



## Universal Testing Machines - Model : UTE



### Features :

- Loading accuracy as high as  $\pm 1\%$ .
- Straining at variable speeds to suit a wide range of materials.
- Printer & PC graphs enable study the behavior of the materials.
- Motor driven threaded columns for quick effortless adjustment of middle crosshead to facilitate rapid fixing of test specimen.
- Continuous roll autographic recorder supplied as standard to enable study of the behavior of materials
- Simplicity 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.
- Simple controls for easy of operation.
- Robust straining frame of an extremely rigid construction.
- Safe operation ensured be means of safety devices.
- Fully enclosed and protected pressure transducer.

- RS 232 serial port to transfer data to computer for analysis/storage evaluation etc.
- Manual control & release valve operation.

### **Application :**

ARUN Electronic 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.

### **Principal of Operation :**

Operation of the machine is by hydraulic transmission of load from the test specimen through pressure transducer 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 pressure transducer housed in the control panel. The transducer gives the signal to the electronic display unit corresponding to the load exerted by the main ram. Simultaneously the digital electronic fitted on the straining unit gives the mechanical displacement to the electronic display unit. Both the signals are processed by the microprocessor and load and displacement is displayed on the digital readouts simultaneously.

### **Machine consists of :**

#### **Straining Unit :**

This consists of a 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 crosshead is rigidly fixed to the table by two strengthened columns.

The lower crosshead is connected to two screwed columns which are driven by a motor. Axial loading of the ram is ensured by relieving the cylinder and ram of any possible side loading by the provision of ball seating.

An displacement scale with a minimum graduation of 1mm, is provided to measure the deformation of the specimen.

Tension test is conducted by gripping the test specimen between the upper and lower cross-heads 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 and electronic display unit.

#### **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.

#### **Electronic Control Unit : (Series Universal 2001-UTE)**

Microprocessor based panel incorporating state of art technology with following features.

- Front panel membrane type key board for machine operation with numeric keys for data entry.
- 7- segment display.
- Data entry with numeric keyboard of test parameters including speeds, rupture % peak, preload, modulus data, test data & specimen data etc.
- 20 input data set storage, 50 results storage maintains data results during power off.
- Batch test facility for generating batch & statistic result using same data set.
- RS 232C serial port, Optional windows based software available for...
- On line graph on PC. Data analysis, statistics, point tracing superimposing graphs to compare with standard, zooming graph etc.

Printer port for printer interface with ...

- Graph & result printout. Test certificate printout .
- Batch Certificate printout .Simple statistic printout.

#### **Optional Software Packages on PC :**

The UNIVERSAL 2001 - UTE series control panel can be hooked to any PC using RS-232 communication port. ARUN offers different exhaustive application, Window based software packages with real time graph on PC to enable the user to effectively evaluated different parameters.

The feature 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 evaluation includes with water fall dig. Mean deviation, frequency distribution, Skew dig., Histogram. Also calculates max. value, min. value, Mean value, Variance, Standard Deviation. (Other statistical parameters on request). Selectable batch & statistical printouts.
- Evaluation 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, Textile testing etc.
- Custom built application software to suit customer requirements.

**Accuracy and Calibration :**

All ARUN Electronic 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 : Part1 : 1992 and IS : 1828 : Part1 : 1991.

ARUN Electronic Universal Testing Machine comply with Grade "A" of BS : 1610 : Part1 : 1992 and class 1 of IS-1828-Part-1:1991. An accuracy of  $\pm 1\%$  is guaranteed from 2% to 100% of the capacity of the machine. Below 20% of the selected range, the maximum permissible error is 0.2% of the full load reading.

**UTE Panel/PC Controlled Machine, Servo Controlled Model available.**

**It is with motorised control valve & automatic operation with given loading /elongation rate.**

**Specification :**

Model	Units	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 (20,000 counts full scale)	N	5	10	20	30	50
Load Range with Accuracy of measurement $\pm 1.0\%$	kN	2 to100	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 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
<b>Connected Load</b>						
Power	kW	1.0	1.0	1.7	1.9	2.6
V		400-440	400-440	400-440	400-440	400-440
Ø		3	3	3	3	3
<b>Dimensions</b>						
L x W x H ( approx. )	mm	2032 x 750 x 1960 x	2032 x 750 x 1960 x	2060 x 750 x 2180 x	2265 x 750 x 2534 x	2415 x 815 x 2900 x

Weight (approx.)	kg-	1500	1500	2500	3500	5500
<b>Standard Accessories</b>						
For Tension Test						
• Clamping jaws for round specimens of Diameters.	mm	10-20 20-30	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 of thickness.	mm	0 - 10 10 - 20	0 - 10 10 - 20	0 - 15 15 - 30	0 - 15 15 - 30	0 - 22 22 - 44 44 - 65
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

**Special Accessories :**

- Load Stabilizer
- Printer
- Plotter
- Brinell Test Attachment
- Electronic Extensometer
- Piston Movement Resolution of 0.01 mm
- Electronic Load Pacer
- Shear Test Attachment
- Software Packages
- Mechanical Extensometer

- Wide range accessories offered on request at additional cost • Due to constant R& D specifications & features are subject to change without notice.
- The dimensions given above are approximate.

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Manufactured by: **ARUN INDUSTRIES**

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