Material Testing Equipment

Universal Testing Machine

ELC 651-1, ELC 652-1 & ELC 653-1

ELC 653-1

Salient Features

- Loading accuracy as high as ± 1% of the indicating value
- 4/6 pillar structure with hydraulic jaw grips.
- Strain measurement at variable speed to cover a wide range of materials adjustable by the manual control valve.
- High reading accuracy and rugged design of digital display.
- Simple control to facilitate ease of operation.
- Robust load frame with extremely rigid construction.
- Large effective clearance between columns enable testing of standard specimen as well as structures.
- Motor driven threaded columns for UP/DOWN movement of lower crosshead for quick change over of specimen, grips and attachment.
- Wide range of standards and special accessories including load stabilizer (Optional).

Application

Edilab Universal Testing Machine is designed for testing metals under tension, compression, bending, transverse and shear load, both in the form of test pieces and as finished product (optional).

Principle of Operation

The load is applied by a hydrostatically lubricated ram. The cylinder in turns receives pressure from the power pack. The load is transmitted to the test specimen and is displayed by a separately housed load indicator.

Loading Units

It consists of a hydraulic cylinder & piston mounted on a robust base. The loading frame consists of an upper crosshead, middle crosshead and lower table. The upper cross-head and lower table are fitted on two/four hard chrome plated columns. The middle cross-head is fitted on two threaded columns. A reduction gear motor drives the chain and sprockets fixed at the bottom of the threaded columns for height adjustments. The cylinder and ram are individually lapped to eliminate friction. Axial loading of the system is ensured by provision of a ball seating under the lower table. An elongation scale with a least count of 1mm is provided for measurement of deformation of various samples. Tensile test is conducted by gripping the test specimen between the upper and middle cross-heads. Compression, Transverse, Bending and Shear test are conducted between the middle crosshead and the lower table.

Hydraulic System

The power pack has a directly driven pump which generates a maximum pressure of 300 kgf/cm^2. The hydraulic pump produces a continuous non-pulsating oil flow. Hence the load application is very smooth. A pressure compensated flow control valve is provided which controls oil flow to the main cylinder. This maintains a constant rate of piston movement and hence straining rate is kept constant. This valve is hand operated and gives infinitely variable oil flow to obtain different rates of straining.

Electronic Control Panel

This includes high precision, sealed in built electronic control panel and very accurate load cell mounted in the loading unit. A stable data acquisition system converts the analog output of pressure transduer into equivalent digital figures.

Computerised Universal Testing Machine

It has a micro processor based electronic panel, Precision load cell for load measurement, Rotary encoder for crosshead displacement/Extension indication, LAN Card for PC interface, Data entry for specimen dimension, serial number, gauge length. Unit selection for load, displacement. Results include Load vs Displacement Curve, Maximum displacement, UTS, % Elongation, Young's Modulus & Proof Stress (if Extensometer is used).

Accuracy and Calibration

Edilab Universal Testing Machines are controlled for precision and accuracy during every stage of manufacturing. The machines are calibrated in accordance with BS:1610 and IS standards. Edilab UTM comply with grade A of BS 1610 : 1964 and grade 1 of IS : 1828 - 1991. An accuracy of ± 1% is guaranteed from 20% of the load range selected to full load. Below 20% of the selected range the maximum permissible error is 0.2% of the full load reading.

Suitable for operation on 440V, 50Hz, three phase, AC supply.

Universal Testing Machine Model Available:

- Computerised (capacity 300 kN, 600 kN & 1000kN)

Specifications			
MODEL NO	**ELC 651-1**	**ELC 652 -1**	**ELC 653-1**
Machine capacity	**300 kN**	**600 kN**	**1000 kN**
Macine Type	**4 Pillar with Hydraulic Jaw set**	**6 Pillar with Hydraulic Jaw set**	**6 Pillar with Hydraulic Jaw set**
Resolution	0.01 kN	0.01 kN	0.01 kN
Max Clearance for tensile test	50 - 600mm	50 - 700mm	50 - 700mm
Max Clearance for Compression test	0 - 600mm	0 - 700mm	0 - 700mm
Clearance between columns	435mm	565mm	650mm
Ram Stroke	200mm	250mm	250mm
Straining/piston speed at no load	0 - 50mm/min.	0 - 50mm/min.	0 - 50mm/min.
For Tension Test Clamping jaws for round specimens	8 - 25mm	8 - 25mm 25 - 45mm	8 - 25mm 25 - 45mm
Clamping jaws for flat specimens thickness Flat specimen width	0 - 20mm 60mm	0 - 30mm 70mm	0 - 40mm 70mm
For Compression Test: Pair of compression plates Dia of circular platen	160mm	220mm	220mm
For Transverse Test: Table with the adjustable rollers Width of rollers Diameter of rollers Max clearance between supports Radius of punch tops	 160mm 50mm 460mm 12mm, 16mm.	 140mm 50mm 600mm 16mm, 22mm.	 140mm 50mm 700mm 16mm, 22mm.
Crosshead geared motor (kW)	0.37	0.37	0.37
Power pack motor (kW)	2.0	2.0	2.5
Weight (approx)	1700kg	2500kg	3500kg

Software for UTM

Edilab recognizes that the most efficient way of testing is with the help of software and the ease of its operation. The Edilab Test Master has been ergonomically designed to suit the various needs of the customers as per their requirements and operation of the software is extremely user friendly and the features are self-explanatory.

Features

- Tensile Testing
- Compression Testing
- Transverse Test for flat sample
- Bend & Rebend Test
- Shear Test
- Torsion Test
- Rubber/Textile Test
- Spring Test
- Extensometer Test

The bright, large and prominent display for the load and displacement adds to the readability of the software and hence effortless observation of the online tests.

The enhanced display of the test screen displays the value of the load and displacement and the online graphs as it is generated during the tests. The selection of the scale on graph enables you to view the graph more prominently on the screen. The extensometer test screen incorporates the results of the normal Load Vs Displacement. Test as well as the Load Vs Extension online graphical view simultaneously, a unique facility on its own. Customization of report is the main feature of new software.

Statistical Analysis:

This powerful tool enables the user to compare and study the results in a statistical format.
Most useful in places where the Batch Reports are studied for the production.
This extraordinary feature has been designed keeping in mind the ever changing needs of the industry to achieve higher standards.
This flexibility can be achieved with the Edilab Software with an assurance of lifetime quality service and updates as per the latest industry standards.
The test data can be analysed for following graphical presentations :

I Mean Deviation
II Frequency Distribution
III Skew Diagram
IV Histogram

- **Security Manager :** This helps the user to protect and save the test data of all the previous tests with help of Password Protection feature.
- **Graph Tracing :** The resultant graph can be traced in various resolution of displacement with special zoom mode for time related behavior of the specimen.
- **Additional Feature** include the facility to incorporate the users Company Logo on the Test Report and can provide wide variety of customization of the software features as per the needs of the customer.

Minimum Recommended Computer Hardware

- 2 GHz Pentium Dual Core or equivalent
- 2 GB RAM, although using multiple testing machines may require additional memory and/or a faster
- Processor
- 256 MB DirectX 9.0 capable video card
- 250GB HD Drive
- CD-ROM Drive
- Mouse or pointing device and keyboard supported by Windows
- Monitor that supports at least 1024 x 768 resolution and 32-bit color
- 2 USB Serial Port adapter per machine
- Windows compatible printer recommended for reporting capabilities
- Windows compatible sound card and speakers (for audio playback)
- Additional USB ports for measuring devices, barcode scanners, printer etc.
- At least 1 integrated serial port (not USB) where possible
- Lan Card for connecting with electronic panel.

Ordering Information :

ELC-651-1	Universal Testing Machine, Computerised, Capacity 300kN
ELC-652-1	Universal Testing Machine, Computerised, Capacity 600kN
ELC-653-1	Universal Testing Machine, Computerised, Capacity 1000kN

Optional Accessories for all capacities

ELC-65109	Electronic extensometer strain gauge type with 2.5 mm extension and gauge length 25 & 50mm
ELC-65110	Brinell test attachment for 300kN UTM
ELC-65210	Brinell test attachment for 600kN UTM
ELC-65318	Brinell test attachment for 1000kN UTM
ELC-65111	Bend test attachment 180*
ELC-65112	Flexural test attachment
ELC-65113	Shear test attachment 6, 8, 12, 16 & 20mm dia
ELC-65114	Shear test attachment 25, 30, 35 & 40 mm dia
ELC-65115	Pair of threaded holding heads 6, 8, 10, 12, 16, 18, 20mm (per SET)
ELC-65116	Gripping device for threaded & shouldered specimens
ELC-65117	Pair of split ring for shouldered specimen 6, 8, 10, 12, 16, 18, 20mm (per SET)

Note: Computerised models will be supplied with Edilab UTM Software. Computer will be Supplied at extra cost.

Brinell cum Rockwell Hardness Tester

New

ELC 663

Hardness is the property of a material that enables it to resist plastic deformation usually by penetration. However, the term hardness may also refer to resistance to bending, scratching, abrasion or cutting.

There are various Hardness Testing Methods.

Edilab Hardness Testing Machine is designed for conducting Brinell & Rockwell Hardness Tests on metallic materials, alloys of all types, hard or soft & of all shapes.

Features:

- Sturdy & Reliable Design.
- Easy to operate.
- Accessories of Brinell & Rockwell Test are part of standard outfit.
- There are 4 quick load change options 60,100,150 kgf for Rockwell Test (HRA, HRB, HRC) and 187.5 kgf (BHN) for Brinell Test in this machine.
- Direct reading of Rockwell scales HR - A,B,C.
- Samples upto 230mm high & 155mm Throat depth can be tested.
- Rockwell Scales - NABL Calibration can be provided on request.
- Brinell Scales - NABL Calibration can be provided on request.

Technical Specification:

Rockwell Scales - A, B, C
Brinell Hardness
Hardness Resolution - 1.0 of a Rockwell unit

Test loads:

Rockwell - 10 kgf Pre Load / 60, 100, 150 kgf Main load.
Brinell - 10 kgf Pre Load / 187.5 kgf Main load.
Display - Analogue.

Accuracy - Conforms to IS 1586 - 2000 (2006)

Specimen accommodations:

Vertical space - 230mm
Horizontal space (from central line) - 155mm

Machine Specifications:

Machine Dimensions -
655 mm(H) x 170 mm(W) x 475 mm(D)
Machine Weight - 85kg (Approximately)

For Voltage Ratings please refer Page No. A 69

Ordering Information :

ELC 663	Brinell cum Rockwell Hardness Tester

ELC 663

Fatigue Testing Machine

New

ELC 664

Fatigue is one of the major reasons for failure of the materials used in all engineering designs, hence It is important to know fatigue properties of major materials before using them for actual application. Fatigue failure is a phenomenon in which a component fails due to repeated loading – load fluctuating between two extreme (maximum & minimum) values. There are various ways of application of repeated loadings.

ELC 664

Edilab Fatigue Failure Testing Machine is designed for applying reversed bending loads on the specimen. In this type of loading the fibres in the test specimen are stressed in compression & tension alternately.

Features:

- Compact simple design, light weight.
- Table top model.
- Load changing simple – through lever arrangement.

Technical Specifications:

Maximum bending moment	kg.cm	200
Bending moment adjustable	kg.cm	25-200
Ranges	kg.cm	5-125
	kg.cm	125-200
Gripping dia of specimen	mm	12
Testing dia of Specimen	mm	8
Rotating Speed	rpm	4200
Accuracy of applied bending moment		± 1%
Digital counter		8 digit
Power required	HP	0.5
Main supply		3Ph, 415V, 50Hz, A.C.
Overall size (approx)	mm	1000 L x 500 W x 600 H
Weight (approx)	Kg	120

Ordering Information :

ELC 664	Fatigue Testing Machine

Pendulum Impact Tester

New

ELC 665

Impact testers are designed to determine the strength of a sample under impact load. This information is important as this strength determines the performance characteristics of the material under impact loading conditions.

Interchangeable strikers, adjustable pendulum drop angle and easy to mount test specimens in the specimen holders, make Edilab Impact tester user friendly and measure the impact resistance of a variety of materials in both Izod and Charpy methods. The basic instrument for conducting both the test methods are same. However the attachements and mounting arrangements for these tests are specific to the tests.

ELC 665

Technical Specifications:

	Charpy Test	Izod Test
Pendulum drop angle	140°	85°
Pendulum effective weight	20.59kgs.	21.79kgs.
Pendulum impact energy	30kg - m	16.52kg - m
Min. graduation	0.2kg - m	0.14kg - m
Least count	0.1 kg - m	0.1 kg - m
Distance of axis of hammer rotation and centre	825mm	825mm
Striking Edge Angle	30° ± 1°	75° ± 1°
Radius of curvature	2.25mm	0.75mm
Width	18mm	Horizontal: 10° Vertical relief: 5°
Support Distance between arms	40 mm	For gripping specimen with dimension 10mm X 10mm
Sloping angle	0°	
Relief angle	10°	
Radius of curvature	1.25mm	

Ordering Information :

ELC 665	Basic Pendulum Impact testing machine complete with Izod and Charpy strikers

Torsion Testing Machine

New

ELC 670

Torsion is the twisting of an object due to an applied torque & is hence expressed in Nm or lbf ft.
Torsion Tests are done on materials to determine properties such as the modulus of elasticity in shear, the torsion yield strength & the modulus of rupture.

For Voltage Ratings please refer Page No. A 69

Torsion testing equipment consists of:

- A twisting head with a chuck for gripping the specimen and for applying the twisting movements to the specimen.
- A weight head, which grips the other end of the specimen & measures the twisting movement or torque.

Features:

- Sturdy & reliable design
- Easy to operate
- Measurement of Torque with electronic load cell.
- Accuracy of Torque measurements ± 1% above 1/5th of the range.
- Can conduct torsion tests on both metallic & non-metallic materials.

ELC 670

Technical Specifications

Maximum capacity	:	100Nm
Least Count	:	0.01Nm
Maximum clearance between grips	:	500mm
Grips for square specimens	:	5-15mm
Grips for flat specimens	:	5-12x40mm

Ordering Information :

ELC 670	Torsion Testing Machine

Crushing Strength of Iron Ore Pellets

The Crushing Strength of Iron Ore Pellets is important for the manufacturer because it provides an idea about the quality problems associated with production. For the consumer it acts as a quality indicator for performance in the blast furnace.

Crushing Strength Testing Machine For Iron Pellets

New

ELC 675

Ref. Standard – ISO 4700, ASTM E 382

Crushing Strength is the maximum compressive load at which an iron ore pellet is broken completely. Compressive load is applied on the pellet between two parallel platens at a uniform speed of 15 ± 5mm/min over the entire period.

The testing machine is a geared machine of 10kN capacity with the capability to apply load at a uniform rate of 15 ± 5mm/minute. The machine is supplied with a 10kN load cell for the measurement of load, a Load indicator with facilities for displaying the load, for holding the displayed value at the peak load value & for automatically switching the machine off at the maximum or breaking load.

For Voltage Ratings please refer Page No. A 69

Ordering Information :

ELC 675	Crushing Strength Testing Machine for Iron Ore Pellets

ELC 675

Manhole Cover Testing Machine

New

ELC 680-HO, ELC 680-EO & ELC 680-DG

Manhole covers & frames are widely used in various locations for Drainage & water works. There are 4 grades of Manhole covers & frames based on the locations of their placement & type of traffic coming on them.
Edilab Manhole cover testing machines are manufactured with high precision & meet the basic requirements of IS 1726.

Classification:

- Analogue model with hand operated pump
- Analogue model with electrically operated pump
- Digital model

Salient features:

- Capacities upto 500kN
- High Stability
- Lead screw for height adjustment to take care of various samples

Ordering Information:

ELC 680-HO	Manhole Cover Testing Machine Hand Operated, Analogue
ELC 680-EO	Manhole Cover Testing Machine, Electrically Operated, Analogue
ELC 680-DG	Manhole Cover Testing Machine Electrically Operated, Digital (On Request)

Note: Micro Controller based & Fully Automatic Machines can be supplied on request.