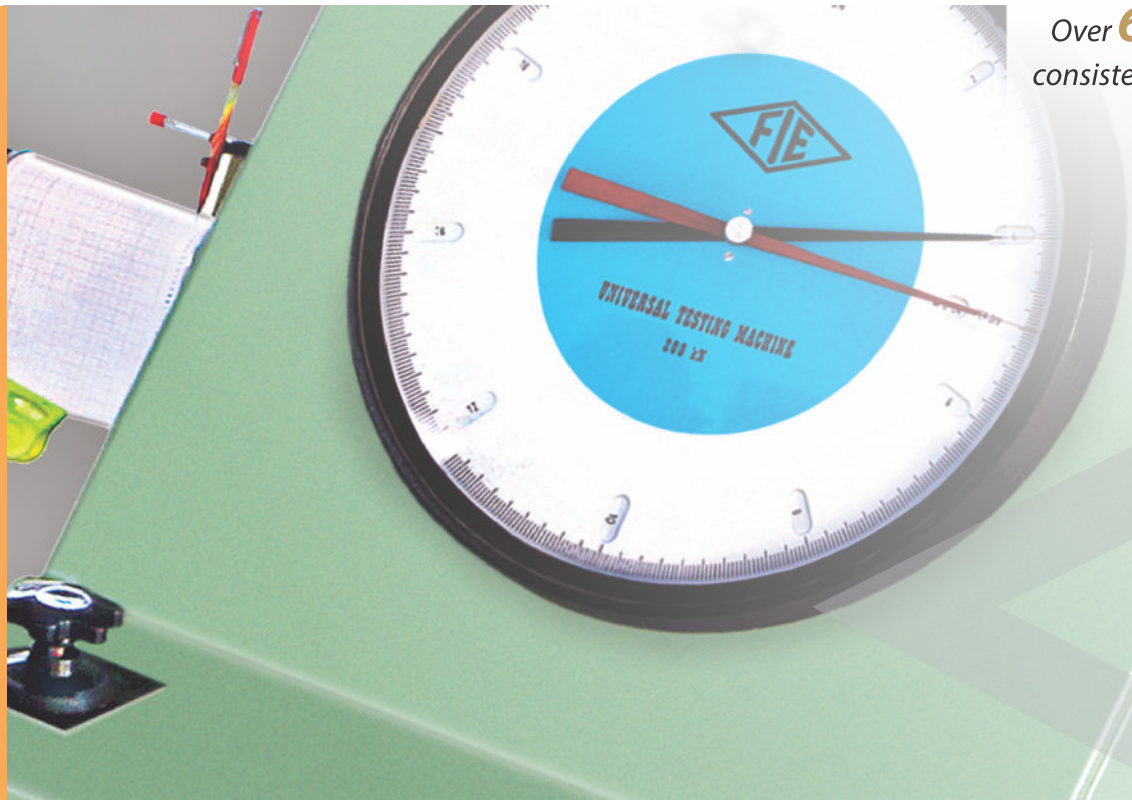
UTN

Over 60 years of consistent excellence



Analogue
Universal Testing Machine

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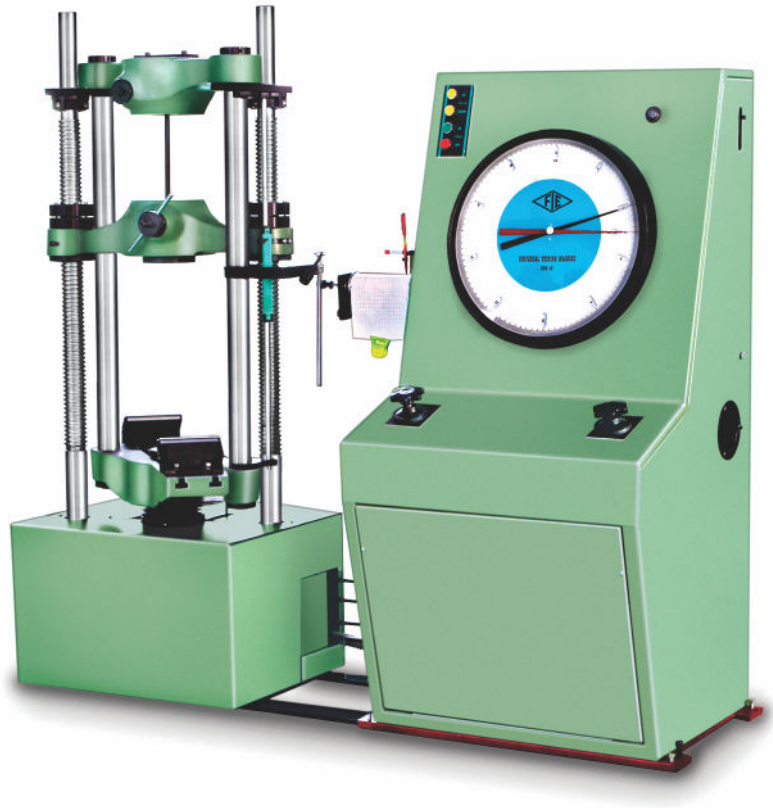
Loading accuracy as high as ± 1%

Motor driven threaded columns for quick & effortless adjustment of lower cross-head-to facilitate rapid fixing of test specimen



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Analogue Universal Testing Machine **Model : UTN**

Features :

- Loading accuracy as high as ± 1%
- Suitable at variable speeds to suit a wide range of materials.
- Continuous roll autographic recorder supplied as standard to enable study of the behavior of materials.
- Motor driven threaded columns for quick effortless adjustment of lower cross-head-to facilitate rapid fixing of test specimen.
- High reading accuracy due to large size and design of dial.
- 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 standards specimens as well as structures.
- Simple controls for ease of operation.
- Robust straining frame of an extremely rigid construction.
- Safe operation ensured by means of safety devices.
- Fully enclosed and protected pendulum.
- Load Capacity : 100 kN, 200kN, 400kN, 600kN, 1000kN.

Application :

'FIE' Analogue Universal Testing Machine is designed for testing Ferrous & Non-Ferrous materials under tension, compression bending, transverse and shear loads. Hardness test on metals can also conducted.

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 rigidly fixed to the lower table by two strengthened columns. The lower cross-head 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.

Compression, transverse, bending, shear and hardness tests are conducted between the lower cross-head and the lower 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, load indicator system & autographic recorder.

Power Pack :

The power pack generates the maximum pressure of 200 kgf/cm2. 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 the 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 mechanical extensometer reading to be taken.

Principle of operation for-

Model : UTN

Operation of machine is by hydraulic transmission of load from the test specimen to a separately housed load indicator.

The hydraulic 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 hydraulically 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 a lever system to a 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 represents 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 a specimen.

Load indicator System :

This system consists of a large dial and a pointer.

A dummy pointer is provided to register the maximum load reached during the test.

Different measuring ranges can be selected by operating the range selection knob.

An overload trip switch is incorporated which, automatically cuts out the pump motor when the load range in use is exceeded.

Displacement :

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

Pendulum Dynamometer :

This unit permits selection of favorable hydraulic ratios producing relatively small frictional forces.

Pressurized oil in the loading cylinder pushes up the measuring piston proportionately and actuates the special dynamometer system.

The piston is constantly rotated to eliminate friction.

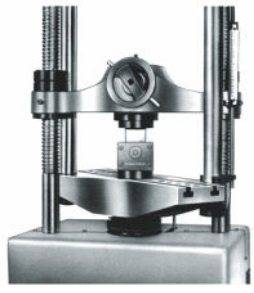
The dynamometer system is also provided with an integral damper and ensures high reliability of operation.

The load transmitted to the dynamometer is transferred through a pendulum to the load indicator.

Attachments :

Attachment for Tension Test of - Shouldered & Threaded specimens upto M6 to M20 (Min. length 110 mm).

Attachment for Tension Test of - Wire Ropes (Min. Ø1 to Ø10mm)



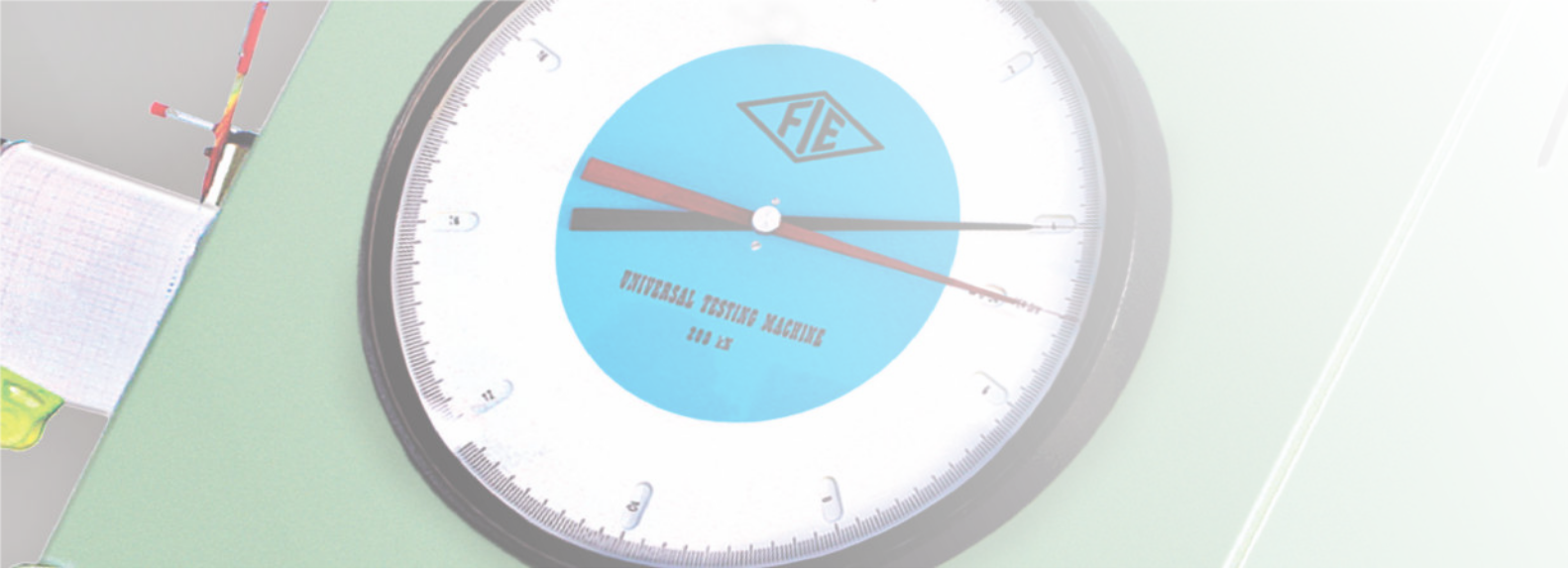
Shear Test (Min. Ø5 to Ø20mm) & (Min.Ø25 to Ø40mm

Technical Specifications for - Analogue Universal Testing Machine
Model – UTN

- **Maximum allowable capacity for Tensile & Compression test – 80% of the machine capacity for tensile test and full capacity for compression test.**

MODEL	UNIT	UTN 10	UTN 20	UTN 40	UTN60	UTN 100
Maximum Capacity	kN	100	200	400	600	1000
1stMeasuring range	kN	0-100	0-200	0-400	0-600	0-1000
Minimum Graduations	kN	0.2	0.4	1	1	2
2 nd Measuring range	kN	0-50	0-100	0-200	0-300	0-500
Minimum Graduations	kN	0.1	0.2	0.5	0.5	1
3 rd Measuring range	kN	0-25	0-50	0-100	0-120	0-250
Minimum Graduations	kN	0.05	0.1	0.25	0.2	0.5
4 th Measuring range	kN	0-10	0-20	0-40	0-60	0-100
Minimum Graduations	kN	0.02	0.04	0.1	0.1	0.2
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 for UTN	HP	1.3	1.3	2.3	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 UTN						
Clamping jaws for round specimens of diameter		10-20	10-20	10-25	10-25	10-25
	mm	20-30	20-30	25-40	25-40	25-45
Clamping jaws for flat specimens of thickness		0-10	0-10	0-15	0-15	0-22
	mm	10-20	10-20	15-30	15-30	22-44
Width	mm	50	50	65	70	70
FOR COMPRESSION TEST						
Pair of Compression Plates of diameter.	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.
- Colour scheme subject to confirm at the time of order.



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Manufactured By :

Fuel Instruments & Engineers Pvt. Ltd.

Plot No. 68 & 89, Parvati Co-op Industrial Estate, YADRAV-416 145 (Ichalkaranji),
Tal : Shirol, Dist : Kolhapur, Maharashtra State, INDIA.

Cell : +91 93090 72719, 95790 55146 ● **E-mail :** mrk1@fietest.com, mrk2@fietest.com
Web : www.fietest.com

FIE/TEST/DD-CAT-UTN-REV01