



## ROCK TESTING EQUIPMENT WITH STIFF LOADING UNIT

### ●● HR72.545

#### High Pressure Triaxial Cell with lifting equipment Pressure Range 0-50 MPa.

The unit consists of metallic high pressure chamber. A hardened, ground and lapped frictionless equal area plunger passes through the removable head. The cylinder is clamped to a removable base plate having four drilled take off positions for lateral pressure, pore pressure, back pressure and top drainage. The specimen pedestal and loading pads are also hardened. Spherical seating is provided at the top of the specimen loading pad for self alignment. Triaxial



cell is suitable for specimen size of 54.7mm diameter. Only 2 sets of pedestals are provided as standard along with the unit that is BX & NX. Lifting arrangement is provided on the sides for fixing of the sample.

#### AXIAL LOADING DEVICE (BASED ON CLOSED LOOP PRINCIPAL)

Suitable for controlled axial loading in stress/strain basis. A signal is generated in a function generator on ramp basis



This signal gets processed in the P.I.D controller and is matched with the machine signal ( load or displacement). After both the signals are processed the resultant signal controls the servo valve thereby closing the closed loop system Refer to the diagram.

General specifications of the system are:-

Static closed loop operation, capable of performing stress of strain control as well as post failure behavior. Meet the stringent requirement as per the international norms.

16 bit processor with 200 Hertz anti-alias filter.

Advanced digital servo control from any system sensor based on windows operated software.

Remote emergency stop switches and different locations to shut down the system in case of emergency.

#### Stiff Frame

The system is a totally welded structure, which gives a tremendous amount of stability to the system. It has an equal area hydraulic cylinder attached to the base and

an oil filled spherical seating is screwed to the top. The clearances horizontal and vertical area enough to test standered concrete and rock specimen under unconfined state. It can accommodate a triaxial cell with a sample size upto 90 mm size. Other technical specifications are:-

Load in capacity of the unit (Static & Dynamic)	: 1000kN
Total travel of the ram	: 75mm
Clearance - Horizontal	: 450mm
Vertical	: 700mm
Platen size	: 250mm
Hardness of platens	: 45 HRC
Flatness of platen	: 0.01mm
Stiffness of the frame	: 1750kN/mm
Servo Valve capacity	: 25 L.P.M



## Power Pack (Electro Hydraulic Pumping System)

Hydraulic Power Packs are designed to meet the essential requirements to operate 'HE-ICO' Servo controlled electro hydraulic system. Maintenance requirements are minimum with the proper care of the pressure line and return line filters. Safety devices like heat exchanger, relief valve, pressure switch, emergency switch, over load protection, over travel protection are all provided in the system as standard.

- Capacity of the reservoir : 200 liters
- Flow of the pump : 20 L.P.M
- Operating pressure : 200 bars
- H.P of the prime mover : 15 H.P

### ACCESSORIES ON THE PRIME MOVER

- Level Gauge
- Temperature Gauge
- Pressure Switch
- Inlet cum breather

## Signal Conditioning and Controlling system

Signal conditioning and controlling system comprises of two main components

- 1) Signal conditioning and amplifier system
- 2) Computer Pentium IV (Or Upgraded model at the time of supply)

Signal conditioning unit has four channels. Two are controlling channels and the other two are only measuring channels. This system accepts the signals from the strain gauges pasted on the load cell, and also have a carrier demodulator for displacement sensor. Two channels are kept free for add on at any time. Four input channels are provided to care the readings to be monitored from strain gauges.

## ●● HR72.585

### Digital High Pressure Controller Pressure Range 0.5 - 50 Mpa.

The Controllers are designed to maintain confining pressure at the set value with the help of servo valve. Sensing back is from a sensitive pressure transducer. Pressure is maintained with in the range of  $\pm 20\%$  irrespective of any deformation that takes place during testing of the specimen. All the electrical controls are easily accessible and are mounted on the front panel.

The unit operates on 440 volts, 3 phase, 50 hz supply.

### Dedicated Computer with high speed Data Acquisition Card

Details of Data Acquisition Card :-

- 32 bit PCI- bus
- 12/16 bit analog input resolution
- Auto scanning channel selection upto 256 channels
- Upto 100 Khz A/D sampling rates
- 16 single ended analog input channels
- Biopolar input signals
- Programmable gain of x1, x2, x4, x8, x16
- Input range : +/-10V, +/-5V, +/-2.5 V, +/-1.25V, +/-0.625V
- One 12-bit monolithic multiplying analog output channel
- 16 digital output and 16 digital input channels
- 4 extended digital input and digital output channels on the 37 - pins connector
- 3 independent programmable 16-bit down counters.
- Three A/d trigger modes : software trigger, programmable pacer trigger, and external pulse trigger
- Pre-trigger control
- Internal DC-to-DC converter for stable analog power source.

Software for conducting Triaxial Test (Inclusive)