

SOIL MECHANICS TESTING MADE EASY

ACE EMS

Advanced Automatic Oedometer System
for Soil Consolidation

Standards BS 1377:5 | ASTM D2435 | ASTM D3877 | ASTM D4546 | NF P94-091 | EN 17892:5



The ACE EmS is a versatile and fully automatic Oedometer soil consolidation testing system that benefits from the new low maintenance, efficient and environmentally friendly Electromechanical Servoactuation (EmS) technology. Silent, compact and high performing, the ACE EmS can be run via our ingenious software that can connect up to 60 units with just one PC, enabling you to expand your laboratory gradually and seamlessly.



Save time and ensure test accuracy and repeatability

The Fully automatic ACE EmS can complete the whole test in fully automatic mode by selecting the load (stress), offering a practical and accurate way to obtain reliable results without any need for manual intervention, reducing the risk of human error.



Environmentally friendly and quiet

Equipped with the new Electromechanical Servoactuation (EmS) technology requiring no dead weights or large and noisy air compressors, thus drastically reducing noise levels.



Low maintenance and easy installation

with Electromechanical Servoactuation (EmS) technology requiring single phase power and almost zero maintenance.



Clarity in results

The Oedometer test results are saved and displayed in real-time, speeding data capture. Results are processed with our easy-to-use Geo-Analysis templates, written by experts around international standards allowing you to concentrate on analyzing your materials; not on programming your testing machine.



Future-proof – modular and expandable

Connect up to 60 units via LAN port using the one PC software allowing you to build your laboratory without interruption — resulting in excellent return on investment.



High performance

High performance with load capacity of up to 20 kN, equivalent to 10,000 kPa on 50.47mm Oedometer consolidation cell.



A compact system of unparalleled value

Robust, versatile load frame, with adjustable vertical clearance using dedicated extension rods.

High performing 20 kN capacity Load cell to measure vertical force (supplied with traceable calibration certificate).

Multisize standard fixed ring cell for soil specimen are available with diameter ranging from 50.47 mm to 112.80 mm.

Small footprint – less than 300mm wide.

10 mm displacement transducers measuring vertical settlement (supplied with traceable calibration certificate). Optional transducers with different travels also available.

Ground breaking, low maintenance and environmentally friendly EmS technology, with automatic “next step” time-driven actuation. No dead weights or compressor required.

Optimized PID closed-loop control delivering fast, smooth & accurate loading and precise load holding through multiple test steps.



Technical specifications

Maximum vertical force: 20 kN

Ram travel: 25 mm

Minimum testing speed: 0.00001 mm/min

Maximum testing speed: 50.00000 mm/min

Horizontal clearance: 175 mm

Vertical Clearance: 185 mm
(265 mm with extension columns)

Dimension: 300 x 390 x 600 mm

Weights: 40 kg (approx.)

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

Ordering information

26-WF31E20

Automatic computerized Oedometer ACE EmS

Consolidation cells

The cell is constructed in aluminum and comes complete with two porous stones, load pad, cutter and clamping ring (see all the parts in the exploded view p 7).



Wide range of Consolidation Tests

ACE EmS is a versatile fully automatic Oedometer soil consolidation testing machine perfectly equipped to perform a wide range of consolidation tests.

- > **Incremental loading test** – BS 1377:5 | ASTM D2435 | EN 17892:5
Determines the magnitude and rate of soil consolidation when restrained laterally and drained axially whilst being subjected to increasing controlled-stress loading.
 - > **Swelling test** – ASTM D4546*
Measures the magnitude of one-dimensional wetting-induced swell or collapse under different vertical (axial) pressures, as well as the magnitude of swell pressure and free swell.
 - > **Unconfined compression test** – ASTM: D2166/ BS 1377:7
Ascertains the unconfined compressive strength of cohesive soils using strain-controlled application of the axial load. The soil is subjected to a rate of strain whilst the axial force and axial deformation are measured during compression.
 - > **CRS (Constant Rate of Strain)** – ASTM D4186
Measures the magnitude and rate-of-consolidation of saturated cohesive soils using axial strain-controlled conditions, when the soil specimen is restrained laterally and drained axially to one surface. The soil is subjected to uniform deformation and axial force; axial deformation and base excess pressure are measured during this consolidation process.
 - > **CHG (Controlled Hydraulic Gradient) test***
No dedicated Standard exists however, CHG can be performed using an adapted Incremental loading test with another condition added to monitor the dissipation of pore pressure sequence.
- * Please contact our friendly pre-sale engineer specialist about components required to allow this test to be performed with standard software.

Incremental Loading Test

Customizable and easy-to-use software



The ACE EmS software has been expertly designed by Geotechnical specialists who run the tests, not just software engineers.

The intuitive graphical interface is customizable and will enable you to perform all test procedures with ease. The ability to preset all test conditions and let each oedometer unit perform the entire test independently and automatically gives you consistency across testing procedures and the flexibility to perform other tasks while the test is still running.



- ✓ Fully customizable graphical interface
- ✓ Ability to preset all test conditions
- ✓ Entire test performed independently and automatically by each oedometer unit

Access to various standard configurations



PC Controlled configuration

ACE EmS modular and expandable configuration connects up to 60 units via LAN port using the one PC software allowing you to build your laboratory without interruption — increasing productivity and profitability.



CONNECT UP-TO 60 UNITS

ACE EmS LAN – PC connection allows gradual modular expansion

Local User Interface configuration

Our most compact configuration — the combination of the ACE EmS with our high resolution 6" touch screen color display will give you full control of a single unit, without the need of a PC.

Numerical and graphical display of the readings are presented clearly and data is recorded on a sturdy, high-storage-capacity USB pen drive supplied with the system. All data is conveniently output in TXT format.



CRS Test configuration

Additional accessories required for this configuration:

- CRS cell
- Extension rods
- Pressure transducers
- One water pressure line

CRS cell

- Continuous monitoring of test parameters (axial load, pore pressure, axial compression)
- Sample dimension 63.5 x 25.4mm
- Max. working pressure 3,500 kPa
- Relatively short time to perform consolidation test



Extension rods and centering pin for CRS (Constant rate of strain) and Unconfined (UC) test



Pressure transducer with de-airing block for pore pressure measurement



Hydromatic Stand-alone

Hydromatic standalone is a compact and general-purpose water pressure source that also enables the ACE unit to measure volume change:

- Powers up to two hydraulic pressure lines and measures the associated volume changes
- Generates water pressure regulated under closed-loop control up to either 3,500 kPa or 1,700 kPa
- High resolution measurement of pressure (0.1 kPa)
- High volume capacity, 250 cc
- Lightweight with a small footprint
- No air compressor required

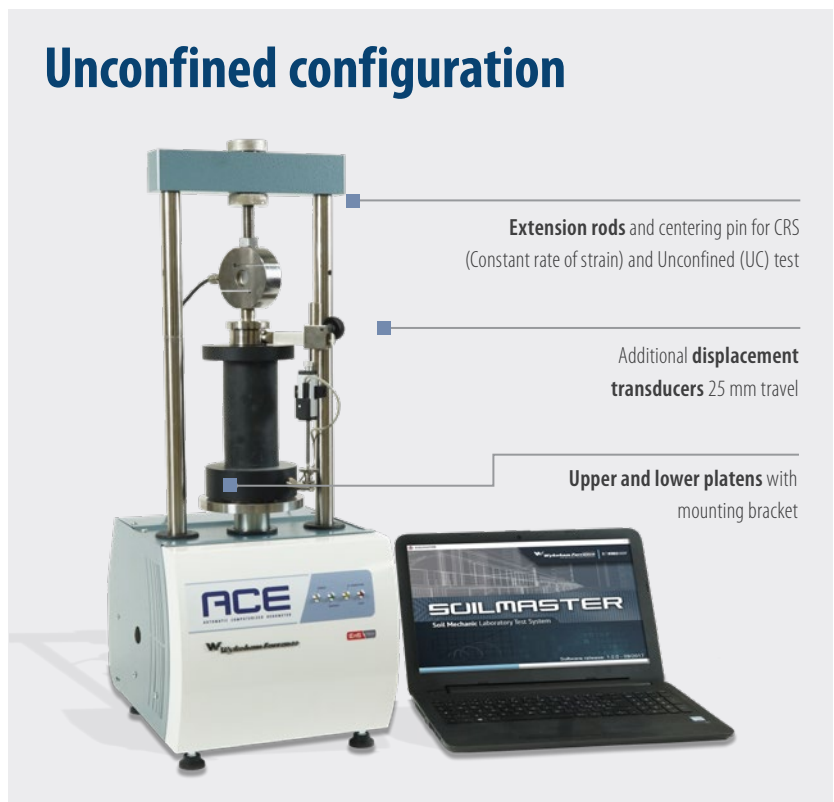


Unconfined configuration

Extension rods and centering pin for CRS (Constant rate of strain) and Unconfined (UC) test

Additional displacement transducers 25 mm travel

Upper and lower platens with mounting bracket



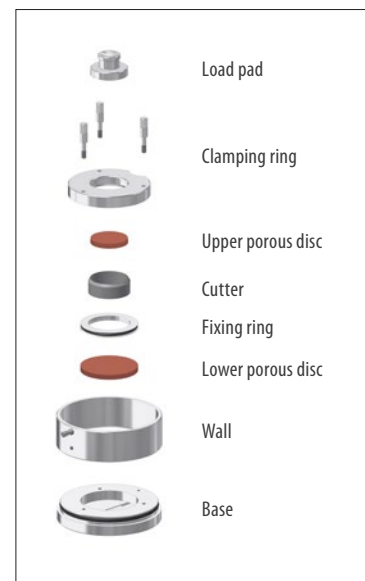
For a complete test configuration, visit our web site or contact our dedicated team of experienced geotechnical engineers on wfsupport@controls-group.com.

Accessories

Consolidation cells

The cell is constructed in aluminum and comes complete with two porous stones, load pad, cutter and clamping ring (see all the parts in the exploded view below).

Model	Specimen dia. x h, mm	Area (cm ²)	Calibration disk
26-WF0320	50.47 x 20	20.00	26-WF0320/9
26-WF0321	63.50 x 20	31.67	26-WF0321/9
26-WF0325	71.40 x 20	40.00	26-WF0325/9
26-WF0326	75.00 x 20	44.16	26-WF0326/9
26-WF0335	112.80 x 25	100.00	26-WF0335/9



Software / Touch Screen Controller

26-WF31E20/SW

PC software for remote control and data acquisition of up to 60 units connectable to a single PC. (PC controlled configuration)

26-WF31E20/T

Optional local user interface with 6" touch screen high resolution color display allowing full control of a single ACE EmS including full test execution. (Local user configuration)

Important: Please note that either the software or local user interface (see sections to the right) are mandatory for running the consolidation tests on the ACE EmS.

Upgrading kit

26-WF31E20/E

ACE EmS extension rods and centering pin for Constant Rate of Strain (CRS) and Unconfined (UC) test.

26-WF31E20/U

Upper and lower platens with mounting bracket for Unconfined (UC) test with ACE EmS.

Data Processing template

30-WF6016/T1

Consolidation Geo-Analysis template BS 1377:5.

30-WF6016/T6

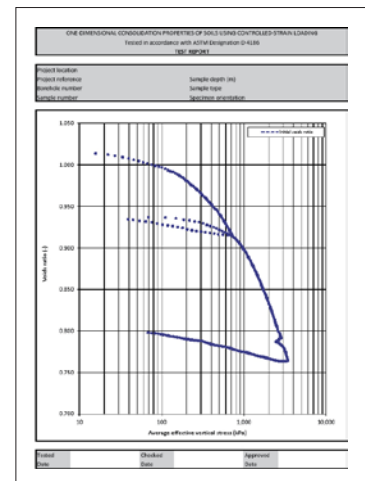
CRS type consolidation Geo-Analysis template conforming to ASTM D4186

30-WF6016/T8

Consolidation Geo-Analysis template conforming to ASTM D2435.

30-WF6016/T8A

Consolidation Geo-Analysis template conforming to ASTM D4546.



30-WF6016/T1, 30-WF6016/T6, 30-WF6016/T8, 30-WF6016/T8A



SHEARMATIC EMS

Advanced Automatic Direct/Residual Shear Testing Machine



AUTOTRIAX EMS

Automatic Triaxial Tests System

▶ Wykeham Farrance Customer Care

At Wykeham Farrance, we are proud of our products.

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 wfsupport@controls-group.com.

Visit our website for more information www.controls-group.com/wf.



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