

MCC, multifunctional control console

MAIN FEATURES

- **Unique technology based on servo-controlled proportional valve optimized for construction materials for load, stress and displacement controlled tests, with superior performances: fast reaction time, excellent sensitivity to minor variations, extremely wide oil flow range**
- **All above features extended onto up to 4 different frames ranging from 15 kN to 5000 kN**
- **Accuracy and reliability thanks to advanced electronics, efficient closed-loop control, high effective resolution, optimized P.I.D. algorithms**
- **Performs user defined displacement/deformation tests for research purposes: Unlimited combinations of load/stress, displacement/strain cycles, load/stress ramp sequences and test procedures**
- **Low frequency dynamic tests with a maximum of 0.1 Hz (depending on the wave amplitude)**

GENERAL DESCRIPTION

Automatic hydraulic systems for static and low frequency dynamic tests on building materials under control of Load/Stress, Displacement, Strain.

Ideal both for **traditional tests**, such as compression and flexure on concrete, cement, mortar, blocks etc. and cyclic tests for the determination of **secant elastic modulus (E)**, and also for measuring, for example, the **ductility and fracture energy** of concrete reinforced with fibres (**FRC**) and lined with polymers (**FRP**), or the toughness of sprayed concrete slabs (**shotcrete**) under concentrated load tests. The console is connectable to up to four test frames.

TECHNICAL SPECIFICATIONS

Hydraulics

- Max working pressure: 720 bar.
- Hydraulic motorized power pump with automatic double stage mode: low pressure/high flow rate (2l/min) for the fast approach (min.40mm/min) and high pressure/low flow rate (0.7 l/min) for test execution.
- Wide flow rate range allowing the control of several frames with different capacities from 15kN up to 5000kN.
- Forced ventilation oil cooling system.
- High efficiency oil filtering system with anomalies warnings (e.g.low oil level and dirty oil filter).
- Oil flow regulated by servo controlled proportional valve with high frequency driving signal.
- 2 (extendable to 4, see upgrading options) electronic ON/OFF valves for remote automatic selection via PC of the active frame.

Hardware and firmware

- 8 active channels (each one can be used by the machine as feedback variable to control test execution):
- 4 for load sensors (load cells or pressure transducers)
- 4 for displacement transducers (potentiometric, LVDT amplified, magnetostrictive) and deformation transducers (strain gauge)
- Effective resolution 132.000 divisions, Closed loop control with high frequency PID.
- Control frequency: up to 120 Hz
- Electrical characteristics of the channel conditioners: Feed from 0.5 to 10V DC (digital selection)
- Single-/dual-ended input with automatic detection
- Input signal from -2.5 to +2.5V DC
- Zero and gain digitally adjustable

DATA SHEET

- Data acquisition synchronized on all channels
- Calibration of the 8 channels in engineering units, via linearization function (up to 10 steps) which allows optimisation of readings accuracy over the whole test range.

User interface

The system is controlled via the PC. An alphanumeric keyboard and an icon driven display are also provided for factory settings and use of unit in local mode.

- Graphical display 320x240 pixel

Software

The PC allows:

- Remote control of the complete system (Console and Frame) for automatic test execution
- Real time and deferred management of tests data and results, either in numeric and in graphic format
- Active frame selection via software
- Printing and saving of customized test reports both for single and batch tests in Excel format

The following software packages are included:

Software for compression, flexural, splitting tests to EN and ASTM Standards.

Software for determination of Elastic Modulus on concrete and cement allowing:

- User-defined test cycles and step programmable sequences
- Real-time display of stress/ time and stress/axial strain diagrams
- Automatic verification of sample centering, as per standards requirements

Software for displacement/strain controlled tests allowing:

- Free unlimited programmable load/stress/displacement/strain cycles to fulfil any kind of test procedure
- Possibility to display different curves in the same graph (for instance it's possible to display 3 different strain curves acquired by 3 different transducers in one graph with the same time axis)
- Real time display and monitoring of all test data
- Real time variation of settings, including the control method (load, displacement or strain), active channel used as feedback variable, load/displacement/strain rate, target value
- Constant load/displacement/strain function with closed loop feedback assuring precise holding of the target value

Physical specifications

- Power rating: 750 W
- Dimensions (lxwxh): 470x410x1000 mm
- Weight approx.: 120 kg

ORDERING INFO

50-C8422/MP

MCC, stand alone closed loop control console for up to 2 test frames expandable to 4. Software included for compression, flexure, indirect tensile tests and Elastic Modulus determination. Allows load, displacement and strain control. PC included. 230 V, 50 Hz, 1 ph

50-C8423/MP

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Same as above but 220 V, 60 Hz, 1 ph

50-C8424/MP

Same as above but . 110 V, 60 Hz, 1 ph

ACCESSORIES

ACCESSORIES FOR ELASTIC MODULUS

Compressometer-Extensometer for Elastic Modulus determination

Strain gauges

Axial-circumferential compression device

TESTING FIBER REINFORCED CONCRETE AND SHOTCRETE

Measurement of beam deflection and toughness

Displacement transducer for measurement of crack opening

Energy absorption test on slabs

CONCRETE COMPRESSION FRAMES

ASTM C39, AASHTO T22 Compression frames

EN 12390-4, EN 772-1 Compression frames

General utility compression frames

CEMENT COMPRESSION FRAMES

Compression-flexure cement testing frames

Compression-flexure cement testing frames, multipurpose models

FLEXURE FRAMES

High stiffness flexural frame, 200 kN cap., SIMPLEX

High stiffness flexural frame, 200 kN cap., DUPLEX

High stiffness flexural frame, 350 kN cap., SIMPLEX

High stiffness flexural frame, 350 kN cap., DUPLEX

Universal, open structure flexural frame, 300 kN cap.

PC CABINET

86-D2999

Cabinet for PC and printer with three extractable shelves to hold keyboard, printer and mouse. Complete with dust prevention system with two vented filters in the cabinet housing the PC. 230 V, 50 Hz, 1 ph

ADDITIONAL INFORMATION

UPGRADING

Third frame facility

50-C7022/UP1

Upgrading of the MCC control console for the connection of a third frame.

Third and fourth frame facility

50-C7022/UP2

Upgrading of the MCC control console for the connection of a third and fourth frame.

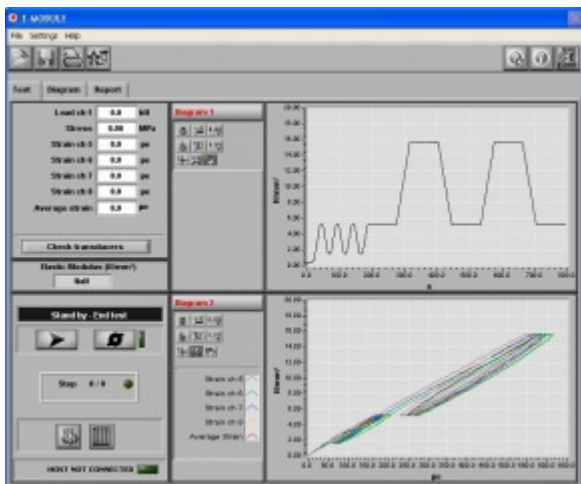
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MCC advanced servo hydraulic control console for static and low frequency dynamic test on building materials complete with PC and PC cabinet

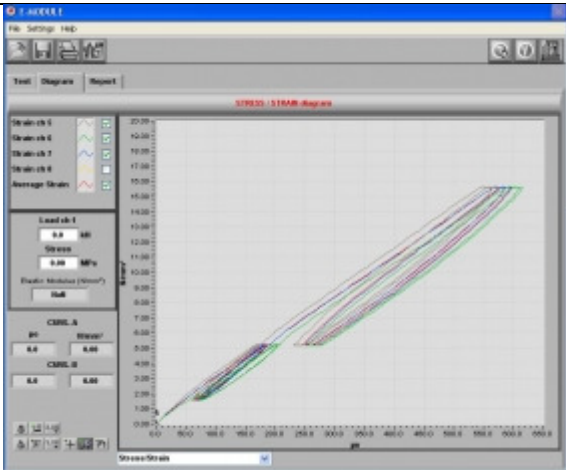


Complete testing system with 4 frames connected to the same unit

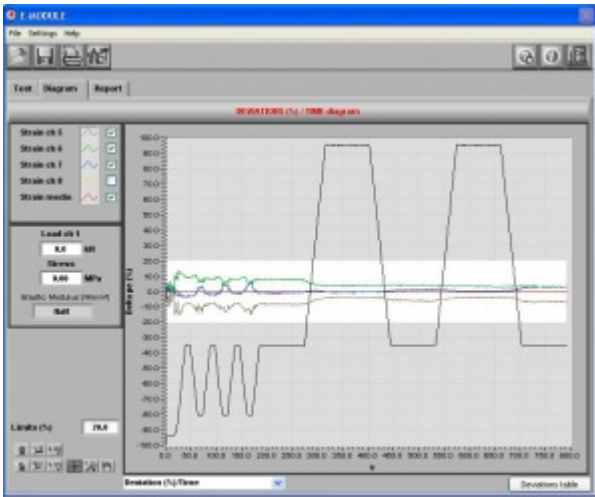


Main screen of the E-Modulus software

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Stress vs Strain diagram

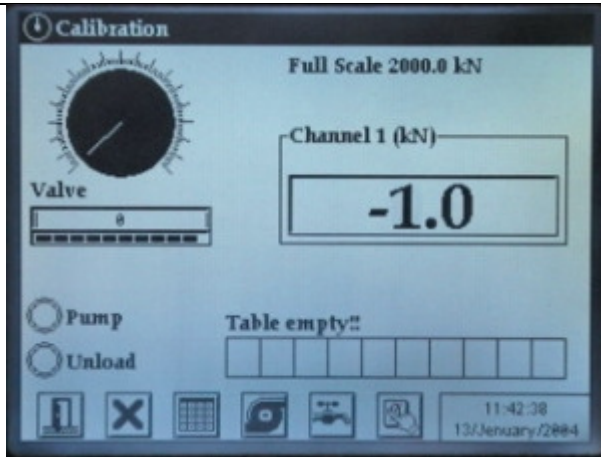


Deviation of the strain values measured by each transducer compared to the average reading (red line)



Detail of MCC display used basically for calibration purpose

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Calibration menu



Detail of rear panel of MCC series



Specimen fitted with 55-C0222/F compressometers

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MCC console upgraded with 50-C7022/UP2 distribution block for connection

to up to 4 frames (mcc).