UNIVERSAL TESTING MACHINE

EKLAVYA
TECHNO SOLUTIONS

Experience the
Next Generation
of Excellence



Universal Testing Machine

Microprocessor Based Panel

PC Software

USB Connectivity

Features :

1.Equipped with motor-driven threaded columns for smooth and precise adjustment of the lower crosshead, ensuring fast specimen setup and alignment.

2.Advanced Software Control: User-friendly interface with real-time graphing, data storage, and ASTM/ISO compliant analysis tools.

3.Microcontroller-Based Electronic Design: Delivers fast, accurate signal processing with robust safety interlocks and intelligent test automation.

4.Rigid Frame Construction: Heavy-duty, vibration-free design guarantees consistent performance and extended machine life.

Features

High Loading Accuracy: *Achieves a loading accuracy of ±1%*
.Variable Straining Speeds: Allows straining at adjustable speeds to suit a wide variety of materials.
Data Analysis & Graphing: *Equipped with printer and PC connectivity to generate load–elongation graphs for detailed material behavior analysis.*
Motorized Crosshead Adjustment: *Motor-driven threaded columns enable quick and effortless adjustment of the lower crosshead, ensuring rapid specimen setup.*
Digital Readouts: *Simple and precise digital displays provide easy and accurate readings.*
Comprehensive Accessories: Supplied with a wide range of standard and optional accessories, including a load stabilizer, to accommodate different test requirements.
Quick Changeover: *Enables easy interchange between plain, threaded, and screwed specimens.*
Spacious Test Area: *Large clearance between columns allows testing of standard specimens as well as larger structural components.*
User-Friendly Controls: *Intuitive and simple control system ensures convenient operation.*
Robust Frame Design: B*uilt with a highly rigid and durable straining frame to ensure long-term stability and accuracy.*
Enhanced Safety: *Designed with multiple safety features for secure and reliable operation.*
Protected Load Sensing System: The pressure transducer is fully enclosed and protected for extended life and consistent performance.
Data Connectivity: I*ncludes a USB interface for seamless data transfer to a computer for analysis, storage, and evaluation.*
Manual Operation Option: *Features manual control and release valve operation for fine control during testing.*
Available Load Capacities: *Offered in capacities of 100 kN, 200 kN, 400 kN, 600 kN, 1000 kN, 1200 kN, 1500 kN, and 2000 kN..*

Applications

The EKLAVYA Universal Testing Machine is designed to perform tests on ferrous and non-ferrous materials under various loading conditions such as tension, compression, bending, transverse, and shear. Additionally, hardness tests on metals can also be conducted with suitable attachments.

Machine Construction

Straining Unit

The straining unit consists of a hydraulic cylinder, motor, chain, and sprocket drive mechanism. The table is directly coupled to the ram of the hydraulic cylinder and mounted on a robust, rigid base frame for high stability.
The cylinder and ram are precisely lapped to minimize friction and ensure smooth operation. The upper crosshead is firmly fixed to the table by two heavy-duty columns , while the lower crosshead is connected to two screwed columns driven by a motorized system for effortless positioning.To ensure accurate axial loading, ball seating is provided to eliminate any side thrust on the ram and cylinder.
A high-resolution rotary encoder (minimum resolution 0.1 mm) is fitted to accurately measure specimen deformation.
Tensile Tests are performed by gripping the specimen between the upper and lower crossheads.
Compression, bending, transverse, shear, and hardness tests are conducted between the lower crosshead and the table.
The motorized lower crosshead movement allows for quick and convenient adjustment, simplifying specimen installation.

Hydraulic Control System

The hydraulic system is controlled using hand-operated control wheels that regulate the oil flow to and from the main hydraulic cylinder.
The flow control is infinitely variable, allowing smooth and precise operation.
A regulating valve is incorporated to maintain a nearly constant piston movement rate, ensuring stable load application during testing.
This design also allows for accurate extensometer readings to be taken during elongation measurement.

Principle of Operation (Model: UTE)

T*he machine operates on the hydraulic transmission principle, transmitting load from the test specimen through a pressure transducer to a separately housed digital load indicator.*
This system eliminates the use of traditional mechanical levers and knife edges—components susceptible to wear and shock damage—ensuring improved reliability and accuracy.
Load application is achieved through a hydrostatically lubricated main ram. The hydraulic pressure generated in the main cylinder is transmitted to the pressure transducer located within the control panel.
The transducer converts the hydraulic pressure into an electrical signal proportional to the applied load, which is then processed and displayed digitally. Simultaneously, the rotary encoder mounted on the straining unit measures specimen displacement.
both load and displacement signals are processed by the system's microprocessor, providing real-time digital readouts of load and elongation.

Control Panel Assembly

The Control Panel houses the hydraulic power pack, drive motor, oil tank, control valves, and the digital display electronics in a compact, well-protected enclosure.

Power Pack

The hydraulic power pack is designed to generate a maximum pressure of 200 kgf/cm^2. It incorporates a high-performance hydraulic pump that provides a continuous, non-pulsating oil flow, ensuring smooth and consistent loading throughout the test.

Electronic Control Panel (Series Universal M-2301)

 Direct Print Options – Supports printer connectivity for instant graph & result print-outs , batch certificates, test certificates, and simple statistics reports.

 Advanced Microprocessor-Based Design – Incorporates cutting-edge electronics for high-speed, reliable, and intelligent test operations.

 User-Friendly Membrane Keypad – Front panel with numeric keys for quick data entry and easy operation

. *Clear Digital Display – Bright 7-segment display ensures precise visibility of test parameters and results.*

 Auto Load Cell Recognition – Automatic detection and configuration of load cells, eliminating manual setup errors.

 Comprehensive Data Entry – Input of test parameters including speed, rupture %, peak load, preload, modulus, specimen dimensions, and more

. *Batch Testing Facility – Enables multiple specimen testing with automated statistical analysis for batch reporting.*

 Operator Convenience – Optional remote handset simplifies specimen loading and unloading.

 Flexible Connectivity – Standard RS232C port with optional Windows-based software for enhanced features:

- *Online graph plotting*
- *Data analysis*
- *statistics Point tracing*
- *superimposed graph*
- *detailed curve evaluation*

Technical Specifications for - Electronic Universal Testing Machines
Model – UTE

MODEL	UNIT	UTE 10	UTE 20	UTE 40	UTE 60	UTE 100
Maximum Capacity	kN	100	200	400	600	1000
Measuring range	kN	0-100	0-200	0-400	0-600	0-1000
Load resolution (50000 counts full scale)	N	2	4	8	12	20
Load range with accuracy of Measurement +/-1%	kN	2 to 100	4 to 200	8 to 400	12 to 600	20 to 1000
Resolution of piston movement (Displacement)	mm	0.1	0.1	0.1	0.1	0.1
Clearance for tensile test (At fully descended working piston)	mm	50-700	50-700	50-700	50-800	50-850
Clearance for compression test (At fully descended working piston)	mm	0-700	0-700	0-700	0-800	0-850
Clearance between columns	mm	500	500	500	600	750
Ram Stroke	mm	150	200	200	250	250
Straining/ Piston Speed (at no load)	mm/min	0-300	0-150	0-150	0-100	0-80
CONNECTED LOAD						
Power	HP	1.33	1.33	2.33	2.5	4
V		400-440	400-440	400-440	400-440	400-440
Φ		3	3	3	3	3
STANDARD ACCESSORIES						
FOR TENSION TEST						
Clamping jaws for round specimens of diameter	mm	10-20 20-30	10-20 20-30	10-25 25-40	10-25 25-40	10-25 25-45
Clamping jaws for flat specimens of thickness	mm	0-10 10-20	0-10 10-20	0-15 15-30	0-15 15-30	0-22 22-44
Width	mm	50	50	65	70	70
FOR COMPRESSION TEST						
Pair of Compression Plates of Dia.	mm	120	120	120	120	160
FOR TRANSVERSE TEST						
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 tops	mm	6,12	6,12	12,16	16,22	16,22

Due to constant R& D specifications & features are subject to change without notice.
Maximum allowable capacity for Tensile & Compression test –
80% of the machine capacity for tensile test and full capacity for compression test.

Electro Mechanical Universal Testing Machine

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