Latest generation of Triaxial Systems for Soil Mechanics

Boost your laboratory with our modular devices expertly designed for Soil Mechanics testing
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The stress-strain behavior of Soil is typically investigated with triaxial test on undisturbed, remolded or compacted specimens subject to increasing loads and variable drainage conditions simulating as closely as possible the site conditions and the effects of construction, excavation, embankment, landslide, wave propagation, seismic loading.

Wykeham Farrance, the Soil Testing specialist with 75 years expertise in the field, has launched a new generation of Triaxial Systems matching all the laboratories’ needs and strictly compliant to the International Standards.

The following pages present 4 triaxial systems with increasing level of sophistication. The vast range of accessories and the high flexibility opens to a huge number of configurations (more than 1000) matching any customer requirement.

**Triaxial System with automatic expandable data acquisition and automatic pressure / volume controller:** the expandable compact solution for standard triaxial testing (effective and total stress) and for many other Soil tests. Data acquisition can be shared with others soil testing equipment (e.g. consolidation and shear).

**Triaxial System with automatic built-in data acquisition and automatic pressure / volume controllers:** the simplest compact solution for standard triaxial testing (effective and total stress). No requirement for external data acquisition and/or PC.

**Fully Automatic Triaxial System AUTOTRIAX 2:** the advanced triaxial testing system that can automatically and contemporaneously run up to 6 independent tests without human intervention.

**Dynamic Triaxial System DYNATRIAX EmS:** the advanced dynamic triaxial testing system based on the EmS technology for cyclic and static tests including resilient modulus.
Triaxial System with automatic built-in data acquisition and automatic pressure / volume controllers

Total Stress (UU), Effective stress (CU, CD) – CBR – Unconfined – CRS (constant rate of strain)

**Benefits**

- Simplification and reduction of space: devices for compressed air, control panels and ancillary air/water systems are no longer required
- On-board (via USB) automatic data acquisition for all the sensors required (vertical deformation, axial force, cell pressure, back pressure, pore pressure, volume change).
- Closed loop automatic control and management of cell and back pressure
- Compact configuration with small footprint, Hydromatic easily installed in vertical or horizontal position
- PC no strictly required for test management, tests can be easily performed with the 6” touch screen
- Additional control mode, including machine and data acquisition via remote PC and software,
- Additional package for data processing and reporting, fully conforming ASTM and BS standards

**Technical Specifications**

- **Capacity**: 50 kN and 100 kN
- **Speed range**: 0.00001 – 99.99999 mm/min (TRITECH) and 0.00001 – 50.8 mm/min (TRIAX)
- **Working pressures**: 1700 or 3500 kPa
- **Specimen range**: 35,38,50,70,100,150 mm diameter
- **Touch screen**: resolution 640 x 480 pixel; 65 K colours; Contrast ratio 250:1
- **Effective resolution**: 131000 points
- **USB port**
- **LAN communication**
- **Sampling rate**: 50 reading per second, per channel
- **110-220 V, 50-60 Hz, 1 ph**
Triaxial System with automatic expandable data acquisition and automatic pressure volume controller

Capacity: 50 kN and 100 kN

Speed range: 0.00001 – 99.99999 mm/min (TRITECH) and 0.00001 – 50.8 mm/min (TRIAX)

Working pressure: 1700 or 3500 kPa

Specimen size range: 35,38,50,70,100,150 mm diameter

Touch screen: Resolution 640 x 480 pixel; 65 K colours; Contrast ratio 250:1

Effective resolution: 131000 points

USB port

LAN communication

Sampling Rate: 500 reading per second.

110-220 V, 50-60 Hz, 1 ph

Benefits

- Possibility to perform various tests (e.g. consolidation, shear, triaxial) in parallel, each one with independent clock, channels and logging mode.

- Simplification and reduction of space: no longer required devices for compressed air, control panels and ancillary air/water systems.

- GEODATALOG 8 is conceived with the concept of modularity and flexibility: up to 8 units can be linked to form a network, so that a modular system can be expanded up to 64 independent channels.

- Automatic manage and acquisition with close loop control for cell and back pressures.

- Compact configuration with a small footprint, Hydromatic easily installed vertically or horizontally.

- Additional package software for real time data processing and reporting fully conformed to ASTM and BS standards.
Autotriax2
Fully Automatic Triaxial System

Total Stress (UU), Effective stress (CU, CD) – Stress path – $K_0$ – CBR – Unconfined – CRS – Permeability – Unsaturated soil – Hydraulic consolidation

**Technical Specifications**

- **Maximum no. of simultaneous tests:** 6
- **Maximum no. of channels:** 96 (in the most extended configuration)
- **Maximum capacity:** 50 kN and 100 kN
- **Speed range:** 0.00001 – 99.99999 mm/min
- **Specimen range:** 35, 38, 50, 70, 100, 150 mm diameter
- **Water working pressure:** 1700 or 3500 kPa
- **Pressure resolution:** 0.1 kPa
- **Maximum capacity of pressure / volume controller:** 250 cc
- **Volume resolution:** 0.001 cc
- **Effective resolution:** 131000 points
- **LAN communication**
- **110-220 V, 50-60 Hz, 1 ph**

**Benefits**

- 24/7 testing without interruption, maximizing productivity and reducing demands on your staff.
- Fully PC control system
- Multitasking, user-friendly Windows-based, the PC software complies with relevant standards.
- Ability to install software and fit additional accessories as required will enable the Autotriax2 to perform many types of tests.
- The modular concept of the Autotriax2 for easy expansion and upgrade.
- External factors and inconsistencies between different operators are minimized; test procedures are always repeatable and compliant.
- Six independent, both advanced and standard, triaxial tests can be performed at the same time.
**Dynamic Triaxial System**

Cyclic triaxial - Total stress (UU) - Effective stress (CU, CD) - Stress path - \( K_0 \) - Unsaturated soil - Resilient modulus

### Technical Specifications

- **Maximum Dynamic force:** \( \pm 15 \) kN
- **Maximum Static force:** \( \pm 10 \) kN
- **Maximum vertical travel:** 50 mm (longer travels available)
- **Maximum testing frequency:** more than 10 Hz (depending on testing conditions)
- **Volume change measure:** 100 cc volume change device with automatic flow inversion
- **Maximum confining pressure:** 1000 kPa
- **Maximum back pressure:** 1000 kPa
- **Close loop control frequency:** 10 kHz
- **16-bit ADC input channels for transducers (16 channels)**
- **110-220 V, 50-60 Hz, 1 ph**

### Benefits

- Electromechanical Servo-actuation technology; it offers excellent reliability, more accurate testing and lower maintenance requirements.
- Three axis closed loop control for axial load or displacement, cell and back pressure
- Multitasking, user-friendly Windows-based, the PC software is supplied pre-installed and ready to use. This excellent software controls the entire triaxial test and associated parameters.
- Complete automation of all test stages using high sensitivity closed loop P.I.D. feedback control
- Capability to perform Static (effective stress and stress path), Dynamic and Unsaturated soils triaxial tests
- Standard and user defined wave shapes also derived from in situ measurements (from violent earthquakes to sedate ocean waves)
### Standard Triaxial

<table>
<thead>
<tr>
<th>Macro Configuration</th>
<th>Built-in system</th>
<th>Expandable</th>
<th>Fully automated</th>
<th>Dynamic</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Typical End User</strong></td>
<td>Education purposes that don’t necessarily require an external data acquisition unit with dedicated PC.</td>
<td>Commercial laboratory with a shared data acquisition (e.g. triaxial, shear, oedometer and many other tests)</td>
<td>University Researchers Commercial laboratory</td>
<td>University Researchers Commercial laboratory</td>
</tr>
<tr>
<td><strong>Level of automatization</strong></td>
<td>Automatic data acquisition and managing of pressure and volume</td>
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<td>Fully automated and PC control by dedicated software</td>
<td>Automated and PC control by dedicated software</td>
</tr>
<tr>
<td><strong>Test Type</strong></td>
<td>Total stress (UU) Effective stress (CU, CD) CBR Unconfined CRS</td>
<td>Total stress (UU) Effective stress (CU, CD) CBR Unconfined CRS</td>
<td>Total stress (UU) Effective stress (CU, CD) Stress path K₀ Unconfined CRS Permeability Unsaturated soils</td>
<td>Cyclic triaxial Total stress (UU) Effective stress (CU, CD) Stress path K₀ Unsaturated soils Resilient modulus</td>
</tr>
<tr>
<td><strong>Max capacity [kN]</strong></td>
<td>50/100</td>
<td>50/100</td>
<td>50/100</td>
<td>± 15 - dynamic ± 10 - static</td>
</tr>
<tr>
<td><strong>Max Pressure [kPa]</strong></td>
<td>1700/3500</td>
<td>1700/3500</td>
<td>1700/3500</td>
<td>1000</td>
</tr>
<tr>
<td><strong>Specimen dimension [mm]</strong></td>
<td>35 – 150 dia.</td>
<td>35 – 150 dia.</td>
<td>35 – 150 dia.</td>
<td>38 – 100 dia.</td>
</tr>
<tr>
<td><strong>Control unit / data acquisition</strong></td>
<td>-6&quot; touch screen colour panel (to control load frame and four channels readings)</td>
<td>-6&quot; touch screen colour panel (to control pressure and show pressures and volume change readings)</td>
<td>Data acquisition and control unit – MASTER UNIT for transmitting data and information between the software and all the active components</td>
<td>CDC- Compact Dynamic Controller and data acquisition for transmitting data and information between the software and all the active components</td>
</tr>
<tr>
<td><strong>Number of channels</strong></td>
<td>4 ch - load frame 2 ch - pressure system</td>
<td>8 ch expandable up to 64</td>
<td>Up to 96 in most extended configuration</td>
<td>16 ch</td>
</tr>
</tbody>
</table>
Discover our full range of products

At Wykeham Farrance, we are proud of our products. As one of the longest established manufacturing companies in the world of Geotechnical Testing Systems, we are dedicated to supplying high quality, accurate, affordable, easy-to-use systems for Advanced Testing of soils.

Discover our full range of testing systems by visiting [www.wfi.co.uk](http://www.wfi.co.uk).

Wykeham Farrance Customer Care

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

For support from our expert Customer Care Team, contact your local Wykeham Farrance distributor or email soil@controls.it. Visit our website for more information [www.wfi.co.uk](http://www.wfi.co.uk).

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Automatic machine for Direct / Residual Shear Testing

Resonant Column / Torsional Simple Shear System