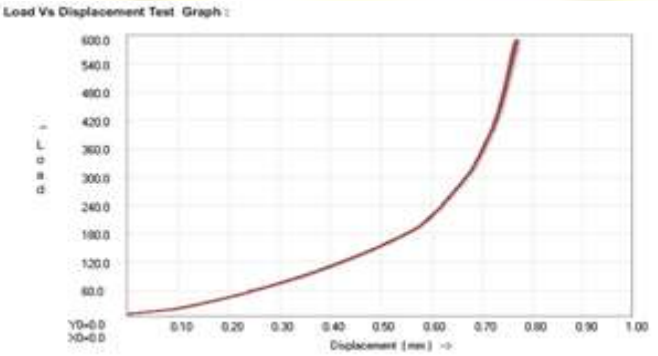
Software Features

- Menu driven form system with colour graphs to compare sample test results
- Test details and reports are stored in database
- User programmable master test templates
- User can select test from master test Templates and can start similar test
- Load and Elongation is continuously displayed on screen
- Overload protection for machine by electronic control
- Tare Load and Reset Elongation facility available
- User selectable sample break detect condition
- Load rate and strain rate are also displayed while testing
- Unlimited Load rate and strain rate control steps
- With Load rate controller, user can hold the load on specimen for unlimited time
- With Load rate control, user can specify positive or negative Rate of Loading
- User selectable units for load and displacement (kg, kN, N, Ibf, mm, cm, inch etc.) Results and graphs are automatically displayed accordingly
- Online display of Load and Displacement (Stress, Extension, Strain) etc. while test is conducted
- Provision of auto zeroing of Elongation at preload set by user
- User Programmable Reports. User can select Header, Footer, Specimen information, Dimensions, Test information, Test results, Stastical analysis as per his need
- Generated reports can be exported to PDF file and can be e-mailed
- If electronic extensometer is used then proof stress values from 0.1% to1%can be determined
- Software will give alert to user to remove extensometer when load crosses .2% of Gauge length selected then proof load value is calculated. (With extensometer)
- Separate graph of extensometer and encoder is displayed
- Provision of calculation of Load and Elongation at yield, Peak load and Load at break, Yield stress, Ultimate stress etc
- Special software for tensile, compression, bend, TOR steel and other test software as per customer requirements



	Disp. at F1, Loading mm	Disp. at F1, Unload. mm	Disp. at F1, Avg. mm	Disp. at F2, Loading mm	Disp. at F2, Unload. mm	Disp. at F2, Avg. mm	Peak Load	Height at Peak Load mm	Height at Preload mm
1	0.619	0.622	0.621	0.602	0.607	0.605	592.5	0.599	1.370
2	0.619	0.621	0.620	0.602	0.606	0.604	592.73	0.599	1.369
3	0.619	0.621	0.620	0.601	0.606	0.604	592.2	0.599	1.369
4	0.619	0.621	0.620	0.602	0.606	0.604	591.3	0.599	1.368
5	0.618	0.621	0.620	0.601	0.606	0.604	592.36	0.599	1.369
6	0.618	0.621	0.620	0.602	0.606	0.604	591.52	0.599	1.368
7	0.618	0.622	0.620	0.601	0.606	0.604	592.96	0.599	1.367
8	0.618	0.621	0.620	0.601	0.606	0.604	591.6201	0.599	1.368
9	0.618	0.621	0.620	0.601	0.606	0.604	591.76	0.599	1.368
10	0.618	0.621	0.620	0.601	0.606	0.604	592.56	0.599	1.369
11	0.617	0.621	0.618	0.601	0.606	0.604	592	0.599	1.367
12	0.618	0.621	0.620	0.601	0.606	0.604	591.96	0.599	1.368
13	0.618	0.621	0.620	0.601	0.605	0.603	592.26	0.599	1.368
14	0.618	0.621	0.620	0.601	0.605	0.603	592.42	0.599	1.367
15	0.618	0.621	0.620	0.601	0.605	0.603	591.46	0.599	1.368



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Microcomputer based Machine Control System

- Full-fledged sealed membrane alpha numeric keyboard for data entry
- 16 x 2 Lines LCD Graphics display with backlit for displaying Load and Elongation of crosshead with bigger font size.
- Load indicated with resolution of 0.01% of machine capacity for entire range.
- Elongation is measured with resolution of 0.01 mm.
- Controller for load rate and strains rate control
- Auto detection of overload and over travel and specimen break. On detection of any condition hydraulic system is automatically turned off.
- Tare load and Reset Elongation facility
- Peak Load and Elongation at Peak, Load at break, Elongation at break, UTS, %Elongation, %reduction in area, Yield load etc. results for offline test.
- RS232C interface for computer connectivity
- Built in Centronics parallel port / Serial Port for printer interface.

TECHNICAL SPECIFICATIONS	HUTM-100KN	HUTM-200KN	HUTM-400KN	HUTM-600KN	HUTM-1000KN
Measuring Cap. (kN)	100kN	200kN	400kN	600kN	1000kN
Measuring Range. (kN)	0-100 kN	0-200 kN	0-400 kN	0-600 kN	0-1000 kN
Least Count (kN)	0.004 kN	0.008 kN	0.016 kN	0.024 kN	0.04 kN
Load Range in kN with accuracy of Measurement ± 1%	2 to 100	4 to 200	8 to 400	12 to 600	20 to 1000
Resolution of Piston movement (mm)	0.01 mm	0.01 mm	0.01 mm	0.01 mm	0.01 mm
Max. tensile clearance at fully descended piston position	50 to 700 mm	50 to 700 mm	50 to 700 mm	50 to 800 mm	50 to 850 mm
Maximum clearance for Compression test (mm)	0-700	0-700	0-700	0-800	0-850
Distance between columns (mm)	450mm	500mm	500mm	600mm	750mm
Piston Stroke (mm)	150mm	200mm	200mm	250mm	250mm
Maximum straining speed at no load (mm/min)	300	150	150	100	80
Power Supply	3 phase 415V 50 / 60 Hz A.c.				
H. P. (Total)	1.5	1.5	2.5	2.5	4
Overall dimensions (Approx) (mm L x W x H)	1950 X 800 X 1850	2000 X 800 X 1900	2100 X 800 X 1900	2200 X 800 X 1900	2350 X 800 X 2700
Weight (Approx in kg)	1300	1400	2000	3000	4200

Standard Accessories	
Tension Test JAWS For	Round specimen dia (mm): 10-25
	Round specimen dia (mm): 25-40
	Flat specimen Thickness (mm): 0-15
	Flat specimen Thickness (mm): 15-30
	Max. width for Flat specimen (mm): 65
For Compression Test	Pair of Compress Plates dia. Ø(mm): 120mm
For Transverse Test	Adjustment roller supports width (mm): 150mm
	Diameter (mm): 30mm
	With Max. adjustable clearance (mm): 500
	Punch Taps of Radius (mm): 6
	Radius (mm): 12

Optional Accessories:

- Load stabilizer for maintaining desired load.
- Extensometer (Mechanical type)
- Extensometer (Electronic type)
- Printer, plotter, UPS
- Attachments for Brinell Test, Shear Test,
- 180 Bend Test Nut & Bolt Testing, Bend Re-bend etc
- Attachment for testing of wire ropes

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