

Triaxial Shear Test, UMI-135D

Digital Triaxial Shear Test Apparatus for 38mm dia specimen – for CD UU CU TEST

Tri-axial Testing Machine with Data Acquisition System Comprising of the following :-

Digital Load Frame

It is an Advanced version of mechanical load frames. In this load frame rate of strain is controlled through combination of electronic and servo motor. The unit operates on 220 Volts 50 Hz single Phase supply

Specification :

- Capacity of the load frame - 50 kN
- Vertical Clearance - 650 mm
- Horizontal Clearance - 275 mm
- Platen Diameter - 225 mm
- Platen speed - 0.0001-9.9999 mm/min
- Fast Forward/reverse : 10 mm/min
- Platen Travel : 100 mm max.
- Weight - 110 kg App.



Salient Features

1. Password protected operation of touch screen Panel and software
2. Touch Screen operated and controlled for TARE, PARAMETER SETTING, START, STOP,
3. Menu driven Test selection of UU, CU or CD
4. The screen displays load, Pore pressure and vertical displacement.
5. Independent taring and calibration of each Channel
6. Programmable Data Transfer interval
7. Precision loading rate of 0.0001 to 9.9999 mm / minute.
8. Rapid approach in forward or reverse direction to `Home` position
9. On line data transfer to PC through RS 485
10. Automatic Data saving on touch of `Save Data`
11. Facility for selection of measurement unit KN, KG

Triaxial Cell - 1 No.

Pressure Range - 1000 Kpa Suitable for performing triaxial tests on soil specimen of 38 mm with lateral



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pressure up to 10.5 kg/cm². The cell has four take off positions and is fitted with three no volume change valves. Supplied Complete with one set of following accessories for 38 mm dia. specimens.

DIGITAL AIR WATER CONSTANT PRESSURE SYSTEM WITH DATA LOGGER - FOR 01 TRIAXIAL CELL

Digital Air water Constant Pressure System with 2 cells, with 3 pressure transducer (For cell pressure, pore pressure and back pressure) of 10.5 kg/cm² with least count of 0.1 kg/cm² - suitable for 2 triaxial cell, with Data logger for Cell Pressure, Back Pressure and Pore Pressure. B-check to be calculated manually.

AIR COMPRESSORS, 15 kg/sq.cm.

It is a single stage compressor fitted over an air receiver, ON/OFF switch, Pressure gauge & pressure outlet valve are provided as standard. Suitable for operation on 220 volt 50 Hz, single phase supply.

De-airing Chamber with vacuum Pump

It has a vacuum regulator, 20 ltr, water chamber and additional lines for vacuum mm and vacuum Gauge.

Electronic Data Acquisition

The three Channel micro controller based signal conditioning & touch panel display unit is suitable to measure Axial Load, pore /back pressure and vertical displacement, directly indicated in their respective engineering units during Triaxial testing. The system receives the output signal from the sensor i.e Load cell, pore/back pressure sensor attached to the Triaxial Shear Test apparatus. The data of all three channels of Triaxial shear test can be transferred to computer through RS 485 and can be online monitored. The unit also provides the facility of online monitoring of data of all the sensor on Touch Panel Display provided at the front. Broadly the following facilities are incorporated in the system:

- Touch Panel is provided to perform various operations such as TARE, PROGRAMMING, START, STOP etc
- Independent Taring of each channel -Data transfer interval is programmable (between 10 second to 1 hour)
- Automatic data saving on stop bottom
- Online data & time of test will be stored along with the data.
- Online (while the test is in progress) data transfer to the computer through RS 485 port.
- Note - The Electronic unit operates on 220V AC+ 10%, 50Hz

Sensor Specification :

- Load Cell
- Capacity : 1000 kg (Least count 0.01 kgf)
- Type : S -Shaped
- Excitation Voltage : 10VDC
- Nominal output : 3.0m V/V
- Non-Linearity : 1000 M Ohms
- Safe Over Load : 150% of rate capacity
- Ultimate Over load : 250% of rated capacity



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- Temp. Range : 0° to 60° cc
- Temp. Effect on output : <1.0015% FSO/Degree CC
- Temp. Effect on zero : <1.0020% FSC/Degree

PRESSURE TRANSDUCER

- Capacity : 2000 Kpa
- Excitation Voltage : 12 VDC
- Nominal Output : 4-20mA
- Over Pressure Limit : 2 times F.S
- Burst Pressure : 3 times F.S
- Max. Loop Resistance : 10M Ohms at 50 V DC
- Isolation Voltage : 250VAC
- Supply Current : 20mA for 4-20mA output
- Operating Temp. Range : -40°C to 50°C

LINEAR VARIABLE DIFFERENTIAL TRANSFORMER (LVDT)

- Stroke : = +/- 20mm (Least count 0.001 mm)
- Linearity Deviation = 1% of rated capacity
- Repeatability : +/- 0.1% of rated capacity
- Hysteresis : +/- 0.5% of rated capacity
- Excitation : 2- volt rms 2 KHz sinusoidal
- Sensitivity : 1m V/V/mm
- Safe Temperature Range: 0° -50° cc
- Core Fixture : Spring Loaded Plunger

Software Specification:

- Data acquisition from signal conditioning unit to computer
- Has option for manual recording of data, Calculates Dry Density, Moisture Content, Void Ratio, Degree of Saturation, 100% Saturation Moisture Content etc.

Display the following Plots (Graphical)

- (a) Consolidation Curve
- (b) Stress -Strain Curve for every test
- (c) Axial Strain vs Pore Pressure
- (d) Effective Stress Ration vs Axial strain
- (e) p-q plot and gives the value of c and f in terms of effective Ratio