

# AUTOMATIC TRIAXIAL TESTING SYSTEM (10kN / 3 CELL VERSION)

Standard : ASTM D4767, ASTM D2850, ASTM D7181, BS 1377-7, BS1377-8



### Test Module

- Data Acquisition Module
- Back Pressure Saturation Test;
- Consolidation in same direction and consolidation in different direction (pre contact) test;
- Consolidate – undrained test (U-U test);
- Consolidate – undrained test (C-U test);
- Consolidate – drainage test (C-D test);
- Triaxial creep test
- Stress path triaxial test (Optional)
- K0 Consolidation (Optional)
- Temperature controlled triaxial test (Optional)

**Fully Automatic Triaxial Testing System Apparatus** model is adopting the advanced technology. It is integrated the technology of mechanic, electronic, fully-automated control and sensor automated checking. The range of Triaxial Loading Frame has been designed to be used as part of computer-controlled triaxial system with stress path Triaxial Testing System or as a stand alone unit. Consist of Triaxial Loading Frame and Advanced Pressure Volume Controller (APVC). Load frame are built up with the LCD graphical display and panel keypad.

Model Number	Parts Description
NL 5019 X / 004 – P 001	10kN / 3 Cell Triaxial Load Frame

**Triaxial Load Frame** with rigid, durable, low noise and smooth running characteristics, adopts the stepper motor coupled with worm gear drive system to supply the power source. It is equipped with upper and lower limit device; the axial deformation is measured and collected by high-precision displacement sensor. Axial load is measure by force sensors. Machine are equipped with overload protection.

### Features:

- Fitted with internal pressure transducer.
- The Loading Platen is made is made from stainless steel.
- All external parts are either stove enamel painted or chrome plated for corrosion protection.
- Comprised of a rigid chromed steel twin column construction for rigidity at high loads.
- High displacement sensor to measure deformation with 50mm range at accuracy of  $\pm 0.003$ mm.
- Built with PLC Control mode adopts LCD graphics display in English.
- Multifunctional keyboard input.
- Convenient and quick operate.
- Built in ADVC Unit

### Technical Specifications :

Model Number	NL 5019 X / 004 – P 001
Maximum Axial Force (Load Sensor)	10 kN
Maximum Sample Diameter	Ø 70mm x 140mm (H)
Testing Speed Rate	0.00001 - 9.99999 mm/min
Precision	+/- 0.1% F.S.
Displacement Sensor Measuring Range	50mm with accuracy $\pm 0.003$ mm
Maximum Vertical Clearance	500mm
Horizontal Clearance	260mm
Platen Diameter	98mm
Power	110~240 V, 50/60 Hz, 300 W
Dimension	1300 (L) x 800 (W) x 1300 (H) mm
Weight	320 kg

**The Advanced Pressure Volume Controllers (Built in version)** is very easy to use and an ideal solution for the most modern laboratories. When used with Test Master Loader, data loggers and software, they can be controlled from a computer to form part of a complete automated triaxial testing system. They may also be used as stand alone units which are fully functioning with or without computer control. All the devices has its own computer interface. The devices come complete with internal volume and pressure transducers. Both channel are pre-calibrated, it can generate pressures up to 2000kPa (20 bar) and provides a maximum volume measurement of 60ml which is readable to 0.001ml.

### Technical Specifications :

Maximum Pressure	2 Mpa (20 Bar)
Pressure Resolution	1 kPa
Maximum Volume	60 ml
Volume Resolution	0.001 ml
Precision	+/- 0.1 % F.S.
Confining Pressure	Measuring Range : 0 ~ 2 MPa Resolution : 1 kPa Accuracy : +/- 1 kPa
Back Pressure	Measuring Range : 0 ~ 2 MPa Resolution : 1 kPa Accuracy : +/- 1 kPa
Pore Pressure	Measuring Range : 0 ~ 2 MPa Resolution : 1 kPa Accuracy : +/- 0.1% F.S.

### Features:

- Fitted with internal pressure transducer.
- Pressure can be ramped up or down at a selected rate in kPa per min.
- Pressure or volume can be set, and maintained, at either kPa or ml respectively.
- Max. Volume capacity of 60ml, readable to 0.001ml.
- Protected transducer configuration and calibration.
- Non-volatile storage of calibration and control parameters.
- Quiet operation.
- The advanced microprocessor controls screw pump for the precise regulation and measurement of fluid pressure and volume change. The fluid is de-aired water.
- The advanced microprocessor based electronics includes:
  - 1) Fast 16bit A/D converter
  - 2) Serial port for computer control

### NL TLC - 10:

#### Triaxial Load Cell 10kN

Used to measure the axial force applied to a specimen in triaxial cell (supplied come with a connector attaching to crosshead of load frame)



Model Number	Parts Description
NL 5019 X/004 – P 003	Ø 70mm Triaxial Cell

Top and Bottom Cell Caps are made in aluminum alloy and the transparent cell cylinder is made of high resistance acrylic material. It is easy to assemble and dismantle by quick clamping rods. The bottom cell cap is supplied with three inlet valves, Back Pressure, Cell Pressure and Pore Pressure. A003 can be used for specimen range with diameter 38mm x 76mm and 50mm diameter x 100mm and 70mm diameter x 140mm.



Model Number	NL 5019 X / 004 – P 003
Maximum Sample Size	Ø 70mm x 140mm (L)
Minimum Sample Size	Ø 38mm x 76mm (L)
Maximum Cell Pressure	2000 kPa
Dimension (Internal Diameter)	Ø 180 mm
Weight	8.8 kg

**Note:** Base Adapters, rubber membranes Top Cap, Porous Stone and etc should be order separately. Refer table for accessories.

Model Number	Parts Description
NL 5019 X/004 – P 004	Triaxial Software with Laptop

Stress Path Triaxial Testing System (V3.11) is the software represent a break through in geotechnical laboratory control software. It has ability to choose particular test modules for any international Standards requirements. Flexibility in hardware configuration, that means that the testing quality will depend on the hardware attached, not on the software.



### Features:

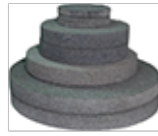
- Ability to batch multiple tests by taking a queue.
- The datas displayed can be change during testing.
- Able to plan the future development of laboratory testing within a framework.
- Comply to international Standards.
- Modules testing available are general Triaxial Testing including Unconsolidation Undrained (UU), Consolidation Undrained (CU) and Consolidation Drained (CD).



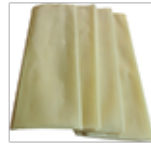
A001



A002



A003



A004



A005



A006



A007



A008



A009



A010



A011



A012



A013



A014

### Legend

### Accessories

	Description
A001	<b>Base Adapter</b> . Used to adapt the triaxial cell base for different sample sizes.
A002	<b>Top Cap</b> . Used to spread the load evenly over the whole cross sectional area of the sample when drainage to the top of the sample required. Includes a nylon tube and connector for the drainage line.
A003	<b>Porous Disc</b> . Acting as a filter to ensure the passage of water into and out of the sample evenly spread over the whole cross-sectional area. Two are required for the top and bottom of the sample.
A004	<b>Rubber Membrane</b> . To provides a protective waterproof barrier around the sample. Made of Rubber Latex and supplied in pack of 10.
A005	<b>O-ring</b> . Used to seal the membrane against the base adapter and the top cape of the sample. Supplied in pack of 8.
A006	<b>Membrane Stretcher</b> . To stretch the membrane during its positioning.
A007	<b>Filter Paper Drains</b> . Used as a side drain when specimens have low permeability. Very usefull when saturating clays before consolidation and shearing. Supplied with pack of 50.
A008	<b>Split Former</b> . To prepare coarse grain soil specimen. It is made of two aluminium halves.
A009	<b>O-ring Placing Tool</b> . Used for applying the O-ring with the minimum to the sample.
A010	<b>Split Mould</b> . Used for trimming the ends of undisturbed soil specimen.
A011	<b>Electrical Water Pump</b> . To pumping water from tank to Triaxial Cell.
A012	<b>Rubber Teat</b> . To sucking for Membrane stretcher.
A013	<b>Filter Paper for Base</b> . Used only for specimens of very low permeability soil in order to reduce the maximum length of drainage path of a distance equal to the specimen radius.
A014	<b>Water Tank</b> . Used for water storage.

Name	Ø 38mm x 76mm (H)	Ø 50mm x 100mm (H)	Ø 70mm x 140mm (H)
<b>Base Adapter</b>	NL 5019 X / 38 – A001	NL 5019 X / 50 – A001	NL 5019 X / 70 – A001
<b>Top Cap w Drainage</b>	NL 5019 X / 38 – A002	NL 5019 X / 50 – A002	NL 5019 X / 70 – A002
<b>Porous Disc (2pcs)</b>	NL 5019 X / 38 – A003	NL 5019 X / 50 – A003	NL 5019 X / 70 – A003
<b>Rubber Membrane (pack of 10)</b>	NL 5019 X / 38 – A004	NL 5019 X / 50 – A004	NL 5019 X / 70 – A004
<b>O-Ring (pack of 8)</b>	NL 5019 X / 38 – A005	NL 5019 X / 50 – A005	NL 5019 X / 70 – A005
<b>Membrane Stretcher</b>	NL 5019 X / 38 – A006	NL 5019 X / 50 – A006	NL 5019 X / 70 – A006
<b>Filter Paper Drains (pack of 50)</b>	NL 5019 X / 38 – A007	NL 5019 X / 50 – A007	NL 5019 X / 70 – A007
<b>Split Former</b>	NL 5019 X / 38 – A008	NL 5019 X / 50 – A008	NL 5019 X / 70 – A008
<b>O-Ring Placing Tool</b>	NL 5019 X / 38 – A009	NL 5019 X / 50 – A009	NL 5019 X / 70 – A009
<b>Split Mould</b>	NL 5019 X / 38 – A010	NL 5019 X / 50 – A010	NL 5019 X / 70 – A010
<b>Electrical Water Pump</b>	NL 5019 X / 004 – A011		
<b>Rubber Teat</b>	NL 4023 X / 004 – P005		
<b>Filter Paper for Base (pack of 100)</b>	NL 5019 X / 38 – A013	NL 5019 X / 50 – A013	NL 5019 X / 70 – A013
<b>Water Tank</b>	NL 5019 X / 004 – A014		



**Optional Accessories :**

Model Number	Parts Description
NL 5019 X/004 – A 015	De-airing Tanks

**De-airing Tanks** are used with Triaxial Test Systems to remove entrapped air in the water when connected to the vacuum pump. The de-airing water system produces not less than 10L batches of de-aired water without the use of heat, combined with mechanical agitation and vacuum evacuation.

**Technical Specifications :**

Model Number	NL 5019 X / 004 – A 015
Container size	Ø 200mm (inner) X 450mm
Capacity	>10L of degassed water preparation
Voltage	220V
Power	1000W
Degassing vacuum degree	Approx. -98kPa
Weight	30kg
Size(mm)	350 x 350 x 100mm