TESTMAK
MATERIAL TEST EQUIPMENTS

HS AUTOMATIC COMPRESSION & FLEXURAL TESTING MACHINE

CONCRETE

www.testmak.com

HS Automatic Compression & Flexural Testing Machines

PRODUCT MODEL

C3236	2000 kn Automatic Compression Testing Machine with 200 kn Flexural Frame, EN, 220-240 V 50-60 Hz
C5226	2000 kn Automatic Compression Testing Machine with 200 kn Flexural Frame, ASTM, 220-240 V 50-60 Hz

STANDARDS

ASTM C39 | EN 12390-3, 12390-4 | BS 1881 | ГОСТ 10180-2012

DESCRIPTION

The TESTMAK HS Automatic Compression Testing Machines Compressive strength or compression strength is the capacity of a material or structure to withstand loads tending to reduce size, as opposed to tensile strength, which withstands loads tending to elongate. Compressive strength is usualy measured on a compression testing machine; These systems range from to ones with over 2000 kN capacity. Measurements of compressive strength are affected by the specific test method and conditions of measurement. Compressive strengths are usually reported in relationship to a specific international standard.

The Testmak HS series Automatic Compression Testing Machines are design to test the compression strength of concrete cube and cylinder specimens of different sizes. The rigid design provides stability and strength for a better using experience. Automatic compression machines with an LCD control unit that displays the

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data graphically of each test with the ability to save and recall the results of the tested specimens. Automatic mode or manual mode in which the user gets the ability to adjust the load rate and period manually are available. Suitable for CE security norms and compression machines are supplied in Class 1 starting from 50 kN. The upper seating adjusts itself to apply homogeneous loading on the sample. Upper and lower platens in accordance with international specifications. Surface hardness 55HRC, flatness tolerance 0.02 mm. Traceable certificate of surface hardness available on request.

200 kN capacity Flexural Frame:

200 kN capacity flexure frame have been designed for reliable and consist ent testing of fl exural test on standard concrete beams, concrete or natural stone kerbs, concrete paving fl ags, and natural stone slabs and tensile splitting test of concrete paving blocks. The flexure testing frame is the result of con tinuous research to upgrade the testing machines with latest technologies to conform to the latest standards EN 12390-5, EN 12390- 6, EN 1338, EN 1340, BS 1881, ASTM C78, C293 and C496 in terms of its technical properties taking into account client requirements. These also meet the requirements of CE norms for health and safety of the operator.

HS Automatic Compression Testing Machines supplied complete with following accessories;

1- Spacer Discs;

For ASTM Standards;

- Diameter 165 mm x Height 90 mm spacer disc 1 piece
- Diameter 165 mm x Height 40 mm spacer disc 1 piece
- Diameter 165 mm x Height 30 mm spacer disc 2 piece

For EN Standards;

- Diameter 205 mm x Height 90 mm spacer disc 1 piece
- Diameter 205 mm x Height 50 mm spacer disc 1 piece
- Diameter 205 mm x Height 30 mm spacer disc 1 piece

2- Upper Platen;

- Upper Platen Diameter 165 mm (with ball seating assembly) (For ASTM Standards)
- Upper Platen Diameter 300 mm (with ball seating assembly) (For EN Standards)

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3- Lower Platen;

• Lower Platen Diameter 165 mm (For ASTM Standards)

• Lower Platen Diameter 300 mm (For EN Standards)

4- Piston;

• Piston Diameter 250 mm (For 2000 kN Capacity Models)

• Piston Diameter 300 mm (For 3000 kN Capacity Models)

5- Automatic Hydraulic Power Pack ;

• Automatic Hydraulic Power Pack, 410 bar (For All Models)

Testable Specimens

• **Concrete Cubes:** 70, 100 mm, 150 mm, 200 mm concrete cube sample or any other custom cube and prism size can be tested with this machine.

• **Concrete Cylinder:** 100x200 mm, 150x300 mm, 160x320 mm concrete cylinder samples or any other custom diameters cylinder can be tested with this machine.

• **Concrete Beams:** 100x100x400 mm, 100x100x500 mm,150x150x600 mm, 150x150x750 mm concrete cylinder samples or any other custom diameters cylinder can be tested with this machine.

Safety Features

• Maximum pressure valves to avoid machine overloading

• Piston travel limit switch

• Emergency stop button

• Front and rear transparent durable plexiglas guards

• Software controlled maximum load value

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TECHNICAL SPECIFICATIONS

MODEL NO: C3236		
Test Type	Flexure	Compression
Capacity	200 kN	2000 kN
Class 1 Measuring Range	4 to 200 kN	50 to 2000 kN
Lower Platen Dimensions	-	300 mm
Upper Platen Dimensions	-	300 mm
Max. Clerance Between Lower Rollers	900 mm	-
Max. Vertical Clearance	425 mm	340 mm
Piston Diameter	80 mm	250 mm
Maximum Piston Movement	100 mm	50 mm
Horizontal Clearance	650 mm	360 mm
Power	1100 W	
Oil Capacity	18 Liter	
Maximum Working Pressure	30 Bar	410 Bar
Dimensions	900x950x1500 mm	
Weight	1050 kg	

MODEL NO: C5236		
Test Type	Flexure	Compression
Capacity	200 kN	2000 kN
Class 1 Measuring Range	4 to 200 kN	50 to 2000 kN
Lower Platen Dimensions	-	165 mm
Upper Platen Dimensions	-	165 mm
Max. Clerance Between Lower Rollers	900 mm	-
Max. Vertical Clearance	425 mm	370 mm
Piston Diameter	80 mm	250 mm
Maximum Piston Movement	100 mm	50 mm
Horizontal Clearance	650 mm	360 mm
Power	1100 W	
Oil Capacity	18 Liter	
Maximum Working Pressure	30 Bar	410 Bar
Dimensions	900x950x1500 mm	
Weight	1050 kg	

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UPPER & LOWER PLATENS

C3070/A-01 | Upper Platen (with ball seating assembly) Ø 165 mm, Lower Platen Ø 165 mm
C3070/A-02 | Upper Platen (with ball seating assembly) Ø 216 mm, Lower Platen Ø 216 mm
C3070/E-03 | Upper Platen (with ball seating assembly) Ø 300 mm, Lower Platen Ø 300 mm
C3070/A-04 | Upper Platen (with ball seating assembly) 310x410x90 mm, Lower Platen 310x410x90 mm
C3070/E-04 | Upper Platen (with ball seating assembly) 310x500x38 mm, Lower Platen 310x500x38 mm

The platens enable the testing of a wide variety of cylinder, cube blocks or similar samples. Produced from high quality steel, which is then hardened. Surface hardness 55HRC, flatness tolerance 0.02 mm. Traceable certificate of surface hardness available on request. Have centering rings on the lower platens for proper centering of 100 mm and 150 mm cube, 100 mm and 150 mm cylinder samples.

TMC-3211-01

TMC-3212-01

TMC-3213-01

TMC-3214-01

Product Code	C3070/A-01	C3070/A-02	C3070/E-03	C3070/E-04
Desctription	Upper Platen (with ball seating assembly) Ø 165 mm, Lower Platen Ø 165 mm	Upper Platen (with ball seating assembly) Ø 216 mm, Lower Platen Ø 216 mm	Upper Platen (with ball seating assembly) Ø 300 mm, Lower Platen Ø 300 mm	Upper Platen (with ball seating assembly) 310x500x38 mm, Lower Platen 310x500x38 mm
Sample	4" , 6" dia. cylinders 100 mm cubes	6" dia. cylinders 100, 150 mm cubes	Cylinders: 100x200 mm, 150x300 mm, 160x320 mm Cubes 100,150,200 mm	Blocks up to 310x500 mm
Used with Frames	TMC-3200, TMC-3201, TMC-3204, TMC-3206, TMC-3208, TMC-3209	TMC-3200, TMC-3201, TMC-3203, TMC-3204, , TMC-3205, TMC-3206, , TMC-3207, TMC-3208, TMC-3209	TMC-3203, TMC-3205, TMC-3207, TMC-3209	TMC-3202, TMC-3203, TMC-3204, TMC-3205, TMC-3206, TMC-3207, TMC-3208, TMC-3209
Standards	ASTM C39	ASTM C39 and EN 12390-4	EN 12390-4	EN 772-1
Hardness	≥ 55 HRC	≥ 55 HRC	≥ 53 HRC	≥ 600 HV
Dimensions	170x170x145 mm	220x220x145 mm	310x310x175 mm	320x510x175 mm
Weight	21 kg	38 kg	78 kg	135 kg

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DISTANCE PIECES

C3060/A-01 | Distance Pieces, Ø 165x15 mm
C3060/A-02 | Distance Pieces, Ø 165x30 mm
C3060/A-03 | Distance Pieces, Ø 165x40 mm
C3060/A-04 | Distance Pieces, Ø 165x90 mm
C3060/E-05 | Distance Pieces, Ø 205x30 mm
C3060/E-06 | Distance Pieces, Ø 205x50 mm
C3060/E-07 | Distance Pieces, Ø 205x90 mm

Distance pieces are used to reduce the amount of vertical clearance between the upper platen and the lower platen. 600 to 3000 kN machines are supplied with 205 mm and 165 mm dia distance piece.

Model	Dimensions	Weight (approx.)
C3060/A-01	165x165x15 mm	2,5 kg
C3060/A-02	165x165x30mm	5 kg
C3060/A-03	165x165x40 mm	7 kg
C3060/A-04	165x165x90 mm	14 kg
C3060/E-05	205x290x30 mm	8 kg
C3060/E-06	205x290x50 mm	13 kg
C3060/E-07	205x290x90 mm	22 kg

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LCD DATA ACQUISITION CONTROL SYSTEM

The Data Acquisition Control provides real-time graphical indication. Automatically determines the load rate in accordance with the international standards upon sample type. With the STOP and START buttons, the test will automatically stop or start.

LCD Data Acquisition Control System has different units are available (kN / kgf / lbf). Can do Automatic Load Rate upon Sample Type. Total load and also per area are given. and has real time graph indication. Stops Automatically, when Test is completed. Test results can be send printer to with software or from the thermal printer. Can do calibration easily from 5 points. Manual Control is available. Computer and printer are not included in the price.

Data Acquisition Control

Technicial Specifications

- 3 universal analog input sockets (ADC)
- Each analog input with 18 bit precision (1/256000)
- 1 replacement analog input
- A total of 4 analog high-precision measuring capacities
- 2 analog output sockets (DAC)
- Analog outputs generate a 0-10V DC output signal
- Motor speed control devices, servo valves with this output signal, proportional valves, etc. reference signal is produced.
- PULSE / DIR outputs (PULSE / DIR / ENA) to control the servo and stepper motor drives
- 5 digital outputs for general purpose (can pull relays and control different electrical units)
- 5 digital inputs for general purpose (receives and evaluates input signals like limit contacts from the environment)
- Potentiometer input (reference signal input for calibration and remote control)
- 2 RS232 serial communication signal outputs (communicates with computers)
- It also connects to motor drives via serial communication via MODBUS connection
- USB communication signal output (communicates with computers)
- Connects to local networks and the Internet with Ethernet 10/100 network connection output (optional)
- Connects to portable devices via Bluetooth wireless connection (optional)
- 500 test results can be stored in internal memory
- Due to the SD (memory) card connection, a large number of test results can be stored in the device memory (40,000 test results).
- In addition, the results can be taken from the device memory and transferred to the computer as an Excel table. (Optional)
- Color TFT display supports 16 lar and 7 800 screen sizes, supports 16M colors and supports 800x480 pixel screen resolution

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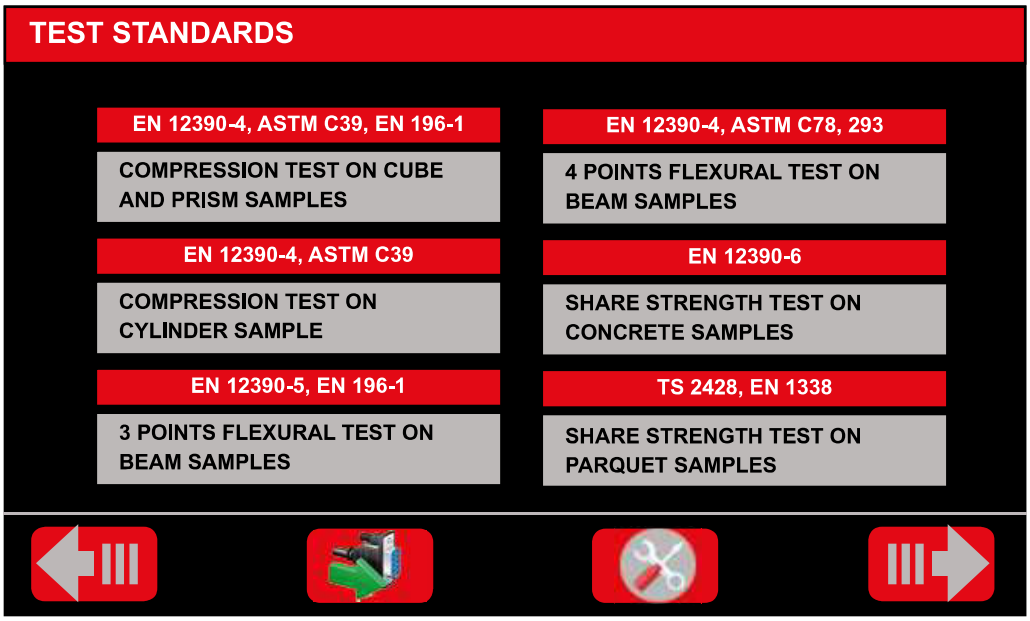
• Resistive touch screen allows easy operation of device functions by touching the screen
• Access to frequently used functions with 6 membrane keypads
• The industrial standard operates with 24V DC supply voltage. Built-in voltage filter and regulator protects against input signal fluctuations
• Sensor modules are compatible with loadcell (load cell), pressure sensor (4-20 / 0-20 mA), potentiometric distance sensors, strain washers, thermocouples and all kinds of mV output sensors.
• Provides precise calibration with multi-point calibration (up to 10 points)
• Setting and calibration menus are password protected and prevent unauthorized use
• Allows testing with a computer or device
• There are many test sample information screens and test methods in the device memory and tests can be performed easily
• Different menu languages can be selected via the device via language support
• Speed control algorithm is closed loop PID control and all parameters can be adjusted on user side.
• The device can switch between one-touch load and deformation control modesCihaz farklı makinelere kolayca adapte edilebilir ve en uygun kontrol sağlanır
• The graphical field that visualizes the test results on the screen has the ability to change the scale automatically and automatically adjusts the optimal scale as the values change
• Firmware updates can be made via USB input. In addition, via the computer allows remote or internet update.

When energized to the device, on the digital indicator display will show the following information.



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Test standards and methods

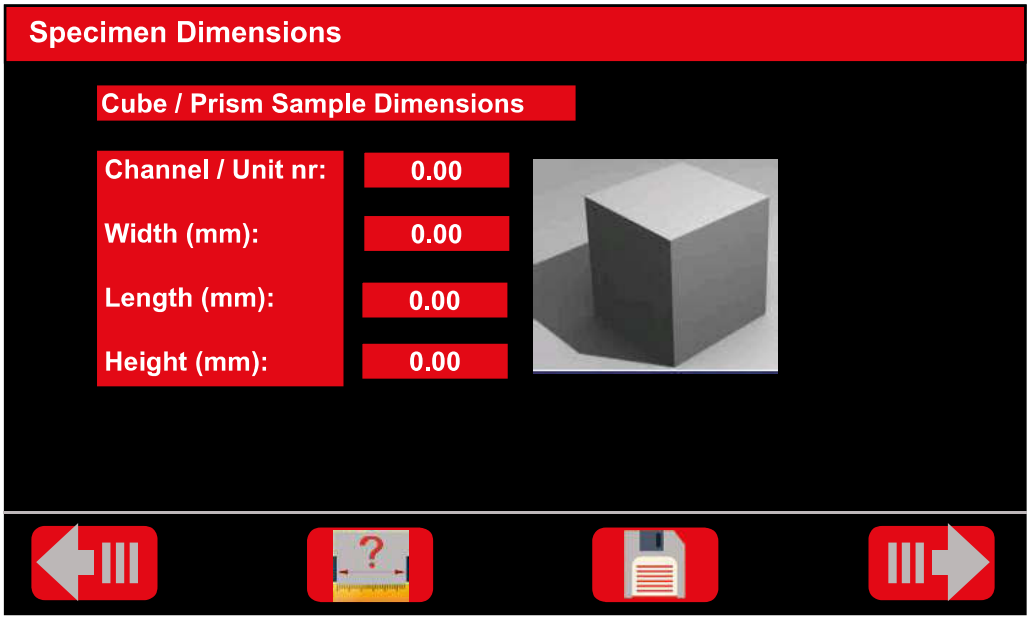
There are already 18 commonly used test methods in the device memory. With updates, this number is increasing.

The input is displayed by touching the area of the test standard you want to test.

Toggle left / right arrow keys between test standard screens. In addition, the test standards screen is one of the most frequently used home screens, so you can switch from here to the computer connection screen and the settings menu

Compression Strength in Cube / Prism Samples

The compressive strength test in cube samples is a test method commonly used in the ASTM C39 | EN 12390-3, 12390-4 concrete tests standard. When this test method is selected, the sample size screen is displayed first.



After a short period of time numune Receiving sample information lanmış message is displayed, the predefined sample sizes of this test method are loaded from memory. Thus, the loss of time from entering the same information is prevented.

It is important to note that with the sample information, the unit number to be tested and the sensor input channel to which the test unit is connected are entered into the device.

The selection of the sample dimensions and the selection of the test unit are performed in this screen. The device makes the necessary calculations according to the entered dimensions and determines the values of the cross-sectional area, etc. and makes the strength calculation accordingly.

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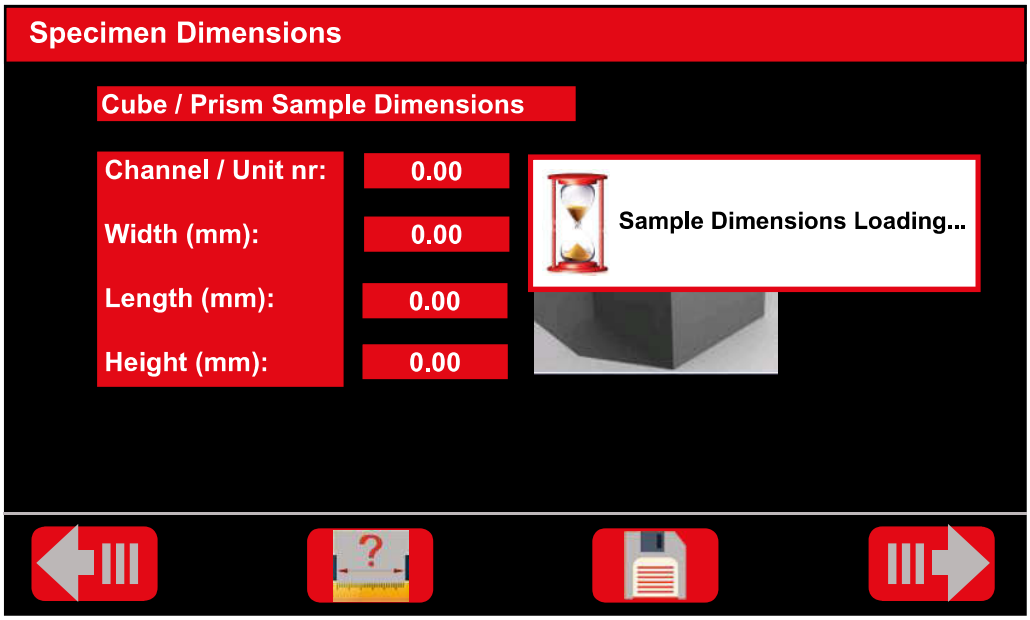

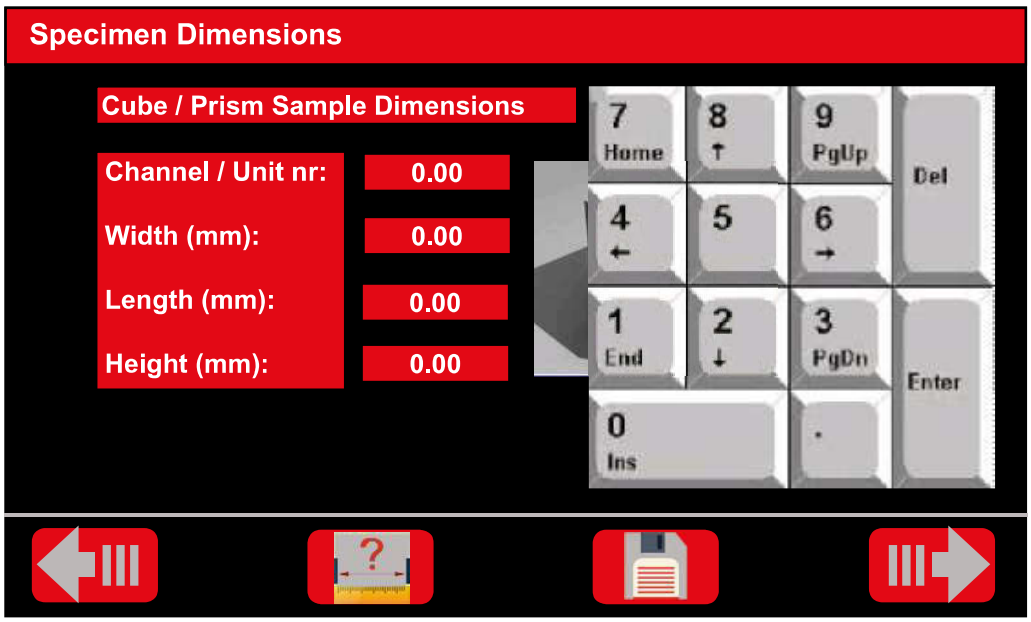

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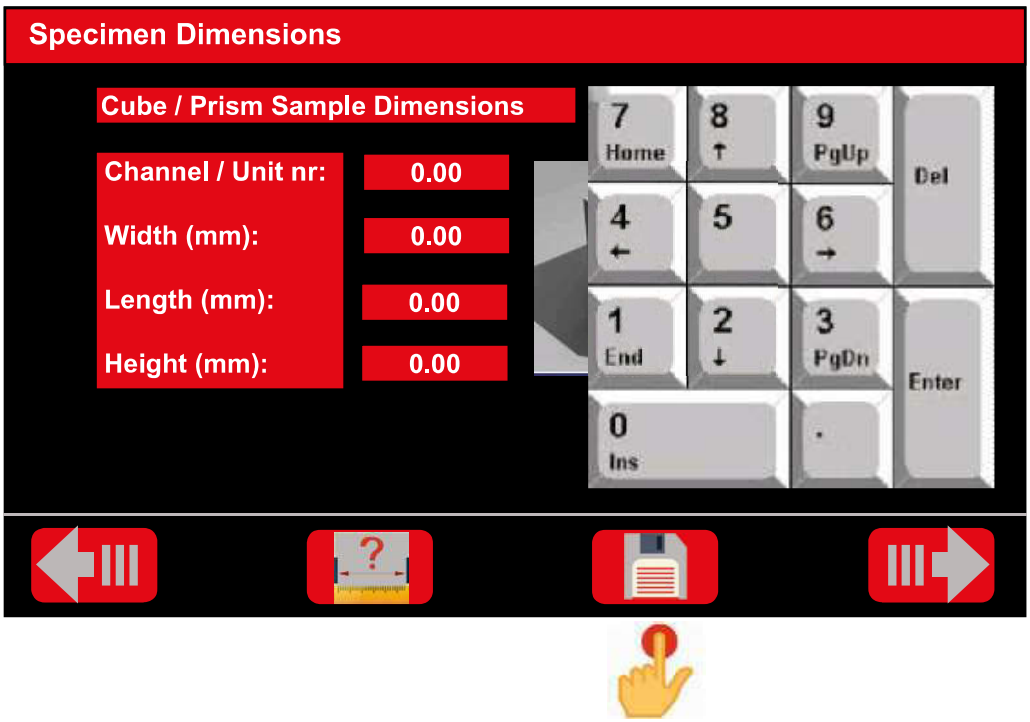
Thus, in which test method the device will receive the data from which sensor, the calibration values, the unit, the unit to be controlled and the required parameters will be automatically loaded.
To change any value displayed on the screen, touch the corresponding data field to open the on-screen keyboard.
Use the on-screen keyboard to enter the desired value and press ENTER.
The DEL (Delete) key is used to delete the incorrect data.
The on-screen keyboard disappears when the enter key is pressed.



The (SAVE) button is used to store data in the device memory.

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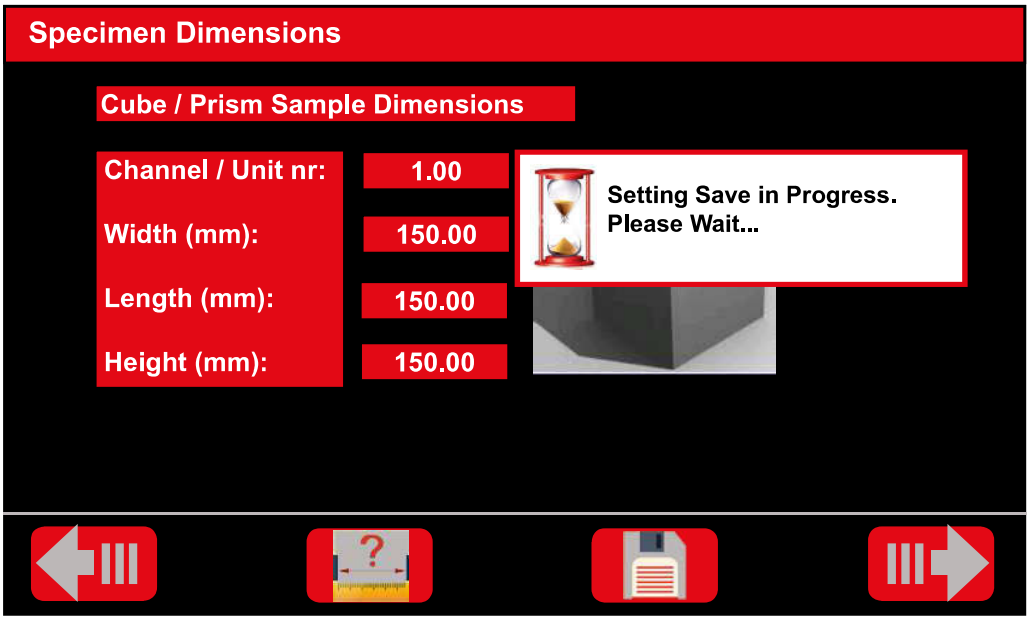

When saving data, the message ”Saving settings ir is displayed.
The method and screen layout described in this chapter are generally valid for all test methods and can be easily entered and saved by following the same process steps.
a: edge length (mm)
s: cross-sectional area (mm²)
$s = a^2$

F: Maximum applied load (kN)
MP: Compressive strength (MPa)

$$б = F/s \text{ (Mpa)}$$

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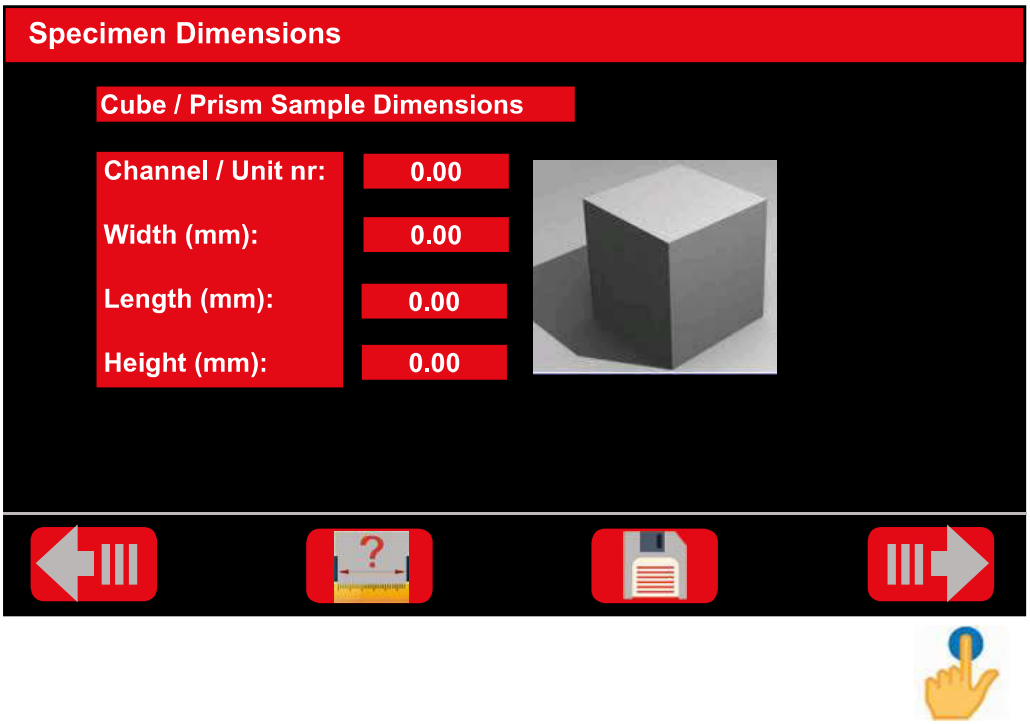

The NEXT button is used to proceed to the next step.

The next step will be to determine the test parameters related to the selected test method.

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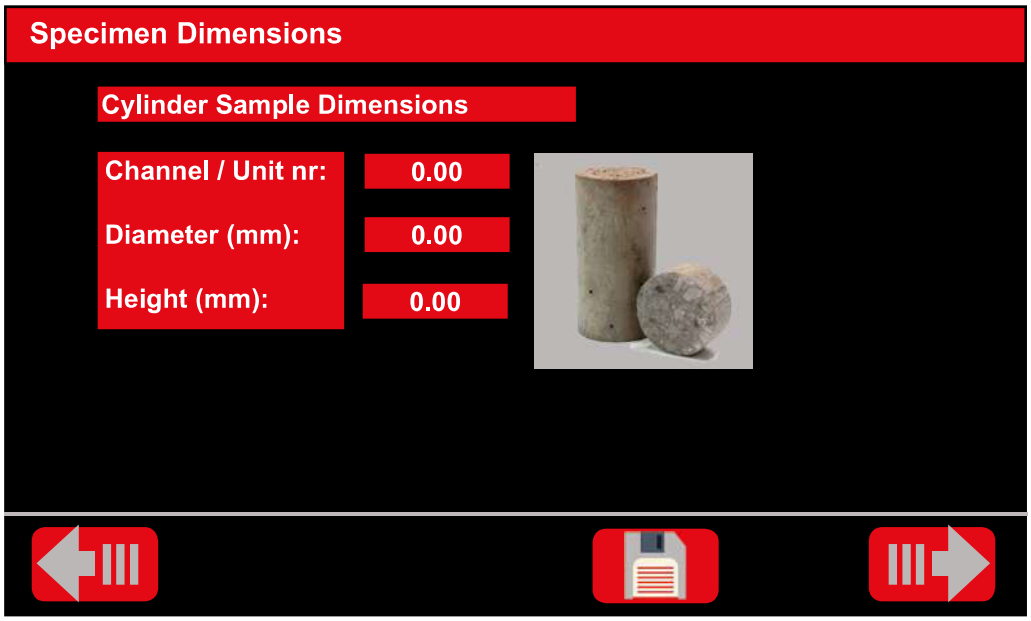
Compression Strength in Cylinder Samples

When this test method is selected, the sample size screen is displayed first.



d: diameter (mm)

s: cross-sectional area (mm²)

$$s = 3.14*(d/2)^2$$

F: Maximum applied load (kN)

MP: Compressive strength (MPa)

$$б = F/s \text{ (Mpa)}$$

Test Screen

The screen test screen where the tests are performed in accordance with the test method.

At the top of the test screen, the channel, unit and the active value are displayed. In some tests, more than one active measuring channel is shown on the display.

In addition, the test number, the highest measured load value (Fmax), the time elapsed during the test, in seconds, and the set test speed are displayed.

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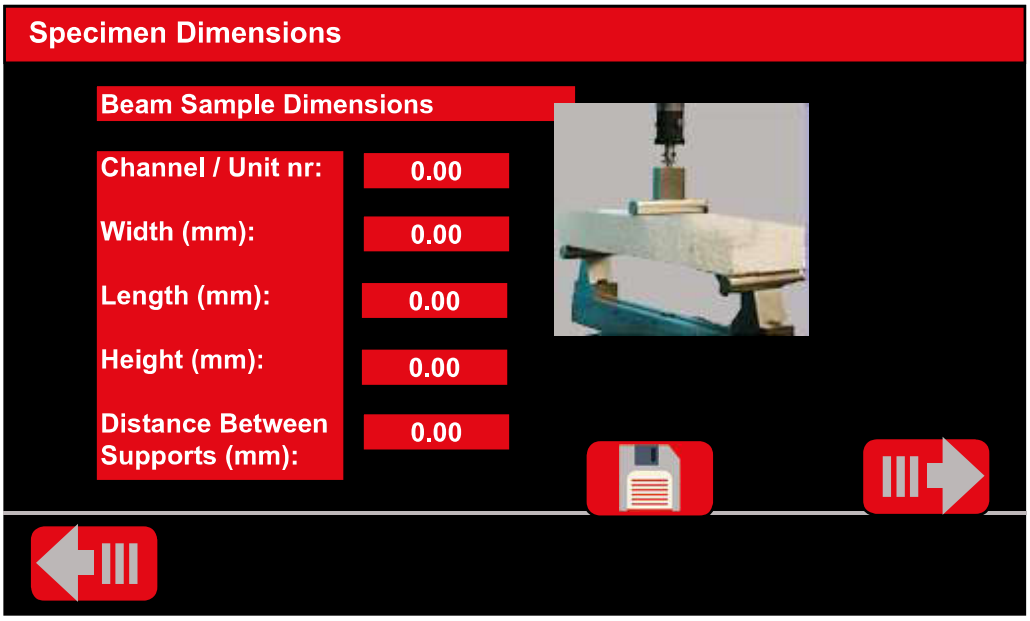
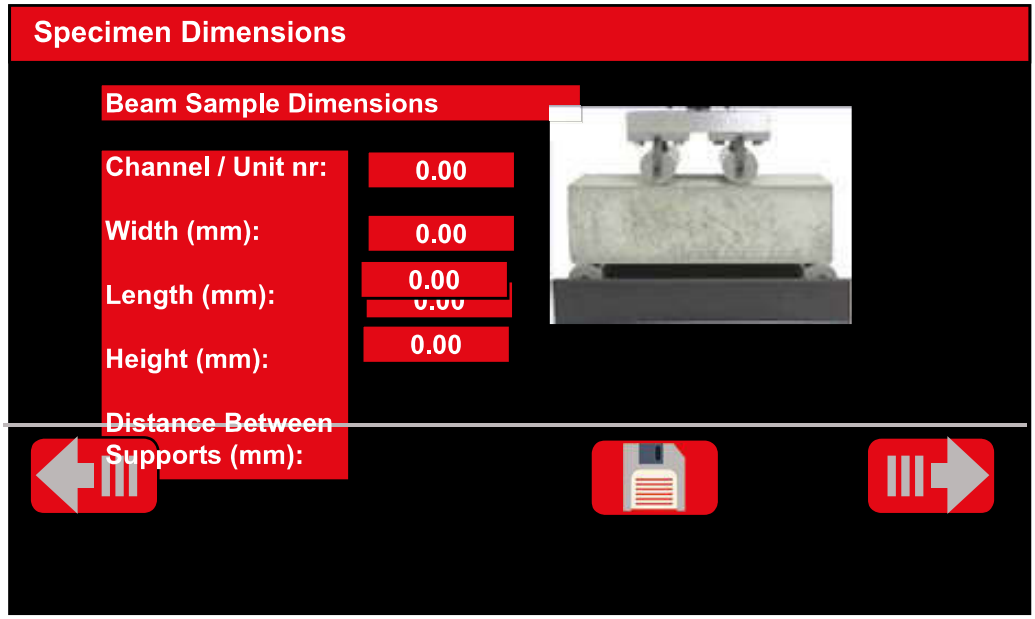
Flexural Test in Concrete Beam, Border and Paving Samples

When this test method is selected, the sample size screen is displayed first.





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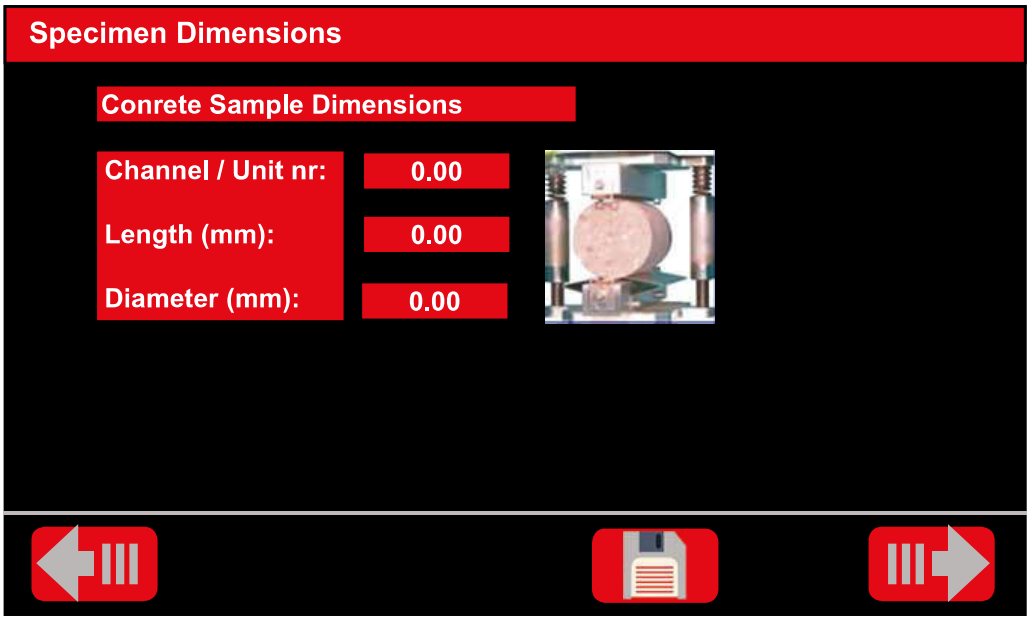

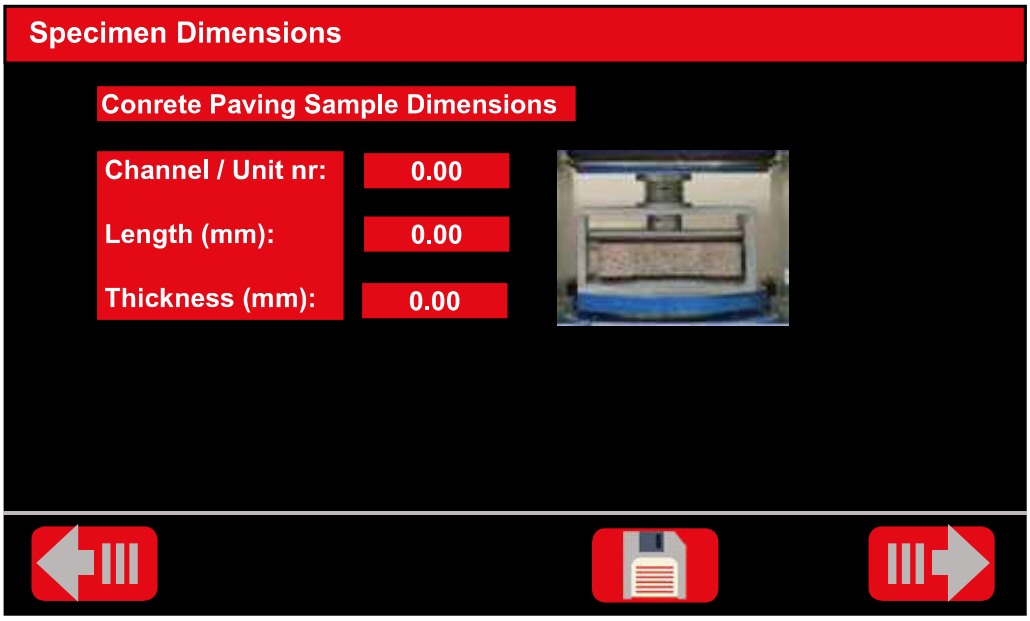

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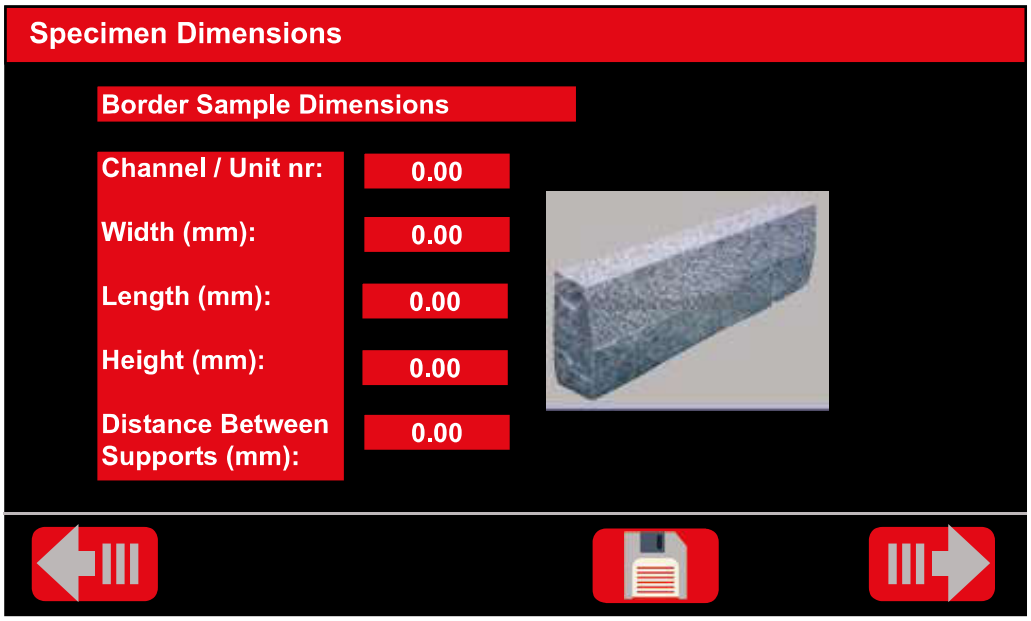

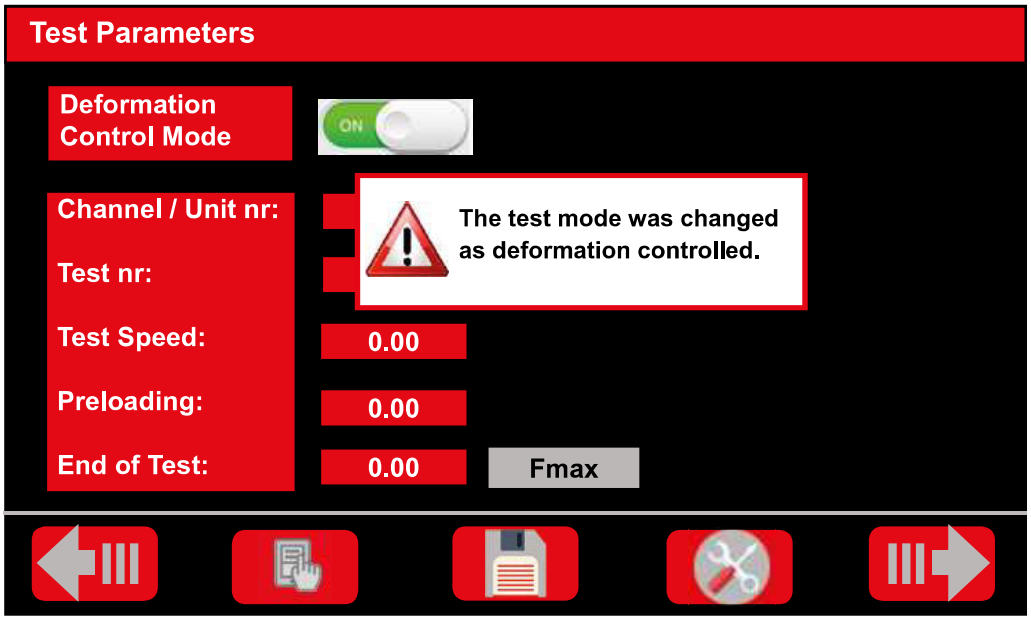

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Start the Test Pause on Load End of test

Start the Test

Press (START) to start the test. First, the device performs a bit of fast loading up to the boot value. When the boot value is reached, the speed is automatically set to the test speed level and kept constant at this level until the end of the test.

Pause on Load

If you want to stabilize the load at any load level during the test (PAUSE), press the hold button. In this case, the load is fixed at the load value level when the hold button is pressed and the device starts to wait. If this button is pressed again, the load will resume.

Pause on Load

The device automatically terminates the test when the condition specified for the end of the test occurs.

This condition is usually a decrease in the load as a result of the breakage of the test specimen, but sometimes the test can be completed when a certain load or deformation value is reached.

The user can also end the test at any time by pressing the STOP key at any time (STOP). The unit automatically terminates the test to protect the machine and the sensors when the device detects that the specified loading capacity has been reached.

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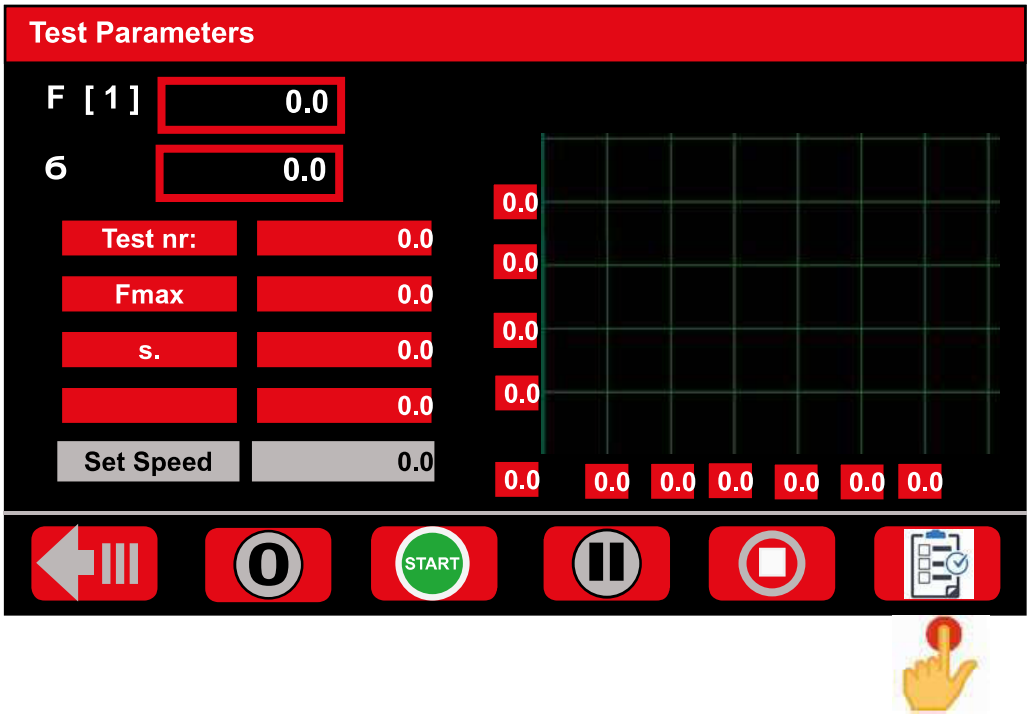
Test Results

The test results are saved as a table in the device memory. To access this table, press the test button on the test screen. In this case, the test results are displayed.



Test Results

When the test results are displayed in a table, the test result is displayed on each page. Use the up / down arrow keys to scroll through the pages. This allows switching between 500 test results in the device memory.

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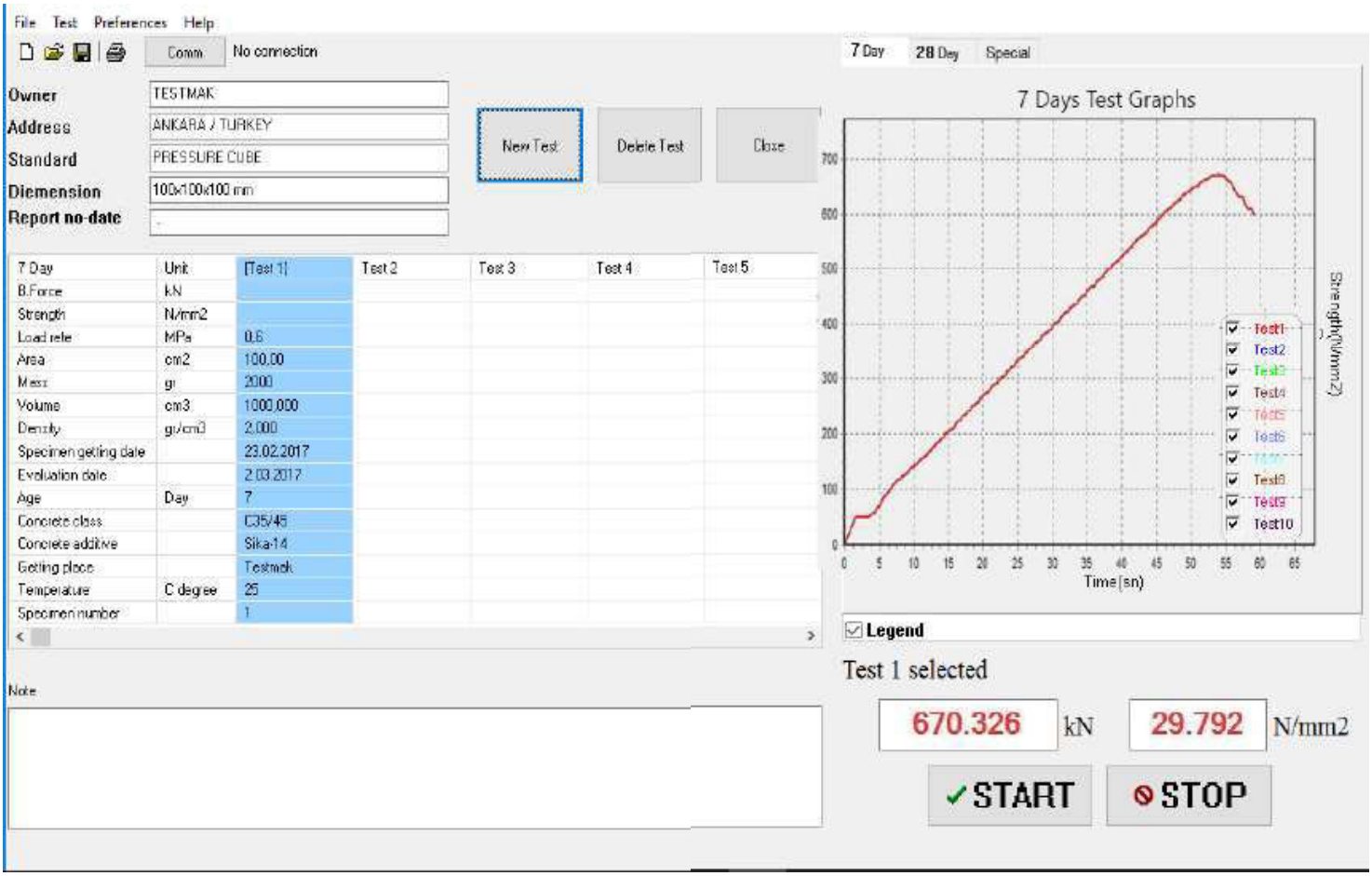
SOFTWARE

The tests and calibration can be done and monitored with a computer by connecting it to the machine. LCD Control unit can connecting with RS232 or USB port to the machine. Using the state-of-the-art software provided by TESTMAK with the machine will help performing and managing the tests in a very easy and fast way. By performing the tests via computer, the results can be saved and recalled when required. Reports can be generated automatically by the software and sent to printer.



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