

## DATA SHEET

# Automatic Shear Testing Machine SHEARMATIC EmS



SHEARMATIC EmS - Electromechanical Servoactuated technology, automatic direct and residual shear testing machine 27-WF21E80

## General description

The Shearmatic EmS is the fully automatic shear testing machine that benefits from the new low maintenance, efficient and environmentally-friendly Electromechanical Servoactuation (EmS) technology. Silent, compact and high-performing, the Shearmatic EmS testing system can be run as stand-alone unit or with our ingenious software that can connect up to 6 units with just one PC, enabling you to expand your laboratory gradually and seamlessly.

### Direct/Residual test description

The test determines the consolidated drained shear strength of one specimen of a soil material under direct shear boundary conditions. The specimen is deformed at a controlled rate on or near a single shear plane determined by the configuration of the apparatus.

### Fully automatic

The SHEARMATIC EmS can complete the whole test in fully automatic mode from consolidation to shear stage; selecting the load (stress) for consolidation and a predefined shear speed for shearing stage offering a practical and accurate way to obtain reliable results without any need for manual intervention, reducing the risk of human error.

### Complete stand-alone system

Total control of a single unit, including full test execution is achieved without the need of a PC. The user interface is based on a large 6" touchscreen color display permitting to start, pause and stop the test, choose the data recording mode, show the readings during the test execution and carry out the transducers calibration. It comes supplied with a USB pen drive allowing unlimited storage, TXT format data output.

### Clarity in results

- Test results are saved and displayed in real-time, speeding data capture.
- Results are then processed using Wykeham Farrance (WF)'s 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.

### Interchangeable shear boxes

- Standard WF shear boxes from 50 to 100mm diameter or from 60 to 100 mm square.

### Totally new and ingenious software (optional)

- Allows the remote control, from a single PC, of multiple Shearmatic EmS machines. When the Remote control mode is used, the PC

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software becomes the user interface and manages the main functions as well as the channels calibration by linear, polynomial and multi-coefficient curves.

- Can pilot up to 6 Shearmatic EmS units from one single PC with user able to select single or multiple unit batches.
- Once the software is installed and linked to the first SHEARMATIC EmS, it is easy to add more units by enabling the associated LAN communication (IP address) without complications or costs.
- Calibrations of displacement transducers and load cells are stored as txt file and easy to recall, up to 10 calibration points can be recorded for each channel.

Standard complete configuration consists of:

- Shearmatic EmS
- Shear boxes (see accessories and related products)
- Template for data processing ( see accessories)

## Main features

- **Fully automatic**, standalone Direct / Residual Shear soil testing system managed by local user interface with 6" touch screen high resolution color display that can also accurately perform Consolidation tests using appropriate consolidation cells.
- **High-performing** with maximum vertical and horizontal force of up to 10 kN, infinite variable speed from 0.00001 to 15.00000 mm/min and adjustable number of cycles from 1 to 50
- **Save time and ensure test accuracy** with straight horizontal transmission of force facilitated by high stiffness load chain shear box, driving head and load cell, eliminating horizontal load measurement inaccuracies.
- **Fast, smooth and accurate loading delivered by integrated optimized PID closed-loop** control with precise load ensured by a load cell directly mounted on the loading tip.
- **Totally flexible**— choose to control unit either via the Integrated local user interface or via PC
- **Modular and expandable with optional dedicated software** – gradually connects up to six units via LAN port using the same PC software allowing you to build your laboratory without interruption – resulting in excellent return on investments.
- **Environmentally friendly and quiet** – new Electromechanical Servoactuation (EmS) technology requiring no dead weights or large and noisy air compressors, thus drastically reducing noise levels.
- **Long-life and low maintenance** with corrosion-free, techno-polymeric shear box carriage. Lightweight and easy to clean, the top-quality techno-polymeric material offers excellent resistance to corrosion.

## Standards

- ASTM D3080
- AASHTO T236
- BS 1377:7
- EN 17892-10

## Specifications

Maximum vertical force: 10 kN

Maximum horizontal force: 10 kN

Max horizontal travel: 23 mm - displacement transducer: 25 mm

Max Vertical travel: 12.8 mm - displacement transducer: 10 mm

Test speed: from 0.00001 to 15.00000 mm/min

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Maximum number of consolidation steps: 99

Maximum number of shear cycles: 50

Weight approx.: 60 kg

Sample type and size: up to 100 mm square or round

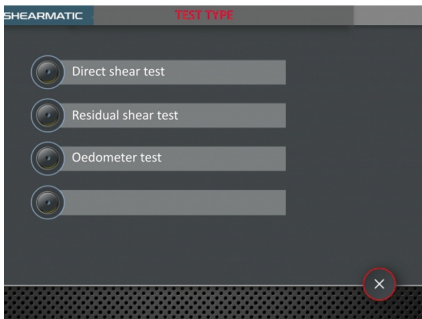
Dimensions approx. [l x h x d]: 990 x 550 x 350 mm

Multivoltage – Multifrequency power supply 115-230 V, 50-60 Hz, 1Ph

Power consumption: 200 W



Round and square cutting tool and extrusion dolly

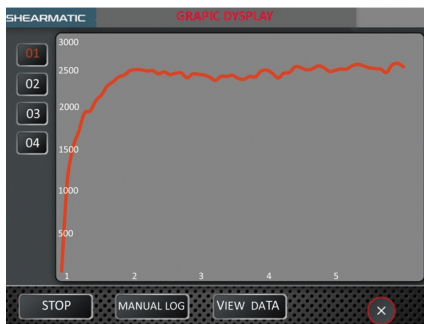


Test selection screen shot . It is possible to select among 3 types of test, direct shear, residual shear and oedometer test (consolidation)

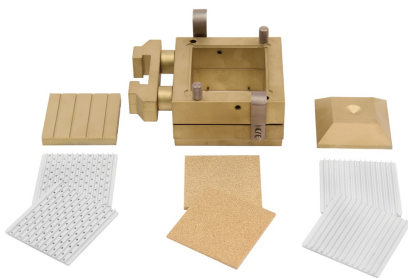
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Screenshot of the manual control mode of the horizontal and vertical stepper motors. Transducers readings, vertical yoke position and horizontal force are shown in real time



Live graphical display of Channel 1 Horizontal force. These data can be also shown listed in a table and single readings can be manually saved if necessary



Shear box assemblies

## Products

27-WF21E80

SHEARMATIC EmS - Electromechanical Servoactuation, automatic direct and residual shear machine. 115-230 V / 50-60 Hz / 1Ph.

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### Accessories and consumables

#### **27-WF21E80/C**

Accessories for performing automatic consolidation test using electro-mechanical direct and residual shear apparatus SHEARMATIC EmS. Consolidation cell not included (to be ordered separately)

#### **27-WF21E80/SW**

Shearmatic EmS software activation code. For remote control and data acquisition from ShearmaticEmS (27-WF21E80), multiple units connectable to a single PC.

#### **27-WF0215/8**

Extrusion dolly for 60mm square samples

#### **27-WF0216/8**

Extrusion dolly for 100mm square samples

#### **27-WF0217/8**

Extrusion dolly for 50mm dia samples

#### **27-WF0218/8**

Extrusion dolly for 60mm dia samples

#### **27-WF0219/8**

Extrusion dolly for 63.5mm dia samples

#### **27-WF0222/8**

Extrusion dolly for 100mm

#### **30-WF6016/T2**

Direct and residual Shear Geo-Analysis for MS EXCEL Template according to BS 1377:7

#### **30-WF6016/T9**

Direct and residual shear Geo-Analysis template conforming to ASTM D3080