WYKEHAM FARRANCE
A Division of CONTROLS

SOIL AND ROCK MECHANICS TESTING

AUTOTRIAXQube

Pioneering All-in-One Triaxial Testing System

www.controls-group.com

The new AUTOTRIAXQube is a revolutionary, all-in-one automatic triaxial testing system that integrates the many components of triaxial testing into one, single compact system. Designed to make triaxial testing easier than ever before, the AUTOTRIAXQube will fit neatly in any laboratory and compliment your existing testing capability.

All-in-One Automatic Triaxial Testing System

Space Saving
Occupying less than one square meter, the AUTOTRIAXQube is the ideal solution for any laboratory where space is at a premium.

Easy to Install
There's no need for external panels, tank or hydraulic connection — simply connect the AUTOTRIAXQube to water and power supply and start testing.

Fast Water De-Airing
The built-in vacuum pump, tank, control valves and cavitation system will de-air the water quickly and efficiently down to levels of dissolved air acceptable for triaxial test methods.

Integrated Triaxial Cell
Thanks to its lifting system and its three internal columns frame, the triaxial cell is easy to handle.

Integrated Vacuum System
For a streamlined and time saving sample preparation process.

Reliable and Accurate
The system is programmed with standardized test procedures reducing inconsistencies from operator variables, or other unpredictable external factors. So there is no need to collect and save data manually, or perform complex calibration procedures.

Efficient and Repeatable
AUTOTRIAXQube can complete the whole test — from saturation to failure — in full automatic mode without any interruption, saving time, minimizing operator intervention while increasing accuracy.

Versatile and Expandable
Capabilities can be expanded to perform permeability testing simply by adding a third pressure line. Advanced measurements can be also obtained with the addition of a Bender Element system, or local strain sensors.

25 kN submersible load cell
suitable for compression and extension test using vacuum top cap.

Built-in 50 mm potentiometric transducer
for measuring the deformation of samples from 38-70 mm diameter.

Three 3,500 kPa pressure transducers
with de-airing block panel for cell, back and pore pressure measurements.

Integrated de-airing water system
including vacuum pump, tank, control valves and cavitation system.

Four sturdy wheels
for easy positioning and manoeuvrability anywhere in the laboratory.

Reinforced Triaxial cell
with internal frame and lifting system to assist the operator.

All-in-one PC (optional)
with effective/total stress and stress path k_0 software.

Leak-proof top plate
designed to safely collect and drain excess water.

Compact front panel
to manage preliminary action such as de-airing water, water saturation circuits, sample positioning and filling of triaxial cell. In case of an emergency, simply stop the process by pressing the Emergency stop button at any time.

Easy monitoring of the water level
of hydromatic pressure volume and cell/back pressure lines from front panel. Pre-arrangement additional pressure line for performing permeability test.

Technical Specifications

• **Maximum load capacity:** 25 kN	• **Volume resolution:** 0.001 cc
• **Maximum sample size:** 70 mm diameter x 140 mm height	• **Piston travel:** 100 mm
• **Maximum confining pressure:** 3,500 kPa	• **Integrated de-airing tank:** 20 liters
• **Maximum back pressure:** 3,500 kPa	• **Units:** SI or US Customary
• **Pressure resolution:** 0.1 kPa	• 110, 220V 50-60 Hz, 1 pH
• **Maximum volume capacity:** 250 cc	

AUTOTRIAXQube
Key Components & Functionality

Secure Triaxial Cell Lifting System

The new lifting mechanism allows the operator to raise the cell to its highest position and rotate it through 90 degrees, until it's safely held in place with a magnetic latch. This removes the need to lift the total weight of the cell while freeing space on the work bench for sample preparation tools.

Easy Sample Preparation with Clever Internal Load Frame Mechanism

The integrated triaxial cell includes an internal load frame consisting of three columns supporting an upper pivoting crosshead. It is able to rotate, clearing the necessary space to prepare the sample. This is particularly useful when compacting a non-cohesive sandy specimen than can be prepared with "soft" compaction, or by pluviation method. Once the specimen is complete, the operator can easily center the upper plate so that the load cell connects through the top cap to the specimen. They can then easily lower the triaxial cell with the specimen already connected to the submersible load cell, without any disturbances (crucial for a low density specimen).

High-Precision Submersible Load Cell

The AUTOTRIAXQube uses a unique high-precision 25 kN submersible load cell in which pressure does not affect the load reading. This makes it a perfect solution for performing stress path and K_0 tests.

Universal Accessories Compatibility

All existing accessories already in use with 70 mm banded triaxial cell from 38 mm up to 70 mm diameter samples are fully compatible with the AUTOTRIAXQube system, including:

1. Top cap
2. Vacuum top cap
3. Pedestal
4. Base disc
5. Pair of porous stone
6. Rubber membrane
7. O-rings
8. Membrane stretcher
9. O-ring placing tool
10. Two part split mould
11. Lateral filter drains
12. Filter disk
13. Hand sampler
14. Two part split former with vacuum attachment

Built-in Ingenious Hydraulic System

The preliminary system set-up including water circuit saturation, pressure system and triaxial cell filling can be quite time-consuming in any triaxial testing. Yet, it is crucial to get this preparation right in order to avoid any possible damage or compromise to the sample already positioned in the triaxial cell.

With the AUTOTRIAXQube the whole process is simplified to make triaxial testing as easy as possible:

Multi-function Control Panel

The manual valves that were once fitted to a wall panel have now been replaced by internal electro-valves connected to the control panel, making the initial set-up simple and straightforward. The whole procedure for de-airing water can be managed via the integrated de-airing system, and sample positioning has been simplified by enabling the control panel to move the platen up and down. This is especially helpful when you need to connect a sample to the submersible load cell.

De-airing Block Panel

All pressure transducer sensors can be easily de-aired thanks to the de-airing block panel, located near to the base of the triaxial cell. The panel is designed to accommodate water, so any water pushed through the line during the circuit saturation process can be caught in the tray and drained away.

Integrated Standalone De-airing System

The full water de-airing process can be managed quickly and efficiently thanks to the compact multi-function control panel. The integrated de-airing system includes a vacuum pump, a 20 liter tank, three operating control valves and high-speed cavitation system.

At the end of the de-airing process, water can be easily pushed through the pipes to fill the whole hydraulic circuit and triaxial cell. The multi-function control panel is also used to manage discharge of the water from the triaxial cell to the de-airing tank, when testing is complete.

User-friendly Software

The user-friendly software and desktop PC* allow the operator to control all phases of testing over a fast Ethernet connection. The AUTOTRIAXQube can also connect using Wi-Fi which is useful for remote training and support.

If you already use our flexible and renowned AUTOTRIAX software as part of your existing system, there is no need to invest in any additional software as the AUTOTRIAXQube can easily be integrated and controlled as an independent system by your existing PC and software.

Wide Range of Triaxial Testing

The AUTOTRIAXQube has been carefully designed to make a wide variety of triaxial testing easier than ever before:

→ **Effective stress test,**
in which the soil is first saturated, consolidated and then taken to failure:

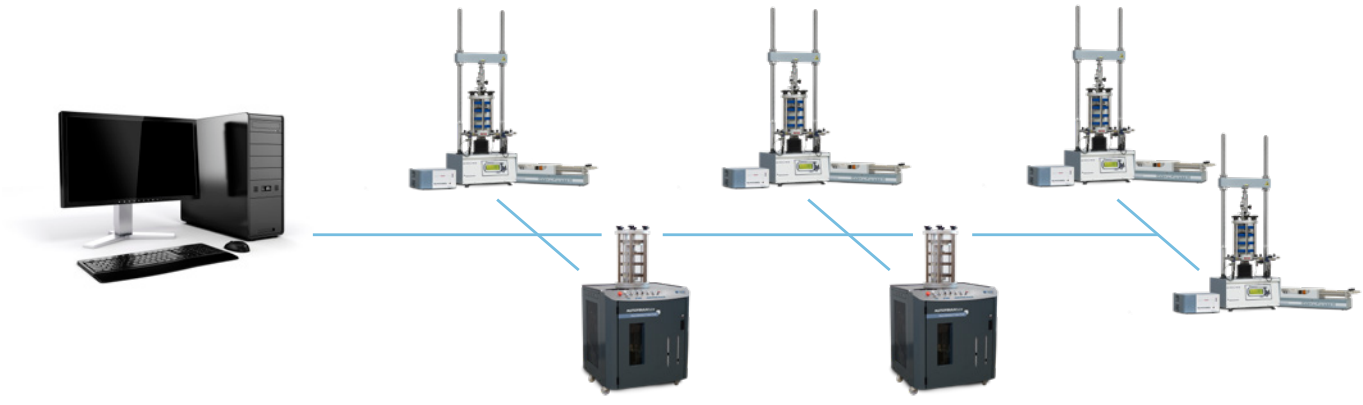
– CU/CAU (Consolidated Undrained) test:**
Deviator stress is applied by keeping cell pressure constant, without allowing any further drainage.

– CD/CAD (Consolidated Drained) test:** Deviator stress is applied by keeping cell pressure constant and by allowing drainage. The rate of loading must be slow enough to ensure that no excess pore water pressure develops.

→ **Total stress test,**
in which no saturation or consolidation is performed until failure is reached:

– UU (Unconsolidated Undrained) test: the failure is reached in undrained conditions, without waiting for the consolidation of the soil specimen.

→ **Stress Path and K_0 test*****,**
triaxial tests allow you to replicate the changes in stresses experienced in-situ during natural events, excavations, and constructions.



* To be ordered separately. Please note that an optional all-in-one PC model is also available.

** Anisotropic consolidation according to EN 17892:9 is available. For anisotropic consolidation, a vacuum top cap is required

*** Requires separate activation codes

Additional Testing with Optional Upgrades

ADVANCED MEASUREMENTS

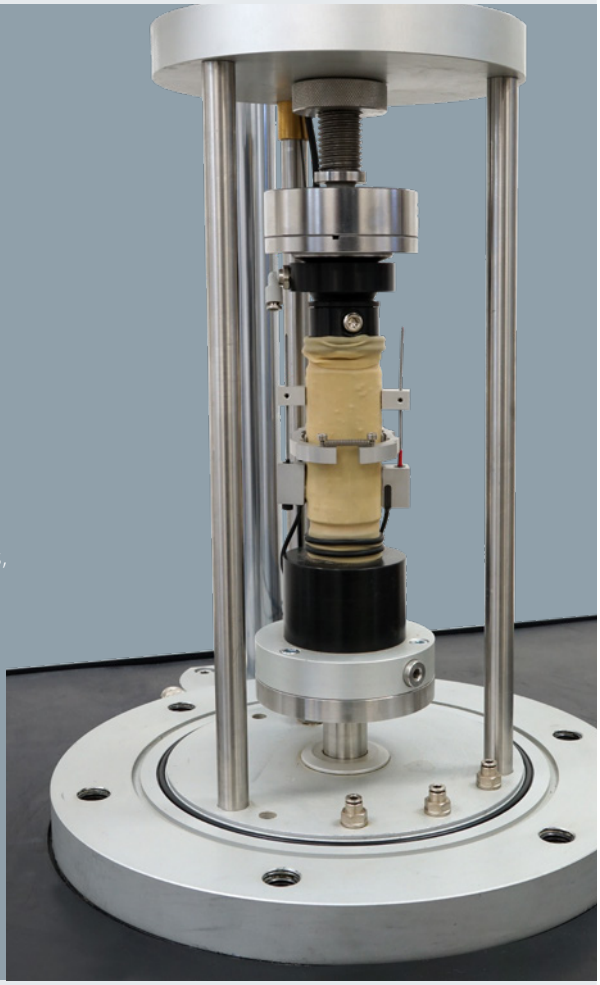
The **AUTOTRIAXQube** can be easily upgraded for advanced measurements such as Bender Elements and Local Strain Measurement:

Bender Elements

Bender elements measure the maximum shear modulus (Gmax) of soil samples in order to evaluate their stiffness. Gmax (typically with shear strain levels of about 0.001%) is a key parameter in low-strain dynamic analysis used to predict soil behavior or soil structure interaction during earthquakes, explosions or machine and traffic vibrations.

Local Strain Measurement

Sample Hall Effect Transducers are very light and easy to handle, therefore can be mounted to the sample with minimal disturbance. They are used to eliminate the errors caused by deflections of loading system and bending of the porous stone onto the ends of the specimen, that affect the evaluation of deformation, especially at initial small strain.



PERMEABILITY TESTING

The AUTOTRIAXQube can also be used to evaluate the hydraulic conductivity of soil samples when investigating infrastructures such as earth dams, saturated embankments, and landfill sites. In addition to the two standard pressure lines (for cell and back pressure) a third pressure line (for a single Hydromatic system and its valves) can also be added to perform permeability testing by applying the required hydraulic gradient.

CONSTANT RATE OF STRAIN (CRS) AND UNCONFINED TEST

Ancillary tests such as constant rate of strain (CRS) and unconfined tests can be performed by adding dedicated software and certain specific accessories.

CRS Adapter

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Wykeham Farrance Customer Care

Wykeham Farrance is the Soil and Rock Testing Division of CONTROLS. As one of the longest established manufacturing companies in the world of Construction Materials Testing solutions, we are dedicated to supplying high quality, accurate, affordable, easy to use systems.

As a valued customer of CONTROLS, you will receive continuous, expert support and advice for your Wykeham Farrance equipment. Furthermore, we can offer full installation and training in the correct operation of your equipment.

For support from our expert Customer Care Team, contact your local CONTROLS office / distributor or email **wfsupport@controls-group.com.**

For more information, please visit **www.controls-group.com.**

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