

# THE AEC 1112- AC UNIVERSAL TESTING MACHINE

## PRODUCT DESCRIPTION

**THE AEC 1112- AC UNIVERSAL TESTING MACHINE** is a dual column Electromechanical, floor standing or table top Universal Testing Machine testing for Tensile Test, Compression Test, Tear Test, adhesive bond peel testing with flexible polymeric sheets and textile fabrics as bonded materials, Puncture Test Fabric Sheets and Polymer Films, Ropes and Belts/Straps as per the national and international standard like IS, British Standard ASTM, DIN, ISO standards etc.

**THE AEC 1112- AC UNIVERSAL TESTING MACHINE** is working in dual mode through microprocessor based unit without computer and through computer.

**THE AEC 1112- AC UNIVERSAL TESTING MACHINE** is supplied with calibration certificate from NABL and Govt. accredited laboratories.



## PART NUMBER

**THE AEC 1112 UNIVERSAL TESTING MACHINE**

## FEATURES:-

- **THE AEC 1112 UNIVERSAL TESTING MACHINE** fully encased, ergonomically designed, precision aligned and consist of dual column floor design with pre- loaded ball screw drive for zero play/ backlash type with guidance columns for increased lateral stiffness and linear crosshead travel.
- Lower stationary cross head with integrated drive, the upper stationary crosshead and the traveling crosshead with graduated crosshead position scale and markers.
- The guide columns and ball screws fully enclosed to protect surfaces.
- The column covers and easy handling & safe to fix the attachment of accessories.
- It is digital closed loop command feedback motion control system with high performance brushless three-phase AC servo motor and drive.
- Jog or remote-control panel for easy mounting of specimens and up and down movement for cross head
- Operating panel, operating temperature -10°C to 55°C, humidity 10% to 90% and electronic device is fitted with main machined in compact size for easy accessibility to the working areas along with cabling. Interchangeable lower capacity load cell, compression plates, bending attachment etc without removing wedge screw grips.
- Autos return facility after test at zero position or home position.
- Interface for PC or Laptops via Ethernet, USB and RS 232 port
- Compatible with any PC
- Input of test data and formatting of test report
- Wide range of grips to suit variety of materials and shapes

# SPECIFICATIONS

MODEL	AEC1112-AC10KN	AEC1112-AC20KN	AEC1112-AC50KN	AEC1112-AC100KN	AEC1112-AC250KN
Capacity (KN)	10	20	50	100	250
Measuring Range (KN)	0-10	0-20	0-50	0-100	0-250
Crosshead Testing/ Return Speed Range (mm/min) adjustable	0.0001-1000	0.0001-1000	0.0001-1000	0.0001-1000	0.0001-1000
Crosshead speed accuracy (%)	±0.1	±0.1	±0.1	±0.1	±0.1
Position control resolution in µm	0.01	0.01	0.01	0.01	0.01
Position accuracy %	0.05	0.05	0.05	0.05	0.05
Vertical clearance in two crosshead (mm)	1450	1450	1450	1450	1450
Horizontal clearance between columns (mm)	750	750	750	750	750
Power supply Single phase (VAC)	200-250 & 50Hz	200-250 & 50Hz	200-250 & 50Hz	200-250 & 50Hz	200-250 & 50Hz
Frame Axial Stiffness (KN/mm)	90	225	250	300	350

## LOAD CELL

Load Cells 500N,1000N,10KN,20KN,50KN 100KN and 250KN offer alloy steel or total stainless steel construction, complete hermetic sealing, oil proof, water proof and anti-corrosion making them suitable for use in all kinds of environments. Strain Gauge type load cells, for rapid changes and for larger test space with capability of taking full capacity with provision to auto range selection. Load Cell design for tension and compression loading, easy installation and flexible application. Automatic zero-point, sensitivity balancing and temperature fluctuation compensation It is safety and anti-explosion product that can be used in atrocious weather and hazardous areas. It is to approved/ recognized International/ National standards as per ASTM E 4/ DIN 51221 class 1/ ISO 7500- 1 class 0.5, BS 1610 and IS 1828 (P-1)

- ❖ Accuracy of load cell: ±0.5% of full scale
- ❖ 150 % or more overload capacity without mechanical damage

## TRANSDUCER AND ELECTRONIC CONTROL:

- Control panel with ON/OFF, AUTO/MANUAL, START, STOP, RETURN, and EMERGENCY STOP.
- Automatic identification of load cell
- 4 channel controller for force, extensometer, displacement and additional slots for future expansion.
- High speed real time synchronization of process data at all the channels,
- Monitoring of safety and errors and reporting to the monitor.

- Data transmission through LAN/USB 2.0
- Fully digital closed loop control system

## **SAFETY FEATURES:**

All safety device/parameters duly approved by National/International bodies like EN 50081-1, 73/23/EEC, EN 61010-1 as per their directives.

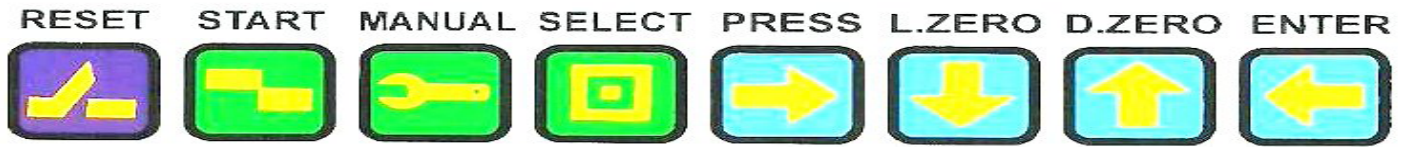
- Control panel visible indication and software language in English.
- Dual level mechanical limit switches in front of machine.
  - ❖ First level switch stop the crosshead.
  - ❖ Second level limit switch cut the power to the machine.
  - ❖ First level limits ever fail in the future.
- Frame structure capacity 150 % extra of working capacity of load frame.
- Automatic transducer for Over load and over travel protection,
- Emergency stop switch in front of the machine.

## **ACCESSORIES:**

- Electro-mechanical- wedge action grips rated capacity to hold flat jaw and pyramid jaw for tensile testing of 60-65 HRC.
  - ❖ Flat Jaws: Sample thickness of min range 1 to 30 mm
  - ❖ Temperature range: -80°C to 350°C
  - ❖ Pyramid Jaws/ Round Jaws: Sample diameter up to 20 mm for gripping of specimens.
- Compression fixture/ platen 100/125/150/175/200 mm dia.
- 3-point bend test attachment rated capacity for metals & ceramics:
  - ❖ Distance between supports: 500 mm.
  - ❖ Width of support: 100 mm.
  - ❖ Support roller diameter: 20/30/40 mm.
  - ❖ Bending size max. : 70 mm.
- Electronic extensometer:
  - ❖ Gauge length 10, 25 and 50 mm.
  - ❖ Accuracy:  $\pm 0.5\%$  as per ASTM E 83 class, ISO 9513 class 0.5extensometer.
  - ❖ Resolution: 1 micron.
- Long travel contact type automatic extensometer and compatible with the manual system and software.
  - ❖ Gauge length 10 to 200 mm adjustable
  - ❖ Accuracy:  $\pm 0.5\%$  as per ASTM E 83 class, ISO 9513 class 0.5extensometer.
  - ❖ Automatic clamping and un clamping of the extensometer on the sample during test and remains on sample till fracture
  - ❖ Resolution: 0.01  $\mu\text{m}$
  - ❖ Measurement Range: 100mm
- Temperature Chamber along with controlled cooling & heating system:
  - ❖ Environmental chamber temperature range: -70°C to +350 °C.
  - ❖ Accuracy of temperature  $\pm 1^\circ\text{C}$  with connectors to Dewar of cooling systems.
  - ❖ Dewar 120 liters capacity self pressurized LN2 with inlet and outlet connectors along with the pressure gauges.

- High temperature furnace:
  - ❖ Chamber temperature range: - +850 °C.
  - ❖ Accuracy of temperature  $\pm 1^\circ\text{C}$
- Compatible latest computer, Printer and UPS.

## MANUAL

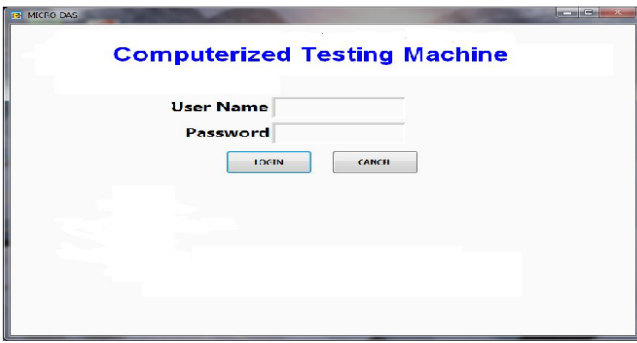


## FOR COMPUTERISED

## COMPUTER CONTROLLER, INTELLIGENT CONTROL UNIT(DATA ACQUISITION) AND SOFTWARE

It is user friendly multifunctional & fully customized software. It is perpetually licensed and any up gradation in future free of cost. It is a menu driven and window 7/8/10 or latest version based with graphical user interface. Software for tensile, compression, Cycling, controlled loading and unloading cycle as per national/ international standard test methods with following features as per to international standards ASTM, ISO, EN in adhesives, plastics, metals, composites, elastomers etc.

- Select unit of load (kg, KN, N, Lbf, Ton and Gram) & unit of Disp (MM, Inch and cm).
- Analysis & control of test result like force, stress, strain, position, tensile strength, % elongation, elongation at max, initial modulus, proof stress, yield Upper/ lower yield load, stress, yield strain, value of work of rupture, ultimate strain, % reduction area etc
- Off-line mode to analyses data, generate methods on secondary PC which is not connected to machine.
- Real time numerical displays (digital or analog) for test data as well as facilities for generating graphs and tables of processed test results. Graphical user interface as per the Microsoft windows standards.
  - ❖ Load Vs. Elongation Graph
  - ❖ Load Vs. Displacement Graph
  - ❖ Displacement vs. Time Graph.
  - ❖ Stress vs. Strain Graph etc.
- User install the in multiple systems for post processing (windows operating system)
- Saving and retrieval of test methods and data.
- Printing of test Report for tested samples and store test data in files.
- Statistical analysis of data and documentation using Multi graphs in Load-Elongation, Load vs. Displacement, Displacement vs. Time & Stress- Strain graphs, value of work of rupture, modulus yield stress and proof stress etc.
- Store & export results in various format like word, excel, ASCII & PDF.
- Copy, paste and make the report with graph and result table from software in excel and word applications.
- Run time screen displaying both the real time graph and the calculated results of multiple specimens simultaneously.



## COMPUTERISED OPERATION

### THE DATA BASE STARTS TO LOAD

- Enter a user Name.
- Enter a Password.
- Click LOGIN / ENTER.

## FEATURES :- ( THE VIEW OF FUNCTION ACCORDING TO THE ICONS)

- **OFFLINE:** - Click to make ONLINE, It turns to MACHINE IDLE.
- **STOP:**-it can uses to STOP test, start, up, down etc. (Emergency stops also)
- **START A TEST:-**make a TEST.
- **UP:-**CROSS HEAD.
- **DOWN:** - CROSS HEAD.
- **RESET LOAD:-**Before and After a TEST.
- **RESET PEAK LOAD:-**. Before and after a TEST
- **RESET DISP.:-**Before and after a TEST.
- **CAL:-**AUTO CAL.
- **GRAPH SET:** - One can adjust GRAPH according to the required LEVEL.
- **INPUT:-**Enter ALL INPUTS before a TEST.
- **ADMIN:** is Used for selection of test modes.
- **COMM SETTING:-**Select Required COMPORT.
- **REPORT:-**One can view ALL TYPES OF REPORTS.
- **Exit:** - From TEST WINDOW
- **SET SPEED:** - Works in variable speed.



## SPEED CONTROL

## FOR TEST CONTROL

- ❖ Load rate control.
- ❖ Strain rate control.
- ❖ Displacement rate control
- ❖ Stress rate control.



## CYCLIC AGAINST SET DISTANCE



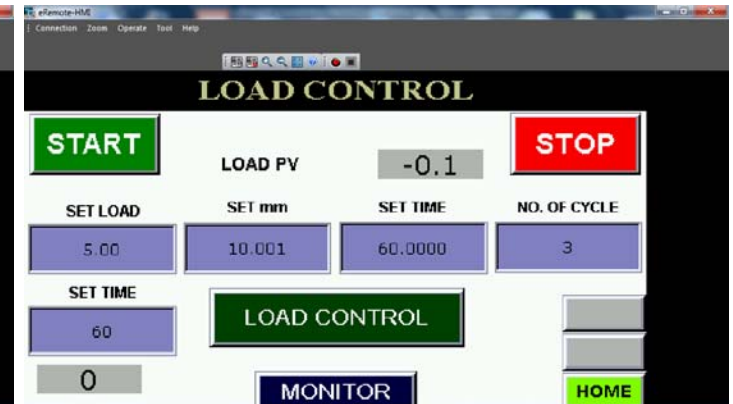
## POSITION CONTROL



## STRESS RATE CONTROL



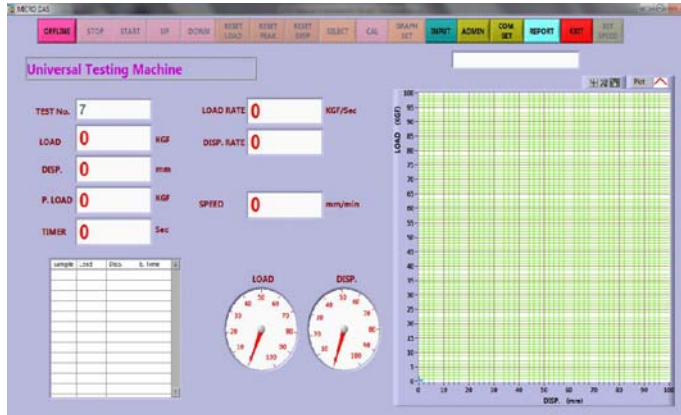
## LOAD RATE CONTROL



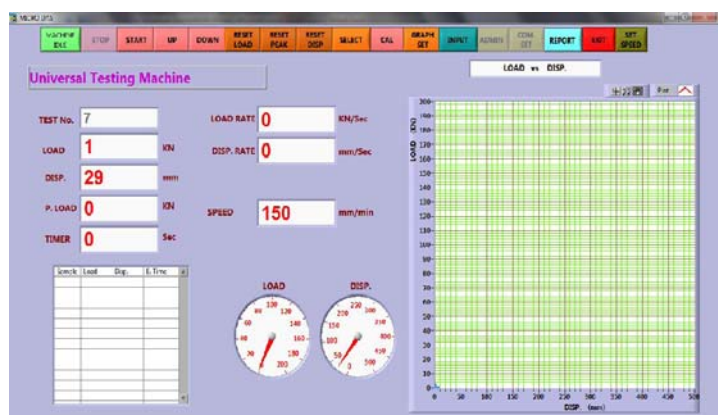
## CYCLIC LOADING IN TENSION AND COMPRESSION

## HOW TO OPERATE THE SYSTEM WITH SOFTWARE

### MACHINE IN OFF LINE MODE



### MACHINE IN IDLE AND ONLINE MODE



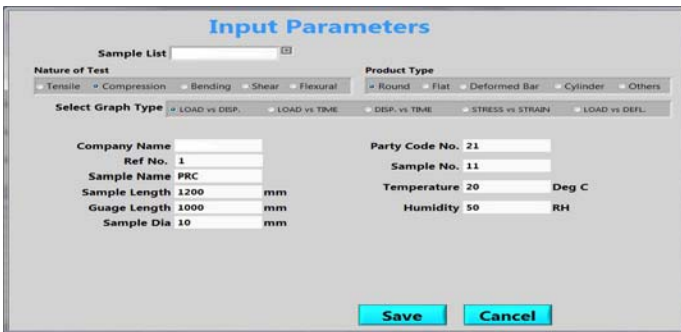
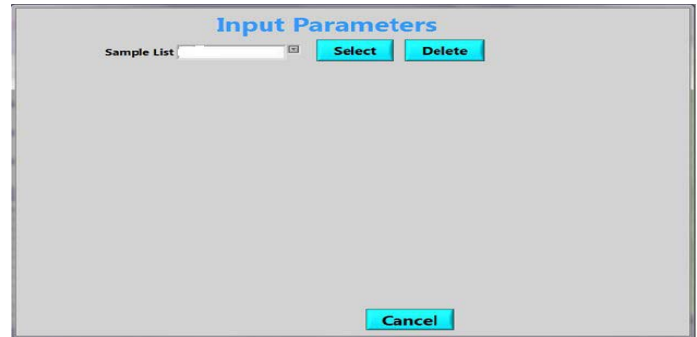


## SELECT REQUIRED COMPORT, IF NECESSARY

- ❖ CLICK COMM SETTING ICON.
- ❖ SELECT COMM PORT.
- ❖ CLICK SAVE.
- ❖ THEN CLICK ON OFFLINE KEY.
- ❖ MACHINE BECMES IDLE.

## BEFORE START A TEST ENTER INPUT REQUIRED INPUT PARAMETERS

- ❖ CLICK ON INPUT PARAMETER ICON
- ❖ FIRST, SELECT A SAMPLE FROM LIST OR ENTER A NEW ONE
- ❖ SELECT NATURE OF TEST

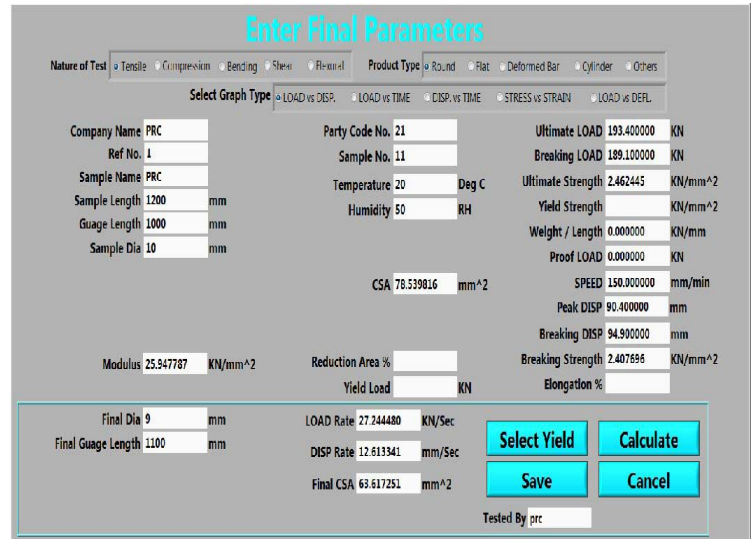


- ❖ SELECT PRODUCT TYPE
- ❖ SELECT GRAPH TYPE
- ❖ ENTER ALL REQUIRED PARAMETERS
- ❖ After that click “SAVE” key.

## CLICK TEST “START” BUTTON

- THE MACHINE AUTOMATICALLY STARTS and
- MACHINE MAKES ON LINE GRAPH & STOPS AUTOMATICALLY
- AFTER BREAKING

## FINAL ENTRY OF PARAMETERS AFTER BREAKING



## Select Report Type

- Select Single Report
- Select Multi Report
- Select Sample Report

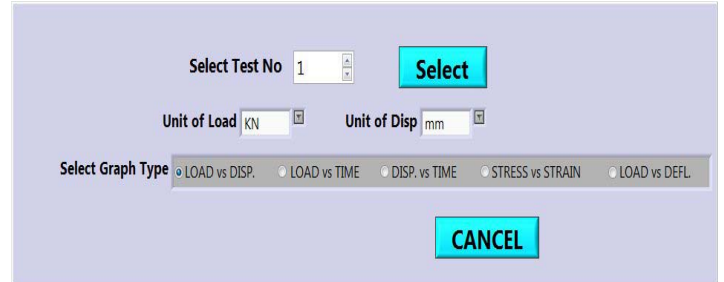
**Exit**

## HOW TO VIEW A TEST REPORT

- ❖ Select the required report type
- ❖ HOW TO GENARET A TEST REPORT
- ❖ Click Report ICON.

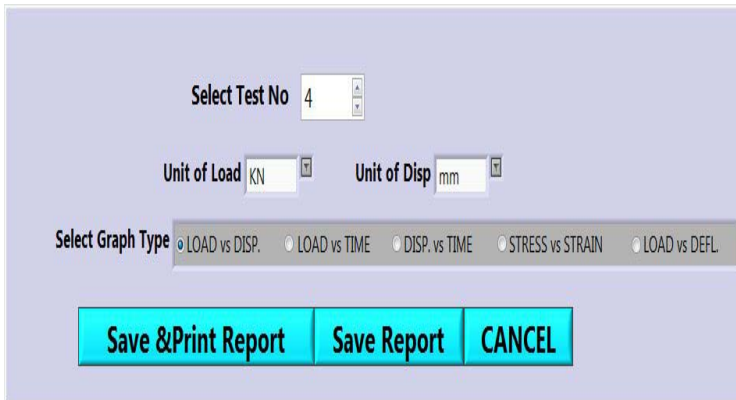
### IT SHOWS THIS WINDOW

- ❖ Select test no.
- ❖ Click select key.



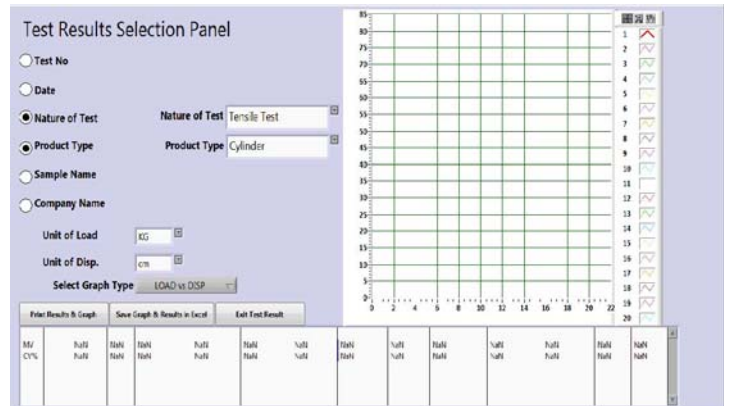
### IT SHOWS THIS TYPE WINDOW.

- ❖ Select unit of load (kg, KN, N, Lbf, Ton and Gram) & unit of Disp(MM, Inch and cm).
- ❖ Select graph type.
- ❖ Click save & print report or save report otherwise cancel.
- ❖ The Report generates automatically in “D” drive (saves only in “D”)



## HOW TO GENARET A MULTI TEST REPORT

- ❖ Click Report
- ❖ Show this window.



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