Chapter 1 | GENERAL INFORMATION

1.01 WARNINGS
The manufacturer does not accept any responsibility for direct or indirect damage to people, things or animals and use of the appliance in different conditions from those foreseen.
The manufacturer reserves the right to make changes to the documentary information or to the appliance without advance notice.
Check the machine responds to the standards in force in the state in which it has been installed.
All operations necessary for maintaining machine efficiency before and throughout use are the operator’s responsibility carefully read the entire manual before operating the machine.
It is vital to know the information and limitations contained in this manual for correct machine use by the operator.
Interventions are only permitted if the operator is accordingly competent and trained.
The operator must be knowledgeable about machine operations and mechanisms.
The purchaser must ensure that operators are trained and aware of all the information and clarifications in the supplied documentation.
Even with such certainty the operator or user must be informed and therefore aware of potential risks when operating the machine.
Safety, reliability and optimum performance is guaranteed when using original parts.
Any tampering or modifying of the appliance (electrical, mechanical or other) which has not been previously authorised in writing by the manufacturer is considered abusive and disclaims the constructor from any responsibility for any resulting damage.
All necessary operations to maintain the efficiency of the machine before and throughout use are the responsibility of the user.

1.02 WARNING AND DANGER INDICATIONS - SIGNS
The machine has been designed and constructed according to the current norms and consequently with mechanical and electrical safety devices designed to protect the operator or user from possible physical damage. Residual risks during use or in some intervention procedures on the device are however present. Such risks can be reduced by carefully following manual procedures, using the suggested individual protection devices and respecting the legal and safety norms in force.
This manual includes “Warning” and “Danger” indications in relevant chapters. These indications are shown with the words “Danger” or “Warning” in bold font and uppercase to make them highly visible.

"WARNING" indicates that machine damage could be caused should indications be ignored

"DANGER" indicates that machine damage and/or injury to the worker could be caused should indications be ignored.

"DANGEROUS ZONE" indicates any zone inside or in the proximity of the appliance in which a person is exposed to the risk of injury or damage to health.

1.03 AIM OF THE INSTRUCTIONS MANUAL
This manual has been edited with the aim of providing all machine operators with all the necessary information on installation, use and maintenance from production to scrapping in as comprehensive and clear manner as possible. All the procedures useful for any foreseeable emergency situations have been listed by the manufacturer and can be verified during use. Operators, for whom this manual has been written, due to their competence must give instructions or operate the machine themselves.
The instructions manual must be carefully consulted by laboratory or site safety managers, equipment operators and any internal and external maintenance workers. The manual is integral to the product and refers to this appliance only. The manual must be safeguarded and always kept near the equipment so that it can be easily consulted whenever necessary.
IMPORTANT: The manual does not substitute the experience and technical training of the worker but must be considered a guide for carrying out its functions.
Furthermore all the norms and rules the operator should be aware of or consult for correct use of the machine and/or test performance can be found in the manual.
This responsibility is entrusted to the installer and Laboratory or Site Manager where the machine is installed.
The Constructor is available to provide further information.

1.04 STRUCTURE OF THE INSTRUCTIONS MANUAL
The manual can consist of a number of documents, as shown in the appropriate list. Verify that all documents are present; otherwise request the missing parts from the Constructor before using the machine.
Instructions can be supplied with enclosures containing diagrams and designs, which are necessary for interpretation of correct machine use and maintenance.
1.05 COMPOSITION OF THE INSTRUCTIONS MANUAL

<table>
<thead>
<tr>
<th>Description document</th>
<th>Instruction manual code</th>
</tr>
</thead>
<tbody>
<tr>
<td>INSTRUCTIONS MANUAL</td>
<td>BM455</td>
</tr>
</tbody>
</table>

1.06 MODIFICATIONS AND ENCLOSURES OF THE INSTRUCTIONS MANUAL

This manual reflects the state at the time of the launch of the machine on its market. If any modifications, improvements or adjustments have been made since machine supply the Manufacturer does not have to intervene on the marketed machine and will not consider the machine or the manual deficient or inadequate.

1.07 CONSTRUCTOR IDENTIFICATION

See the front page headline

1.08 MACHINE IDENTIFICATION DATA

On the identification nameplate of the machine are reported the identification data and the electrical characteristics.

1.09 EC STAMP

SEE EC DECLARATION

1.10 USAGE

The Automatic Ring and Ball apparatus has been designed to determine the softening point of asphalts and pitches. The bath temperature is measured by means of an electronic system, in accordance to the EN 1427 Standard.

The temperature of the bitumen dipped into a liquid solution of water or glycerine is automatically measured by means of two different channels and the values are shown on the digital display.

The temperature gradient is kept uniform during the test thanks to the thermoregulator that have to be adjust in compliance with the International Standards.

Appropriate uses: All those described in the “Usage” section
Inappropriate uses: All those not described in the “Usage” section

This appliance is for the exclusive use which it has been conceived for. Any other use is considered improper and therefore negligent.

Machine use is allowed only in places free from danger of explosion or fire. During operation check for conditions of danger. immediately stop the machine should it be working irregularly, and consult the authorised dealer’s Sales Service department. It is the Client’s responsibility to verify at the time of installation and use that no conditions of use arise which are different to those indicated. Refer to the Constructor when in doubt.

1.11 OPERATORS

"QUALIFIED PERSONNEL" means people who, due to their training, experience and education, as well as knowledge of the relevant standards, limitations and measures, have been authorised by the “PLANT SAFETY MANAGER” to carry out any necessary activity and are able to recognise and avoid any possible danger.
The manufacturer recommends that the instructions, procedures and recommendations in this manual and the work safety legislation in force be scrupulously adhered to, even with the use of appropriate protection devices (whether individual or part of the machine).

Knowledge and respect of the instructions, safety warnings and danger in this manual are all necessary for installation, operation, management and machine maintenance with a minimal risk.

The “PLANT SAFETY MANAGER” has the following responsibilities and duties:
- To know the machine functions, its commands, safety and protection devices, possible dangers of use and all the information in this manual in detail. This knowledge can only be gleaned from detailed reading of this manual.
- To know the safety legislation in force in detail in order to operate the machine.
- To recognise the “QUALIFIED PERSONNEL” for transportation, handling, installation, use, maintenance, disposal, etc.
- Correctly train and educate the “QUALIFIED PERSONNEL” before allowing them access to the machine. The personnel must also be exhaustively trained with regards to the machine’s protection devices.
- Ensure the machine’s safety devices are not tampered with or removed and are checked on a daily basis. Provide the operator appropriate individual protection devices according to the laws in force.
- The constructor is available for clarification, assistance and training and declines all responsibility for damage to things or people resulting from improper, incorrect and negligent use by untrained personnel.

### 1.12 STORAGE

| ❗️ WARNING | The appliance must be stored and conserved in the original packaging and in a closed environment, protected from atmospheric agents with a minimum temperature of -15°C, and a maximum of +60°C and a maximum humidity of 70%. |

### 1.13 TRANSPORTATION AND MOVEMENT

| ❗️ WARNING | In order to avoid irreparable machine damage, move with care, do not overturn, protect from rain, do not stack, protect the packaging and its contents from bumps and sources of heat. |

During transportation and movement it is important to avoid bumps, overloading with other packages, exposure to freezing or heating atmospheric agents, or any other potentially harmful condition to the device, things or people.

Machine transportation and movement must be entrusted to Qualified Personnel who can ensure correct movement.

| ⚠️⚠️ DANGER WARNING | Do not transport or move the product should it be impossible to respect the conditions on the packaging or there be any doubts. Request information from the constructor. |

### 1.14 PACKAGING REMOVAL

After removing the packaging check the machine is complete and that there are no visibly damaged parts. DO NOT USE THE MACHINE and refer to the constructor when in doubt.

| ⚠️ DANGER | The components used for packaging (plastic bags, polystyrene, nails, screws, wood, etc) must be kept out of reach of children, as they are sources of danger. These components should be placed in the appropriate containers. |

| ⚠️ WARNING | In order to avoid bumps and overturn adopt the normal and logical precautions. |

| ⚠️ WARNING | Before disposing of the packaging check all machine components such as accessories, utensils, instructions, documents etc have been removed. |
### TECHNICAL CHARACTERISTICS

#### 2.01 GENERAL MACHINE DESCRIPTION

**FRONT VIEW**

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>B1</strong></td>
<td>PROBE FOR THE TEMPERATURE MEASUREMENT</td>
</tr>
<tr>
<td><strong>B2</strong></td>
<td>GLASS 600ml</td>
</tr>
<tr>
<td><strong>B3</strong></td>
<td>SENSORS FOR THE DETECTION OF THE POSITION OF THE TWO BALLS</td>
</tr>
<tr>
<td><strong>B4</strong></td>
<td>PROTECTION TO AVOID BURNT</td>
</tr>
<tr>
<td><strong>B5</strong></td>
<td>FRAMEWORK FOR SPECIMENS AND BALLS</td>
</tr>
<tr>
<td><strong>B6</strong></td>
<td>DISPLAY TOUCH SCREEN INTERFACE</td>
</tr>
<tr>
<td><strong>B7</strong></td>
<td>DISPLAY KEYS</td>
</tr>
<tr>
<td><strong>B8</strong></td>
<td>AGITATION MAGNETIC BAR</td>
</tr>
<tr>
<td><strong>B9</strong></td>
<td>POWER SWITCH</td>
</tr>
</tbody>
</table>
### Dimension and Weight

<table>
<thead>
<tr>
<th>A1</th>
<th>LAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>A2</td>
<td>RS 232</td>
</tr>
<tr>
<td>A3</td>
<td>CANALI ANALOGICI</td>
</tr>
<tr>
<td>A4</td>
<td>N°2 PORTE USB</td>
</tr>
<tr>
<td>A5</td>
<td>SLOT SD CARD</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2.02 DIMENSION AND WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LENGTH</strong></td>
</tr>
<tr>
<td><strong>WIDTH</strong></td>
</tr>
<tr>
<td><strong>HEIGHT</strong></td>
</tr>
<tr>
<td><strong>WEIGHT</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2.03 ELECTRICAL SUPPLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>On the identification nameplate of the machine are reported the identification data and the electrical characteristics.</td>
</tr>
</tbody>
</table>
### 2.04 Noise

**DANGER**

Continuous use of the appliance and machines predictably present in the installation environment could cause a heightened daily personal exposure to noise.

The air noise emission levels shown do not necessarily imply the levels of exposure to the worker. The levels of exposure to the operator are obviously linked to the emission levels of the appliance; however other factors influence the levels of exposure to the operator: length of exposure, environmental characteristics, the presence of other machines etc. The appliance emission levels allow anyway an estimate to be carried out on the dangers due to noise.

If the daily personal exposure is equal to or more than 85 dB (A) it is advisable to use the Individual Protection Devices (protective headphones, plugs, etc.). If the daily personal exposure is equal to or more than 90 dB (A) it is compulsory to use Individual Protection Devices (protective headphones, plugs, etc.). For further information consult the standards in force in the country of installation.

### Chapter 3 General Safety Standards

#### 3.01 General Standards

To ensure the safety of machine operators:
- Any tampering with the appliance not pre-emptively authorised by the manufacturer exempts the manufacturer from any responsibility for damage caused by or to it.
- The removal or tampering with safety devices entails a violation of the safety standards.
- Machine use is only allowed in areas where there is no risk of explosions or fires.
- Only the original fittings can be used. The use of unoriginal fittings exonerates the manufacturer from all responsibility.
- Check the appliance is in ideal working conditions and that its parts are not worn or faulty before carrying out all necessary maintenance.
- Do not wear loose clothing, ties, chains or anything else which could become caught in the frame or other moving parts of the appliance.
- Be aware of the danger of electrical shocks from direct or indirect contact due to unforeseen electrical faults.
- Do not subject the appliance to violent impact.
- Do not expose the appliance to fire, welding sparks or extreme temperatures.
- Do not bring the appliance into contact with corrosive substances.
- Do not wash the appliance with jets of water.
- Check the workspace around the machine is clear from potentially dangerous objects.
- The machine operator must wear appropriate work clothing such as protective glasses, gloves and mask in order to avoid damage from, for example, harmful dust projection. Wear a lower back support when lifting heavy parts. There should be no hanging objects such as bracelets or otherwise, long hair should be protected with relevant precautions, shoes must be appropriate for the type of operation to be carried out.

**DURING USE**

When operating check there are no conditions of danger. Immediately stop the machine when it is functioning irregularly. Contact the authorised Sales Service department.
- For the operator’s safety do not touch any part of the appliance when testing and use the appropriate individual protection devices in order to keep the operator safe.

#### 3.02 Machine Safety Devices and Protection

**DEFINITION:** Protections are all the safety measures that consist of the use of specific technical means (repairs, safety devices) to protect people from dangers which cannot be limited reasonably in design.

**DANGER**

Tampering with the protections or any appliance modification could cause risks to users or other exposed people. The manufacturer does not assume any responsibility for direct or in direct damage to people, things or animals following tampering with the protections.

#### 3.03 Passive Safety Devices

Passive safety devices are the devices or solutions which eliminate or reduce the risks to the operator without any active intervention by the operator.

The appliance is supplied with the following passive safety devices:
- The appliance is provided with an anti-burn protection placed in correspondence to the heating surface that prevents the operator to get in touch unknowingly with high temperature parts.
3.04 ACTIVE SAFETY DEVICES

Active safety devices are the devices or solutions which eliminate or reduce the risks to the operator and require active and conscious intervention by the operator for the preventive action to be carried out.

The appliance is supplied with the following active safety devices:
- On the right side of the appliance there is a general power switch B10 which also works as emergency button.

Chapter 4 INSTALLATION INSTRUCTIONS

4.01 LOCATION

The equipment must be placed in an ideal position and environment for the use it has been conceived for (laboratory use and protected from atmospheric agents) and that the machine is placed by a qualified operator.

ALLOWED TEMPERATURE: from +5°C to +40°C
ALLOWED RELATIVE HUMIDITY: from 30% to 70%
MAXIMUM HEIGHT OVER SEA LEVEL: 1000 m

GENERAL ADVICE
- The machine must be installed in an area which allows ease of access to all parts so that maintenance may be carried out.
- Unauthorised people and objects which could be potential sources of danger must not be permitted in the area surrounding the machine.

Do not position the equipment near instruments or appliances which could produce vibrations.

The appliance rests on rubber feet and had to be placed on a plane surface for a better stability, otherwise it may capsize and cause injuries.

For an easy use it is advisable to place the appliance at about 700 mm height from the ground surface.
The required minimum space for the installation is 538x320x420 (Picture 2).

4.02 TRANSPORTATION AND MOVEMENT

These instructions are applicable to the machine assemblers.
Ensure the equipment is correctly supported at the lifting point and that the machine does not slip.
Do not remain in direct line with the application of force and do not allow personnel where there are loads that cannot be adequately supported by mechanical means.

4.03 ASSEMBLING PROCEDURE

- Place the appliance on a plane surface – see the “LOCATION” chapter
- Connect the temperature probe to the connector (A2) placed on the back side of the appliance. Place the probe in its apposite place in the framework.
- Plug in the power cable in its apposite connector placed close to the general power switch (B) and connect the other end to a 230V tap, endowed with fuse 16A.
- Now the appliance is ready.
### 4.04 ELECTRICAL CONNECTION

**DANGER**

Wiring of the electrical system must be carried out by qualified personnel. Before wiring consult the electric plan linked to the instructions manual and the registration plate on the machine for information regarding supply, frequency and nominal current. Connect the earthing system via the PE terminal (yellow-green) before any other connection. Apply a knife switch at the top of the connecting cable of the machine to the power system. The knife switch must be combined with a safety device against the overload with a differential switch (safety switch). The technical features of the safety device must be in accordance with the standards in force in the country where the machine has been installed.

**ELECTRIC TOLERANCES:**

- Real voltage ± 10% of the nominal one
- Frequency: ± 1% of the nominal one in a continuous way
- ± 2% of the nominal one for a short period

The harmonic distortion of the sum from the second to the fifth harmonics not more than 10% of the total voltage as a real value between the conductors. A further distortion of 2% is accepted for the sum from the sixth to the thirtieth harmonics of the real total value between the conductors.

With reference to the voltage imbalance of the three-phase voltage, the inverted sequence component and the zero sequence component must not be more than 2% of the direct sequence component of the voltage. The voltage pulses must not last more than 1.5 ms with an up/down time between 500 ms and 500 ms and a peak value not higher than 200% of the real value of the nominal tension.

The electric supply must not be interrupted or zeroed for more than 3 ms at any time. Between two interruptions it must not take more than 1 s.

The interruptions must not overcome 20% of the tension peak for more than one cycle. Between two interruptions it must not take more than 1 s.

The manufacturer assumes no liability for any damages to people, things and animals caused by the non-compliance of the above instructions.

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### Chapter 5 MAN – COMMAND INTERFACE

#### 5.01 WORKPLACE

After having positioned and prepared the machine, the operator has to program the test’s parameters through the control panel and start the machine. During the test the operator can visually inspect the inside of the glass, and monitor the test data through the display on the panel.
5.02 COMMANDS AND SIGNALS

The user-appliance interface is composed by a touch screen display (B6) and multifunction buttons (B7).

Each buttons may have different functions, depending on the program phase in which the operator is acting: the function is visualized through the symbol placed close to the button. To activate each function, the operator must simply press the relevant button.

5.03 METERS -INDICATORS

The probe measures (B1) the temperature of the liquid in which the specimens are immersed during the test.

5.04 MAIN MENU

The main menu allows the selection of the general configuration functions of the machine. It has been organized on such a way to visualize a number of fixed items for the normal functions of the machine and a number of variable items which depend on the International Standard installed on the machine.

The following list includes the icons that represent the regular functions and does not include the ones of the standards (see the related chapters).

- !: visualization of the enabled alarms
- : tests storage
- : system configuration
- : control panel
How to select an item of the main menu with the touch screen

1. Scroll through the menu (← or →) up to the desired item has been visualized.

Touch the desired item and wait for the activation of the selected function.

How to select an item of the main menu with the keyboard

1. Scroll through the menu (← or →) up to the desired item has been visualized.

2. Press the confirmation key (△) and wait for the execution of the selected function.

5.05 CONTROL PANEL

It allows to select the “general” configuration functions of the machine. The menu items are as follows:

- : date and time
- : International settings
- : touch screen calibration.
- : internet connection
- : Power saving setting.
- : change the password (PROTECTED BY PASSWORD – default 4444).
- : software maintenance (PROTECTED BY – default 5555).

How to select an item of the main menu with the touch screen

1. Scroll through the menu (← or →) up to the desired item has been visualized.
2. Touch the desired item and wait for the activation of the selected function.

How to return to the main menu with the touch screen

1. Press (↑) and wait for the visualization of the main menu.
• **How to select an item of the control panel using the keyboard**

1. Scroll through the menu ( or ) up to the desired item has been visualized.

2. Press the key of confirmation ( ) and wait for the activation of the activated function.

• **How to return to the main menu using the keyboard**

1. Press the key and wait for the visualization of the main menu.

### DATE AND TIME

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day</td>
<td>1-31 for the months of January, March, May, July, August, October, December; 1-30 for the months of April, June, September, November; 1-29 for the month of February in a leap year; 1-28 for the month of February in a non leap year.</td>
</tr>
<tr>
<td>Month</td>
<td>January, February, March, April, May, June, July, August; September, October, November, December</td>
</tr>
<tr>
<td>Year</td>
<td>1970-2069</td>
</tr>
<tr>
<td>Hour</td>
<td>0-23</td>
</tr>
<tr>
<td>Minute</td>
<td>0-59</td>
</tr>
<tr>
<td>Second</td>
<td>0-59</td>
</tr>
</tbody>
</table>

**ATTENTION**
The date and time settings will be lost if the machine is switched off for more than 19 consecutive days.
# INTERNATIONAL SETTINGS

[Image of international settings parameters with options for measurement system, decimal separator, date format, time format, and language selection.]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Measurement system</strong></td>
<td>Select the “Metric” measurement system to express the load values in “kN”, the displacement values in “mm”, the deformation values in “µε”, the temperature values in “°C”,…&lt;br&gt;Select the “U.S.” measurement system to express the load value in “lb”, the displacement value in “in”, the deformation values in “µε”, the temperature values in “°F”,…</td>
</tr>
<tr>
<td><strong>Decimal separator</strong></td>
<td>“Point”, “Comma”</td>
</tr>
<tr>
<td><strong>Date format</strong></td>
<td>Below a list of the possible formats (with an example of how the date 1 June 2009 can be visualized)&lt;br&gt;“d/M/yy” → es. “1/6/09”&lt;br&gt;“dd/MM/yyyy” → es. “01/06/09”&lt;br&gt;“d/M/yyyy” → es. 1/6/2009&lt;br&gt;“dd/MM/yyyy” → es. 01/06/2009&lt;br&gt;“M/d/yy” → es. 6/1/09&lt;br&gt;“MM/dd/yy” → es. 06/01/09&lt;br&gt;“MM/dd/yyyy” → es. 06/01/2009&lt;br&gt;“yyyy/M/d” → es. 2009/1/6&lt;br&gt;“yyyy/MM/dd” → es. 2009/01/06&lt;br&gt;“yy/M/d” → es. 09/1/6&lt;br&gt;“yy/MM/dd” → es. 09/01/06</td>
</tr>
<tr>
<td><strong>Time format</strong></td>
<td>Below a list of the possible formats (with an example of how the time 14.27.05 can be visualized)&lt;br&gt;“h:mm:ss tt” (or “h:mm tt”) → “2:27:05 PM” (or “2:27 PM”)&lt;br&gt;“H:mm:ss” (or “H:mm”) → “14:27:05” (or “14:27”)</td>
</tr>
<tr>
<td><strong>Language</strong></td>
<td>ITALIAN, ENGLISH, FRENCH, GERMAN, SPANISH, POLISH, RUSSIAN, GREEK, PORTUGUESE, DUTCH</td>
</tr>
</tbody>
</table>

---

## TOUCH-SCREEN CALIBRATION

Below the touch screen calibration screen

![Attention icon] Once activated the calibration procedure cannot be interrupted and must be ended.
How to calibrate the touch screen

1. Hold the pen at the center of the viewfinder, wait for the acquisition of the coordinates and the displacement of the viewfinder to the next position.
2. Repeat step 1 for the five proposed positions (in order: center, bottom right, top right, top left, bottom left).
3. Confirm the calibration by touching the LCD or by pressing the key.

ATTENTION
To get a proper calibration is necessary to hold firmly the pen during the 5 steps foreseen by the procedure.

NETWORK CONNECTION

The screen of the network connection displays the configuration parameters for the TCP/IP protocol set by the user (if DHCP is disabled) or automatically assigned by the DHCP server (if enabled).

Press the key to change the parameters.
Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>DHCP</td>
<td>Select &quot;Enabled&quot; to activate the configuration of a dynamic IP address (assigned by DHCP). Select &quot;Disabled&quot; to activate the configuration of a static IP address (entered by the user).</td>
</tr>
<tr>
<td>IP Address</td>
<td>The parameter is accessibile only when DHCP is disable. In this case enter a valid IP adress.</td>
</tr>
<tr>
<td>Subnet Mask</td>
<td>The parameter is only accessible when DHCP is disabled. In this case, enter a valid subnet mask.</td>
</tr>
<tr>
<td>Gateway Address</td>
<td>The parameter is accessibile when DHCP is disabled. In this case enter the IP adress of the gateway. The parameter is not required if the machine is connected to the local network.</td>
</tr>
<tr>
<td>Address of the synchronization server tick</td>
<td>It is used to connect to the server that manages the synchronization of the multiple devices on the network. Enter a valid IP address if this function is required.</td>
</tr>
</tbody>
</table>

ATTENTION For a correct configuration of the network contact your administrator or refer to the example helpsheet.

POWER SAVING SETTINGS

The power saving settings allow to automatically turn off the backlight of the display in case of no work. They are especially useful with battery powerful instruments because they allow to increase the charge life.
<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power saving</td>
<td>“Enabled”, “Disabled”.</td>
</tr>
<tr>
<td>Timeout</td>
<td>Enter the time (in seconds) after which, the system turns off the display backlight to reduce the power consumption in case of no works. To reactivate the backlight, &quot;touch&quot; the screen, move the mouse or press a key.</td>
</tr>
</tbody>
</table>

**PASSWORD**

The change password screen allows to customize the access keys to the “critical” functions of the machine.

![Password Screen](image)

**ATTENTION** Each password must be entered twice to prevent that typing errors make unusable the corresponding function.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profile password</td>
<td>Enter a numerical value</td>
</tr>
<tr>
<td>Device password</td>
<td>Enter a numerical value</td>
</tr>
<tr>
<td>Channel password</td>
<td>Enter a numerical value</td>
</tr>
<tr>
<td>Access password (current screen)</td>
<td>Enter a numerical value</td>
</tr>
<tr>
<td>Software password</td>
<td>Enter a numerical value</td>
</tr>
</tbody>
</table>

**SOFTWARE MAINTENANCE**

![Software Maintenance Screen](image)

**Device name** (TMNET-xxxxxxxx)

**Operating system version**

- **DEVICE**
  - **CPU**: PYA270 [TDV]
  - **Operating system**: 4.0 [3/03/2012 3:16:57 PM]
- **OPERATION**
  - Software update
  - Pen-drive
- **Pen drive**
- **Operation**
- **Execution of the selected operation**
- **Windows exit**
- **CPU name**
- **Closing screen**
• **How to update the software**

<table>
<thead>
<tr>
<th>ATTENTION</th>
<th>During the update process (which could take a few minutes) ensure that the power supply stays on.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>ATTENTION</th>
<th>During the update process, the backup and the restore of the configuration and of the license will be performed in automatic.</th>
</tr>
</thead>
</table>

1. Select the operation “Software update”.
2. Select the storage device.
3. Ensure that the storage device is into the slot and that it contains, in the root, both the image file “IMGxxx.bin” (“xxx” is the name of the CPU installed in your device then, in the case of the example the file will be “IMGTDX.bin”) and the program Upd.exe to perform the update.
4. Press the button for the execution of the selected operation ( ).
5. Confirm the update and wait for the end of the operation. During the update operation the device will restart twice.

• **How to update the license file**

1. Select the operation “License update”.
2. Select the storage device.
3. Ensure that the storage device is in the relative slot and it contains the file “License.dat” in the folder “\<device name>”.
4. Press the button for the execution of the selected operation ( ).
5. Confirm the update and the end of the operation and the restart of the electronics.

• **How to back up your configuration system**

1. Select the “Backup” operation.
2. Select the storage device.
3. Ensure the storage device is into the slot.
4. Press the button for the execution of the selected operation ( ).
5. Confirm the back up and wait for the end of the operation.
6. Verify in the folder “\<device name>” on the storage device has been saved the file “License.dat” and that subfolders “Certificate”, “Configuration”, “Specimen” and “Standard” containing the configuration file has been saved.

• **How to restore the system configuration**

1. Select the “Restore” operation.
2. Select the storage device.
3. Ensure that the storage device is in the related slot and it contains the file “License.dat” in the folder “\<device name>”. and the subfolders “Configuration”, “Specimen” and “Standard”.
4. Press the key for the execution of the selected operation.
5. Confirm the restore and wait for the end of the operation and restart the electronics.

- **How to restart the device with a temporary license (function used by technical assistance for the system diagnostic)**

1. Select the operation "Temporary license"
2. Select the storage device
3. Ensure that the storage device is in the relative slot and it contains the file “License.tmp” in the root
4. Press the button for the execution of the selected operation.
5. Confirm the use of the temporary license and wait for the restart of the electronics.

| ATTENTION | To restore the original license, restart the machine. |

- **How to exit from Windows**

1. Press the exit button.
2. Confirm the exit from Windows and wait for the restart of the electrics.

---

**5.06 SYSTEM CONFIGURATION**

**Activation status chart.**

<table>
<thead>
<tr>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>!</td>
<td>THE MACHINE IS NOT CONFIGURATED/ NO DRIVE IS ACTIVE</td>
</tr>
<tr>
<td>R</td>
<td>Ready for the test execution</td>
</tr>
<tr>
<td>T</td>
<td>Preheating phase</td>
</tr>
<tr>
<td>A</td>
<td>Auto-adjusting of the temperature ramp</td>
</tr>
<tr>
<td>☢️</td>
<td>A ball drop is detected</td>
</tr>
</tbody>
</table>

The configuration menu allows the selection of the “particular” configuration functions.
Chart of the system configuration items

<table>
<thead>
<tr>
<th>Configuration profile</th>
<th>Configuration of analog input channels</th>
<th>Machine configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>(FUNCTION PROTECTED BY PASSWORD – default 1111)</td>
<td>(FUNCTION PROTECTED BY PASSWORD – default 3333)</td>
<td>(FUNCTION PROTECTED BY PASSWORD – default 2222)</td>
</tr>
</tbody>
</table>

- **How to select a menu item of the control panel on the touch screen**
  1. Scroll the menu ( or ) up to visualize the desired item.
  2. Touch the item of interest and wait for the activation of the selected function.

- **How to return to the main menu on the touch screen**
  1. Touch and wait for the visualization of the main menu.

- **How to select an item of the control panel using the keyboard**
  1. Scroll the menu ( or ) up to visualize the desired item.
  2. Press the key of confirmation ( ) and wait for the activation of the selected function.

- **How to return to the main menu with the keyboard**
  1. Press the key and wait for the visualization of the main menu.
### How to select a configuration profile

1. Select the ID of the configuration profile
2. Close the screen

### How to duplicate a configuration profile

**WARNING!** The duplication of a configuration profile is possible only if the right password is entered.

1. Select the id of the “source” configuration profile
2. Use the key to copy the current profile (\[\]).
3. Select the ID of the “destination” configuration profile (different from the “source” one)
4. Use the key to “paste” the current profile (\[\]).
5. Confirm the duplication and wait for the end of the operation and for the concerning confirmation message

### How to delete a configuration profile

**WARNING!** The elimination of a configuration profile is possible only if the correct password is entered

1. Select the ID of the configuration profile to delete
2. Use the key to delete the current profile

### COMMANDS

1. to close the configuration screen of the extended analog channel.
To configure an analog channel, use the following 8 buttons.

The below window allows to define the configuration of the analog channel.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td>“Load”, “Displacement”, “Deformation”, “Temperature”.</td>
</tr>
<tr>
<td><strong>Capacity (1)</strong></td>
<td>Numerical value</td>
</tr>
<tr>
<td><strong>Scale factor (2)</strong></td>
<td>Numerical value</td>
</tr>
<tr>
<td><strong>Unit of measurement (3)</strong></td>
<td>“kN”, “Ib” for load channel; “mm”, “in” for displacement channels; “µε”, “in” for deformation channels. “°C”, “°F” for temperature channels.</td>
</tr>
<tr>
<td><strong>Enabling alarm flag</strong></td>
<td>“Off”, “On”.</td>
</tr>
<tr>
<td><strong>Alarm threshold (4)</strong></td>
<td>Numeric value</td>
</tr>
<tr>
<td><strong>Input</strong></td>
<td>“±5V”, “±2.5V”, “±1.25V”, “±600mV”, “±300mV”, “±150mV”, “±80mV”, “±40mV” for high resolution channels (1 and 2); “±5V”, “±80mV”, “±40mV”, “±20mV” for other channels</td>
</tr>
<tr>
<td><strong>Data bit</strong></td>
<td>8-24</td>
</tr>
<tr>
<td><strong>Filter type (5)</strong></td>
<td>“None”, “Average”, “Low pass”.</td>
</tr>
<tr>
<td><strong>Filter depth (6)</strong></td>
<td>2-100</td>
</tr>
</tbody>
</table>

(1) Request for load and displacement channels
(2) Request for deformation and temperature channels
(3) The unit of measurement used to configure the analog channel is independent from the measuring system selected in the international settings. In this way, the operator can enter the capacity of the transducer directly in the unit of measurement indicated in the specifications without worrying about the ways of working of the system.
(4) The parameter is only configurable if the enabling alarm flag is active.

The analog data are over-sampled compared to the actual needs of the application. The samples in excess can be used to stabilize the reading algorithm variable in relation to what has been selected for the parameter “filter type”. If the filter type is "None", is used the last sample read in the time window of acquisition without the
application of mathematical algorithms. If the "Filter Type" is "Average", the samples in the time window of acquisition is applied to an arithmetic average and if "Filter Type" is "Low Pass" the changes of the values in the time window of acquisition are "damped" attenuating in proportion to the value of "Depth filter".

(5) The parameter is configurable only if the filter is "Custom".

**Commands**

1. ✅ to activate the calibration of the analog channel.
2. ❌ to activate the extended configuration of the analog channel (not available for temperature channels).
3. ✅ to cancel the changes and to close the screen.
4. ✅ to confirm the changes and close the screen.

**EXTENDED CONFIGURATION OF the ANALOG CHANNEL**

**General Information**

![Extended Configuration Screen]

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Description associated with the channel.</td>
</tr>
<tr>
<td>Decimal number</td>
<td>Decimal numbers used to express the measured quantity (Automatic, 1,2,3,4,5,6)</td>
</tr>
<tr>
<td>Check date</td>
<td>Date of the latest calibration check</td>
</tr>
</tbody>
</table>

**COMMANDS**

1. ✅ to enter the next page of the extended configuration of the analog channel.
2. ✅ to enter the previous page of the extended configuration of the analog channel.
3. ✅ to close the extended configuration of the analog channel.
**PID control**

**IMPORTANT!** The extended configuration of the analog channel is **not** available for temperature channels. In the case of manual machine is available only the second screen.

To maintain a constant speed (load rate) is used a common system said negative feedback PID (Proportional - Integrative - Derivative). The controller acquires a speed value in input and compares it with the desired value. The difference is then used to settle some input data to the process to reach its stabilization.

The proportional component sets the reaction of the current error (the difference between the theoretical value and the read value), the integral component sets the reaction to the sum of the past errors, the derivative part sets the reaction in function of the speed at which the error changes.

### Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pid constant (1)</td>
<td>Numerical value.</td>
</tr>
<tr>
<td>p[I]d constant (1)</td>
<td>Numerical value.</td>
</tr>
<tr>
<td>p[D] constant (1)</td>
<td>Numerical value.</td>
</tr>
</tbody>
</table>

(1) Only for automatic machine

**COMANDS**

1. ➡️ to enter the next page of the extended configuration.

2. 👈️ to enter the previous page of the extended configuration.

3. ❌ to close the extended configuration.

**ANALOG CHANNEL CALIBRATION**

**IMPORTANT!** The calibration of the analog channel is **not** available for deformation channels.

### Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calibration chart</td>
<td>Pairs of numerical values to convert the points beds into engineering values (load, displacement) or resistance values into engineering values (temperature).</td>
</tr>
</tbody>
</table>
COMMANDS

1. 
2. 
3. 
4. 
5. 
6. 
7. 
8. 

To stop the activation of the plate, touch the key or press the key . If the machine doesn’t stop, use the switch on the back or remove the power cord.

ANALOG CHANNEL CALIBRATION CHECK

COMMANDS

1. 
2. 
3. 

To close the screen for the analog channel calibration check.
MACHINE CONFIGURATION

HARDWARE SETTINGS

Auto save: Complete
Run log file: None

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autosave</td>
<td>At the end of each test, it allows to automatically save the results on USB card or SD card.</td>
</tr>
<tr>
<td>Log file</td>
<td>It allows to save additional information regarding the execution of the temperature ramp.</td>
</tr>
</tbody>
</table>

COMMANDS

1. [→] to activate the next configuration screen.
2. [←] to activate the previous configuration screen.
3. [×] to cancel the changes and close the screen.
4. [✓] to confirm the changes and close the screen.

SHAKER CONFIGURATION

STIRRER

Stirrer: 100.0
Always on:
### Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shaker</td>
<td>➢ At the end of each test, it allows to automatically save the results on the USB pen or SD card.</td>
</tr>
<tr>
<td>Always active</td>
<td>➢ It allows to save the additional information regarding the execution of the temperature ramp.</td>
</tr>
</tbody>
</table>

### PHOTOCELL CONFIGURATION PARAMETERS

![PHOTOCELL CONFIGURATION PARAMETERS](image)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filter</td>
<td>➢ Filter for the recognition of the balls fall. Useful to rule out any air bubbles in the liquid of the glass. The laser beam of the machine must be constantly interrupted for the indicated time.</td>
</tr>
</tbody>
</table>
TEMPERATURE CORRECTION CONFIGURATION

Password: 2222

HARDWARE SETTINGS

Auto saving: Complete
Run log file: None

TEMPERATURE

Temperature offset: 0.0 °C
Temperature gain: 0.25
Read only max. temperature:
**Temperature offset:** In this field enter an offset value that will be added to the temperature measurement. For example, by entering an offset of 0.5 degrees, you will obtain, during the test phase, a higher temperature value of 0.5 degrees. On the contrary, to get a lower temperature, it is necessary to enter a negative offset (for example -0.5 degrees).

**Temperature gain:** This is a numerical constant, and indicates the proportional increase of the “Temperature offset” when the temperature increases. Normally, keep the default value (0.25).

**Read only max. temperature:** If deselected, it allows to unblock and increase the maximum limit of temperature during the test phase. However, not more than 200 degrees.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature offset</td>
<td>Correction value of the measured temperature (from -10 to +10 °C)</td>
</tr>
</tbody>
</table>

**WARNING**
The device BM455 is already equipped with a standard calibration for the PT100 probe, that can be kept even after a possible replacement of the probe. It is advisable to proceed with the insertion of this offset only if the temperature measurement differs clearly and repeatedly from a certificated reference thermometer. Please note that, the detecting point of the temperature in the glass, has to be the same for probe and reference thermometer.

**HEATING PARAMETERS CONFIGURATION**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starting steps number</td>
<td>65</td>
</tr>
<tr>
<td>Deviation Up</td>
<td>2.500 °C</td>
</tr>
<tr>
<td>Deviation Down</td>
<td>0.500 °C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starting steps number</td>
<td>Heating power at the beginning of the test</td>
</tr>
<tr>
<td>Deviation Up</td>
<td>Heating at the maximum power until the indicated variance of the temperature</td>
</tr>
<tr>
<td>Deviation Down</td>
<td>Heating power indicated at the beginning until indicated variance of the temperature</td>
</tr>
</tbody>
</table>
WARNING  
It is possible to carry out the test for the softening point determination only by buying the relative license.

Test configuration

With water:

- **Test description**: [Description]
- **Standard**: Water
- **End test**: 80 °C
- **Rate**: 5.0 °C/min
- **Measured temperature**: 19.9 °C
- **Balls position**
- **Temperature gradient**

With glycerol:

- **Test description**: [Description]
- **Standard**: Glycerol
- **End test**: 150 °C
- **Rate**: 5.0 °C/min
- **Measured temperature**: 24.3 °C

**Parameters:**

1) **Test description**
   Alphanumeric value, it is a description that is saved together with the data of the test.

2) **Standard**
   Test type. With water and glycerol

3) **End test**
   Maximum temperature which causes the end of the test.
1. to start the test execution with the desired parameters.

2. to close the test execution screen.

• **Preheating**

In case the measured temperature is lower than that required for the test start (30 °C for the test in glycerol and 5 °C for the test in water), a preheating stage starts, where the liquid will be slowly brought to a temperature suitable to the test. The required time is about 15 minutes.

At the end of the preheating, place the balls and confirm.
• **Test execution**

During the test execution the trend can be shown through two screens:

1) Numerical display.

![Numerical Display Diagram]

- Time passed from the start of test
- Actual value of the temperature
- Temperature of the balls fall
- Error detected in the maintenance 5°C/min gradient

2) Graphic display

![Graphic Display Diagram]

- Graphic with the trend of the temperature over time

The temperature will rise with a fixed gradient of 5 °C per minute.

**COMMANDS**

1. to switch from the numerical visualization to the graphic one and vice versa

2. to stop the test execution.
• **Ball fall**

During the test execution, when one of the ball falls down and touch the specific plate, the temperature is recorded and reported in the specific tab.

![Temperature display](image)

- Left ball is not yet fallen
- Temperature of the right ball fall

• **Test stop**

The test will stop when the second ball falls or the maximum temperature is reached.

To manually stop the test execution it is possible to touch the key or press .

**Test results**

At the end of the tests, the results are shown through two screens:

1. Numerical display.

![Numerical display](image)

- Ball fall temperature
- Average value and difference between the two temperatures
2. Graphic display.

![Graphic display]

**COMMANDS**

1. to switch from the numerical visualization to the graphic one and vice versa.

2. to save (it is necessary to insert into the slot, an SD card or a Pen-Drive) or send to the thermal printer the test results.

3. to close the screen of the test execution.

---

**Printing and storage of the test results**

- Save the test on SD-Card or Pen-Drive
- Print on thermal printer
- Print on USB printer (PCL compatible)

**COMMANDS**

1. to close the printing and storage screen
Chapter 6  MACHINE REGULATION AND TUNING

The first time these operations must be performed by qualified personnel in the presence of the operator in charge. (Standard EN 292-2 art. 5.5 1d)

DEVICE TO DETERMINE THE POSITION OF BALLS AND SPECIMEN

The device is regulated and calibrated, and meets the requirements foreseeen by the Standard under the below conditions:

<table>
<thead>
<tr>
<th>Condition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid used</td>
<td>glycerine</td>
</tr>
<tr>
<td>Graduation on the glass</td>
<td>toward the operator (see picture 2)</td>
</tr>
<tr>
<td>Working temperature</td>
<td>90°</td>
</tr>
<tr>
<td>The glass must lean</td>
<td>against the front part (toward the operator) of the guide hole where it is placed (see picture 2).</td>
</tr>
<tr>
<td>Manufacturer’s original glass</td>
<td>600ml, well cleaned in order not to limit its transparency (see picture 2)</td>
</tr>
<tr>
<td>The framework for balls must be placed</td>
<td>above the support columns; let the references of the frame correspond to those of the column (see picture 1)</td>
</tr>
</tbody>
</table>

Make sure that the above conditions are carefully respected. In case the above conditions are not respected, the determination of the position of the balls might not be executed properly.

Please consider that external factors, such as anomalous light beams, impurities in the liquid of the thermostatically controlled bath, and electrostatic currents, may affect the correct detection even if all the working conditions are respected.

In this case, check once again that the working conditions are carefully respected. If the detection of the ball position is still uncorrected, the detection device will have to be adjusted in order to restore the correct functioning.

**WARNING**

Use the calibrating rods (supplied upon request) that simulate the balls and also check all the test conditions (such as temperature, the liquid of the thermostatic bath, the position of the ring that contains the specimen and of the centring device) in order to adjust the equipment.
The following errors may happen:

1. The ball or the specimen position is not detected or it is detected even if not present
2. The ball or the specimen position is detected at a wrong height

**HOW TO CORRECT ERROR 1**

| WARNING | The below procedure has to be carefully followed and sometimes needs to be repeated more than one time in order to obtain the desired results. |

We suggest to perform the test in a place not much lighted in order to better see the light beam issued by the detecting device. The ball position is controlled by a light beam emitted by a transmitter and received by a receiver. The ball position is automatically detected when the ball or the bituminous specimen interrupts the light beam during the fall.

If the ball or the specimen position is not detected or it is detected even if not present, adjust the transmitter and the receiver directions.

- Rotate the carter that covers the detection devices by unscrewing the relevant fixing screws.

- Place the following parts on the apparatus: the glass that contains the glycerine, the framework for specimens and balls along with the ring that contains the specimen and the balls centring device. Do not put the balls or the calibration rod on the apparatus (see picture 6).

- Bring the glycerine temperature to 90°C
The display has to show that the balls are in their highest position; a green light has to appear on the receiver. If this condition does not occur, follow the “A” Procedure.

If this condition does not occur, manually rotate the horns in support of the sensors.

Next, insert the calibrating rods into the framework for specimens and balls, paying attention to centre the balls centring rings, until the spherical side will lean on the lower plate of the framework.

The display has to show that the balls are in their lowest position; the green light of the receiver will turn into orange or to green-red.

If this condition does not occur, manually rotate the horns in support of the sensors.
**HOW TO CORRECT ERROR 2**

**WARNING**  
The below procedure has to be carefully followed and sometimes needs to be repeated more than one time in order to obtain the desired results.

By acting on the screws that support the framework (see picture 9) the operator can change the distance of the ball from the lower side of the ring that contains the specimen. The lower side is the point in which the temperature is detected.  
By unscrewing the screw anticlockwise, the distance from the lower side of the ring increases, while screwing the screw clockwise, the distance decreases.  
Each screw adjusts the position of the nearest ball: therefore the operator has to act on the left screw to adjust the position of left ball or on the right screw to adjust the position of the right ball.

For a correct functioning of the apparatus, we suggest to adjust the screws in such a way that the ball position is visualized on the display when the ball is placed at a distance of about 2-3 mm from the lower plate of the framework.

N.B. the check has to be performed by using the calibrating rods.

---

**Capitolo 7  IN FUNCTION - USE**

<table>
<thead>
<tr>
<th>DANGER WARNING</th>
<th>Before setting the machine in motion it is essential that the Operator and Safety Manager have read the Instructions Manual and understood all parts of the machine and activities linked to it (Risks, Dangers, Functionality, Operation, Protections, Commands, etc.)</th>
</tr>
</thead>
</table>

**7.01 MACHINE CALIBRATION – METERS - INDICATORS**

The machine is checked in the factory, using sample equipment periodically checked by officially recognised institutes. These checks cannot guarantee that the machine, meters and indicators will provide accurate values and results conforming to the standards in force in the countries the machine has been installed and used in. Normally such norms envisage calibration check after every movement. In order to obtain correct values and results it is therefore VITAL that the operator, once the machine has been installed and set up and before official tests, has an officially recognised body check the machine characteristics, its calibration and results/values reliability. The manufacturer is exempt from all responsibility in the case of direct and indirect damage from use of the machine without officially approval by the relevant bodies.

**7.02 SWITCHING THE APPLIANCE ON**

Put the general power button B9 to the “I” position in order to switch the appliance on.
In order to allow a beginner operator to properly equip the appliance, follow these correct procedures:

Place the bitumen specimens into the rings, as described by the **UNI-EN 1427 Standard**, and put the rings and the centre squares into the framework (B5), as shown in the picture.

Put the glass (B2) full of water or glycerine liquid on the heating surface.

**WARNING**

To enable the appliance to work properly it is necessary that the glass graduation is turned toward the operator and does not interfere with the range of action of the laser sensors, which detect the balls position.

- Put the agitation magnetic bar (B8) at the bottom of the glass (B2).
- Place the framework (B5) into the glass (B2) as shown in the picture.
- Put the temperature probe (B1) into the centre of the framework (B5) in a vertical position (with reference to this action have a look at the instructions given by the Standard).
- Now the appliance is ready for the test.
7.04 SWITCHING THE APPLIANCE ON
See paragraph “softening point”

7.05 NORMAL STOP
To manually stop the test run, you can press the button or press the button.

7.06 EMERGENCY STOP
In case of emergency the test can be immediately stopped putting the general power switch (B9) on “0” position.

7.07 START UP AFTER EMERGENCY
To re-start the appliance the operator must simply put the general power switch (B9) on “1” position. The normal functions will be restored.

DANGER Before re-starting the appliance determine and eliminate the causes of the emergency stop

7.08 TEST START UP
Before using the appliance regularly check it is working correctly by carrying out at least one complete empty cycle according to the previous instructions.
Should there be any problem consult the chapter “DIAGNOSTICS”.
If the instructions in this manual do not provide the solution to the problem, contact Sales Assistance.

7.09 PRACTICAL EXAMPLE OF USAGE
- Connect the temperature probe to the connector (A3) placed on the back side of the appliance. Place the probe in its appropriate place in the framework.
- Plug in the power cable in its appropriate connector placed close to the general power switch (B9) and connect the other end to a 230V tap, endowed with fuse 16A.
  1. Place the appliance on a plane surface as described in chapter “LOCATION”
  2. Follow all the procedures described in chapter “ASSEMBLING PROCEDURES”.
  3. Put the specimens into the rings and then put the rings into the provided appropriate framework (B5) (see chapter “EQUIPPING”)
  4. Prepare the water (or the glycerine) into the provided glass (B2) following the procedures described in the EN1427 and ASTM D36 Standards; then place the glass on the heating surface.

WARNING N.B. To enable the appliance to work properly it is necessary that the glass graduation is turned toward the operator and does not interfere with the range of action of the laser sensors, which detect the balls position.

  5. Place the agitator magnetic bar (B8) at the bottom of the glass.
  6. Position the framework (B5)
  7. Then put the probe (B1) into the framework as described in chapter “EQUIPPING”.
  8. Switch the appliance on (see chapter “SWITCHING THE APPLIANCE ON”)
  9. If necessary, carry out the pre-heating phase as described in chapter “PRE-HEATING”.
  10. Carry out the heating phase as described in chapter “HEATING” and end the test.
DANGER

All the operations of maintenance, checking and control must be carried out by personnel professionally qualified and knowledgeable about machine and mechanisms. All the operations must be carried out when the machine is switched off and with the feeding cable physically separated from a knife switch of feeding. It is permitted to use only the original spare parts. The use of not original spare parts free the constructor from the responsibility.

8.02 PERIODIC CHECKS

The laser sensors must be kept clean in order to work properly. Periodically clean the appliance in order to preserve it and its efficiency. No particular maintenance is required.

DANGER WARNING

Do not perform maintenance – interventions on the machine which have not been quoted and described in this instructions manual without first contacting the manufacturer. Periodically clean all machine parts and oil the unpainted parts in order to preserve the machine and its efficiency. Avoid the use of solvents which damage paint and parts in synthetic material.

8.03 EXTRAORDINARY MAINTENANCE

For extraordinary maintenance operations refer directly to the Manufacturer.

8.04 AUTHORISED MAINTENANCE CENTRES

For information on the nearest authorised help centre it is essential to contact the manufacturer.

Chapter 9 GUIDE TO RECOGNISING DAMAGE AND ANOMALIES

This chapter presents and discusses all the simple problems which could occur during machine use. The appropriately qualified, professional personnel must carry out all the maintenance procedures, check and control, as well as all the repair operations on parts of the machine or the electrical system. Contact Technical Sales Assistance for any other problem not listed on the previous table or should the malfunctioning persist after the intervention of the operator in accordance with the previously mentioned courses of action.

Chapter 10 SPARE PARTS

WARNING DANGER

Only original spare parts can be used. Use of unoriginal spare parts exempts the manufacturer from all responsibility. Procedures for substitution of spare parts will be provided by the manufacturer along with the part. For spare parts contact the manufacturer’s Sales Service department.

Capitolo11 INACTIVITY

Ensure all machine parts are in safe working order before operating it again should the machine be inactive for a long period of time. When in doubt contact the Manufacturer.

Chapter 12 DECOMMISSIONING THE MACHINE

Should it be decided that the machine is to be no longer used, proceed as follows:
• Disconnect the electrical supply network by removing the connecting cable therefore making it unusable.
• Make the potential sources of danger harmless, such as sharp or protruding parts.
• Dismantle the machine; divide it into similar parts and dispose of according to the standards in force

Recycling notice for the disposal of electrical and electronical devices
This symbol, shown on the device or on the package and/or the documentation, suggests that the device should not be disposed together with other home garbage at the end of its life cycle.

To avoid further environment, or health-care damage, caused by the unsuitable disposal of garbage, the user should separate this device from other different types of garbage and recycle it in responsibly to avoid the reuse of material resources. Users must take care at the disposal of the equipment by taking it to the nearest recycling site for appropriate recycling treatment for electrical and electronical devices. Gathering and Recycling deplete devices allow the preservation of natural resources and grant them the adequate treatment by respecting health and environment.

For further information on your local recycling site please contact your local council or city waste treatment department. The developer, as producer of electrical and electronical devices, will provide to finance the recycling and treatment services for deplete devices that will come back through these recycling sites, according to the local statement.
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BACKLIGHT DISPLAY
Cavo Display Cable
Cavo Tasti Dock

Display Cable

Keyboard Cable