ADVANCED TRIAXIAL TESTING SYSTEM

Standard : BS 1377:7, BS 1377:8, ASTM D4767, ASTM D2850, ASTM D7181, AASHTO T297

Triaxial test is a common method to determine the stress-strain characteristic and parameters of shear strength, mostly performed on undisturbed soil samples. The data is used for many soil engineering purposes such as ground, foundations, slope, excavations and embankments.

The test is mostly performed on cylindrical soil samples of Ø 38 mm to 150 mm, with height being twice its diameter. It is subjected to stress along its vertical axis while applying fluid pressure in perpendicular directions & deformations are recorded until failure.

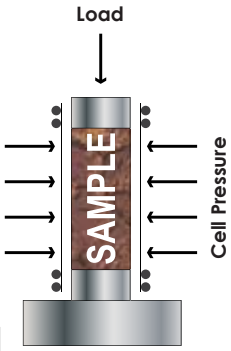
Three common triaxial tests namely :

- Unconsolidated Undrained (UU)
- Consolidated Undrained (CU)
- Consolidated Drained (CD)

Unconsolidated Undrained Test (UU)

NL APVC – CP2M - Advance Pressure Volume Controller (Cell Pressure)

NL 5019 X / 003 & 006 – P001 - Triaxial Load Frame



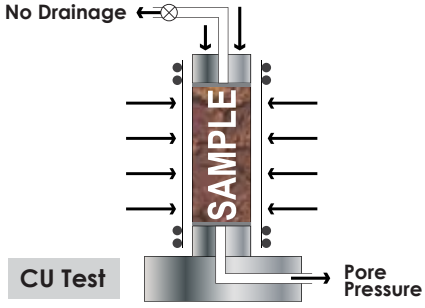
Consolidated Undrained Test (CU) & Consolidated Drained Test (CD)

NL APVC – CP2M - Advance Pressure Volume Controller (Cell Pressure)

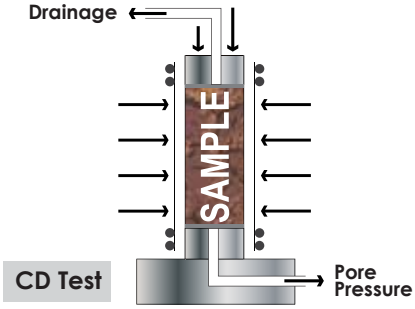
NL APVC – BP2M - Advance Pressure Volume Controller (Back Pressure / Volume Change)

NL 5019 X / 003 & 006 – P001 - Triaxial Load Frame

NL PT – 2 kPa
2000kPa Pressure Transducer with De-Airing Block (Pore Pressure)



*drainage during consolidation only



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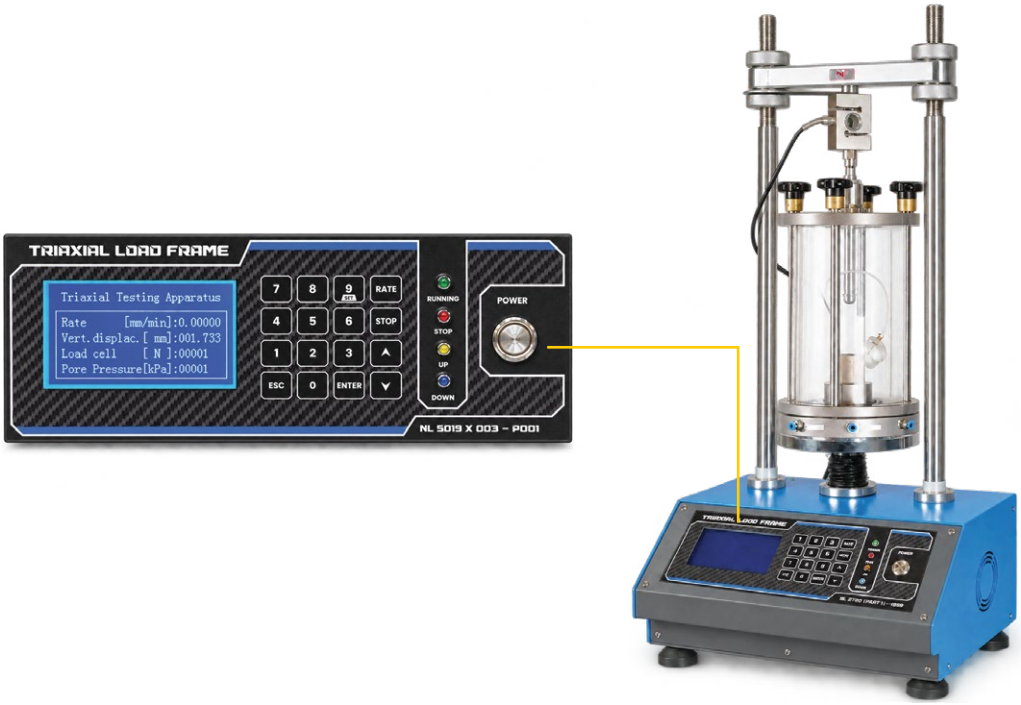

Triaxial Load Frame

NL 5019 X / 003 & 006 – P 001

Precise CNC machined high-performance and advanced load frame which is heavy duty with rigid two columns design. Provides extremely stable & consistent loading during test. High accuracy microprocessor control system loading for precise speed control to perform tests within 0.00001 to 9.99999 mm/min. High quality luxury touch pad panel for ease of operation and long lasting use.

Main Features:

- Large easy to read LED screen display.
- Versatile high quality keypad.
- Connectable to datalogger for computer control, parameters display and analysis.
- Full variable speed setting from 0.00001 to 9.99999 mm/min.
- Adopt a silent and stable operation, ensures no vibration during test.
- Designed to perform dedicated Triaxial tests – UU, CU and CD.
- Ideal for research laboratories and advanced testing that require high quality tests and high repeatability.

Technical Specifications :

Model Number	NL 5019 X / 003 – P 001	NL 5019 X / 006 – P 001
Capacity	10 kN	50 kN
Testing Speed	0.00001 - 9.99999 mm/min	
Max. Vertical Clearance	600 mm	700 mm
Horizontal Clearance	215 mm	315 mm
Platen Diameter	185 mm	185 mm
Max. Sample Size	Ø 70 mm	Ø 150 mm
Power	220~240V, 1Ph, 50/60 Hz	
Product Dimension	390(W) x 350(D) x 930(H) mm	600(W) x 440(D) x 1185(H) mm
Approx. Weight	36 kg	80 kg

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Accessories for Triaxial Load Frame:

Model Number	Parts Description
NL TLC – 10	10 kN Load Cell
NL TLC – 50	50 kN Load Cell
NL DT – 3DP	25 x 0.001 mm Digital Displacement Gauge c/w COM Cable
NL PT – 2 kPa	2000kPa Pressure Transducer with De-Airing Block (Pore Pressure)

Load Cell

Displacement Gauge

Pressure Transducer with De-Airing Block

Advance Pressure Volume Controller (Back Pressure) — NL APVC – BP2M

Advance Pressure Volume Controller (Cell Pressure) — NL APVC – CP2M

NL Advance Pressure Volume Controller provides both the required pressure and volume measurements of water. The oil-free mechanism uses high precision stepper motor ensuring pressure supplied is consistent & self-adjust to preset pressure should there is increase or decrease of pressure. Fine control of water pushes water at 1mm³ resolution for precise back pressure measurement.

Main Features:
- Easy set pressure via keypad and display.
- Convenient table top size, to replace conventional bulky, noisy & dangerous air compressor.
- Long lasting high precision & silent stepper motor operation.
- Dual-purposed – act as either main controller for cell pressure or volume change.
- Connect PC for display & easy control of pressure and volume change.

Technical Specifications :

Maximum Pressure	2 Mpa (20 bar)
Water Volume	180 ml
Accuracy	1 kPa & 0.01 ml
16 Keypad Display Panel	65 x 38 mm LCD
Power	220 VAC, 1Ph, 50/60 Hz
Product Dimension	660(L) x 100(W) x 135(H) mm
Approx. Weight	7.4 kg

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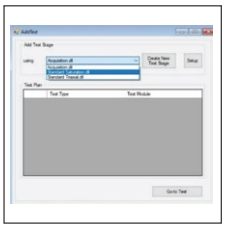
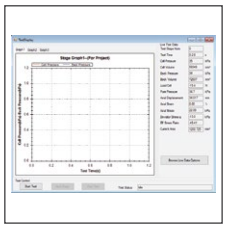
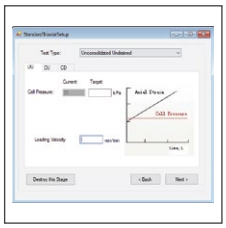
Desktop Computer Unit c/w Operation and the Software

TT 6ST – PC1

Automatic data acquisition function, with steps for complete trixial test from saturation, consolidation & shearing. The software allows user to perform complete triaxial test with ease, which are the standard UU, CU & CD tests. Simple & clear setting of basic test information. Even beginners will find it easy to use, as the software is designed to be user friendly for any types of users.

Main Features:
- Simple & clear setting of basic test information.
- Selection of acquisition, saturation, UU, CU & CD functions.
- Automatic or manual control of triaxial stages according to BS & ASTM.
- Real time display of cell, pore & back pressure.
- Calibration function for all parameters display.
- Unlimited data storage via computer hard disk.
- Control directly triaxial frame & pressure volume controller from pc.

Triaxial Cell

Precisely made of high quality aluminium alloy & high resistant acrylic cell cylinder to withstand maximum pressure of 2000 kPa. Fitted with industrial grade quality on/off valves for cell pressure, back pressure & pore pressure hose connections. No tools required for dismantling & assembling the cell, as the clamping rods are tightened & loosen using hand knobs.

Technical Specifications :

Model Number	Max. Sample Size	Max. Pressure	Height	Diameter	Weight
NL 5019 X / 003 – P 003	Ø 50 mm	1700 kPa	376 mm	Ø147 mm	6 kg
NL 5019 X / 004 – P 003	Ø 100 mm	1700 kPa	485 mm	Ø187 mm	11 kg

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A001

A002

A003

A004

A005

A006

A007

A008

A009

A010

A011

A012

A013

A014

007

A015

Legend

	Description
A001	**Base Adapter** . Used to adapt the triaxial cell base for different sample sizes.
A002	**Top Cap** . Used to spread the load evenly over the wholecross 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	**Porous Disc** . 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	**Rubber Membrane** . To provides a protective waterproof barrier around the sample. Made of Rubber Latex and supplied in pack of 10.
A005	**O-ring** . Used to seal the membrane against the base adapter and the top cape of the sample. Supplied in pack of 8.
A006	**Membrane Strecher** . To strech the membrane during its positioning.
A007	**Filter Paper for Side Drains** . Used as a side drain when specimens have low permeability. Very usefull when saturating clays before consolidation & shearing. Supplied w pack of 50.

	Description
A008	**Split Former** . To prepare coarse grain soil specimen. It is made of two aluminium halves.
A009	**O-ring Placing Tool** . Used for applying the O-ring with the minimum to the sample.
A010	**Split Mould** . Used for trimming the ends of undisturbed soil specimen.
A011	**Electrical Water Pump** . To pumping water from tank to Triaxial Cell.
A012	**Rubber Teat** . To sucking for Membrane stcrecher.
A013	**Filter Paper for Base** . 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	**De-Airing Water Tank (with Mounting Bracket)** . Used for water storage.
007	**Oil Free Vacuum Pump** . With built-in thermal protection device
A015	**Nylon Tubing M6** . for vacuum (5 meter / roll)

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Accessories

Name	Specimen Dimensions			
	Ø 38mm x 76mm (H)	Ø 50mm x 100mm (H)	Ø 70mm x 140mm (H)	Ø 100mm x 200mm (H)
Base Adapter	NL 5019 X / 38 – A001	NL 5019 X / 50 – A001	NL 5019 X / 70 – A001	NL 5019 X / 100 – A001
Top Cap w Drainage	NL 5019 X / 38 – A002	NL 5019 X / 50 – A002	NL 5019 X / 70 – A002	NL 5019 X / 100 – A002
Porous Disc (2pcs)	NL 5019 X / 38 – A003	NL 5019 X / 50 – A003	NL 5019 X / 70 – A003	NL 5019 X / 100 – A003
Rubber Membrane (pack of 10)	NL 5019 X / 38 – A004 (160 mm Length)	NL 5019 X / 50 – A004 (200 mm Length)	NL 5019 X / 70 – A004 (240 mm Length)	NL 5019 X / 100 – A004 (320 mm Length)
O-Ring (pack of 8)	NL 5019 X / 38 – A005	NL 5019 X / 50 – A005	NL 5019 X / 70 – A005	NL 5019 X / 100 – A005
Membrane Strecher	NL 5019 X / 38 – A006	NL 5019 X / 50 – A006	NL 5019 X / 70 – A006	NL 5019 X / 100 – A006
Filter Paper for Side Drains (pack of 50)	NL 5019 X / 38 – A007	NL 5019 X / 50 – A007	NL 5019 X / 70 – A007	NL 5019 X / 100 – A007
Split Former	NL 5019 X / 38 – A008	NL 5019 X / 50 – A008	NL 5019 X / 70 – A008	NL 5019 X / 100 – A008
O-Ring Placing Tool	NL 5019 X / 38 – A009	NL 5019 X / 50 – A009	NL 5019 X / 70 – A009	NL 5019 X / 100 – A009
Split Mould	NL 5019 X / 38 – A010	NL 5019 X / 50 – A010	NL 5019 X / 70 – A010	NL 5019 X / 100 – A010
Electrical Water Pump	NL 5019 X / 38 – A011			
Rubber Teat	NL 5019 X / 38 – A012			
Filter Paper for Base (pack of 100)	NL 5019 X / 38 – A013	NL 5019 X / 50 – A013	NL 5019 X / 70 – A013	NL 5019 X / 100 – A013
De-Airing Water Tank (w Mounting Bracket)	NL 5019 X / 38 – A014			
Oil Free Vacuum Pump	NL 7022 X / 007			
Nylon Tubing M6 (5 meter / roll)	NL 5019 X / 38 – A015			

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