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UNIVERSAL T STING MACHINE

Over **60** years of consistent excellence

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Analogue Universal Testing Machine

Model : UTN



High reading accuracy due to large size and design of dial

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Loading accuracy as high as $\pm 1\%$



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



Over **60** years of consistent excellence

Analogue Universal Testing Machine Model : UTN

Features :

- Loading accuracy as high as <u>+</u> 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.

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)

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.



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

Technical Specifications for - Analogue Universal Testing Machine **Model – UTN**

Maximum CapacitykN10020040060010001stMeasuring rangekN0-1000-2000-4000-6000-1000Minimum GraduationskN0.20.41122 nd Measuring rangekN0.00-2000-3000-500Minimum GraduationskN0.10.20.50.513 rd Measuring rangekN0.050.100.220.20.5Minimum GraduationskN0.050.100.200.400-600Minimum GraduationskN0.000.040.10.10.20Clearance for tensile test (At fully descended working piston)mm50-70050-70050-70050-80050-800Clearance for compression test (At fully descended working piston)mm150200200250250Straining/ Piston Speed (at no load)mm/min0-3000-1500-1000-8000-800Connect CED LOAD Qmm131.32.33333V	MODEL	UNIT	UTN 10	UTN 20	UTN 40	UTN60	UTN 100
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 0.11 0.2 0.5 0.5 1 3 rd Measuring range KN 0.05 0.1 0.25 0.2 0.5 4 th Measuring range KN 0.05 0.1 0.25 0.2 0.5 4 th Measuring range KN 0.05 0.1 0.25 0.2 0.5 4 th Measuring range KN 0.05 0.1 0.25 0.2 0.5 4 th Measuring range 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 50-800 50-850 Clearance for compression test (At fully descended working piston) mm 50 50 50 60 50 Clearance between columns mm 50.0 0 0.50	Maximum Capacity	kN	100	200	400	600	1000
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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 0.11 0.25 0.2 0.5 4 th Measuring range KN 0.02 0.40 0.40 0.40 0.40 0.41 0.2 4 th Measuring range KN 0.02 0.04 0.11 0.1 0.2 Clearance for tensile test (At fully descended working piston) mm 50-700 50-700 6-00 0-800 0-850 Clearance between columns mm 500 500 600 750 Ram Stroke mm 150 200 200 250 250 Straining Piston Speed (at no load) mm/min 0-300 0-150 0-100 0-800 0-800 CONNECTED LOAD m 1.3 1.3 2.3 3 3 3 3 3 3 3 3 3 <td>Minimum Graduations</td> <td>kN</td> <td>0.2</td> <td>0.4</td> <td>1</td> <td>1</td> <td>2</td>	Minimum Graduations	kN	0.2	0.4	1	1	2
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 50-800 50-800 50-800 Clearance for compression test (At fully descended working piston) mm 60-700 6-700 6-800 750 Clearance between columns mm 500 0.00 200 250 250 Straining Piston Speed (at no load) mm/min 10-300 0-150 0-100 0-800 CONNECTED LOAD mm 10 400-440 400-440 400-440 400-440 400-440 400-440 400-440 400-440 400-440 400-440 400-440 400-440 400-450 25-40 25-45 10-25<	2 nd Measuring range	kN	0-50	0-100	0-200	0-300	0-500
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 50-800 60-850 Clearance between columns mm 500 500 600 750 Ram Stroke mm 150 200 200 250 250 Straining/ Piston Speed (at no load) mm/min 0-700 0-700 0-700 0-700 0-800 0-800 CONNECTED LOAD mm/min 0-00 0-150 0-100 0-800 0-800 0-700 0-700 0-700 0-700 0-700 0-700 0-700 0-700 0-700 0-700 0-800 0-800 0-700 0-700 0-700 0-700 0-700 0-700 0-700 0-700 0-700 0-700 0-700	Minimum Graduations	kN	0.1	0.2	0.5	0.5	1
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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 500 500 600 750 Ram Stroke mm 150 200 200 250 250 Straining/ Piston Speed (at no load) mm/min 0-300 0-150 0-100 0-800 CONNECTED LOAD m 400-440 400-440 400-440 400-440 400-440 φ 3 3 3 3 3 3 3 STANDARD ACCESSORIES mm 20-30 20-30 25-40 25-45 25-45 Clamping jaws for flat specimens of diameter 0-10 0-10 0-15 0-15 0-22 for diameter mm 10-20 10-20	Minimum Graduations	kN	0.05	0.1	0.25	0.2	0.5
Clearance for tensile test (At fully descended working piston) mm 50-700 50-700 50-700 50-800 50-800 Clearance for compression test (At fully descended working piston) mm 0-700 0-700 0-700 0-800 0-800 Clearance between columns mm 500 500 500 600 750 Ram Stroke mm 1500 200 250 250 250 Straining/ Piston Speed (at no load) mm/min 0-700 0-150 0-100 0-800 CONNECTED LOAD mm 1.3 1.3 2.3 2.5 3.5 V 400-440 400-440 400-440 400-440 400-440 400-440 \$\$0 3 3 3 3 3 3 3 STANDARD ACCESSORIES mm 10-20 10-25 10-25 10-25 10-25 for ampling jaws for fround specimens mm 20-30 25-40 25-40 25-40 Clamping jaws for flat specimens mm 10-20	4 th Measuring range	kN	0-10	0-20	0-40	0-60	0-100
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(At fully descended working piston) mm 0-700		mm	50-700	50-700	50-700	50-800	50-850
Ram Stroke mm 150 200 250 250 Straining/ Piston Speed (at no load) mm/min 0-300 0-150 0-160 0-000 CONNECTED LOAD m 1 1.3 2.3 2.5 3.5 Power for UTN HP 1.3 1.3 2.3 2.5 3.5 V 400-440 400-440 400-440 400-440 400-440 400-440 φ 3 3 3 3 3 3 3 STANDARD ACCESSORIES 10-20 10-20 10-25 10-25 10-25 Clamping jaws for round specimens of diameter 10 0-10 0-15 0.15 0.22 of diameter mm 10-20 10-20 15.30 15.30 22.44 Vidth mm 50 50 65 70 70 FOR COMPRESSION TEST mm 120 120 160 160 160 FOR COMPRESSION TEST mm 120		mm	0-700	0-700	0-700	0-800	0-850
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CONNECTED LOADImage: formed to the state of	Ram Stroke	mm	150	200	200	250	250
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Clamping jaws for round specimens of diameter 10 10-20 10-25 <td>STANDARD ACCESSORIES</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	STANDARD ACCESSORIES						
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of thickness mm 10-20 10-20 15-30 15-30 22-44 Width mm 50 50 65 70 70 FOR COMPRESSION TEST mm 120 120 120 120 160 FOR TRANSVERSE TEST mm 120 120 120 160 FOR TRANSVERSE TEST mm 160 160 160 160 FOR TRANSVERSE TEST mm 160 160 160 160 width of rollers mm 160 160 160 160 160 Diameter of Rollers mm 30 30 30 50 50 Maximum clearance between supports mm 500 500 600 800	Clamping jaws for flat specimens		0-10	0-10	0-15	0-15	0-22
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Pair of Compression Plates of diameter.mm120120120120160FOR TRANSVERSE TESTTable with adjustable rollerswidth of rollersmm160160160160160Diameter of Rollersmm3030305050Maximum clearance between supportsmm500500600800	Width	mm	50	50	65	70	70
FOR TRANSVERSE TEST Table with adjustable rollers width of rollers mm 160 <td< td=""><td>FOR COMPRESSION TEST</td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	FOR COMPRESSION TEST						
Table with adjustable rollerswidth of rollersmm160160160160Diameter of Rollersmm30303050500Maximum clearance between supportsmm500500500600800	Pair of Compression Plates of diameter.	mm	120	120	120	120	160
width of rollersmm160160160160160Diameter of Rollersmm3030305050Maximum clearance between supportsmm500500500600800	FOR TRANSVERSE TEST						
Diameter of Rollers mm 30 30 30 50 Maximum clearance between supports mm 500 500 600 800	Table with adjustable rollers						
Maximum clearance between supports mm 500 500 500 600 800	width of rollers	mm	160	160	160	160	160
	Diameter of Rollers	mm	30	30	30	50	50
Radius of punch tops mm 6,12 6,12 12,16 16,22 16,22	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.

Analogue Universal Hardness Testing Machine

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Series : UTN



Over **60** years of consistent excellence

Manufactured By : Fuel Instruments & Engineers Pvt. Ltd.

Sold and Serviced by : SUZUKI INSTRUMENTS

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Web-Site : simaterialtestingservices.com